Affordances of digital technologies for autonomous language learning: A Q-methodological research

Doctor of Philosophy

Institute of Education

Ismail Karaoz

November 2020

Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

Ismail Karaoz

Abstract

Autonomous language learning, which can be defined as learners' taking control of their language learning, has recently seen a growing interest both from researchers and practitioners. It has been suggested that autonomous language learning is more effective than learning non-autonomously. Therefore, there have been educational interventions with several technologies with the aim of promoting autonomous language learning, and it has been observed that technology can support autonomous language learning in many ways. However, most existing studies have generally focused on the effect of one specific technology and without a clear theory to explain the relationship between autonomous language learning and technology. The present research argued that preventing learners from choosing technologies freely is incongruent with one of the most important elements of autonomous language learning, which is the freedom to make choices. Therefore, in order to shed fresh light on the relationship between technology and autonomous language learning, the present study aimed to explore the affordances of digital technologies for autonomous language learning by adopting the tenets of the theory of affordances.

In contrast to previous studies, this study conceptualized technology as a digital environment rather than as a device or tools system and explored this relationship through the lens of technologies which the students had already been using, thereby without limiting them into one single technology. It used Q methodology pursuant to the aim of providing a systematic analysis of the affordances of digital technologies for autonomous language learning. Within its bespoke data collection structure, twenty participants from an upper-secondary school in Norway were first interviewed with semi-structured interviews. In the second tier of data collection, data were collected from a different group of twenty-four participants with nominal group technique. After the analysis of data from first two tiers, a set of forty-five single statements were generated to be used in the third and last tier of the data collection. By online means, forty-two students were asked to sort and rank these statements (Q-sort) concerning the aim of research (i.e., the affordances of digital technologies for autonomous language learning). Findings suggest that digital technologies afford learners to find their own English learning resources; learn English in more natural ways; and learn English in a more systematic and organised way. In light of results, it can be argued that educational interventions with one specific technology restrict how autonomous language learning can manifest itself. It could also be suggested that learners need to be allowed more freedom to choose technologies if the hidden affordances in digital environments are to be realized and attended to for autonomous language learning.

Acknowledgements

I would like to take this opportunity to appreciate and acknowledge the valuable contribution and cooperation of various persons in completion of this research.

First and foremost, I would like to express my sincere gratitude to my supervisor Dr. Geoff Taggart for his continuous support and genuine guidance throughout this research project. I would also like to extend my thanks to my second supervisor Dr. Billy Wong and my former first supervisor, Dr. Berry Billingsley, for her support and guidance at the early years of my research work.

I would also like to express my sincere thanks to all the respondents that have spent their valuable time to participate in this project.

Lastly, I also wish to extend my thanks to my beloved wife and parents who have always supported me from their heart at all times.

Contents

List of Figures

List of Tables

List of Acronyms

ALS: Adaptive Learning Systems

ASR: Automatic Speech Recognition

BETT: British Educational Training and Technology

CALL: Computer-Assisted Language Learning

CFA: Centroid Factor Analysis

CMC: Computer-Mediated Communication

CMS: Course Management System

CRAPEL: Centre for Research and Pedagogical Applications in Language Learning

ESOL: English for Speakers of Other Languages

EV: Eigenvalue

LMOOC: Massive Open Online Courses of Languages

MOO: Multi-user Object Oriented

OILE: Online Informal Learning of English

PCA: Principal Component Analysis

VLE: Virtual Learning Environment

ZPD: Zone of Proximal Development

Chapter 1 Introduction

This thesis is the outcome of a Q-methodological research study which investigated the relationship between digital technologies and autonomous language learning. The research focused on what affordances digital technologies can provide to the learners of English as a foreign language in an upper-secondary education level in the Norwegian context so that they can take control of their learning. This chapter provides a background to the study by giving a reflexive account of the researcher's positionality to the research; expanding on the philosophical and pedagogical underpinnings of learner autonomy; elaborating on the educational curriculum in Norway; stating the purpose of the research; presenting the research question, research rationale and the research aim, and it concludes by describing the overall structure of the thesis.

1.1 Background to the researcher and positionality

Part of the interest in researching the relationship between learner autonomy and technology comes from my background as an educator and researcher. Cohen, Manion and Morrison (2018, p. 302) argues that '[researchers] bring their own biographies and values to the research situation', and it is possibly because of that a researcher does not start their study 'with a clean sheet' (Denscombe, 2014, p.

88). These arguments in educational research literature suggest that a researcher should reflect on their background for the purposes of positionality. Therefore, this section will present a background account of mine as a teacher and researcher which shaped my personal motivation to start this research which is to explore the relationship between autonomous language learning and digital technologies within the tenets of the theory of affordances by adopting a mixed-method case study approach and by using Q-methodology.

During my BA study, I studied a number of courses such as "Classroom Techniques in Teaching English to Young Learners, Materials Development and Adoption, Language Testing and Evaluation, Educational Technologies and Materials Development, and Computer-Assisted Language Learning" and these courses strengthened my view as a trainee teacher that the students should not be dependent on their teachers in learning English as a foreign language. Yet, when I went to a secondary school for my "Teaching Practice" course, I observed that the students were mostly dependent on their teachers and did not have much control over their learning. There was a mismatch between what I was studying and what was happening in the schools. At these days, this discrepancy sparked a curiosity in me about how the learners of English could be helped to have more control over their language learning and made me consider studying more about this issue, which two years later would lead me to do a masters' study and immediately after a PhD research.

Having graduated from my BA in English Language Teaching degree in 2010, I started working immediately as an English teacher at a university in Turkey where I taught both general English and English for specific purposes courses. During my

two-year teaching career, I believed that the students in my classes should not be teacher-dependent students who would see their teacher, me, as the only source of information to learn English. I believed that these students should be taking as much control over their learning as possible because their teachers, whether me as their English teachers or their other subject teachers, would not be with them all the time after they have graduated from the university. The school could only offer them certain hours of English lessons, but there was no end to learning English. Therefore, they should be able to take more control over their learning and make the best of the opportunities to learn English outside the classroom to improve their English language skills. In my English for specific purposes classes such as English for tourism and foreign trade, I believed that my students should especially be taking charge of their learning. The reason was that they would be looking for and possibly working in tourism and foreign trade jobs where they would not only need general English skills but more specialised level of English. Therefore, it was important for my students to manage their learning, and even continue learning English outside the classroom.

My belief in that autonomous language learning is an important capacity for language learners grew stronger when I started working in the Self-Access Centre for Language Learning at the University of Reading after I started my PhD studentship. I could observe students who were studying academic English and other modern foreign languages looking for extra resources such as books, audio materials or peer support from more advanced learners or speakers of their target language(s). I could see that the students had to do ‘extra’ studying after they have left their classrooms to improve their language skills. While I could observe

this as an administrative staff at my workplace, I was probably feeling the same things as these learners because I was learning German as a foreign language. I was enrolled on a German language course at the university, but it was only three hours a week. Therefore, to improve my German language skills, I was doing extra out-of-class study such as reading books, following news websites and listening to music in German.

While I believed that autonomous language learning was an important capacity to become more effective language learners, in terms of use of digital technologies, I positioned myself with the belief that digital technologies could provide opportunities to students to take control over their learning. Reflecting on my teaching role, I had to follow a certain syllabus for English courses at the university with my fellow teachers, and therefore digital technologies could provide learners with more opportunities to practice English. I could still encourage my students to make use of digital technologies which they could access from their smartphones, desktop computers or laptops. For example, I used to encourage my students to listen to audio materials in English on the Internet, or watch movies in English. As an important sign of taking control over their learning, some of my students would sometimes share their learning strategies such as joining online chat programs where people from other countries would also join and chat in English. In a similar vein, I could observe how digital technologies could be useful for learners to take control over their language learning with the learners who used to come and study in SACLL where I was working during my PhD studentship. Some of the students used to do extra practice on writing and reading skills on ‘Road to IELTS’ software on SACLL computers, watch movies in English by borrowing DVDs from

SACLL archive or do online quiz at Quizlet website. By such ways, I believed that digital technologies would provide opportunities to students that they could not get in the classroom.

Yet, I was also critical about how digital technologies could be supportive of autonomous language learning from some other aspects. First of all, a ‘one-size-fits-all’ understanding would not ‘fit all the students’. In 2012, I stopped teaching English at my university in Turkey and came to the UK for my MA study. When I left my job, the university in Turkey started an online English teaching programme in which all the students who were to take English courses at the university at that time would study English on an asynchronous language learning software which they could access online. One year later, I did research for my master’s dissertation and I explored the attitudes of students towards learning English via such an online platform without the presence of a teacher. One of the findings from this research (Karaoz, 2013) was related to autonomous language learning. According to the results, while some students could select where they would like to learn rather than coming to school and taking control over the time when they would like to do learning, some other students felt that such an online course would cause them distraction when learning English. Also, for some students, the content of the online course was not relevant for their future employment since the content was designed for General English courses rather than English for specific purposes.

To sum up, my work experience as a teacher of English and administrative support worker in SACLL and my research experience from my master’s study

contributed to my beliefs that language learning could not be refined within the limits of physical classrooms. For successful foreign language learning, learners should be taking any opportunities outside the classroom to help them improve their target language skills. In this regard, digital technologies can offer opportunities to language learners which they could not normally get solely from their teachers. However, one single digital technology would not cater to the needs of every language learner. Particularly when more and more people have more access to digital technologies, limiting the learners to one single digital technology would also be in incongruent with their capacity to take control over their learning. Therefore, in this research, I aimed at exploring what digital technologies could offer to language learners in terms of autonomous language learning from the perspective of multiple digital technologies.

To realise my research aim, I wanted to situate my study at a school abroad. I wanted to explore the practices of students abroad learning English by using digital technologies. In order to recruit participants, I first contacted colleges in the UK where English was being taught as an ESOL course and where digital technologies were being used by the students and the teachers. As finding a school that could accommodate my research was proving hard, I expanded my search to schools abroad where English was being taught as a foreign or second language and the digital technologies were being used by the students as well. In the end, a secondary school in Norway where English was being studied as a foreign language and the multiple digital technologies were being used for learning by the learners themselves agreed to take part in my study. Therefore, the Norwegian context was selected to situate my research to explore what digital technologies could offer to

learners in terms of autonomous language learning from the perspective of multiple digital technologies due to its suitability for my research aim. As I read more about autonomous language learning in the Norwegian context, I observed a gap in terms of the use of digital technologies and autonomous learning of English as a foreign language, which supports the focus of my research.

1.2 Background of autonomy in language learning

In addition to a personal motivation to understand the relationship between autonomous language learning and technology, there are also philosophical, theoretical and pedagogical rationales for autonomous language learning, as well. In the English Oxford Living Dictionary (2018), the concept of "autonomy" is defined as "the right or condition of self-government" and "freedom from external control of influence; independence" ("autonomy", 2018). Etymologically, it comes from a combination of two separate words in Greek; *autos* means self, and *nomos* refers to law ("autonomy", 2018). In that sense, the concept of autonomy can be traced back to Ancient Greece where it was used to refer to self-governing states with their laws, hence, originally the concept of autonomy is derived from a political context. Despite being a political concept, autonomy was later applied to individuals as a philosophical concept (Benson, 2011). Particularly, the works of 18th and 19th-century European philosophers such as Immanuel Kant (1724-1804) and John Stuart Mill (1806-1873) became the roots of the idea of personal autonomy (Benson, 2011).

Firstly, Immanuel Kant became influential in terms of bringing the idea of personal autonomy into prominence. Kant's perception of personal autonomy reflects an ideal of a society which is comprised of self-governing individuals. It is also drawn from Kant that in a society "individuals should be treated as 'ends' in themselves, and never as 'means' towards other ends" (Benson, 2011, p. 50). Secondly, John Stuart Mill was another influential philosopher in terms of inspiring the concept of personal autonomy. Mill supported the principle that "individuals should be free to act as they wish, so long as their actions do not cause harm to others" (Benson, 2011, p. 50). For Mill, an ideal society was comprised of such individuals who enjoyed their freedom while maintaining mutual respect with other individuals in society. From the principles of these two philosophers, it can be understood that it is the wellbeing and freedom of individuals within a society that matter most (Benson, 2012). Yet, the idea of personal autonomy as an aspiration brings about the question of how an individual can realise personal autonomy.

Wall (2003, p. 308) suggests that there are a number of requirements for an individual to realise personal autonomy.

> To realize autonomy, one needs several things. One needs at least (1) the capacity to form complex intentions and to sustain commitments, (2) the independence necessary to chart one's own course through life and to develop one's own understanding of what is valuable and worth doing, (3) the self-consciousness and vigour necessary to take control of one's affairs, and (4) access to an environment that provides one with a wide range of valuable options. Elements (1) and (3) refer to mental capacities and virtues. Element (2) refers to one's relations with other persons who could exercise power over one. Element (4) refers to the environment in which one lives.

Benson (2011) elaborates on Wall's (2003) requirements to realize autonomy, suggesting that they indicate freedom from internal and external constraints. While elements 1 and 3 refers to internal and psychological constraints, elements 2 and 4 are more related to external constraints which an individual needs to deal with. According to Wall (2003, p. 308), it is those latter external constraints that the authorities in a governing state should be concerned with and "protect the independence of its subjects and ensure that they have access to a wide range of valuable options". This is because "the state is generally not an effective instrument for cultivating mental capacities and virtues" Wall (2003, p. 308). Therefore, the onus is on the individual to master internal constraints while authorities in an ideal state respect the freedom of individuals who aspire to live autonomously.

On this basis, promoting individuals' personal autonomy has been among the long-term objectives of liberal education systems. It was assumed that one of the most important aims of education was "to develop in individuals the ability to make their own decisions about what they think and do" (Boud, 1988, p. 18), and autonomy in learning is clearly fundamental to this notion. An extract from the Norwegian National Common Core Curriculum for primary and secondary education, which constitutes the basis for creating other subject curricula at various stages of education, exemplifies this:

> Education shall provide learners with the capability to take charge of themselves and their lives, as well as with the vigour and will to stand by others. [Education] must teach the young to look ahead and train their ability to make sound choices, allow each individual to learn by observing the practical consequences of his or her choices, and foster means and manners, which facilitate the achievement of the results they aim at. The young must gradually shoulder more responsibility for the planning and achievement of their own education - and they

> must take responsibility for their own conduct and behaviour. (Trebbi, 2008, p. 42)

This illustrates the kind of autonomous person the state wants learners to become. One possible reason for promoting autonomy through education is that education makes the concept of autonomy less abstract and tangible. To put it another way, education as a setting and process can contextualise autonomy. However, even if personal autonomy becomes the goal of education, it may not be realised at the end of the education process. Boud (1988, p. 20) argues that:

> As long as autonomy remains as an abstract concept divorced from any particular situation, it can be an ideal to which we can aspire, but it is not something which we can realistically expect to emerge from any given course.

Benson (2011, p. 53) elaborates on this argument, stating that:

> A commitment to the fostering of learner autonomy *within* educational processes [...] takes us a step further than a more general commitment to the fostering of personal autonomy as an eventual *outcome* of these processes [italics in original].

Therefore, it is possible to understand that to achieve personal autonomy as a goal of education, learners should exercise autonomy during their education. According to Benson (2000), being free from constraints in learning and providing learners with a satisfying variety of learning choices within the learning environment can, indeed, be regarded as non-radical components of learners' rights that lead to personal autonomy. In other words, Benson (2009, p. 26) states that teachers, or those in the role of educators, should take over the responsibility to "support their [learners'] autonomy as far as we [teachers] are able by creating the conditions in which it [autonomy] can flourish". Only then, as Boud (1988) put it, can autonomy

become ideologically dreamed and desired and be more likely to be achieved as a goal rather than becoming a concept divorced from a specific situation and environment.

According to the ideological argument for autonomy in learning, it is the right of an individual to have the freedom to make his or her own decisions in education as well as in other areas of life. For this reason, autonomous learning practices are considered "emancipatory practices, contributing to the good of the individual and of society" (Ciekanski, 2007, p. 112). Turning to language learning, the topic of the present study, for Hamilton (2013, p. 18), being autonomous in language learning has more wide-ranging effects beyond learning, including an individual's ability to "communicate independently". According to Littlewood (1996, p. 429), being able to learn and communicate independently are "major factors enabling a person to make choices in life", which ultimately "contribute to each learner's autonomy as an individual". In a similar vein, Macaro (2008, pp. 59-60) states that:

> Having a choice in their [learners'] own language learning means the language learner or user taking control not only of the language being learnt, but also of the goal and purpose of that learning [since] autonomy resides in being able to say what you want to say rather than producing the language of others.

Within this perspective, autonomy in language learning can be considered as a subset of autonomy in learning as a whole, where learners can exercise being autonomous within the process of education. By having choices and making decisions about their language learning, learners can learn to become autonomous in their life after education. Particularly, what Macaro (2008, p. 60) refers to as one's being able to "say what [s/he] want[s] to say rather than producing the

language of others" is in line with what Wall (2003, p. 308) refers to as developing "one's own understanding of what is valuable and worth doing" as a requirement to become an autonomous individual.

Apart from its philosophical underpinnings, autonomy in language learning has been regarded as important for a number of other reasons. From a psychological perspective, learners will learn a language more successfully when they take responsibility for their learning because cognitive, social and affective dimensions also matter in the learning process (Dickinson, 1987). For Crabbe (1993, p. 443), once a learner is in charge of his or her learning, learning becomes "more meaningful, more permanent, [and] more focused on the processes and schemata of the individual". Furthermore, it has been suggested that autonomy can increase language learners' motivation to be more committed to the language learning processes once they are more involved and proactively engaged in these processes, especially through reflection on their learning (Dafei, 2007). Lastly, autonomous language learning is particularly important when "the increased need for plurilinguistic competence" has become one of the "constant changes the modern world is undergoing" (Vázquez, 2016, p. 97). Within this constantly changing environment, it is difficult for learners to rely on formal language education within educational institutions throughout their life. Therefore, learners need to acquire lifelong learning skills through autonomous language learning practices (Ciekanski, 2007) to "acquire the knowledge and skill they want" (Crabbe, 1993, p. 443), particularly once they have left formal education (Le, 2013).

1.3 The rationale for the research

Given its importance, there existed a relationship between digital technologies and learner autonomy. Technology is generally related to an individualised and learner-centred form of education, and it is generally believed that individuals learn better and more successfully when they "use technology to participate [in learning] on a flexible and autonomous basis" (Selwyn, 2017, p. 148). In the 1970s, autonomy as a concept was introduced into language learning field when self-access centres for language learning were established by the Centre for Research and Pedagogical Applications in Language Learning (CRAPEL), and technology played an important role in terms of facilitating autonomous language learning (Lai, 2017). The learners in such centres were provided with computer programs for language learning activities in (Lai, 2017), and they were able to make decisions regarding their own learning objectives, progress and assessment (Riley & Zoppis, 1985). Since then, due to this growing interest in learner autonomy in language learning and continuing technological developments, noticeable attempts have been made with technology-based approaches to foster learner autonomy in language learning (Benson, 2011). As Schmenk (2005, p. 107) states, "the popularity of learner autonomy may be at least partially related to the rise of computer technology and the growing importance of computers in language learning environments worldwide".

While technology may have the potential to provide opportunities for autonomous language learning, the mere presence of technology (e.g. mobile devices and the internet) and their use for personal needs, particularly beyond the classroom

environment, do not necessarily result in autonomy in language learning (Stockwell, 2012). Arnó–Macià (2012, p. 96) concurs, arguing that the presence of technology does not directly lead to autonomous language learning, but it can facilitate it "as long as appropriate conditions are met, such as providing choices, relevant materials, learner training, reflection, scaffolding, and support". Indeed, the notion of 'appropriate conditions' is also emphasized by Benson (2011, p. 2), who suggests that learner autonomy can be developed when suitable conditions are provided: "One condition for the development of autonomy is the availability of opportunities to exercise control over learning". Yet, it can be argued that providing the students with an appropriate technological environment does not guarantee that they will realize their autonomous language learning capacity (Mason, 2001). In addition to that, it can also be argued that an attempt to foster learner autonomy through one particular technology-based practice may not appeal to each learner at the same level. Therefore, the benefits of the opportunities provided by technology are likely to differ from one learner to another. For this reason, as Hamilton (2013) argues, if educators' purposes are to provide "the conditions in which it [autonomy] can flourish" (Benson, 2009, p. 26), "it is necessary that we have a clearer understanding about the nature of the relationship between technology and autonomy" (Hamilton, 2013, p. 10).

Based on such calls in the literature to look at this relationship much closer, this research's rationale is to explore this relationship between technology and autonomous language learning from the perspectives of students at a Norwegian upper-secondary school with a focus on how students use digital technologies on their own without the direct control of their teachers for learning English. The study

has been situated at a Norwegian school because no studies so far looked at this relationship in the Norwegian context, thereby creating a scope for a clear understanding of what such 'conditions in which [autonomy] can flourish' (Benson, 2009, p. 26) from students' perspectives.

This research will be a single case study, and it will be focusing on the Northview School which is an upper-secondary school in Norway (the research site will be referred with a pseudonym of Northview School hereafter). The findings are likely to have implications for senior leaders and teachers of English within Northview school in terms of pedagogical recommendations to foster autonomous language learning of their students by using digital technologies. The findings from this research may also have relevance to teachers of English as a foreign language in other contexts, and possibly for other language teachers, too.

As it will be further discussed in section 1.5 "Background to the education system and curriculum in Norway", the national curriculum of Norway does not prescribe methods for teachers to use for their teaching. Yet, English subject curriculum, for example, states competence aims which can be seen as a combination of autonomous language learning and use of digital technologies, such as "[to] select different digital resources and other aids and use them in an independent manner in own language learning" (Utdannings-direktoratet, 2013). As a result, such competence aim requirements in the curriculum and lack of guidance in terms of methods to be used to meet such competence aims pose the risk of teachers turning to more teacher-centred teaching practices to achieve competence aims (Haglund, 2018). Therefore, findings from this study can shed a light on how teachers of English as a foreign language can facilitate autonomous language learning while at

the same time meeting the competence aims in the curriculum by using digital technologies.

With its focus on language learner autonomy, this study is not the first one in the Norwegian context. There have been studies related to language learner autonomy. For example, Knaldre (2015) compared two Norwegian national curricula to find out how learner autonomy is promoted within each curriculum. In another study, Haglund (2018) investigated English as a foreign language teachers' perceptions of learner autonomy at the upper-secondary level of education. In terms of the relationship between learner autonomy and technology, Cruaud (2018) studied the relationship between gamification and language learner autonomy by looking at how a gamified web-based application which was developed for French as a foreign language in upper-secondary school in Norway could support autonomous language learning. Yet, the focus of this study was on a single web-application and French as a foreign language. In another study, Vestnik (2020) investigated how teachers of English as a foreign language facilitate learner autonomy in Norwegian high schools but without a clear focus on the use of digital technologies. Therefore, this study also aims to fill this gap in the literature in the Norwegian context by looking at the relationship between digital technologies and learner autonomy in English as a foreign language in a Norwegian upper-secondary school.

1.4 Aims of the research

The main aim of this research is to find out what autonomous language learning related affordances that digital technologies provide to students who study English

as a foreign language in a Norwegian upper-secondary school. It aims to investigate and understand the relationship between technology and autonomous language learning with regards to the affordances that digital technologies provide to learners to take control of their learning. As a result, informed recommendations can be made for future technology-based practices to develop language learner autonomy. To achieve this aim, this research uses the theory of affordances (Gibson, 1979) as a theoretical framework to explain the relationship between technology and learner autonomy in language learning. This research also shifts the focus from one single technology to explore the digital technologies that the learners were using at the time of the research as part of their English language learning experiences. While focusing on multiple digital technologies, this research conceptualises technology as a digital environment rather than as a tool or a device.

Under this aim, this research did not make a distinction between in-school provision and out-of-school provision of autonomous language learning. In fact, it aims to find out what affordances that digital technologies, whether they are used inside or outside the school, provide to students for autonomous language learning. Still the school learning may have provided an input on autonomous language learning outside the school. Curricular activities and tasks assigned by the teacher to be completed outside the school may have also shaped the ways how students were studying autonomously. Yet, this study focused on affordances of digital technologies without making a distinction between inside and outside the school.

1.5 Background to the education system and curriculum in Norway

This research adopted a case study approach to explore the relationship between autonomous language learning and digital technologies, and a secondary school in Norway was selected for the site where this research was situated. This section will, therefore, present background information and a reflection and discussion of the structure of the curriculum in Norway with a particular focus on the subject curriculum of English as a foreign language. Yet, to make this discussion and reflection on curriculum more meaningful, this section will first present a brief overview of information about the education system in Norway.

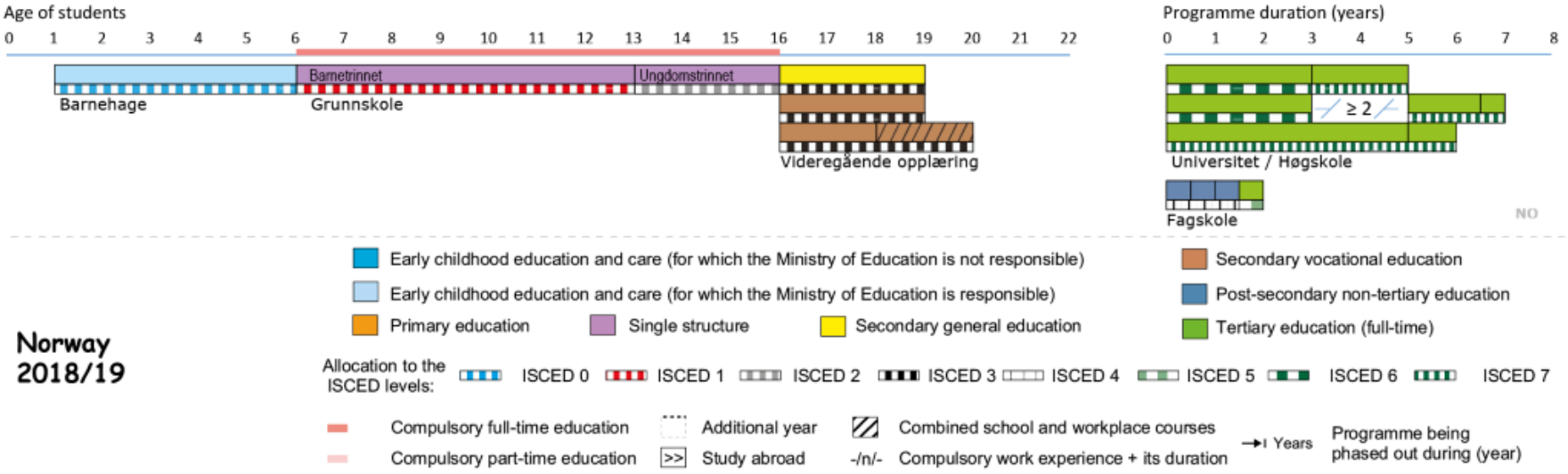
1.5.1 Structure of the education system in Norway

The education system of Norway can be traced back to cathedral schools in middle ages, but it was with the reforms starting in the mid-18th century that education began to take its current structure in Norway. In 1889, seven-year primary education was made compulsory for children aged between seven and fourteen, and this was later increased to nine years with the educational reform in 1969. In 1974, a comprehensive school system was introduced for the primary and lower secondary levels while selective school placement system was discarded (Trebbi, 2008). In the meantime, the upper secondary schooling was re-organised in 1976 following the changes in the educational system in 1974. Before 1974, upper secondary schools consisted of *gymnas* which provided education particularly to prepare the students for higher education and *yrkesskoler* which provided

vocational education. Both these schools were merged and unified into one school and what is currently known as *videregående skole* was created. According to Trebbi (2008, p. 40), such reforms in 1974 and 1976 aimed to maintain a continuous education for every student regardless of their background and "to provide equal access to education- education being viewed as a means of overcoming social inequality", which resulted in individual differences of the students in terms of learning being taken into consideration during teaching. Therefore, it is claimed that the roots of learner autonomy can be traced back to the years in the mid-1970s in the education system in Norway (ibid).

The reforms in the 1990s brought about a number of other changes in the structure of the education system in Norway (Eurydice, 2019a). First of all, the nine-year compulsory education for primary and lower secondary schools was increased to 10 years. In 1994, students were also given a statutory right to continue to upper secondary education once they finished their primary and lower secondary education. While this upper level of secondary education has not been made compulsory, the students who wish to continue their education are entitled to this right. Finally, the education system in Norway took its current structure with another educational reform in 2006, *Kunnskapsløftet*, which means Knowledge Promotion. With this latest educational reform, the structure of the education system in Norway can be represented in Figure 1 (Eurydice, 2019b).

Figure 1 Structure of the education system in Norway



Within this structure, *Barnehage* refers to the early childhood education and care level in the Norwegian education system. It is not a compulsory level, but the children can go to barnehage from the age of one until the age of six when they start the primary level of education. The compulsory ten-year education, *grunnskole*, starts at the age of six and it is comprised of two main stages. These are *barnetrinnet* which refers to primary level and covers grades one to seven, and *ungdomstrinnet* which refers to lower secondary school level and covers grades eight to ten. After the students have finished their grunnskole education, they can start upper secondary education which is *videregående opplæring* in Norwegian, and it covers the grades eleven, twelve, and thirteen. The students at upper secondary education are aged between sixteen and nineteen, but some students can be older than this age group. While this level of education is not compulsory, as it has been stated, the students have a statutory right to continue their upper secondary education. The upper secondary school can take up to four years depending on the education programs. As it can be seen from the area highlighted with yellow and brown colour in Figure 1 above, upper secondary school in Norway comprises of general studies programmes, which are also called *studieforberedende utdanningsprogram* (study preparatory education program) and vocational education and training programmes, which is referred as *yrkesfaglige utdanningsprogram* in Norwegian.

Finally, the students can continue to study at a college or university after they have finished their upper secondary education. Higher education level is structured in the form of a bachelor degree which takes three years; master degree which is two years; and three-year PhD level. Yet, the students may also opt to study at *fagskoler*

which provides a vocational education within the timeframe of half a year to two years.

1.5.2 Structure of English subject curriculum in Norway and how it was implemented in the research site

English is one of the core compulsory subjects taught at every grade in Norwegian schools, from grade 1 in primary school to the end of upper secondary education. English subject curriculum is represented with ENG01-03 code. It is given a varying number of teaching hours according to the school grades. In grades 1-4, English is given 138 teaching hours while this increases to 228 hours in grades 5 to 7. In the lower secondary school which comprises the grades 8-10, it is given 222 teaching hours. When it comes to upper-secondary education, it is given 140 teaching hours in the first year (VG1) of general studies programmes, but when it comes to vocational educational programmes, the teaching hours are divided as 84 hours in the first year (VG1) and 56 hours in the second year (VG2) of upper secondary education (Utdannings-direktoratet, 2013).

While the English subject curriculum is a single document, it is implemented in schools in the light of other legal documents. The first and foremost of these documents is the Education Act of Norway (Act relating to Primary and Secondary Education and Training, 1998) which regulates primary and secondary education levels in Norway. This act constitutes the basis of the further legal documents which constitute the curriculum for education in Norway including English subject curriculum. The current curriculum in Norway was established with the education and curriculum reform of *Kunnskapsløftet* which translates as *Knowledge*

Promotion (LK06) (henceforth, LK06 curriculum) in English, and it came into effect with the 2006/07 school year. LK06 curriculum consists of a number of different regulatory documents which are related to one another. These are the regulations of the Education Act:

- National core curriculum for primary, secondary and adult education in Norway (Utdannings-direktoratet, 2011a)
- Quality framework (Utdannings-direktoratet, 2011b)
- Subject and hourly distribution (Utdannings-direktoratet, 2019)
- Curricula for subjects (Utdannings-direktoratet, 2013)

National core curriculum is the overall curriculum for the primary, secondary, and adult education in Norway, and it elaborates on the main objectives in the Education Act of Norway. It constitutes a 'binding foundation for the development of separate and subject curricula at different levels of education' (Trebbi, 2008, p. 42), and it is comprised of the core 'values and visions' for the education levels from primary to adult education (Knaldre, 2015, p. 40). *Quality framework*, or Principles of Training in another name, represents a bridge between the national core curriculum and the subject curricula (Utdannings-direktoratet, 2011b). The principles within this document are based on the values and visions in the core curriculum, and it expands on how education is carried out according to the laws and regulations. Similar to the national core curriculum, the principles of the quality framework are valid for all educational levels. The essential principles which are outlined and explained in the quality framework include social and cultural competence, motivation for learning, learning strategies, student participation, tailored training, roles and competences for teachers and instructors, home collaboration and

collaboration with the local community (Utdannings-direktoratet, 2011b). *Subjects and hourly distribution* regulation provides an overall guideline to schools and it outlines how many teaching hours each subject should be given in primary and secondary education (Utdannings-direktoratet, 2019). Finally, *curricula for subjects* deal with the curriculum of individual subjects. Each subject's curriculum starts with the purpose of the relevant subject and continues with main subject areas which explain how the competence goals should be understood and education should be provided. Each subject curriculum also specifies the competencies for different stages at the primary and secondary level and explains the basic skills which are required to achieve competences within each subject.

English language's importance is recognized within the subject curriculum's purpose section:

> English is a universal language. When we meet people from other countries, at home or abroad, we need English for communication. English is used in films, literature, songs, sports, trade, products, science and technology, and through these areas many English words and expressions have found their way into our own languages. When we want information on something of private or professional interest, we often search for it in English. In addition, English is increasingly used in education and as a working language in many companies (Utdannings-direktoratet, 2013, p. 2).

It is possible to understand from the quote above that it is important for students in the Norwegian context to master English language skills not just for academic success, but because English has been a universal language. It is also highlighted in the subject curriculum that English will provide learners with opportunities in terms of personal development. The *purpose* of the English subject curricula (2013, p. 2) states that**:**

> It is also important to establish our own goals for learning, to determine how these can be reached and to assess the way we use the language.

> Learning English will contribute to multilingualism and can be an important part of our personal development. […] English as a school subject is both a tool and a way of gaining knowledge and personal insight. It will enable the pupils to communicate with others on personal, social, literary and interdisciplinary topics. The subject shall help build up general language proficiency through listening, speaking, reading and writing, and provide the opportunity to acquire information and specialised knowledge through the English language. Development of communicative language skills and cultural insight can promote greater interaction, understanding and respect between persons with different cultural backgrounds. Thus, language and cultural competence promote the general education perspective and strengthen democratic involvement and co-citizenship.

Based on this purpose, English subject curriculum is structured into four main subject areas of competence aims. Overall, the concept of competence aims has been one of the most important changes with the new LK06 curriculum, and they describe what each student should be able to once they have finished certain stages of education. The competence aims of English subject curriculum is organised with four main subject areas as shown in Table 1, but these aims vary according to the stages of education (Utdannings-direktoratet, 2013). Currently, the competence aims are specified to be achieved after year 2, year 4, year 7, and VG1 for general studies and VG2 for vocational education programmes.

Table 1 Main subject areas in English subject

Year	**Main subject areas**			
1-10 **Vg1** **Vg2** **(vocational education programme)**	Language learning	Oral communication	Written communication	Culture, society and literature

Language learning subject area is related to what it takes to learn a language other than a student's first language. This subject area focuses on 'knowledge about the language, language usage and insight into one's own language learning' (Utdannings-direktoratet, 2013, p. 3). It is possible to understand from the competence aims after VG1 for general studies and VG2 for vocational education programmes in this subject area that studies aim to make students more independent in their language learning by making them more reflective on their language learning. For example, in terms of monitoring progress, the students are expected to be able to "evaluate own progress in learning English" (Utdannings-direktoratet, 2013, p. 10). In a similar vein, the students are also expected to be able to "evaluate different digital resources and other aids critically and independently and use them in own language learning" (Utdannings-direktoratet, 2013, p. 10). Finally, in language learning subject area, the students are expected to have gained skills to continue learning English beyond what they have been provided by the school. For

example, one competence aim states that the studies in English subject should aim at enabling the students to "evaluate and use different situations, working methods and learning strategies to further develop one's English-language skills" (Utdannings-direktoratet, 2013, p. 10).

The second main subject area, *oral communication*, focuses on students' developing an understanding of and using English language 'by listening, speaking, conversing and applying suitable communication strategies' (Utdannings-direktoratet, 2013, p. 3). The students are expected at this subject area to be able to "evaluate and use suitable listening and speaking strategies adapted for the purpose and the situation". It is also important in this subject area that the students develop a repertoire of English vocabulary, idiomatic structures and grammatical patterns. For example, one competence aim states that the students should be able to "understand and use a wide general vocabulary and an academic vocabulary related to his/her own education programme" (Utdannings-direktoratet, 2013, p. 10).

In *written communication* subject area, the focus is on "understanding and using English language through reading, writing and using suitable reading and writing strategies" (Utdannings-direktoratet, 2013, p. 3). Overall, the competence aims in this main subject area can be said to be similar to the aims of oral communication subject area in terms of the wording of the statements such as understanding and developing a good repertoire of English vocabulary items and idiomatic structures and using them according to the purpose and situation. Yet, one particular statement points out that the studies in English subject should enable students to "evaluate different sources and use contents from sources in an independent, critical and verifiable manner" (Utdannings-direktoratet, 2013, p. 10). It is possible to see once

again that the students are expected to manifest independence in their language learning as in *language learning* main subject area.

Finally, *culture, society and literature* subject area deals with a cultural understanding of English-speaking countries. It focuses on "topics connected to social issues, literature and other cultural expressions" (Utdannings-direktoratet, 2013, p. 3). The competence aims in this subject area focus more on enabling students to discuss and elaborate on current news from English language resources; culture and social conditions of English-speaking countries; and different kinds of literature and media products such as films in English language from other countries.

The four main subject areas after VG1 general studies and VG2 vocational programmes show that English subject curriculum does not solely focus on the knowledge of English language. As per the purpose, which is highlighted in the same document, the subject curriculum aims the students to be competent in both oral and written communication skills in such a more globalised world where English has become the universal language while at the same time they are aware of the culture, society and literature of the English-speaking countries. As for more relevant to the topic of this present research, it is also possible to see that there is a transition towards students' taking more control over their learning such as reflecting on their own language learning progress, evaluating several resources for oral and written communication, and performing these in an independent manner.

While the English subject curriculum specifies the competence aims within four main subject areas as discussed above, it does not prescribe any methods or

resources for teaching or achieving these competence aims. This is again due to one of the reforms of the LK06 curriculum which is the abolishment of clear guidelines for teaching methods and resources to be used (Knaldre, 2015). Instead, the five basic skills which "contribute to the development of competence in the subject, while also being part of this competence" were integrated into the structure of each subject curriculum including English subject curriculum (Utdannings-direktoratet, 2013, p. 4). The competence aims within these main subject areas are integrated with *basic skills* of *oral skills, writing skills, reading skills, numeracy skills* and *digital skills.* Table 2 shows what these basic skills mean in English subject curriculum (Utdannings-direktoratet, 2013, pp. 4-5).

Based on these characteristics of generic competence aims and the abolishment of the methods and resources, the new LK06 curriculum is overall claimed to have provided more freedom and space for adaptation at a local level (Haglund, 2018; Knaldre, 2015). The aims in the previous curriculum of L97 were specified in such detailed and specific way that the curriculum was claimed to have had bigger control over teachers, and therefore did not allow much room to teachers for adaptation at a local level. These aims would also describe what students should have experienced within each subject, and therefore subject curricula in L97 curriculum was more process-oriented and it would be referred as "subject syllabuses" (Knaldre, 2015, p. 52). Competence aims in LK06 curriculum, however, focused more on what students should be able to do once they have finished their studies at various stages of their education in terms of the relevant

Table 2 Basic skills in English subject curriculum

Basic skills	Conceptual meaning of basic skills in English subject curricula
Oral skills	Being able to listen, speak and interact using the English language
Writing skills	Being able to express ideas and opinions in an understandable and purposeful manner using written English
Reading skills	Being able to read English language texts to understand, reflect on and acquire insight and knowledge across cultural borders and within specific fields of study
Numeracy skills	Being able to use relevant mathematical concepts in English in different situations, and being familiar with units of measures used in English-speaking countries and to understand and to communicate in figures, graphic representations, tables and statistics in English
Digital skills	Being able to use a varied selection of digital tools, media and resources to assist in language learning, to communicate in English and to acquire relevant knowledge in the subject of English.

subject. For example, while L97 curriculum would express subject aims with statements beginning with "[p]upils should have the opportunity to […], competence aims in LK06 curriculum are expressed with statements which begin with "[t]he aims of the studies are to enable pupils to […]" (Knaldre, 2015, p. 52). Also, competence aims in LK06 curriculum were specified in more generic terms, and they were not as detailed and specific as the aims in L97 curriculum. In addition to that, since specific guidelines on methods and resources were also replaced with a more generic five basic skills within each subject curriculum, the teachers could have the chance to adapt their teaching based on their classroom conditions. Yet, the LK06 curriculum is also criticized due to its too broad competence aims and lack of clear guidelines on teaching methods. According to the Haglund's (2018)

research, for example, some teachers of English subject at upper-secondary education level believed that the competence aims were too open which made it difficult to deliver each competence aim within the schedule given. In addition to that, the pressure to meet competence aims also made some teachers adopt more teacher-centred teaching methodologies and leave little space for the involvement of students in determining the teaching resources and content, which could be considered as a weakness of LK06 curriculum in terms of facilitating the development of autonomous language learning. Within this overall structure of the education system in Norway, this present study was situated in an upper secondary education level school in Norway, and the focus was on learners who were aged between sixteen to nineteen. Two factors played a role in selecting the Northview School for data collection site. Firstly, this school teaches English as a foreign language, and, the teachers and the learners at the school were interested in using technology for language learning. The latter factor could particularly play an important role when the learners were asked to reflect on the relationship between technology and language learning. The sampling strategy will be expanded on further in the methodology chapter.

As per the requirements of the English subject curriculum, Northview School had 140 teaching hours of English in the first year (VG1). English lessons were taught in five-hour block lessons per week which meant that the students studied English in one day only. The implementation of the curriculum reflects the flexible and broad characteristics of the LK06 curriculum. The schools and the teachers are delegated more freedom in terms of their selection of teaching materials and methods as well as the content. Teaching materials, for example, can be made up

of course books and other more authentic materials such as audio and visual materials from the Internet or in a printed format such as newspapers and literary books. As it has been stated in the previous section, LK06 curriculum does not prescribe any specific teaching methodologies. Instead, it only outlines the competence aims, and it is the schools' and teachers' responsibility at a local level to achieve these aims. In Northview School, it was possible to see that one way of such delegated freedom in teaching was to use digital technologies to achieve competence aims in English subject curriculum. For example, one of the competence aims of oral communication subject area in English subject curriculum is to enable students to "listen to and understand social and geographic variations of English from authentic situations" (Utdannings-direktoratet, 2013, p. 2). Related to this competence aim, the students occasionally make Skype talks with students from other English-speaking countries such as New Zealand and the United States of America. In another example, two of the competence aims in culture, society and literature subject are to enable students to "discuss and elaborate on culture and social conditions in several English-speaking countries" and to "present and discuss current news items from English language sources" (Utdannings-direktoratet, 2013, p. 2). Related to these two competence aims, the students were studying American presidential election at the time of data collection, and they were writing their essays about election campaign on their blog websites where other students could also read and give feedback. Student participation was also important when English subject curriculum was being implemented in Northview school. While it was a requirement to meet the competency aims within the curriculum, the students could

also make decisions in terms of how these aims were achieved due to the flexible structure of English subject curriculum.

1.6 Research question and focus of the research

This research aims to answer the following research question:

> What are the affordances of digital technologies for autonomous English language learning to students studying in a Norwegian secondary school?

By answering this research question, this research aims to explore the relationship between digital technologies and autonomous language learning. In terms of their relationship, the focus is on understanding what affordances digital technologies provide learners to take control over their language learning. In the pursuit of this aim, the context of this research can be described in the following ways.

The language learning explored in this research was English as a foreign language. This is because English is the most common language of international communication, being spoken by a quarter of world's population (British Council, 2013), and it is the most widely used language on the internet as of December 2017 (Internet World Stats., n.d.). As a consequence of its popularity, English language learning has thrived with the advent of technology. Technological improvements and ubiquitous access to technologies mean that English has become part of many young learners' daily life, and online platforms have become another means of learning English for these learners (Toffoli & Sockett, 2015). It is evident that the affordances of digital technologies for autonomous language learning could become much clearer with a focus on English as a foreign language.

In terms of types of technology, this research focused on the digital technologies that were being used by the participants at the time of the research. However, to truly understand the affordances of digital technologies from the perspective of learners, digital technologies were not limited to one technology. This decision was based on the belief that the learners should also be in control of the technologies that they were using and that they were going to give an account of how these technologies had been helpful to promote autonomous language learning.

1.7 Thesis structure

The structure of the thesis is as follows:

Chapter 1 provides a background to the study, describes the purpose of the research, presents the research question and concludes by describing the overall structure of the thesis.

Chapter 2 presents the literature review. In this chapter, the key concepts of learner autonomy in language learning are discussed, as well as digital technologies and the concept of affordances.

Chapter 3, 4 and 5 constitute the three parts of the methodology used in the research. In Chapter 3, the ontological, epistemological and methodological underpinnings of the research are presented, and Q-methodology is introduced as the selected research methodology. Chapter 4 presents a survey of digital technologies together with a description of survey data collection, and an analysis and the results of the

survey. Chapter 5 focuses on how the main data for this research were collected with the implementation of Q-methodology.

In Chapter 6, three factors obtained from the factor analysis in Chapter 5 are presented. The three factors are presented separately in a narrative description which includes the rankings of the statements within each factor and participants' answers to open-ended questions at the end of Q-sorting.

Chapter 7 discusses the results from Chapter 6 and presents what affordances digital technologies provide learners for autonomous language learning. The results are discussed in the light of the literature review.

Finally, Chapter 8 concludes the thesis by revisiting the research aim and by presenting the contributions, implications and the limitations of this research. It finishes by offering suggestions as to the possible areas can be pursued as future research.

Chapter 2 Literature Review

This chapter establishes the background of this research study by defining and giving a theoretical account of three key terms; autonomy in language learning, affordances, and technology. Each key term will be explored in three separate sections in this chapter.

2.1 Autonomy in language learning

The first section in the literature review focuses on learner autonomy in language learning, which is referred to interchangeably as learner autonomy and autonomous language learning. It explores this key term by giving an account of the definitions of autonomy in language learning and the versions and models of autonomy in language learning from different perspectives. This section aims to reach a working definition of the concept of learner autonomy in language learning to provide the participants with a reference point from which they can consider whether digital technologies provide any affordances for them to take control over their learning.

2.1.1 Definitions of learner autonomy

Referring to the definitions that are given by the other researchers in the field, it is generally asserted that defining, describing or identifying what autonomy refers to is not easy (Cooker, 2012; Damio, 2013). It is important to clearly define the concept of learner autonomy as Benson and Voller (1997, p. 1) suggest that

"concepts which we can hardly disagree are often those that stand most in need of clarification". For this reason, this research adopts the expanded definition of learner autonomy by Benson (2011, p. 119), according to which learner autonomy is "a systematic capacity for effective control over various aspects and levels of the learning process". Explaining learner autonomy in more detail this is difficult as Benson (2011, p. 58) argues that "autonomy is a multidimensional capacity that will take different forms for different individuals, and even for the same individual in different contexts or at different times". Learner autonomy does not "always present itself as a prescribed pattern" and "different variations of autonomy can emerge from the actions of the participants and their interaction with the environment" (Murray, 2014, p. 243). These arguments are relevant for this research because digital technologies can provide different affordances to learners to take control over their learning. In other words, with the help of digital technologies, some learners may take control over their learning differently to other learners, thereby showing variations of how learners take control over their learning with digital technologies.

Although this research aligns itself with the definition of Benson as one's taking control over his/her own learning, as Huang (2009, p. 7) suggests, how learner autonomy is defined or conceptualised with versions and models in the literature can help to provide "useful background and a broad framework for the presentation and discussion of the overall findings", which are in this research the affordances of digital technologies for autonomous language learning. This is because "different definitions of autonomy often turn out to be different descriptions of autonomy, in which particular ways of being autonomous take over the definition of the broader

concept" (Huang, 2009, p. 7). Therefore, the rest of this section will explore other definitions and conceptualisations of learner autonomy.

Researchers in the field have provided various definitions of learner autonomy by approaching it from different viewpoints. One of the earliest definitions is that of Holec (1981) who defines autonomy as "the ability to take charge of one's own learning [...] and to hold the responsibility for all the decisions concerning all aspects of this learning". Based on this definition, Holec (1981) further describes what an autonomous learner does, such as determining the goals of the learning, selecting materials and content, selecting activities and strategies, monitoring the progress and evaluating the outcomes. In a similar vein, Dickinson (1987, p. 11) defines autonomy as "the situation in which the learner is totally responsible for all of the decisions concerned with his learning and the implementation of those decisions". This definition also emphasises the learner's responsibility, in line with Holec (1981). However, Dickinson (1987, p. 11) approaches learner autonomy from a situational dimension, rather than one of capacity, where the learner is in total control of his/her learning and "there is no involvement of a teacher or an institution" and "the learner is also independent of specifically prepared materials".

Dickinson's (1987) situational independence approach to learner autonomy may be more valid in cases where language learners choose the self-instruction way in which "people teach themselves foreign languages" (Benson, 2011, p. 137). However, Benson (2008, p. 22) is critical of Dickinson's (1987) definition, stating that "the fact that we have no strong reason to suppose that autonomous learning requires teachers and institutions, does not mean that it [autonomous learning] must proceed independently of them [teachers and institutions]". According to Boud

(1988, p. 19), "autonomy is more than acting on one's own". Little (1991, pp. 4-5) asserts that autonomy can be defined as "a capacity - for detachment, critical reflection, decision-making, and independent action[...]", but he also argues that "...[b]ecause we are social beings our independence is always balanced by dependence; our essential condition is one of interdependence". Therefore, over the years the approaches to define autonomy as a degree of independence from teachers and peers have been challenged by approaches that involve a social dimension in the construct. Jiménez and Vieira (2015, p. 19) argue that this is inevitable when "the social nature" of the humans is taken into consideration, and therefore the social dimensions of autonomy such as "respect for others, negotiation, co-operation, and interdependence" should be considered as well.

According to Murray, three important changes have made researchers take the social dimensions of language learner autonomy into consideration when theoretically defining and refining the construct. The first improvement was that Leni Dam, an English teacher in Denmark, showed through her teaching practices that learner autonomy could still be promoted in the classroom environment when the students were working collaboratively. Dam (1995, p. 1) defines autonomy as "a readiness to take charge of one's needs and purposes. This entails capacity and willingness and act independently and in co-operation with others as a socially responsible person". Llaven-Nucamendi (2009) comments that this capacity explicitly shows itself together with willingness and readiness. However, to elaborate, unlike Holec's (1981) definition, a social-individual and independent-in-cooperation balance can also be observed in Dam's (1995) definition. Therefore, it seems that autonomy should not be viewed solely as an independently and

individually characterized concept, and it suggests that the students did not need to be alone or study to make their autonomy flourish.

The second important change was the increasing interest in Vygotsky's works. Particularly, in terms of zone of proximal development (ZPD), the students could achieve tasks independently in the future by taking instructions and help from the others such as peer students and teachers when they needed at the beginning (Murray, 2014). From this, it can, again, be interpreted that autonomy can flourish in collaboration with others. Finally, and particularly relevant to this research, technological developments have transformed the way the learners can improve their foreign language learning, such as English (Murray, 2014). Learners of foreign languages are able to access interaction with target language speakers and materials outside the classroom more easily than in the past (Benson & Reinders, 2011). With the help of technologies, while the students can study on their own, they can also learn their target language with others beyond the classroom. This also shows why social dimensions have attracted interest from researchers in learner autonomy research.

Of these researchers who shifted their focus to the social dimensions of learner autonomy, O'Leary (2014) expanded the definition of learner autonomy by identifying two dimensions; affective and social. According to the former, learner autonomy entails a capacity for learners to control their learning psychologically and emotionally. According to the latter, learners need to have a capacity to be involved in creating an "informational and collegial learning environment" which contributes to independent/interdependent learning in an effective and interactive way (O'Leary, 2014, p. 235).

Within an ecological approach, Palfreyman (2014, p. 182) defines learner autonomy as a "capacity for intentional use in context of a range of interacting resources toward learning goals". Palfreyman (2014) highlights three important elements in this definition: intentional, a range of interacting resources and a learning goal. According to the first of these elements, the actions of an autonomous learner are "informed, strategic, volitional and non-determined" (Palfreyman, 2014, pp. 182-183). The autonomous learner is aware of and recognizes the resources in the environment which s/he can use for language learning. These actions and use of the resources, however, are not determined by others but will be decided by the learner her/himself. With regards to the second element, a range of interacting resources, Palfreyman (2014) refers to the material, social, and discursive resources which an autonomous language learner will need to explore and make effective use of for her/his language learning. As Palfreyman (2014) suggests, the environment will provide affordances to the learner, and an autonomous learner needs to be able to make use of these resources and affordances to help her/his language learning goals. This constitutes the third element in his definition, namely, the intentional actions of an autonomous learner by using various resources are towards a learning goal. While these aims can be directly related to language itself, such as understanding a song, they can also be long-term goals, such as becoming an international businessperson which still entails a linguistic aspect.

In a similar vein, Murray, Fujishima, and Uzuka (2014) also describe language learner autonomy using an ecological approach. According to them, learner autonomy means "having the possibility to act on the affordances available within the learning environment" (Murray, 2014, p. 236). This understanding of learner

autonomy suggests, as in Palfreyman's (2014) definition, that the environment provides affordances to learners, and learners exercise their autonomy by acting upon these affordances. As a result, Murray et al. (2014) characterize learner autonomy as an emergent phenomenon. The definitions of Palfreyman (2014) and Murray et al. (2014) are relevant and useful to this research because they suggest that environment can provide affordances for autonomous language learning, and this research aims to explore these affordances in a digital environment.

Other than the theoretical definitions and descriptions of learner autonomy, there are also theoretical versions and models of learner autonomy which contribute to the understanding of the concept. Such versions and models of learner autonomy are also particularly useful for operationalizing the concept. In the next part, these frameworks and models of learner autonomy will be presented.

2.1.2 Versions of learner autonomy

2.1.2.1 The autonomy framework of Littlewood (1996)

A key scholar in the field of learner autonomy is Littlewood (1996), who discusses its nature and argues that the term autonomy does not directly refer to learner autonomy in language learning. On the contrary, Littlewood (1996, p. 428) defines autonomy as "a capacity for thinking and acting independently that may occur in any situation". When this capacity is applied to language learning, the ability for independent thinking and acting shows itself in three versions of autonomy, "autonomy as a communicator, autonomy as a learner, and autonomy as an

individual", within the theoretical framework of Littlewood (1996, p. 429), which can be seen in Table 3.

Table 3 Autonomy framework of Littlewood (1996, p. 431)

Autonomy as a communicator	• the ability to use the language creatively • the ability to use appropriate strategies for communicating
Autonomy as a learner	• the ability to engage in independent work (e.g. self-directed learning) • the ability to use appropriate learning strategies, both inside and outside the classroom
Autonomy as a person	• the ability to express personal meanings • the ability to create personal learning contexts, e.g. through interacting outside the classroom

According to Littlewood (1996), learners will display and improve this independent thinking and acting capacity while communicating and being engaged in self-study, and finally, they are likely to improve as an autonomous person. However, these three domains of autonomy entail components of "willingness" and "ability" (Littlewood, 1996, p. 428):

> Ability depends on possessing both knowledge about the alternatives from which choices have to be made and the necessary skills for carrying out whatever choices seem most appropriate. Willingness depends on having both the motivation and the confidence to take responsibility for the choices required.

This statement suggests that "motivation, confidence, knowledge and skills" constitute the heart of willingness and ability that enables the practice of autonomy as communicator, learner, and person. Although this framework has been critiqued in that it does not present "a continuum of autonomy" (Everhard, 2013, p. 62) and it is not clear how learners can attain these higher levels of autonomy as communicators and learners leading to autonomy as a person (Hamilton, 2013), it

presents a systematic way to approach promoting autonomy based on four sub-constructs of motivation, confidence, skills and knowledge.

Littlewood (1999) further elaborates on autonomy as a learner and introduces two levels of self-regulation that are used to refer to learner autonomy: proactive and reactive. The critical difference between these two notions is who triggers or initiates the action. In proactive learner autonomy, it is learners themselves who direct the learning in the forms of setting goals, planning, and evaluation, concepts which Holec (1981) also suggests are necessary to regulate one's learning. In reactive learner autonomy, however, learners are given a direction, or in another meaning, they are set a goal, and within this direction, learners can "organise their resources autonomously to reach their goal" (Littlewood, 1999, p. 75). Littlewood (1999) argues against the viewpoint that what reactive learner autonomy implies cannot be considered as a practice of autonomy, and suggests that reactive learner autonomy can also be practised in education and it may then lead to proactive learner autonomy.

Littlewood's (1999) distinction between proactive and reactive autonomy has also been subject to critique. Dang (2012) sees this model as broad when compared to other models of learner autonomy. However, it can be supported to provide an insight that learner autonomy does not reject the existence of an external individual who initiates the action, but learner autonomy can be possible with the presence of teacher or lecturer, as well.

2.1.2.2 Macaro's (1997) model of learner autonomy

A further model of learner autonomy is put forward by Macaro (1997, p. 169), who provides a functional understanding of the concept "which emphasizes autonomy as developing potential in the learner, on how s/he can use it to operate more effectively, rather than as a reaction to difficulties". Macaro's (1997) rationale for this view relies on the belief that a few hours in the classroom to learn a second language is not enough for the learners to become competent in speaking the second language. For learners to become more competent in the second language, Macaro (1997, p. 186) suggests that learners need "emancipation from the classroom and the teacher". Thus, he (1997) proposes a model of learner autonomy according to which learners can develop abilities to become more competent in the target language. For this reason, Cooker (2012) views Macaro's (1997) model as different from other theoretical models of learner autonomy since it includes both second language acquisition theories and language use. In this model, autonomy is divided into three dimensions that refer to "a development in the learner" (Macaro, 1997, p. 170).

The first of these dimensions is the autonomy of language competence. Macaro (1997, p. 170) explains this as the developing "ability to communicate having acquired a reasonable mastery of the L2 [second language] rule system". According to this dimension of learner autonomy, a learner needs to have mastered linguistic competence, which can be defined as "the knowledge of the items and rules that comprise the formal systems of a language" (Ellis, 2008, p. 970). Learners can then communicate in the second language, and autonomy, in this dimension, manifests

itself in a way that learners can communicate "largely without the help of a more competent speaker" (Hamilton, 2013, p. 42). Therefore, as Macaro (1997) also suggests, learners are in a sense emancipated from the help of a more competent person or knowledgeable authority such as teachers.

Hamilton (2013) suggests that this dimension of Macaro's (1997) model is similar to one of the dimensions of Littlewood's (1996) model, autonomy as a communicator, and this also refers to autonomy as "language use rather than learning strategies" (Hamilton, 2013, p. 42).

The second dimension in Macaro's (1997) model is the autonomy of language learning competence. This dimension implies the ability to transfer language-learning skills to other similar situations such as learning other languages (Macaro, 1997). It is different from the previous autonomy of language competence in that it focuses more on "developing strategies to maximise learning opportunities, making conscious choices about what, when and how to learn" (Hamilton, 2013, p. 43). Therefore, this dimension may manifest itself as a developing ability to apply strategies for finding resources in the target language without the help or mediation and direction of the teacher (Macaro, 1997).

As for the third dimension of the model, Macaro (1997) proposes autonomy of choice and action, according to which learners should be able to choose independently from a variety of choices and act accordingly. He (1997, p. 171) exemplifies the manifestation of this dimension of autonomy by quoting a learner's words as follows:

> ... I can't seem to get to grips of with talking about the town I live in, I'll spend some time this lesson practising that... I want to use languages in my future work, therefore I'll really concentrate on telephone skills... I remember best if I write words down no matter what the teacher says!'

It can be observed throughout Macaro's model (1997) that individuality or independence and emancipation from the control of authority, such as teachers, is the underlying idea of learner autonomy. Learners develop linguistic competence and are liberated from needing the help of a teacher or a fellow learner to provide opportunities for communication. Learners may transfer their learning skills to other languages and therefore once again be liberated from a teacher's guidance. Finally, learners can make their own choices and as a result be liberated from the control of the teacher to act independently with their choices. The understanding of autonomy illustrated in this model can be explained by "the notion of self-determination" (Macaro, 2008, p. 60) which views autonomy as "experiencing oneself as the origin of one's behaviour" (Dörnyei & Ushioda, 2011, p. 25). However, Macaro (2008, p. 60) also acknowledges what he regards as a fact that "individual choice is constrained by society and its institutions". Additionally, Benson (1996, p. 33) argues that there is a "social aspect" to learner autonomy and learner control. Benson (1996, p. 33) identifies learner autonomy as more of a negotiation rather than individual action:

> Greater learner control over the learning process, resources and language cannot be achieved by each individual acting alone according to his or her own preferences. Control is a question of collective decision-making rather than individual choice.

Thus, as Hamilton (2013, p. 44) also suggests, a learner's capacity to manifest his or her abilities to "make independent choices" is likely to be affected negatively from the mismatches between the learners and "external factors".

2.1.2.3 Autonomy as a capacity to take control

Originally, Benson (2011) began his definition of learner autonomy as a capacity, but he opts for a definition of the notion of control rather than taking charge or responsibility. This sense of learner autonomy illustrates the relationship between autonomy, the learners, and the learning process (Benson, 2010). In Littlewood (1996) model, a sense can be inferred that education and language learning at a narrower sense can desirably lead to personal autonomy. However, Benson's (2010) point is critical because what is meant by autonomy in language education may not indeed have such a comprehensive sense initially. Thus, that is one of the reasons Benson (2010, 2011) prefers the construct of control to refer to the relationship between the learners and their learning process.

Benson's (2011) definition of learner autonomy as "the capacity to take control of one's own learning" comprises of three interdependent dimensions of learner control in the learning process: control of learning management, control of cognitive processes, and control over learning content (Benson, 2011, pp. 58-61). As Blin (2005) also puts forward, control of learning management and control over cognitive processes rely on the approaches of Holec (1981) and Little (1991) to autonomy respectively.

Holec's (1981, p. 3) definition of learner autonomy, namely "the ability to take charge of one's own learning", involves "determining the objectives; defining the contents and the progression; selecting methods and techniques to be used; monitoring the procedure of acquisition (rhythm, time, place, etc.); evaluating what has been acquired". For Benson (2009, p. 18), Holec's (1981) definition concentrates more on learning management than the underlying "cognitive processes or learning content". Also, it can be argued that it does not explicitly address the cognitive dimensions of learner autonomy (Blin, 2005). For this reason, it has been found restrictive and has been the focus of further alternative definitions.

Holec (1981) has been critiqued for explaining "WHAT [uppercase in original] autonomous learners are able to do", but not explaining "HOW [uppercase in original] they are able to do it" by Benson (2007, p. 23). In the early 1990s, Little (1991, p. 4) provided another definition which this time focused on the psychological aspect of learner autonomy:

> Essentially, autonomy is a capacity - for detachment, critical reflection, decision-making, and independent action. It presupposes, but also entails, that the learner will develop a particular kind of psychological relation to the process and content of his learning. The capacity for autonomy will be displayed both in the way the learner learns and in the way he or she transfers what has been learned to wider contexts.

The above definition is complementary to Holec's (1981) for embracing a kind of psychological control of cognitive abilities. Benson (2007, p. 23) suggests that the capacity for one's managing of one's own learning relies on "certain underlying psychological capacities". Little (1991) also points out that this capacity involves knowing how to plan, monitor and evaluate the activities of learning as well as

covering "the content and process of learning", i.e.it emphasizes metacognitive skills.

While the earlier two dimensions of learners' control over their learning are built upon the critique of Holec (1981) and Little (1991), Benson (2011) highlights the control over content as important but underplayed element of learner autonomy. According to him (2011, p. 60), "autonomous learners should, in principle, have the freedom to determine their own goals and purposes if the learning is to be genuinely self-directed". This sense is reminiscent of the definition of Dickinson (1987), who emphasizes a learner's full independence for learning. However, Benson (2011, p. 60) also argues that such a self-direction "is only feasible if the learner studies in isolation from others and, because language learning is generally enhanced with others, full self-direction tends to be a less than desirable option". Therefore, a social aspect is emphasized here for a learner to be able to take control over learning content since it may entail learners "to negotiate over goals, purposes, content resources with others" (Benson, 2011, p. 60).

2.1.3 Models of learner autonomy

The models of learner autonomy presented below are used to operationalize learner autonomy to assess and measure the language learner autonomy. They, therefore, differ from the definitions and versions of learner autonomy in terms of giving insights into the practical side of learner autonomy. As they are more relevant to the aim of this research, they also provide a suitable reference for the discussion of findings. At this point, Cooker (2012) presents a review of three models of learner autonomy. Of these models, Tassinari's (2012) and Cooker's (2012) models of

learner autonomy can be useful to illustrate how learner autonomy in language learning can be operationalised.

Tassinari's (2012) model of language learner autonomy was designed to provide language learners with a tool that could contribute to learner's autonomy via self-assessment and evaluation of learning competencies. Tassinari's (2012, p. 78) model is structurally and functionally dynamic. Managing one's own learning is the all-embracing component above other components, and thus it is not "hierarchical" (Cooker, 2012, p. 78). The dynamic structure of the model comes from each component's being in direct relation to another component, and the functionally dynamic nature of the model comes from learners' being able to choose any component to start using the model for self-assessment purposes (Tassinari, 2012). What is more relevant for the current research project's aim is that the ten interrelated components of the model are operationalized with descriptive "can-do" statements, including macro-descriptive statements that also consist of sub-micro-descriptive statements.

It would be too exhaustive to document micro-descriptors of language learner autonomy, but to populate the components of the model, below Table 4 presents the macro descriptors of language learner autonomy.

Table 4 "Can-do" descriptive statements in Tassinari's (2012) model

Component of learner autonomy model	**Descriptors of components**
Motivating myself	• I want to organize my own learning autonomously. • I can motivate myself in a way that works for me.

Component of learner autonomy model	Descriptors of components
Dealing with my feelings	• I can control my feelings when I am learning.
Planning	• I can evaluate my own language competencies. • I can analyse my own needs. • I can set myself goals. • I can plan a time and place for my learning. • I know what I need to complete a task or to achieve a goal. • I can put together a learning plan.
Choosing materials and methods	• I am familiar with a variety of materials and resources for language learning. • I can choose materials and resources. • I can try out new materials and resources. • I am familiar with a variety of language learning methods and strategies. • I can choose different methods and strategies. • I can try out new methods and strategies.
Completing tasks	• I can organise a time and place for my learning. • I can set myself a task. • I can structure my learning independently. • I can use a variety of materials and resources when learning. • I can employ a variety of methods and strategies when learning. • I can carry out my learning plan. • I can analyse elements of the foreign language to detect regularities, irregularities and recurring patterns. • I can analyse texts, conversations and other communication in the foreign language and recognise specific (cultural) aspects of the communication.
Monitoring	• I can recognise my strengths and weaknesses as a learner and /or reflect on these. • I can recognise what prevents me from completing a task. • I can reflect on materials and resources which I have used. • I can reflect on methods and strategies which I have employed. • I can reflect on my learning.

Component of learner autonomy model	Descriptors of components
Evaluating	• I can evaluate my own language competencies. • I can evaluate materials and resources for language learning. • I can evaluate language learning methods and strategies. • I can evaluate my learning.
Cooperating	• I can learn with and from others (for example, other learners, teachers, learning advisors, native speakers and competent non-native speakers). • I can decide when I want to cooperate with others (for example, with other learners, teachers, learning advisors, native speakers and competent non-native speakers

One of the strengths of Tassinari's (2012) model is that it has a dynamic structure (Cooker, 2012). Indeed, it may not be easy to distinguish between the components of language learner autonomy as they are "closely interrelated" (Tassinari, 2012, p. 30). However, it has also been critiqued for only addressing the psychological and technical aspects of learner autonomy, rather than also including the "political, critical and social" aspects (Cooker, 2012, p. 79).

The next model of learner autonomy (Table 5) has been developed by Cooker (2012) in response to the questions of "What is learner autonomy? And "How can I, as a student, develop it? [...] How can I, as a teacher or learning advisor, help my students develop it?" (p. 80). In response to these questions, thirty-four constitutive elements are offered to operationalize learner autonomy, which then were categorized under seven categories. Cooker (2012) states that her model of learner autonomy is more comprehensive than the model of Tassinari (2012) as the latter

applies to the context of self-directed learning only. Conversely, Cooker (2012) blends the political, critical and social aspects of learner autonomy, as well.

Table 5 Learner autonomy model of Cooker (2012)

Category of learner autonomy	Constitutive elements
Learner control	• Ability to analyse/define needs • Ability to set achievable objectives • Ability to manage time • Ability to choose appropriate materials • Ability to negotiate learning • Ability to select partners for pair/group work • Ability to work in one's own • Ability to make choices about how work will be assessed • Ability to assess discrete aspects of one's own work • Ability to assess the work of peers • Ability to take responsibility for one's own learning outside the classroom • Ability to monitor one's own learning progress over time
Metacognitive awareness	• Ability to provide a rationale for materials chosen • Ability to select appropriate learning strategies • Ability to select and reject strategies according to needs • Ability to describe the strategies used • Ability to provide a rationale for the strategies used • Ability to provide an evaluation of the strategies used • Ability to describe alternative strategies that could have been used • Ability to describe plans for future learning
Critical reflection	• Critical understanding of the roles of teacher and learner • Critical awareness of different teaching and learning approaches • Critical awareness of the variations in quality of different teaching and learning inputs
Learning range	• Flexibility in ways of learning • Awareness of breadth of learning content • Ability to collaborate with other students and teachers
Motivation	• Desire to learn • Willingness to speak/use the language • Willingness to be actively engaged in learning activities

Category of learner autonomy	Constitutive elements
Confidence	• Ability to seek out opportunities to speak/use the language • Ability to overcome negative feedback/assessment
Information literacy	• Ability to source and navigate learning resources

To summarise, this first section aimed to set a background to the concept of learner autonomy in language learning by presenting the theoretical definitions, versions, and models of learner autonomy. This section also aimed at reaching a working definition of the concept of learner autonomy in language learning. The reason for that is to provide the participants in the methodology chapter a condition of instruction as a reference point to which they can return and interrogate whether digital technologies provide or furnish any affordances for them to take control over their learning.

In the light of these definitions and models of learner autonomy in language learning, this section will conclude by aligning the view of learner autonomy in this thesis with Benson's (2011, p. 119) expanded definition. According to this, learner autonomy is defined as taking control over one's own language learning. Yet, taking control over learning might still be abstract and technical to the participants. Therefore, taking control over learning can be operationalised with the following statement:

> An autonomous language learner is a learner who learns or study English without the direct control or influence of a teacher and takes control over his/her learning English with self-determined and volitional tasks and activities.

Having established the concept of autonomy in language learning, given the aim of the present study, it is now pertinent to discuss the technology-based approaches to promote autonomous language learning.

2.2 Technology and learner autonomy

Another key concept in this study is technology. This section provides an account of the relationship between technology and autonomous language learning by discussing research studies from the literature which show how technology can provide both opportunities and challenges for learner autonomy. It then moves to a discussion of how technology is conceptualised and defined in this study.

According to Benson (2011, p. 124), autonomy meant the capacity of a learner to have control over his/her learning, and autonomous learning referred to a mode of learning in which "learners demonstrate a capacity to control their learning". There have been many initiatives attempting to promote the capacity for learners to control their learning and be engaged more in autonomous language learning practices. One of the approaches taken is the notion of technology-based approaches.

There has been a long relationship between learner autonomy and new technologies. At first, this relationship was thought as one-directional (Reinders & White, 2011, 2016) in that the new technologies were considered as tools that provided the learners access to resources and materials with which they had the opportunities to learn independently in their own time. Autonomy was seen as an educational goal, and the new technologies could help learners to achieve this educational goal. In line with this view, Murray (1999, p. 296) suggests that "educational technology demonstrates its effectiveness as a purveyor of learner autonomy." Hamilton (2013, p. 69), however, argues against such a suggestion because it denotes that "humans are not, therefore, predisposed to behaving

autonomously". It ignores the possibility that students who are already independently involved in online language activities can be "already significantly autonomous" (Blin, 2004). Hamilton (2013) further elaborates that learners are inherently autonomous and that it is not the technology that makes the learners more autonomous or not. While engaging with language in online environments can be interpreted as an indication of predisposition to autonomous behaviour, not being involved in any online activity should not imply that learners are not autonomous. Some learners can manifest autonomy by choosing not to participate or engage with language in such environments. Therefore, it is more suitable to suggest that learner autonomy could not only be considered as an educational goal, i.e. an end-product, but a degree of this capacity should improve with technologies (Reinders & White, 2016).

2.2.1 Early phases of CALL and learner autonomy

The role of technologies in the development of learner autonomy was first analysed within the association between learner autonomy and Computer-Assisted Language Learning (CALL). The term CALL first emerged in the 1970s to refer to computer programmes which were developed particularly for language learning (Benson, 2011). Egbert (2005, p. 1) defined CALL as "using computers to support language teaching and learning in some way". Warschauer and Healey (1998) reviewed the development of the CALL by the end of the twentieth century and came up with three theoretical phases of CALL, namely behaviouristic, communicative, and integrative. These three theoretical phases of CALL have been drawn upon by

researchers in the literature to review the early examples of the ways that could be supportive of learner autonomy.

As the name of the first phase implies, behaviouristic CALL was inspired by behaviouristic learning models (Warschauer & Healey, 1998, p. 57). The computer programmes and applications mostly involved "repetitive language drills, referred to as drill-and-practice" (Warschauer & Healey, 1998, p. 57). In this mode of learning, the learners repeatedly engaged in the drilling of vocabulary items and grammatical structures and were able to see whether their answers matched pre-described answers on the computer programmes (Benson, 2011). In this regard, the students neither received constructive feedback from the system nor had a chance of interacting with others (Hamilton, 2013). Despite being in the early stages of development, however, behaviouristic CALL provided ways of autonomous language learning to learners. Benson (2011) suggests that behaviouristic CALL applications provided learners with a degree of control by allowing them to choose the modes of instruction, practice and assessment. The learners also had control over the pace of their learning because of the availability of the materials electronically (Hamilton, 2013). In the same vein, since the learning and practice materials were distributed electronically, the learners were not constrained within a classroom, and therefore freed from its physical boundaries(Garrison, 2000), as well. This implies that behaviouristic CALL applications encouraged a degree of control over learning, yet it was limited to allow learners the opportunities to modify their learning to meet their learning needs (Benson, 2011). Additionally, while the learners could have control over the pace and place of their learning, they did not have control over the content, since the materials continued to be delivered

and provided by the teachers. In this regard, it is incongruent with the dimension of control over learning content which Benson (2011) suggests as one of the important elements for a learner to learn autonomously. Behaviouristic CALL was therefore believed to have provided independent learning opportunities to a certain extent for the language learners who wanted "independent, guided learning and activities" (Hamilton, 2013, p. 57). However, since it was argued that autonomous learning could not be refined into a meaning of isolated independent learning (Benson, 2008; Boud, 1988; Little, 1991), behaviouristic CALL only provided a "restrictive view of what it means to be autonomous" (Hamilton, 2013, p. 52).

The second phase of CALL was inspired by communicative principles. The CALL applications were designed to stimulate learners to communicate purposefully in the target language while they worked together on problem-solving activities. This is because the communicative CALL was built upon learning "as a process of discovery, expression, and development" (Warschauer & Healey, 1998, p. 57). It was different from the behaviouristic CALL with regard the focus being "not so much on what students did with the machine, but rather what they did with each other while working at the computer" (Warschauer & Healey, 1998, p. 57). In terms of autonomous language learning, communicative CALL programmes such as computer-mediated communication (CMC) applications and word processors enabled learners to monitor and reflect on their language output (Benson, 2011; Hamilton, 2013), which Schwienhorst (2008) suggests was an important component of autonomous language learning. Particularly with the help of asynchronous CMCs, learners could become less anxious about communicating in the target language, and therefore feel "more liberated and able to communicate"

(Hamilton, 2013, p. 60). This can be associated with taking control over psychological dimensions of language learning in Benson's (2011) conceptualisation of learner autonomy. The communicative CALL approach to learning also provided a "freer use of the target language" in comparison to the behaviouristic CALL (Hamilton, 2013). As Warschauer and Healey (1998, p. 57) suggest, language learners could "generate original utterances rather than just manipulate prefabricated language". Yet, while learners could use the language freely, it was limited freedom. Learners in communicative CALL practices worked to achieve language tasks on computers by using predefined particular language structures, therefore they did not have full control over the linguistic structures in the target language (Hamilton, 2013). In this regard, such communicative practices with CALL programmes are in congruence with the "autonomy as a communicator" dimension of Littlewood's (1996, p. 471) framework which suggests that an autonomous language learner has the "ability to use the language creatively". Therefore, as Hamilton (2013, p. 62) states, "communicative CALL represents a controlled view of how language is used' and offers a limited understanding of what it means to be an autonomous language learner".

The subsequent perspective on language learning, and the phase of CALL after communicative approaches, was termed as integrative CALL. This was essentially inspired by social and socio-cognitive views on language learning (Warschauer & Healey, 1998). The characteristics of this phase involved encouraging the integration of different skills such as reading, writing, listening and speaking in the target language by using multimedia and interactive technological tools (Benson, 2011). In terms of developing learner autonomy, integrative CALL encouraged

learners to think more independently and express themselves in the L2 more freely (Hamilton, 2013). This was in contrast to behaviouristic and communicative CALL, which offered limited opportunities. Also, integrative CALL allowed learners to take control over access to language learning materials, learning content, and interaction (Blin, 2004). Yet, Benson (2011, p. 148) argues that the integrative CALL applications were still limited to "facilitate creative response to input" and some would "reproduce the behaviouristic assumptions of early CALL software with the addition of sound and images".

Murray's (1999) research offers an example to such mixed assertions with regards to the relation of early CALL applications to autonomous language learning. Murray (1999) examined how learner autonomy together with language acquisition might be fostered through simulation technology, in a videodisc programme called *À la rencontre de Philippe*. Learners of French as a foreign language were invited to engage in the target language and be involved in cultural features of the target language in a virtual community, and to study the language-learning programme on their own, which Blin (2005, p. 30) refers as a "situational autonomy". This is mainly because Murray (1999) adopted the learner autonomy model of Holec (1981) which requires learners to take full responsibility for decision-making in their learning. For this reason, it can be said that it mainly deals with taking control over learning management within Benson's (2011) three-level learner autonomy model, and the findings also supported this point. In terms of stimulating learner autonomy, Murray (1999) reported that the learners could control the pace of their work and control their learning at a technical level in line with Benson's (2011) model of learner autonomy. In addition to controlling the pace, simulation

technology was observed to enhance enjoyment and mitigate "performance anxiety" (Murray, 1999, p. 300). This means that simulation technology can help to control the psychological aspects of learner autonomy, as well. However, Blin (2005, p. 31) believes that Murray's (1999) research also revealed a tension about the relationship between "learner autonomy and motivation". For example, learners' "multiple identities (e.g. mother, wife, student, teacher, part-time worker, etc.)" were observed to affect their motivation to commit themselves to engage with the simulation language-learning programme (Murray, 1999, p. 300). Therefore, it may be suggested that technology is a potential for learner's control over learning management, but it may not be convenient for every individual to the same degree.

2.2.2 Development of learner autonomy through digital technologies

Benson (2011) suggests that CALL has entered a new phase with the use of the internet and the related Web 2.0 technologies. Benson and Chik (2011, p. 5) suggest that naturalistic CALL refers to the phases after the integrative CALL which denotes "the computer-based activities that are carried out on the students' initiative, outside school, and mainly to pursue some interest through a foreign language, rather than for the direct purpose of learning the language".

Digital technologies provide a number of opportunities for autonomous language learning. For the clarity and progression of ideas, how digital technologies contribute to autonomous language learning will be discussed under a set of themes rather than discussing each digital technology separately. These themes are access to language learning resources, opportunities for practising language skills,

opportunities for self-regulated language learning, opportunities to become a critical language learner, opportunities to collaborate and interact for language learning, opportunities to take control over psychological and emotional aspects of language learning, and opportunities to become more independent for language learning. By doing so, the same digital technology can be repeated in more than one theme, and this is due to the findings in relevant studies that the same digital technology may have multiple opportunities for autonomous language learning. For example, while Facebook may provide students access to authentic language use, and thereby being covered in theme access to language learning resources, it will also be covered under the heading of opportunities to collaborate and interact for language learning as it enables students to learn from one another.

2.2.2.1 Access to language learning resources

First of all, it is possible to see that digital technologies can be supportive of the development of learners' autonomous language learning skills with the opportunity to access various language learning resources. In their study, Jitpaisarnwattana (2018) aimed to show whether a digital storytelling project can promote autonomous language learning skills of students learning English as a foreign language. The participants in the research were required to create their videos by using a video-editing programme and to practise their English language skills at the same time. It was found out during video-creation tasks that the students took control over their learning by engaging in independent research to find the vocabulary items that they were going to use in their tasks. For this purpose, they benefited from both printed textbooks and online resources on the Internet. In

another research, Miller (2019) investigated how social media platforms, Facebook and Twitter, could be used to support teaching in beginner level Spanish classes. It was found out that such social media websites and applications can provide Spanish language learners with an online environment where they can have access to authentic language usage. The learners in the study, for example, could find more information about the culture of Spanish-speaking countries and read more authentic texts within the news on their own. In a similar vein, Zhang (2016, p.6) reported that by the help of digital technologies, the learners of English could access to “news, the hottest topics, and the most interesting information of other fields” and various accents of English which were resources for improving language skills yet still not having been designed specifically as language learning resources.

Toffoli and Perrot (2017, p. 198) also discuss how different Web 2.0 and "informal online learning practices" can be related to the development of "various types of learner autonomy" such as personal autonomy, learner autonomy, language learner autonomy by providing access to various language learning resources. Online informal learning of English (OILE) was described as "a range of Internet-based communicative leisure activities through which learners are exposed to media content and interact with others in English" (Kusyk & Sockett, 2012, p. 45). In this regard, it is argued to be different from many other out-of-class language learning activities in the respect that "OILE [...] is a process driven by the intention to communicate, with language learning being only a by-product of this communication (Toffoli & Perrot, 2017, p. 201). At this point, it can be argued that those learners do not set themselves any learning goals, yet this is such a difficult task to explore since the learning goals may not be clearly stated by the learners as

the beginning of their learning experiences (Palfreyman, 2014). However, Palfreyman (2014, p, 183) also argues that “[learning goal] will provide direction and narrative structure to the learner’s experiences”. So, at an implicit level, those learners may still be setting themselves learning goals which can be realised by such OILE activities. Unlike learners of OILE, some learners may set themselves learning goals by the help of purpose-designed language learning applications. Nino (2015), for example, found that the learners set themselves learning goals with Duolingo language learning app. This can be partially explained with the built-in features of the application which enabled learners to work towards a learning goal in their target language.

In terms of stimulating learner autonomy, Toffoli and Perrot (2017) suggest that OILE practices provide learners with both specific language-related opportunities, such as learning new vocabulary and expressions, exploring different accents around the world and developing listening, developing grammar and syntax knowledge, and general opportunities such as pursuing a specific area of interest to a learner in the target language, accessing to more up-to-date content, and accessing online resources for language studies. According to Toffoli and Perrot (2017, p. 215), such increased target language use through leaving online comments, engagement with instructions on the Internet, and interaction in English contribute to the "L2 autonomy" of the learners. The notion of L2 autonomy is similar to one of the dimensions in Macaro’s (1997) framework for autonomy, autonomy as language competence which denotes that learners can communicate "largely without the help of a more competent speaker" (Hamilton, 2013, p. 42) once they have mastered the rule system at a reasonable level in the target language. Toffoli

and Perrot's (2017) research is important because it shows what it is about the online environment that attracts learners to autonomous language learning practices. Online activities' being "fun and educational', allowing "authentic and spontaneous L2 use", and being able to write "texts about [learners'] favourite series" are a few of these attractors (Toffoli & Perrot, 2017, p. 221). Such factors may show that the learners are interested in learning with resources and ways that interest them and fun for them. In this regard, Zhang (2016) found out that applications such as English fun dubbing make learners feel more motivated to learn English. The reason was that the learners could find and use "[English] dubbings of their interest" (Zhang, 2016, p. 7). In a similar vein, Gonulal (2019, p. 317)) found that Instagram can make the learning process more fun since the learners could "[combine] pictures with texts". However, while interest and fun may play an important factor, Toffoli and Perrot (2017) suggest that learners engage in the target language more when they are more digitally literate. Therefore, it can be understood that while OILE activities encourage more target language use and subsequently more autonomous language learning practices, digital literacy appears to be an important prerequisite to engage in such online activities.

Within the scope of finding language resources by the help of digital technologies, Suvorov and Cabello (2017) aimed to find out how adaptive learning systems (ALS) could be supportive of the development of language learner autonomy. ALS is defined as "computer-based systems designed to adapt new content to students' individual needs" (Suvorov & Cabello, 2017, p. 37). According to Wang and Liao (2011), the significance of ALSs lies in the potential for offering learners more personal learning experiences, addressing learners' various needs in language

learning by providing different learning routes, and focusing on language skills to be improved by calculating the learners' input in the system. Suvorov and Cabello (2017) found three main affordances of ALSs in their research: extended practice and review, adaptive learning, and instant scores and feedback. The ALSs were capable of offering learners tailor-made questions based on their performance in the ALS exercises. Therefore, learners could get more individualised practice on the system. In this regard, it can be seen that the ALSs were different from the behaviouristic CALL practices which offered the same repetitive drills for all the learners even if their L2 proficiency varied. Also, as the ALSs did not put any time limit in the exercises, learners could take control over the pace of learning, thereby showing a benefit for the development of learner autonomy. Since the ALS also asked how confident learners felt when answering each question, it stimulated "learners' self-reflection" (Suvorov & Cabello, 2017, p. 53), which Schwienhorst (2008) suggests as an important facet of learner autonomy. Finally, the ALSs provided learners instant feedback and scores which showed their performance and what skills should be strengthened. Suvorov and Cabello (2017) suggest that instant scores and feedback encourage learners to identify weaknesses in their learning, and therefore contribute to the improvement of learner autonomy. Yet, concerning the latest affordance, the ALS does not differ greatly from the behaviouristic CALL practices in giving feedback. It can be suggested that instant feedback and scores could have been more supportive of learner autonomy if the learners were given more constructive feedback by the system, such as showing how the learners could correct their wrong answers. This is because Fuchs (2017, p. 182) found that limited

feedback discouraged some learners in her research from "self-regulating and self-directing their learning".

2.2.2.2 Opportunities for practising language skills

As well as being able to access resources online to support their language learning tasks and activities, digital technologies also enable learners to practise their English in real terms. In Gonulal's (2019) research which aimed to find out how English language learners used another social networking site, Instagram, and its pedagogical value for language learning. It was found out by Gonulal (2019) that Instagram had the potential to provide a platform where learners of English could practice what they had learnt throughout their school-life in their English subject classes and never had a proper chance to use in real-life beyond the classroom. By the help of Instagram, the learners could network and connect with *real people* from different countries around the world and engage in real-life conversations and interactions. It was highlighted by the participants of the research that Instagram provided an online environment where they can speak with native speakers or more advanced speakers of English, thereby improving their conversational skills in English, and even exploring different ways of putting forward what they would like to converse in English. By the help of Instagram, the participants could, therefore, have access to a source of opportunities to practice their English language skills. Authentic interaction and conversation with real people can play an important role in learners' maintaining language learning motivation. The findings in Loewen's et. al. (2019) study show that practising English with only repetition and dictation tasks based on typing what students hear on a language learning application such

as Duolingo can lead learners to feel less motivated due to the lack of real interaction. These findings in Gonulal's (2019) study show that digital technologies not only provide access to material resources such as news, authentic texts and information about the culture of the target language, but also human resources.

2.2.2.3 Opportunities for self-regulated language learning

Digital technologies can also support learners' autonomous language learning skills by providing them with opportunities to organise their learning. By using digital technologies, for example, the learners can learn at their own pace and speed (Nino, 2015). Digital technologies also provide greater flexibility to learn a language in terms of time and place. It is reported in Loewen's (2019) study that the learners could take advantage of any places to practice their target language by using Duolingo language learning app. The learners, for example, could use the time to do exercise while waiting for a coffee at a coffee shop, waiting for an order to arrive at a restaurant, waiting for a bus, or even when they were travelling abroad. Kondo et. al. (2012) also highlighted the appreciation of learners of English for the mobility feature of a language learning application. For example, similar to Loewen's (2019) study, the students were observed to make use of the break time between their classes. While such learning practices may appear to be disorganised, some learners can take advantage of digital technologies to better manage their learning time. Nino (2015), for example, observed that some students set reminder notifications on the language learning app they had been using to practice every day. In a similar vein, Shadiev (2018) found out that some students tended to set a specific learning dates and times for their learning tasks and followed their deadlines to accomplish

tasks on the Calendar feature of their mobile multimedia learning system. Therefore, it is possible to understand that the learners can use digital technologies both on an any-time-and-any-place principle and on a more systematic and organised way.

2.2.2.4 Opportunities to become a critical language learner

While Gonulal's (2019) study shows that Instagram can extend learners' opportunities to engage in authentic interaction practices and be exposed to how English is being used by others beyond the classroom environment, it can also become a weakness in this regard for some learners of English. It was found out in the same study that some learners of English did not find English on Instagram very useful for practice since they observed that mostly informal English without a good basis of grammatical accuracy was being used. Few learners even suggested that Instagram could harm their learning English than helping them improve their English language skills. Such a review by the learners shows that the learners also exercise control over their language learning resources by evaluating them in terms of their pedagogical value. In another study which highlights that learners evaluate language learning resources on digital technologies, Nino (2015) showed that learners of foreign languages with mobile applications did not thrust the handy translation applications such as Google Translate since those learners realized that translations of words and phrases on such applications could produce wrong translations and make the students use wrong words and phrases and plagiarism in their works. Instead, those learners supported their translations by using concordance tools which show how a word or phrase could be used in different

contexts. Finally, Teng's (2018, p. 113-114) research also found out that the learners of English exhausted various resources to reach an "accurate and complete information" for the meaning of vocabulary items by benefiting from digital technologies. In the light of these three studies, it is possible to understand that the digital technologies also extend the tools and platforms in which the learners can evaluate the reliability of the resources and information that they find on the Internet.

While language learners can use digital technologies to find their language resources, they can also use them for reflecting their language learning process and understanding what works for them and not. Jitpaisarnwattana (2018), for example, documented that the students in digital storytelling project reported being more reflective both on their learning process and on their English writing. The particular reason in the context of that research was that the students were required to share what they had written with other classmates and teachers, and this has resulted in them to be more careful in what they were going to present in their written works. In another study, Nino (2015) reported that the students using Duolingo language learning application could set themselves goals and take short quizzes to monitor their overall learning and how they were doing. In addition to those, Shadiev (2018) found out that the students who used a mobile multimedia learning system could reflect on their learning by employing a number of strategies such as regularly checking their calendars, looking at their classmates' works to compare their progress, and reviewing the annotations that they made on the learning system. Some students particularly felt a need to reflect on their learning and review their work because if there had been any incomplete parts in their works, they would be

commented on by their classmates. As a result, as Jitpaisarnwattana (2018) also highlights, the students can become more able to identify their weaknesses and identify and find ways and methods to overcome such shortcomings in their language learning.

2.2.2.5 Opportunities to collaborate and interact for language learning

Being able to network and connect with other people on the Internet also provide learners with a useful digital platform to interact and collaborate with other language users and learners, and thereby opening up opportunities to learn from each other among language learners. These studies show that digital technologies enable learners to get access to collaboration and interaction opportunities in various forms in their language learning. Hattem (2014), for example, investigated whether microblogging activities on Twitter can be harnessed in order to write in English at an advanced level English grammar course. During the tasks, the participants manifested of ways in which they could learn from their fellow learners. For example, while one participant pointed out being able to compare their written sentences on Twitter with each other to check whether they had used the language form required within the task correctly or not, another participant highlighted how they used to enrich the content of their sentences by looking at other students' posts on Twitter to get inspiration. Learners' being able to learn from each other's works was also echoed by Miller (2019) and Shadiev (2018). According to a finding in Miller's (2019) study, the participants were able to learn Spanish and get help in their writing Spanish by looking at other fellow learners'

Facebook posts written in Spanish. In Shadiev's (2018) study, the students who could review their classmates' textual annotations and recorded audio files on a mobile multimedia learning system were able to benefit from such tasks in terms of how others finished their tasks, finding out whether there were any mistakes in their own work by comparing it to that of others and getting inspired with ideas to use in their own tasks. As Hattem (2014) acknowledges and as it can be seen from Miller's (2019) and Shadiev's (2018) studies, these findings particularly show that the students could find a way of using a digital technology beyond its original purpose. In another study, Loewen et. al. (2019) investigated the effectiveness of a language learning application, Duolingo. The participants in Loewen et. al.'s (2019) study studied Turkish as a foreign language in a controlled classroom environment. It was found out that the learners could follow the progress of their classmates and compare themselves how others were performing in completing the tasks on the Duolingo application. This, in turn, made the learners more motivated to engage with exercises on Duolingo application and make more progress in a way of competition with others. With this finding, Loewen et. al. (2019) supports a similar finding in Zhang's (2016) study in which the students were required to create textual annotations to images by the help of an English fun dubbing application. As a result of the latter study, it was found out that the students used the platform to look at other students' dubbings, thereby putting themselves in a competitive learning atmosphere. It is possible to understand from Loewen's et. al. (2019) research that purpose-designed language learning application such as Duolingo could create a digital learning community in which the learners could monitor and reflect both on their learning and their fellow learners. As a result, this could create

a more motivating learning atmosphere among the learners. Yet, it is also possible to observe here that the aim of the students appears to be more about making progress to compete with their fellow learners than setting and working towards their own language learning goals.

In addition to the studies above, the learners can also learn from each other by working collaboratively on the same tasks and giving and receiving feedback among themselves. It was reported in Jitpaisarnwattana's (2018) digital storytelling project research in a foreign language classroom that the students could learn from their classmates as the digital platform they had been using provided them with an opportunity to discuss and exchange ideas between each other, which in turn facilitated them to explore more different perspectives in their language learning. The students were also found to have benefited from getting feedback both from their classmates and their teacher to their digital story video. In a similar vein, Shadiev (2018) also found that digital technologies could create a collaborative working environment among the students. Their research suggested that the learners could leave feedback to one another by leaving comments to one another's work. Such comments helped learners to reflect on their classmates' work, find, if any, mistakes in their writings and make corrective suggestions to address any mistakes. As a result, the learners could revise their work and improve their writings and accomplish the task in a better way. One can infer from such a collaborative learning environment and learners' exchange of feedback among themselves that autonomous language learning does not equal to learning on one's own.

2.2.2.6 Opportunities to take control over psychological and emotional aspects of language learning

Digital technologies can also provide opportunities for language learners to take control over their learning with regards to the psychological and emotional aspects of their learning. First of all, it was reported that language learners can learn in less stressful and more relaxed ways by using digital technologies. Shadiev (2018), for example, found that students who used a mobile multimedia learning system experienced lower levels of anxiety during their language practice. In a similar vein, Zhang (2016, p. 6) found out that an English fun dubbing application provided learners to feel less nervous in their spoken English skill as the application provided them "a domain […] to imitate authentic English". As well as making learners feel less stressful, digital technologies also make learners feel more courageous to try different things in their target language. In Hattem's (2014) study in which the students were required to use Twitter and post sentences formed with academic English grammar. Yet, during the intervention process, some participants went beyond producing sentences of only academic English grammar, and they used different types of "language play, including repetition, joking, insulting, improvisational word games, foreign words and references, imaginary worlds and carnival language" (Hattem, 2014, p. 165), particularly by using Twitter as a chat application instead of a microblogging application.

2.2.2.7 Opportunities to become more independent for language learning

In the light of the studies discussed above, it is also possible to understand that digital technologies can enable learners to be less dependent on their teachers and take more control over their learning. Hattem's (2014) study, for example, shows how learners changed the way how they used Twitter other than they were required to use. In Suvorov and Cabello's (2017) study, it was found that the learners could use their own strategies to access different resources such as watching YouTube videos or asking peer learners when they did not engage with the learning tool which was prescribed by their teacher. Yet, it can also be argued that language learners may still need their teachers in some regards. For example, Jitpaisarnwattana (2018) found that students learning English with a digital storytelling application found their teacher's feedback very valuable. It was reported that teacher feedback "helped raise [students'] language awareness" (Jitpaisarnwattana, 2018, p. 150). In addition to that, the students also reported that their teacher's facilitator and counsellor role within their projects helped them "understand their mistakes" (Jitpaisarnwattana, 2018, p. 154). Therefore, it is possible to understand that while in some regards the students can take more control over their learning and rely less on the support from their teachers, in some other aspects, the students may still need the support of their teachers. Yet, it can even be questioned whether students' seeking such help from their teachers may also be a manifestation of their learner autonomy. Instead of searching for resources to

identify and correct their mistakes, the students may choose the easier way and ask their teachers.

2.2.3 Challenges posed by digital technologies for autonomous language learning

The studies as discussed above show that digital technologies can provide opportunities for the development of autonomous language learning. Yet, it is important to consider the challenges posed by digital technologies which can prevent the development of autonomous language learning.

First of these challenges is e-safety when using digital technologies. Digital technologies have the potential to provide learners with the opportunities to take control over their learning. Yet, digital technologies also pose serious risks to learners, particularly children, if the necessary measures are not taken. Those risks include, but not limited to, "cyber-bullies, paedophiles, violent games, illicit downloading of personal information and commercial exploitations" (Cranner, Selwyn & Potter, 2012, p. 128). As has been discussed above, social networking platforms such as Facebook, Twitter and Instagram can provide opportunities to language learners to access to resources and to collaborate and interact with other learners and native speakers of the target language. Yet, Manca and Ranieri (2014, p, 12), for example, reports that social networking platforms such as Facebook can also make young learners open to the threat from "sexual predators, cyberstalking and cyberbullying" given that a large amount of personal information can be made public by the users. In addition to that, such social networking platforms can even create continuous bullying since unlike bullying at a physical school environment,

it does not come to an end when the schools go on a break (Muls, et. al., 2020). The effects of such risks can be detrimental to young people's both school life and personal life, and for this reason, a number of measures can be taken. For example, e-safety training at schools can make learners understand more from their own online experiences, and thereby learning more about e-safety (Gray, 2018). In addition to that, parents and teachers can monitor how particularly children are using mobile devices and online video watching websites such as YouTube and Netflix, and they can inform children about the potential risks to themselves (Dashti & Yateem, 2018). Particularly at young ages, kindergartens and childcare centres can embed opportunities into their practice by which the children at young ages can learn about "digital citizenship and e-safety" (ibid.).

Another challenge posed by digital technologies while learning languages autonomously is that the learners may lack the knowledge and skills needed to use digital technologies, which can be related to being digitally literate, or to put it another way, having digital literacy skills. Digital literacy can be understood as "an inter-related set of skills or competencies necessary got success in the digital age" (List, 2019, p. 147). Digital literacy skills are particularly important for language learners to master because to achieve real literacy skills in a language, the students need to improve themselves in terms of "how to find texts online, evaluate those texts, distinguish genuine from fake websites" (Hafner, Chik & Jones, 2015, p. 1). Yet, it would be wrong to assume that just because children are born into a highly technological world does not necessarily mean that they would be digitally literate. For example, even though the students may have access to the Internet, they may

lack the necessary critical thinking skills to evaluate the reliability of resources from the Internet (Li & Ranieri, 2010).

A lack of digital literacy skills can hinder the development of autonomous language learning. Lai and Gu (2011), for example, reported that learners of a language as a foreign language with higher digital literacy skills showed higher engagement with digital technologies for learning on their own. In a similar vein, Toffoli and Perrot (2017) suggested that learners engaged in the target language through digital technologies more by themselves when they are more digitally literate. Yet, on the other hand, Castellano, Mynard and Rubesch (2011) found that even though the learners of English as a foreign language in their study showed interest in autonomous language learning, they did not have enough knowledge about the available digital technologies that they could use as well as knowledge and skills to make effective use of digital technologies which were already available to them at a self-access centre for language learning in their schools. Similar to that, Li (2013) found that learners of English as a foreign language with high levels of motivation to learn did not fully benefit from Web 2.0 technologies for language practice due to their lack of digital skills to source and find language learning resources through digital technologies. This challenge of not being able to select resources can be more problematic when the abundance of information on the Internet is taken into consideration (Bailly, 2010). As a result, it is possible to observe a link between the level of digital literacy skills and learners' engagement with digital technologies for autonomous language learning. Therefore, a lack of digital skills may prevent learners from fully exploiting the benefits of digital technologies for autonomous language learning.

Another challenge with learning with digital technologies can be that prevalence of digital technologies in today's world can create the impression that students will adopt digital technologies more in their autonomous language learning. Yet, as some studies show, one size does not fit all, and not every student may prefer to integrate digital technologies to their language learning practices. Although it has not been highlighted in many studies, Gao (2019) drew attention to the physical negative effects of digital technologies. For example, it was reported in Gao's (2019) study that some students raised concerns about digital technologies' possible harm for their eyes and skin. Therefore, this can constitute a physical barrier for students against autonomous language learning with digital technologies. It would be insensible to expect such students to engage with digital technologies for learning purposes despite their health concerns. In another study, Kamnoetsin (2014) found that students might not be comfortable with sharing posts in English on social media platforms as part of classwork to practice English. The concern of participants was that their posts or comments could be seen by their friends and family members. Although such posting and commenting features of social media platforms were seen as a resource of feedback and opportunity to improve writing in some studies (e.g. Miller, 2019; Shadiev, 2018), Kamnoetsin (2014) shows that some students may have social concerns which in turn can become a constraint for learning the target language by the help of digital technologies. In a similar vein, the distraction potential of digital technologies might be another challenge for some students. In Gikas and Grant's (2013) study, it was observed that while social networking applications can be advantageous in terms of quickly accessing the information, communication with classmates and providing a number of different

ways to learn, they can also distract learners from their learning, and thereby affecting their concentration on the learning tasks. Finally, particularly when a single technology is selected by another authority such as teachers or researchers than the learners themselves, digital technologies may create a gap across genders in terms of technology use for language learning. In Zhonggen's (2018, p. 227) study, four types of vocabulary learning games were used for English vocabulary acquisition, and it was observed that the scores of male students 'outperformed[sic]' the scores of female students. It was also observed that male students both showed more interest and spent more time engaging with gaming applications than female students. This observed difference across gender groups in terms of scores, interest and time put in learning with gaming applications draws the attention to the point that learners themselves need to have a say in what technology they would like to use or to offer a range of digital technologies among which learners can select. Otherwise, as it was observed in Zhonggen's (2018) study, it can put one group into a more disadvantageous position than others in terms of autonomous language learning.

In Gao's (2019) study, the participant students also voiced another challenge posed by digital technologies which is about communication. The studies in the previous part which discussed the opportunities offered by digital technologies showed that learners can access to numerous language practice opportunities with digital technologies both in spoken and written format, particularly by the help of social networking applications such as Facebook and Instagram. Yet, Gao (2019, p. 77) reported that communication over such social media platforms may also cause *miscommunication* in the target language as "[communication] is not as direct as

face-to-face communication". The reason might be that communication by digital means might lack the non-verbal cues in communication such as body language and eye contact (Junco & Chickering, 2010). For students who may need the support of such non-verbal aspects of communication for complete meaningful communication, it might be difficult to access such numerous opportunities of practice in the target language by the help of digital technologies. As a result, this situation may also become a challenge for students to fully exploit the affordances of digital technologies for autonomous language learning.

Related to e-safety, digital citizenship can both help tackle with e-safety concerns and benefit from the opportunities of digital technologies for learning. According to The International Society for Technology in Education (2019, n.p.), digital citizenship is one of the important elements of education, and it suggests that students should be able to "recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical". The importance of digital citizenship is both recognised by education providers (Herold, 2016) and global technology companies such as Google (Google for Education, n.d.) and Microsoft (n.d.) which provide digital citizenship and safety course and digital literacy course respectively. Therefore, fostering digital citizenship identity of children can help to address e-safety issues in their life, and both to enable learners to take better advantage of digital technologies and to attain digital citizenship, and thereby achieving e-safety, language learners need to improve themselves with digital literacy skills.

2.2.4 Understanding of technology in this research

In light of these studies, it can be suggested that technologies can be supportive of autonomous language learning and encourage learners to take control over their learning. As Benson (2011, p. 152) puts it:

> …they [technology-based approaches] place the learner (as controller of the technological device) in direct control of key aspects of the learning process; they allow wider access to authentic target language sources; and they also allow wider access to authentic interactive use of the target language.

It is also possible to see that digital technologies pose challenges for autonomous language learning. However, most studies in the field focus on the relationship between learner autonomy and technologies within one specific technology. Each study aimed to find out how one specific technology, which was either chosen by the teacher or the school, could be supportive of autonomous language learning. Such practices are in a sense similar to the early work on learner autonomy where the main focus was on supporting the learners with rich resources in self-access centres and training learners how to use these resources for self-directed learning (Benson, 2013). As Benson (2013, p. 840) argues, "learner control was, in effect, both institutionalized and other-initiated". Due to technological developments and learners becoming more digitally literate, however, the "*locus of control* [originals in italic]″ was transferred back to the learners, and autonomous language learning turned out to be "self-initiated and carried out without the intervention, or even knowledge, of language teachers" (Benson, 2013, p. 840). This point is also reflected in the understanding of autonomous language learning in the previous section.

It could be suggested that removing the option for learners to choose the technology seems to be in incongruence with the principle of autonomous language learning, which is having choices (Hamilton, 2013). Conole (2008) also suggests that learners placed more value in the technologies which they came up with themselves. As discussed above, one specific technology does not fit each student. Also, studies show that, with the advent of new technologies and their ubiquitous availability, learners have opportunities to manifest their autonomous language learning in new ways. Therefore, there have been calls in the literature to look at the nature of the relationship between technology and autonomous language learning, and how learners interact with various technological resources and platforms (Lai, 2017, p. 166). This study aims to shed a light on this relationship by investigating how technologies can be supportive of autonomous language learning within a context in which learners could choose the technology they want to engage with. It is worth noting that the nature of this relationship between technology and autonomous language learning comprises of both the learners' learning experiences and technologies. To understand these experiences, and thereby the dynamic nature of this relationship, this research makes use of the theory of affordances (Gibson, 1979) as a theoretical framework. However, before moving on to the discussion of this theory, it essential to give an account of what is considered to constitute technology in this research. As Hamilton (2013) suggests, technology as a concept can have different interpretations.

The concept of technology is not an easy one to define. In its original meaning, the word technology is a combination of two words, *techne* and *logía*, which can respectively be translated as "skill, art or craft" and "the understanding of

something, or as a branch of knowledge" (Selwyn, 2017, p. 8). According to Selwyn (2017, p. 8), this shows that technology can comprise "processes and practices of doing things, understanding things and developing knowledge". In addition to that, it is possible to understand many other things from technology, as well. Computer devices such as smartphones, laptops, tablets, desktop computers; electronic devices such as digital cameras, projectors, smartboards; artificial intelligence systems such as self-controlling robotics; software programmes such as word processors, search engines and games are just a number of computerised devices which can be labelled as modern technologies (Selwyn, 2017). In a similar vein to show that technology does not have a single definition, Arthur (2009, p. 28) suggests three definitions to technology:

> The first and most basic [definition] is that a technology is a means to fulfil a human purpose.[…] As a means, a technology may be a method or process or device. [In the second definition] technology as an assemblage of practices and components. This covers technologies […] that are collections or toolboxes of individual technologies and practices. [In the third definition] technology as the entire collection of devices and engineering practices available to a culture.

Despite being such a nebulous term, however, an understanding of tools or tool systems has been one of the most common views of technology (Osborne, 2014). As Wegerif (2002, p. 2) suggests, "technology is a broad term for human tools systems" which mediates the "human learning and thinking". Golonka, Bowles, Frank, Richardson, and Freynik's (2014) review of types of technologies used in foreign language learning can help to display a small fragment of what technology as a tool or a device can refer to (Table 6).

Table 6 Review of technologies (adapted from Golonka et. al. (2014))

Title of reviewed technologies	Sub-categories
Schoolhouse- or classroom-based technologies	• Course management system • Interactive whiteboard • ePortfolio
Individual study tools	• Corpus • Electronic dictionary • Electronic gloss or annotation • Intelligent tutoring system • Grammar checker • Automatic speech recognition (ASR) and pronunciation program
Network-based social computing	• Virtual world or serious game • Chat • Social networking • Blog • Internet forum or message board • Wiki
Mobile and portable devices	• Tablet PC or PDA • iPod • Cell phone or smartphone

As can be seen from these definitions and descriptions above, the concept of technology can refer to a wide range of different concepts based on how it is used or the nature of the technology that is being used, and that technology is not just limited to the tools or artefacts (Selwyn, 2017). Considering technology as tools provides a limited perspective of what can be done with them (Osborne, 2014). It has been suggested that tools are inclined to be "positivist in nature" which can "have specific purposes that they were designed to achieve" (Osborne, 2014, p. 389). Yet, what can be done with a tool can be more than the initial design intentions. For example, technological tools are not built-in with ill-nature to bully or harass their users. Therefore, it is not the machines or the technological tools which make people go through harmful experiences such as bullying or harassment.

If that had been the case, it would be possible to explain such harmful behaviours with technological determinism. On the contrary, such behaviours are caused by the acts of people themselves, and they are the “handiwork of humans” (Chayko, 2017, p.44). In another example to show that technology is more than tools and artefacts, Selwyn (2017) gives the example of the Internet. Selwyn (2017, p. 8) states that almost everyone now would refer to the activities they have involved online and the knowledge they get from such activities, rather than just the material parts of the "networks of computing devices that support the Internet". In a similar vein, but within the scope of technology in learning environments, Hanson-Smith (2000, p. 2, cited in Benson, 2011, p. 149) notes that "changes wrought by technology far exceeded the designers’ original intentions, often leading to new ways of teaching and learning…[and] more independence and self-sufficiency for students who are moved to take responsibility for and control of their own learning". So, it can be suggested that learners also see technology as more than just a tool, a machine or an artefact, and to understand how learners go beyond the original intentions of designers, a new understanding of digital technologies is needed. To achieve such a new understanding, this study first narrows its focus onto digital technologies, which are separate from the analogue technologies. In today’s world, the difference between two might be very obvious, but a blackboard (not the virtual course management system) is also a technology which, as Osborne (2014) states, is one of the few to be designed for educational purposes. Therefore, it is useful to narrow the scope of what technology refers to in the first instance. Secondly, this research aligns itself with the view of digital technologies as a digital environment. As stated above, the main reason for adopting an understanding of digital

technologies as an environment is due to the aim of exploring how digital technologies can be taken advantage of without limiting them into a deterministic nature.

The digital environment is comprised of digital spaces which are inhabited and converted to digital places by the people. Digital spaces can be considered as what the designers or developers of a digital tool or platform created at a technical level with the software codes. Yet, such digital spaces at a technical level are then occupied and used by people, and in this way, space is transformed into a place. It takes a level of "value of social meaning, convention or cultural understanding" (Osborne, 2014, p. 94). Such digital places within a digital environment show similarities with the real physical places. For example, as Osborne (2014, p. 89) notes, the language which is used to describe digital technologies is also similar to the language which is used to talk about places in a real environment, such as "web*sites, address* bars, *going* online, *visiting* a digital location [originals in italic]", and use of such a similar language with real life is not without any grounds. Chayko's (2008) research, for example, show how online digital spaces can be converted to online digital places by people creating online communities. It is particularly interesting to see that the experiences of the people who spend time in such online places are reminiscent of experiences in a physical non-digital world. For example, the participants in Chayko's (2008, p. 7) study reported that they had an "extremely tightly bonded community that simply cannot be found in normal daily life" and they had felt relieved "to have this place [online community space] to vent and be able to get feedback and sympathy". By using such "place-based metaphors", people feel their experiences are "more collective, more visible, even

more tangible" (Chayko, 2017). For example, it is possible to observe in Chayko's (2008, p. 24) research that people refer to an online forum website as "*a place* where rock fans can *gather* to celebrate the band they love[…], where [they] speak to friends [they] have not seen in a while[…]; *it's* [their] *little gathering place* [italics in original]". Such accounts of Chayko's (2008) study participants imply that a technical online space which is constructed of tools and software coding can be occupied and used by a group of people, and thereby converting this online space to digital place by attributing some social value to it.

In a similar vein, Herrington and Parker (2013, p. 612) suggest that learners consider technology as a "whole new world". In their study, even Herrington and Parker (2013) started their research with an understanding of digital technologies as tools, in which they asked the participants to use technological tools and engage in three different activities. Yet, it was found out within the study that a considerable number of participants experienced digital technologies as a whole new world. In another study, particularly in the area of learner autonomy, Schwienhorst (2008), for example, holds the view that learner autonomy is more related to "learner-centred approach to learning" according to which "learners are encouraged to critically reflect on their learning process and develop a personally meaningful relation to it" (p. 11), and the development of learner autonomy entails "reflection and awareness […]; interaction and collaboration […]; and experimentation and active collaboration" (p. 12). Schwienhorst (2008) considers the technology in his research, the *Multi-user, object-oriented* (MOO) environment which is customizable online chatrooms, as a virtual environment, or as a digital environment in this research, which is different from the real environment. He

suggests that MOO environment can be supportive of the development of learner autonomy by becoming a place for learners where they can reflect on their learning; use the target language by particularly meeting a good number of people to communicate; and experiment with the language by accessing various resources. In a similar vein, Hamilton (2013, p. 51) also shows how technology can become a digital environment by suggesting that "[b]eyond the classroom, technological social networks are well-populated and have grown exponentially", which suggests that "electronic space has the potential to provide a previously unattainable opportunity for linguistic freedom within a rich communicative environment". Benson and Chik (2010, p. 63) also consider websites such as video-sharing site YouTube, an image and video sharing site Flickr, an animated fan fiction site FanFiction.Net, and the site of a multi-player online game called World of Warcraft as "globalised online spaces". Because of the wide availability of such digital technologies, Benson and Chik (2010) suggest that globalised online spaces can stimulate the development of autonomous language learning by providing a digital environment where the learners can use the target language by engaging in online content creation and discussion with other contributors. Finally, Osborne (2014) conceptualizes digital technologies as digital environments, and his research shows how digital technologies could become an extension of the physical classroom environment. While Facebook, for example, acts as "a place for building relationships and receiving feedback on progress over the course of the module" (Osborne, 2014, p. 417), a software called Adobe Visual Communicator becomes a place for learners to "create and then to reflect on what has been created, to cycle thinking" (Osborne, 2014, p. 226). Although Osborne's (2014) research focuses on

the relationship between technologies and authentic assessment and thereby is not directly related to autonomous language learning, it is helpful with regards to showing that digital technologies can be conceptualised as a digital environment.

In the light of the discussion so far, two points can be understood about the notion of technology. The first is that digital technologies support autonomous language learning, but learners' use of technology can exceed the designers' initial intentions for any specific technology. The studies discussed above show that learners could use digital technologies for different purposes and needs. Therefore, how these digital technologies can provide support varies. Secondly, it is possible to conceptualise digital technologies as a digital environment on their own right. Rather than seeing digital technologies as part of "tools that exist on the edge of learning, that are brought in and applied to real learning', technology itself can be considered as a digital environment (Osborne, 2014, p. 389). Such an understanding of technology brings the literature review to another important discussion of how autonomous language learning can be aligned with such an understanding of digital technologies as a digital environment. The next section will, therefore, return to the theory of affordances to provide this theoretical basis and framework.

2.3 The theory of affordances

So far, the previous two sections of the literature review have focused on two important concepts in this research: learner autonomy and digital technologies.

Autonomous language learning was operationalised as learning or studying English without the direct control or influence of a teacher and taking control over one's

own learning with self-determined and volitional tasks and activities. This present study adopted the view that learners have a natural tendency to take control over their language learning, and whether they respond to the opportunities available for language learning on the digital technologies or not can also become a manifestation of learners' taking control over their learning.

Concerning the understanding of digital technologies, this present study distanced itself from seeing digital technologies as a material tools or tools system and aligned itself with a view of digital technologies as a digital environment. In this regard, therefore, this study also avoided seeing digital technologies as having a deterministic character, which implies that "technologies possessing inherent qualities and being capable of having predictable impacts or effects on students, teachers and educational institutions if used in a correct manner" (Selwyn, 2017, p. 37).

In the light of these accounts of two main notions in this research, a theory is sought in which the relationship between autonomous language learning and digital technologies can be discovered in a way that digital technologies can still be supportive of autonomous language learning, but not in deterministic cause-and-effect nature. This research turns to the theory of affordances for this exploration. the next section will, therefore, provide an account of the origin of the theory of affordances, how it is adopted in autonomous language learning studies, and how it can be appropriated to a digital environment in this research.

2.3.1 The origins of the theory of affordances

The theory of affordances is part of a wider, ecological approach to visual perception, and the term was coined by Gibson (1979) who, as a psychologist, argued that humans perceived the environment around them directly. The view of indirect perception which he argued against suggested that the world was meaningless, and meaning was bestowed upon the environment by humans. Such perception works in a way whereby humans collect information from the environment and process it to make meaning of the environment. As Chemero (2003, p. 181) puts it, "[the brain] performs inferences on the sensation, yielding a meaningful perception". With his ecological approach to visual perception, Gibson (1979) suggested that the humans (or originally animals as a unit of analysis in his book) did not need to collect pieces of information and recombine them in the brain. Instead, he argued that humans already live in a meaningful environment. To put it another way, Chemero (2003, p. 181) interpreted direct perception in a way that "meaning is in the environment, and perception does not depend on meaning-conferring inferences; instead, the animal simply gathers information from a meaning-laden environment". Within this larger theory for direct perception, Gibson (1979, p. 127) developed his theory of affordances to explain how "the meanings of things in the environment can be directly perceived" by humans.

Gibson (1979, p. 127, originals in italic) defines the concept of affordances in the following way:

> The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill. The verb to *afford* is found in the dictionary, the noun *affordance* is not. I have made it up.

> I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment.

In this definition, Gibson (1979) suggested that the concept of affordances has a relational character which implies that affordances occur from the relationship between animals, or humans, and the environment. When humans look at an object in the environment, what they perceive is not its "qualities" such as the colour, texture, or size, but what the affordances of this object are (Gibson, 1979, p. 134). Yet, when the concept of affordances refers to both sides in this relationship, it produces a different ontology which cuts the dichotomy of subjective/objective:

> An important fact about the affordances of the environment is that they are in a sense objective, real, and physical, unlike values and meanings, which are often supposed to be subjective, phenomenal, and mental. But, actually, an affordance is neither an objective property nor a subjective property; or it is both if you like. An affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behavior. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer (Gibson, 1979, p. 129)

Osborne (2014) interprets this conception of affordances as showing that while any object can afford something for a human, the same object may afford different things to different humans. In Gibson's (1979) words, for example, a stone "can be a paperweight, a bookend, a hammer, or a pendulum bob. It can be piled on another rock to make a cairn or a stone wall". While the object at this example is the same stone, it can afford different things to different humans "both in the same contexts and in different contexts" (Osborne, 2014, p. 52). In this regard, Gibson (1979, p. 128) compares the affordances to the niches of the environment, "a niche is a set of affordances". From an ecological perspective, the concept of niche "refers more to

how an animal lives than where it lives" and "[t]he natural environment offers many ways of life, and different animals have different ways of life" (Gibson, 1979, p. 128). Various conditions of the natural environment enable humans and many other living organisms to occupy a niche, i.e. to take advantage of different ways of living such as getting food, sheltering, and moving around.

The way that the natural environment provides humans with many offerings for a living is reminiscent of how digital technologies can offer different possibilities to learners for autonomous language learning. It can be suggested that as humans occupy and take advantage of different affordances in the natural environment simply for living, so learners can also take advantage of different affordances in a digital environment for autonomous language learning. As discussed in the previous section, the ways that digital technologies can support autonomous language learning in different ways (e.g. Suvorov & Cabello, 2017; Toffoli & Perrot, 2017) to different learners can be regarded as supporting this interpretation.

While the environment provides affordances to humans, humans tend to make alterations in their environment to change "what it [environment] affords him [humans]" (Gibson, 1979, p. 130). Humans change the shape and the layout of the environment to make life easier by "cutting, clearing, levelling, paving, and building", thereby making "more available what benefits him and less pressing what injures him [sic]" (Gibson, 1979, p. 130). At this point, Gibson (1979, p. 130) reminds the reader that the environment which was artificially constructed from the natural environment did not constitute a new environment, but it was just "the same old environment modified by [hu]man". Gibson's (1979) conception that humans reconstruct their environment to change what it affords reflects what Lai (2017, p.

58) observes, that "language learners do actively manipulate various physical and non-physical resources to create learning opportunities outside the language classroom". It is possible to understand that learners are also in the pursuit of finding affordances beyond the classroom for language learning purposes.

The aspect of affordances that humans can make them more available by altering their environment leads to an important question: What makes humans perceive or attend these affordances? To continue with the example of a stone, for example, it can be used both as a paperweight and a hammer. These are just two possibilities of what a stone can afford to humans, but not everyone attends or perceives these affordances all the time. Gibson (1982) suggested that it is the "the needs" that "control the perception of affordances […] and also initiate acts". To quote Heft (1989, p. 13), "an affordance is perceived in relation to some intentional act, not only in relation to the body's physical dimensions". As Gibson (1979, p. 130) clarifies, "the observer may or may not perceive or attend to the affordance, according to his […] needs, but the affordance, being invariant, is always there to be perceived". Therefore, it can be understood that needs and intentions lead humans to attend to the affordances in their environment. This point is relevant in this research because while there will be different affordances available in the digital environment, and it will be the needs and the intentions of the learners in this research which show what affordances there are for autonomous language learning.

2.3.2 Affordances and autonomous language learning

The concept of affordances has long been discussed and adopted within various communities and disciplines such as psychology, design, and education (Osborne, 2014). As it is most relevant to this study, it is imperative to look at how the concept of affordances was appropriated and adopted in other studies which focused on autonomous language learning.

Murray and Fujishima (2013) focused on a social learning space, which was later named after English Café, with the main purpose of providing learners with an environment where learners could meet and improve their oral communication skills by interacting with other English-speaking students. By adopting an ecological perspective, Murray and Fujishima (2013) aimed to find out the affordances which gave rise to the opportunities for oral practice. This research is relevant to this present research because it shows how affordances arose from the learners' interaction with the environment, which represents the original conception of affordances as having a relational character. The study found that English Café as a social learning space offered many affordances for autonomous language learning. One of the important affordances was that learners did not feel the pressure that they would feel in a classroom. Because the café was available to visit any time, learners were able to practice their oral communication skills in a more relaxed way. Another noteworthy finding was that the English Café offered an affordance of making friends with international students and speaking with them in English, which again contributed to learners' improved speaking skills. In addition to these two points, the English Café also provided learners with the affordances to

learn more about other cultures, to get individual one-to-one language support when they needed it, and to talk about their learning and thereby enhance their metacognitive knowledge and skills. These findings are particularly important as they show that it is not only the material objects in an environment which offer affordances but learners themselves can also offer affordances to each other. In this way, it supports the conception of affordances that "the richest and most elaborate affordances of the environment are provided by […] other people" (Gibson, 1979, p. 135).

In another study, Hamilton (2013) focused on the relationship between a virtual learning environment (VLE) and learner autonomy. Hamilton (2013) also adopted an ecological approach to explore the relationship between learner autonomy and a VLE, and the concept of affordances constituted one of the cornerstones in this exploration. Yet, this study is included here not because of its findings, but the way that affordances are conceptualised and appropriated in the study. Hamilton (2013) considers affordances as materials or resources which can be intentionally designed and built into digital technology. However, the idea that affordances can be pre-determined and integrated into digital technology is in incongruent with the original conception of affordances by Gibson (1979). As discussed above, affordances exist from the relationship between the organisms and their natural environments, according to which affordances in Hamilton's (2013) conceptualisation are positioned at the environment-end of this two-end relationship. However, when considered in terms of a digital environment, it is difficult to grasp affordances in advance since it will be impossible to predict what affordances the learners can get from a digital environment.

In the light of Murray and Fujishima's (2013) research, it can be understood that affordances can provide a theoretical basis to find out how an environment can provide opportunities for autonomous language learning. Yet, Hamilton's (2013) research leads to another important point of how affordances can be appropriated into a digital environment while still maintaining their original conception.

This present research refers to the original conception of the theory of affordances as suggested by Gibson (1979) to explain the relationship between autonomous language learning and digital technologies. The relational nature of the concept of affordances, which cuts the dichotomy between an objective and subjective nature, can be particularly useful to explore this relationship in a non-deterministic way.

2.4 Chapter summary

Collectively, the literature review has presented accounts of three main concepts in this study: learner autonomy, technology as a digital environment, and affordances.

Concerning learner autonomy, the philosophical underpinnings of the concept were discussed and theoretical definitions and models of it were presented. The concept was operationalised in the following way:

> An autonomous language learner is a learner who learns or study English without the direct control or influence of a teacher and takes control over his/her learning English with self-determined and volitional tasks and activities.

In the second section, the notion of technology was discussed about autonomous language learning. Research studies which aimed to develop learners' capacity to learn autonomously were discussed. It was suggested that a deterministic approach

to technology limited what other opportunities it could offer. Therefore, this research aligned itself with the view of digital technologies as a digital environment.

This research aims to explore the relationship between digital technologies and autonomous language learning. When the final accounts of autonomous language learning and digital technologies are considered, the literature review presents the question: what is the relationship between an autonomous language learner, as in the above account, and digital technologies as a digital environment like?

At this point, this literature review turned to the theory of affordances of Gibson (1979) to frame the thinking of this relationship in this research. A language learner already possesses a capacity to learn languages autonomously, and a digital environment provides or furnishes affordances to a language learner to learn autonomously by providing opportunities to take control over one's own learning. That is to say, in the same way, that the niches of the natural environment provide various ways of life to humans, there are niches of the digital environment which the learners can occupy to learn languages autonomously, and digital environments provide affordances to learners to manifest their autonomous language learning.

Having reviewed the relevant literature, this thesis now continues with the methodology of the research.

Chapter 3 Methodology-1: Research Paradigm, Ethical Considerations and Sampling of the Participants

This research aims to understand the relationship, in the form of affordances, between autonomous language learning and digital technologies. This chapter discusses Q-methodology, which is the methodological approach to be used in this research, together with its underlying principles and methods of data collection and analysis. The chapter will be structured into three sub-sections. The present chapter gives an account of the theory and the principles of Q-methodology and discusses why it is suitable for this research. This section also presents how ethical considerations were addressed in this research and how participants were recruited. The second chapter will present the survey of digital technologies used in order both to identify the digital technologies used at the time of the research and also to recruit participants for the main data collection method of Q-sorting. The third chapter of the methodology will present the data collection and analysis procedure in Q methodology.

Before moving to a discussion of Q-methodology, the methodological approach of this research will be presented as a case study mixed methods approach, and it will be followed by a reflection on the ontological and epistemological premises which underlie the phenomenon under investigation will be provided. This reflection contrasts the main research paradigms. A discussion about research paradigms

informs the methodological decisions by providing "[a] way of looking at or researching phenomena, a world view, a view of what counts as accepted or correct scientific knowledge or way of working" (Cohen et al., 2018, p. 8). However, Pring (2015) warns against making an either/or decision among the paradigms since that might, as Cohen et al. (2018, p. 8) put it, "massively over-simplifies the real world, which is complex and complicated". Also, paradigms are already built upon and espouse different ontologies and epistemologies. So, rather than adopting *a priori* paradigm and compelling it to fit into a certain research paradigm, this chapter discusses the ontological and epistemological underpinnings of affordances independently and subsequently moves to present Q methodology.

3.1 A case study mixed methods approach to research

This study aimed to find out what affordances digital technologies can provide for autonomous language learning in a Norwegian context. While there have been studies in the Norwegian context which looked at autonomous language learning, a review of the literature suggested that no study had looked at whether digital technologies provide any affordances for autonomous language learning. Therefore, this study adopted a case study mixed methods approach to fill this gap in the literature in terms of the relationship between digital technologies and autonomous language learning in the Norwegian context.

A case study can consist of one single case or multiple cases. Indeed, Punch (2005, p. 144) argues that “almost anything can serve as a case” in a research study, and Tight (2016, p. 378) also asserts that “all research could be said to involve the study

of cases". Yet, case studies involve a more holistic analytical approach to what is to be studied, and the cases are studied within their original context (Tight, 2016). While planning a case study, Thomas (2011) separates the subject and the object of the case being studied. According to this distinction, the subject of a case study refers to the focus of the research while the object refers to what needs to be explained within the case. As Cohen (2018, p. 383) illustrates, the subject may refer to "an education system, a school, a group of students" while the object to be explained can be "the structures, management effectiveness and levels of achievement". When this distinction between a subject and an object of a case study is applied to this research, the subject, i.e. the focus of this research, is on students studying at an upper-secondary school within the Norwegian education system, and the object of the study, i.e. what is to be explained with those students, is what affordances the digital technologies can provide to them for autonomous language learning.

According to Cohen (2018, p. 376), "case studies are set in temporal, geographical, organizational, institutional and other contexts that enable boundaries to be drawn around the case." In this research, the most important characteristics of the school setting where the study was situated that helped to select this school as the case was that there was an interest in using digital technologies for language learning purposes among the students and the teachers. Also, the students' online comments on how they are learning both in their English classes and outside the school suggest that there are anecdotal traces of autonomous language learning among the students.

In a case study, it is imperative for events and situations to be allowed to speak for themselves, rather than to be heavily interpreted, evaluated or judged by the

researcher. It is indeed one of the key characteristics of case studies that a single reality is rejected, and the researcher should be open and reflexive to explore multiple realities within the case studied (Cohen, 2018). In this regard, this research used Q-methodology, which will be introduced in more detail in the following sections, to capture how digital technologies can provide affordances for autonomous language learning. The reason for selecting Q-methodology is due to its methodological principles. In Q-methodology, the participants of a study, which can be a case study as well, speak for themselves through the Q-sorting technique without being heavily interpreted. The subjectivity of each participant is captured by their complete Q-sorts which does not leave much room for the researcher to change the essence of what the participants put forward as their viewpoints.

While it is imperative to allow the participants to speak for themselves, it is also important to collect data from as many sources as possible in a case study. This is because case studies focus on a case and try to analyse it in more depth within its original context (Denscombe, 2014). This entails the researcher to approach the case being studied to be explored from multiple perspectives with multiple data collection tools, and this subsequently recalls the use of mixed-method research approach. According to Creswell and Plano-Clark (2011, p. 5), mixed-method research provides the opportunity to use qualitative and quantitative data together in one research study or different phases of research, and the aim of which is "to give a greater understanding of the topic or problem in question rather either a quantitative or qualitative approach on its own would provide". This aim aligns with the important feature of case studies which is to collect data from multiple sources when analysing the case. Therefore, as it will be described in the next

chapters of the methodology part of this research, this research also used both qualitative and quantitative data collection methods together which were wrapped in a Q-methodological approach to provide an in-depth analysis of the affordances of digital technologies within the case of Northview School where this study was situated. How Q-methodology fits in a mixed-method research approach will be discussed in section 3.3 together with the principles of Q-methodology.

3.2 Ontological and epistemological stances

In the discussion of paradigms, a researcher can first start with an ontological question which asks "[w]hat is the form and nature of reality and, therefore, what is there that can be known about it?" (Guba & Lincoln, 1994, p. 108) or "is reality of an objective nature, or the result of individual cognition? is it a given out there in the world, or is it created by one's own mind?'(Cohen, Manion, & Morrison, 2011, p. 5). As its research phenomenon, this research aims to explore the affordances of digital technologies for autonomous language learning and, as has been explained in the previous chapter, an ontological position for affordances is not easy to define. The reason is that the concept of affordances cuts the dichotomy between a subjective and objective reality (Gibson, 1979). In response to the questions above in Cohen et al. (2011), it can be stated that "affordances neither belong to the environment nor the individual" (Parchoma, 2014, p. 361), but rather they arise out of the relationship between the person and the environment.

Within the domain of technological affordances, Hutchby (2001, p. 444) argues regarding this subjective-objective dichotomy that "affordances are functional and

relational aspects which frame, while not determining, the possibilities for agentic action about an object". Since affordances are relational, they challenge the conventional duality between positivist and anti-positivist paradigms such as constructivism. Positivism asserts that what we are seeking to explain "exists independent of individuals' perceptions of it" (Waring, 2017, p. 16). Based on this understanding of positivism, the affordances for autonomous language learning would need to be inherent in digital technologies. What a digital technology provides for a learner to learn autonomously would need to be independent of that learner. Such a positivistic understanding of affordances would also mean that the affordances would be the same for every learner. To put it another way, digital technology would need to provide the same thing for every learner. Yet, the studies discussed in the literature review, such as that of Suvorov and Cabello's (2017) and Fuchs's (2017), show that technology does not mean the same thing for every learner. Therefore, a positivistic ontology of affordances would not be suitable for this research. On the other hand, constructivism supports the belief that "[…] multiple realities are constructed by individuals" (Waring, 2017, p. 16). It is difficult to position the affordances of digital technologies in a constructivist ontology, also. A constructivist understanding would mean that affordances were products of mental constructivism which only exists in the minds of individuals. In other words, it would mean that what digital technology could afford would only be created in the minds of individuals, and digital technologies would be meaningless without an individual. Gibson (1979, p. 139) argues that "[a]n affordance is not bestowed upon an object by a need of an observer". To give an example, but not in the context of digital technologies, Gibson (1979) elaborates on

this point by arguing that a post box, for example, does not afford to send a letter just because an individual to send a letter attended it. Whether that individual send a letter or not, Gibson (1979, p. 139) asserts that "[...] the affordance, being invariant, is always there to be perceived". Yet, this potential affordance of sending a letter is realised when an individual attends to this affordance. So, what something such as a post box affords is not created in the mind of an individual, but there occurs a complementarity between post box and an individual for an affordance to arise.

It is difficult to position affordances either as a reality which exists independently in the environment or as a product of the minds of individuals. Therefore, rather than aligning itself with one of the two main paradigms concerning the ontological viewpoint for affordances of digital technologies for autonomous language learning, this research maintains the original viewpoint of Gibson, that affordances are relational, and they exist from the mutual relation between the individuals and the environment. To put it another way, affordances "move from inside the head to the direct and unmediated individual-environment system" (Hill, 2014, p. n.p.)

After addressing the ontological assumptions, the second question that a researcher will ask is related to the epistemological stance: "what is the nature of the relationship between the knower or would-be-knower and what can be known?" (Guba & Lincoln, 1994, p. 108). In terms of this study, the question can be rephrased as to how the affordances of digital technologies for autonomous language learning can be known by the researcher in this research. Representing one of the two main epistemological assumptions, the positivist paradigm suggests that it is "possible to achieve direct knowledge of the world through direct

observation or measurement of the phenomena being investigated" (Waring, 2017, p. 16). Because of the relational ontology of affordances, it is difficult to adopt a positivist/objectivist epistemological stance in this research. What a digital technology affords for autonomous language learning can only be an affordance for particular learners because no one can replace his/her point of view. Therefore, the epistemological position of this research fits better in a subjective paradigm, and the knowledge of the affordances of digital technologies for autonomous language learning can best be understood from the perspectives of participants. At this point, subjectivity in this research does not refer to an understanding in an interpretive paradigm, which asserts that "the social reality is a construction based upon the actor's frame of reference within the setting" (Lincoln & Guba, 1985, p. 80). Such an understanding of subjectivity would again be incongruent with the relational ontology of affordances because it implies a constructed version of affordances. Instead, the meaning of subjectivity adopted in this research refers to a person's perspective or point of view which is "void of the mentalism" (McKeown & Thomas, 2013, p. 2).

In the light of these ontological and epistemological assumptions of affordances of digital technologies, this research turns to Q-methodology as its research methodology. This will be discussed further in the following sections, but the main reason for choosing Q-methodology is that it is congruent with the subjective epistemology of affordances. Next, the underlying principles and key terminological concepts in Q-methodology will be introduced.

3.3 Principles of Q methodology and relevance to the research

At an online conference, Brown (1993, p. 93) recalls having been asked to say "[...] what Q methods are good for – in other words, what are they [Q methods] going to tell me about a phenomenon that I cannot learn some other way?". In response to those participants, Brown (1993, p. 93) states that "[f]undamentally, Q methodology provides a foundation for the systematic study of subjectivity". Q methodology can help to investigate subjectivity, for example, "in aesthetic judgment, poetic interpretation, perceptions of organizational role, political attitudes, appraisals of health care, experiences of bereavement [...], et cetera ad infinitum" (Brown, 1996, p. 561). The focus is on systematically studying subjectivity and Q methodology constitutes "a combination of conceptual framework, technique of data collection, and method of analysis" (Brown & Good, 2010, p. 1149). In this way, a Q-methodological study reveals "the holistic identification of a finite range of distinct viewpoints" concerning the phenomenon under investigation (Stenner, Watts, & Worrell, 2008, p. 216).

William Stephenson, the inventor of Q-methodology, was critical of the way that so-called "R methodologies" investigated the individual differences in the discipline of psychology (Brown, 1980). R methodology was a name which Stephenson used to refer to "methods that employ tests or traits as variables and which operate using a sample of persons" (Watts & Stenner, 2012, p. 21). In such tests and scales such as questionnaires, the participants would be compared over different variables. As a characteristic of such tests, *a priori* meaning was assigned

into the tests as a result of the hypothetic-deductive logic of the R methodology. The scores obtained from such tests using a sample of participants would be factor analysed to "account for the many manifest associations captured in the correlation matrix through the identification of a greatly reduced number of underlying, explanatory or latent variables" (Watts & Stenner, 2012, p. 10). However, as Watts and Stenner (2012, p. 10) put it, Stephenson called this operation "something of a misnomer". His main criticism was that the factors obtained as a result of R methodological factor analysis did not reflect the differences between "personal characteristics of specific individuals" (Watts & Stenner, 2012, p. 10). Rather, those factors showed "the associations and differences between variables mapped at the population level" (Watts & Stenner, 2012, p. 10). That meant that R methodology and by-variable factor analysis could not present individual differences between participants while keeping them as a whole. The differences between individuals would, therefore, be lost.

Stephenson intended to find out the ways of "identifying different types of people, or different types of mood, types of viewpoint and so on, across different life domains and contexts" systematically and holistically (Watts & Stenner, 2012, p. 14). The individual differences between individuals would not be lost after the participants had completed the tests. Stephenson argued against the dominance of R methodology in the discipline of psychology and offered a different approach to factor analysis (Watts & Stenner, 2012). Such a shift was emancipation from R methodological by-variable factor analysis as the undisputed way of conducting this analysis (Watts & Stenner, 2012). Stephenson (1936, pp. 344-345) introduced his inverted factor analysis approach in the following way:

> Factor analysis [...] is concerned with a selected population of n individuals each of whom has been measured in m tests. The (m)(m/1)/2 intercorrelations for these m variables are subjected to [...] factor analysis. The technique, however, can also be inverted. We begin with a population of n different tests (or essays, pictures, traits or other measurable material), each of which is [...] scaled by m individuals. The (m)(m/1)/2 intercorrelations are then factorised in the usual way.

This inverted factor analysis approach led to important implications and constituted the basis for the study of subjectivity in Q methodology. Unlike in the tests or scales in the R methodological tradition, the participants become the *variables* of the tests and scales. Rather than the participants obtaining a score in R methodological tests, it is the tests themselves which obtain scores in Q methodology. Most importantly, however, giving scores to tests is made "from a subjective or first-person perspective using a new unit of quantification [...] psychological significance" (Watts & Stenner, 2012, p. 22). Brown (1997) suggests that this is how Q methodology offers the means to study subjectivity.

When it comes to subjectivity in Q methodology, it has a non-substantive characteristic. This means that subjectivity does not refer to "isolated mind-stuff that exists inside us, or that is somehow separate from the real world of objects" (Watts & Stenner, 2012, p. 26). Instead, Stephenson used the term subjectivity to refer to an "observable domain of self-referent statements and opinion" (Watts & Stenner, 2012, p. 33). To give an example, these statements generally start with personal remarks such as "it seems to me, [...] in my opinion, [...] I agree or (or disagree)" (McKeown & Thomas, 2013, p. 2). It comprises "an individuals' subjective utterances" (McKeown & Thomas, 2013, p. 2). Yet, it is not the same thing as consciousness (Goldman, 1999). Subjectivity is also modified by an

operant character. Operant subjectivity means that subjectivity is best understood as a "behaviour or activity" (Watts & Stenner, 2012, p. 26). In Q methodology, this operant subjectivity is captured through Q-sorting, and this is how subjectivity in an interpretive epistemological understanding differs from subjectivity in Q methodology. In Q-sorting process, a participant does not have to "introspect, or to turn on his [sic] consciousness: instead he [sic] has expressed his [sic] subjectivity operantly; modelling it in some manner as a Q sort"(Stephenson, 1968, p. 501). A completed Q-sort constitutes the viewpoint of an individual.

As well as non-substantive and operant character, subjectivity is also communicable in Q methodology. That is, subjective expressions can be found anywhere where "they are anchored in self-reference –an internal frame of reference relating to anything about which an individual expresses a point of view" (McKeown & Thomas, 2013, p. 2). McKeown and Thomas (2013) illustrate subjective communicability with the example of a declarative statement "it is raining" from Stephenson (1986). As McKeown and Thomas (2013, p. 3) elaborate, a meteorologist can inform viewers by reporting "a low-pressure system will produce several days of precipitation". This is an objective reality that can be observed objectively with a barometer. On the other hand, such an objective reality can mean different things to different viewers such as "[i]f it rains a lot, you can smell the earth, […] Makes me feel sad, if I'm alone, […], I watch thunderstorms

from a nice safe place – it's exciting" (Stephenson, 2014)[1], and such statements constitute the concourse of communication in Q methodology.

To return to the question posed above at an online conference about the value of Q methodology, it rests upon an epistemology which is inherently different to that which underpins R methodology. Ramlo (2016, p. 30) notes from Stephenson (1953) that "epistemology is meant to be the relationship between the observer and the observed, which is somewhat turned upside down in Q, where the belief is that only the observed can capture and reveal their subjectivity as represented as their Q sort". It is suggested in Q methodology that a subjective phenomenon can only be observed from the point of view of the person. Only he or she can capture his or her subjectivity. Also, unlike in the R methodological tradition, the meaning is not built into the tests before the measurement. Brown (1980) compares such tests in which meaning is built in advance and is determined by the observer (researcher) "what a response is to mean" before the test to a situation in which "subject's response breathes life into it [phenomena of interest] in a way that gives the concept a spurious value. In Q methodology, however, the statements in a test or scale such as in a questionnaire only gain meaning with reference to a person. So, these are what Q methodology can help to find out about a phenomenon in ways which are different than R methodological approaches. Yet, it raises a question of how Q methodological principles are relevant to the research aim of this research. It is possible to adapt that question in the online conference in the following way: What

[1] This article is an edited version of a paper presented by William Stephenson at a symposium on mass communication in Amsterdam in November 1978.

is Q methodology going to show about the affordances of digital technologies for autonomous language learning that cannot be learnt some other way?

Because of the ontological nature of the concept of affordances, it is difficult for an external observer to observe or measure what digital technologies afford to learners for autonomous language learning. With Q methodology, however, affordances of digital technologies for autonomous language learning can be grasped from the point of view of the participants. The inherent epistemology of Q methodology allows the observed and the observer to be the same and provide a means to the researcher to capture the affordances of digital technologies for autonomous language learning. Also, in Q methodology, *a priori* meaning cannot be assigned into the statements of affordances in advance. The researcher can prepare written statements which are about what digital technologies can provide or furnish for language learning. Yet, such statements of affordances would not have any significance unless participants rank-order them from their point of view. It does not become the researcher who gives meanings as affordances of digital technologies, but it is the participants themselves who arrange their subjective viewpoints for what affordances of digital technologies for autonomous language learning are according to the condition of instruction.

Dariel (2011) lists a variety of fields that employ Q methodology to investigate the diverse viewpoints on topics such as love, jealousy, perceptions of health, mental health, environmental policy, end-of-life decision making, and euthanasia. The list of topics and research fields can be enlarged with other studies, but there are four research studies which are at the intersection of the main themes of this current research project: language learner autonomy, technology, and affordances. In

Damio's (2013) research, Q methodology is used to find out the subjective viewpoints of trainee English teachers concerning autonomy in language learning. The focus of the research was on the trainee teachers' understandings and practices of learner autonomy in language learning and any cultural effects surrounding the conception of autonomy in language learning. In other recent research into learner autonomy, Cooker (2012) uses Q methodology to understand the non-linguistic outcomes of autonomous language learning from the learners' subjective viewpoints, which were later developed as a learner-informed assessment tool. On the topic of technology, Dariel (2011) used Q methodology to investigate what factors affect academics' e-learning adoption in nurse education. Finally, Hill (2014) employs Q methodology to understand how alcohol-related affordances in legal drinking premises constrain or extend drinking behaviour. Q methodology, therefore, applies to a variety of topics and field of research, particularly when different viewpoints and opinions are likely to occur.

To study subjectivity, a typical Q methodology consists of certain steps (Brown, 1980, 1993; Watts & Stenner, 2012). It starts with sampling a number of statements about a topic (Q-set) and then presenting a single person or a group of people (p sample) these statements (Q set). The participants are then asked to rank-order these statements on a grid according to a condition of instruction, which is called Q-sorting. This operation of the participant ranking the statements according to his/her point of view is what captures the subjectivity in Q-sorts in a systematic way. Later, the obtained Q-sorts are correlated and factor-analysed to identify Q-sorts which share similar viewpoints, and those factors are interpreted by the researcher in the

light of factors scores given to the statements. How these factors were put in practice in this research will be presented in the following sections.

It has been suggested in the literature that such data collection steps in Q-methodology make it align within a mixed-method research continuum. While the Q-sampling step can be described as qualitative, Q-sorting and factor analysis steps can be described as being quantitative (Ramlo, 2016). In addition to that, Stenner and Stainton-Rogers (2004) named such nature of Q-methodology as qualiquantology to refer to a combination of qualitative and quantitative components. Ramlo and Newman (2011), however, analyse where Q-methodology fits within a mixed-method continuum based on a number of concepts which were adapted from Tashakkori and Teddlie (2009). According to this analysis, the only point where Q methodology goes towards the qualitative end is to show that Q-methodology has a subjective purpose. As it has also been discussed in the above paragraphs, Q-methodology aims to capture the subjectivities of the individuals on a given topic, and therefore, it aligns more with a subjective purpose. Yet, it should also be stated that subjectivity is captured through objective means by collecting data through Q-sorting and involving a factor analysis. In the rest of the analysis of Ramlo and Newman (2011), Q-methodology fits in the middle of both extreme ends. In terms of aims of the research, Q-methodology seeks explanations to the matter of issue under investigation, but in the meantime, it aims to explore the subjectivity around the same topic. As for data, Q-methodology generally, but not necessarily, starts with a Q-sample which is comprised of concourse sampling through collecting and collating data in qualitative nature such as with interviews and document analysis. Yet, Q-sample is used for Q-sorting operation by which the

subjectivities of the participants are captured in an operant way, and therefore a quantitative set of data is obtained for further factor analysis which is comprised of statistical analysis. Yet again, statistical analysis generates a set of factors which are interpreted and narrated qualitatively. This interpretation can also be supplemented by data from the concourse development stage at the beginning of the Q-methodological research.

3.4 Strengths and weaknesses of Q-methodology

In this study, Q-methodology has been adopted as the research methodology due to a number of its advantages. First of all, unlike the R-methodological approach, Q-methodology provides a systematic way of analysing the subjective viewpoints of participants in a holistic way. It would be right to acknowledge that the same Q-set statements could have been given to the participants in a Likert-style questionnaire. They could have been asked to state to what extent they agreed or disagreed with these statements, and the obtained data could have been factor analysed. Yet, such an approach would not allow this present research to investigate the opinions of the participants in a holistic way. Instead, as it has been stated above, the individual differences between the participants would be lost by only showing "associations and differences between variables mapped at the population level" (Watts & Stenner, 2012, p. 10). Related to its strength of the holistic approach, Q-methodology is also advantageous in terms of providing the researchers to research sensitive topics. Particularly the Q-sorting step plays an important role in capturing such sensitive responses of participants by allowing them to map their viewpoints through a set of statements without being embarrassed or being judged by the

researchers (Wint, 2013). Finally, it was observed in other studies such as Cooker (2012) that Q-methodology could become more enjoyable by the participants. This could be mainly because the participants in a Q-sorting process actively engages with each of the Q-statements instead of solely marking the statements on an agreement-disagreement spectrum.

Yet, while Q-methodology can be advantageous in certain terms, it also has some weaknesses. To begin with the last advantageous point of being more enjoyable, a Q-sorting process might take a lot more time than collecting data through a questionnaire since the researcher will need to guide a Q-sorter throughout the Q-sorting process. In addition to that, if the researcher wants to carry out follow-up interviews with the participants to explore why they have sorted certain items in certain places on a Q-grid, this will add both to the time of the researcher and to that of the participants. Therefore, this might be an obstacle when the researchers who are using Q-methodology have limited access to the research site and participants.

Another disadvantage of Q-methodology can be said to be working with a smaller number of participants. Generally, it is recommended that a sample of 30 to 50 participants would be sufficient to capture the subjectivities around a topic (McKeown & Thomas, 2013). Yet, such a small number of participants causes the results of a Q-methodological study to be criticized as not being generalisable. Although Brown (1980) argues that the generalisability in Q does not aim to work in a sample-to-universe generalisation as in R-methodological studies, as Dariel (2011) suggests, such small number of participants may cause the researcher to not include the relevant points of views. Therefore, to address this issue, the researchers

may try to collect data from as many sources as possible at the concourse development stage to provide heterogeneity of the statements in the Q-sample. In this research, as it will be revealed in the next chapters, both semi-structured interviews and nominal group technique were used to wide perspectives as possible within the research site where this study was situated.

A rich concourse at the beginning of Q-methodology may also help to overcome another weakness of Q-methodology which is validity, i.e. a Q-methodological procedure's successfully measuring "what it claims to be measuring" (Watts & Stenner, 2011, p. 51). As Dariel (2011) notes that a set of Q-statements which are generated from the data collected at the concourse development stage is what the participants rely on during Q-sorting stage to present their subjectivities around the topic under investigation. Therefore, if the researcher does not aim to make the Q-set as representative of the viewpoints around the topic as possible, it will cause the Q-set not to measure the subjectivities around the topic, and thereby missing other relevant viewpoints. It is thus important again to enrich the concourse data as much as possible to a representative Q-set for Q-sorting.

Finally, Q-methodology's another weakness can be about reliability which is concerned with whether similar factors can be obtained when the same or similar Q-sets were administered to the same or similar participants (Dariel, 2011; Watts & Stenner, 2011). According to Brown (1980), the most satisfactory way to ensure reliability can be through test-retest reliability correlation in which Q-sorting results of the same participants would define the same factor when they Q-sorted the same statements at another time in the future. Given the time a single Q-sorting procedure may take with a single participant, it may prove difficult to obtain re-Q-sorting

results from a future administration. It is therefore difficult to rely on test-retest correlation. Yet, a researcher can still ensure the reliability of the factors by following certain steps. For example, to obtain factors, only Q-sorts which load significantly on one factor only can be selected to define that factor. In addition to that, at least two Q-sorts can be expected to define a certain factor (Brown, 1980). How factors in this study were generated will be further explained in the factor analysis part.

Overall, Q-methodology is not without limitations. Yet, in this study, the strengths of it have overwhelmed the weaknesses particularly due to its strength in exploring subjectivities around a topic, and therefore Q-methodology has been selected as the research methodology.

3.5 Ethical considerations

A certain set of procedures were followed to conduct the study within appropriate research ethics guidelines. First, ethical approval was obtained from the Ethics Committee of the Institute of Education at the University of Reading on 22nd October 2015 (see 8.5Appendix A.1). Within the first application, data collection was planned at a further education college in south England, and ethical approval was received on this basis. Later, the data collection site was changed to an upper-secondary school in Norway which will be referred with the pseudonym of Northview School, and this required an amendment in the ethical approval. The planned changes in the research were submitted as amendments to the ethics

committee, and these amendments were also approved on 21st February 2016 (see 8.5Appendix A.2).

Since data collection was planned to be abroad, the ethical guidelines of the Institute of Education at the University of Reading required the researcher to find out the legal and ethical requirements in Norway and conduct the research per these requirements. To address ethical considerations for research in Norway, The Norwegian National Research Ethics Committee and Norwegian Social Sciences Data Services were contacted. Correspondence with these authorities (see 8.5Appendix A.3) and information from Data Protection Services (n.d.) website confirmed that:

> If the data controller is established in an EEA country, it is sufficient to submit a notification of the project to the relevant authorities in the country concerned. It the data controller is located in a country outside the EEA, the notification must be submitted in Norway by a Norwegian institution that undertakes the role of the data controller's representative.

Therefore, since this study was given ethical approval by the Institute of Education at the University of Reading, no further notice of the project was submitted to authorities in Norway. Having obtained ethical approval, consent was sought from the head of Northview School, where data were going to be collected (8.5Appendix A.4). Also, at every stage of data collection, the participants were informed about the research with information sheets (see 8.5Appendix A.5 and 8.5Appendix A.7), and signed consent for participation was obtained with consent forms (see Appendix A.6 and 8.5Appendix A.8). Signed consent was taken only for interviews and nominal group technique as they took place face-to-face by meeting the participants. Since the survey of digital technologies and Q-sorting took place

online, the information sheet and the consent forms were integrated at the beginning of each of these data collection tools.

Despite taking necessary measures as per ethical guidelines and regulations above, as Cohen (2018, p. 111) reminds, ethical matters are not always "straightforward as rule-following". In addition to written rules, a research study should also consider a number of other issues to research an ethical way. One of these considerations was whether the possible gap between me, i.e. the researcher, and the students in terms of power could have made an impact on them. It could be raised as a matter that my presence at Northview School as an adult and with a researcher identity could have affected students' voluntary participation. Cohen (2018, p. 125) particularly warns against participants' being "railroaded" for taking place in research studies as participants, which means that an authority in a school may make the teachers and students feel obliged to become participants in research. This is particularly likely when the researchers are friends or acquaintances of such authority figures in the schools. In the case of this study, to prevent any such perceived power gap between me and any students, and its subsequent effects, I sought informed consent from the students at various steps. With the informed consent, the students were briefed minimum three times about what my research aimed and what it consisted of. The first of these times was when I pitched my research to the students in their classrooms. The second time was when I walked with the students to the school library where the data were collected. I used the time when we walked to the library to introduce both myself and my research. Finally, the students were given an information sheet about my research which outlined every possible ethical consideration, and they were reminded that they should read

it and ask for clarity about anything or extra questions if they had. At each of these times, I introduced myself both to teachers and students, and I explained to them who I was, in what role I was there in their school, why I was doing this research, what my aims were, why I was conducting this research in their school, and what research participants were expected to do if they wanted to become participants. As well as the information about the research, I also explained particularly to the students that their participation could affect their classroom attendance time as they could not be in the lesson for 15-20 minutes while they were participating in the relevant data collection phase. This was particularly important to state as I had no means to compensate their absence from their lesson during such envisaged timeframe, and it could have been very crucial for students to make a truly informed decision whether to participate or not. Having pitched myself and my study to the students in their classrooms at each step of data collection, I left the classroom to give them time to think about whether they would like to participate in the research or not. The main reason for doing so was to prevent creating a pressure feeling on the students. This break would give the students to think more thoroughly about their decision to participate in the research or not. To consolidate preventing involuntary participation, I did not offer anything in return for their participation such as money for their time or gift vouchers. I also did not know anybody or authority at the Northview School personally, and I did not have any friends or acquaintances. The only person whom I knew was the English teacher and I contacted her through emails to ask for help as a gatekeeper. Therefore, I did every possible action to eliminate my impact it may have had on the students' decision-making to participate in this research.

While I aimed at addressing every possible ethical consideration, it is surely impossible to ignore my impact on the school during data collection. Particularly due to the reason that I could be at the Northview School for a limited period because of the travel visa, I had to discuss in detail with the English teacher who acted as the gatekeeper to help me access to the school how I was going to collect data, how many participants I needed, how long each data collection phase would last, and where I would conduct the data collection phases within the school. Despite such planning, I had to visit the classrooms in lesson time to explain my research to the students as it was the only time when I could find them in one place together. As a result, I had to take nearly 5-10 minutes from classroom time. Yet, I still managed to minimise my impact on the students and the lessons. For example, I informed the teacher before their lesson started and I asked them when the least disruptive time would be to knock on the door and visit their lesson. In addition to this disruption, I also explained to the students that I would take 15-20 minutes of their lesson time if they were to become participants. However, I also believe that I did not just make a negative impact on my research visit to the Northview School. While Northview School has gained international popularity and recognition (e.g. in news coverage and international conferences and educational fairs), it was the first time an international researcher had been to their school for academic research purposes. Therefore, while the students had met journalists before, it was the first time a doctoral researcher had contacted them for research purposes to investigate the ways they had been using digital technologies for learning English. When I explained to them that I had been a doctoral researcher, some of the students found it very interesting and they wanted to learn more about it. In addition to that, I am

yet to share my findings with the school. I believe that my findings would also provide a useful insight into and serve as an evaluation of teaching practices.

Within ethical considerations, e-safety of the participants is also considered. Due to the practicality it brings, online means can be beneficial at times when data collection in person and through printed materials is not possible. Due to the travel restrictions on the researcher, this research used two online data collection tools. Kitchin (2007) suggests that general guidelines of research ethics are still applicable even when data collection is made through online means. On top of such general ethical considerations, researchers can adopt a number of other practices to maintain ethical online-based research where the e-safety of the participants is ensured (Gupta, 2017). First of all, it was observed that the students at Northview School were capable of doing online surveys given their engagement with the digital tools. Yet, to ensure whether the students would be digital literate enough to complete two data collections tools; an online survey and online Q-sorting, it was first confirmed with Teacher A, and she stated that her students would be more than capable to complete these two data collection tools. Similar to non-online data collection procedures, the participants were once again informed about the privacy policy of the research at the beginning of the online survey and online Q-sorting. In addition to that, consent forms were integrated at the beginning of online data collection tools, and it was ensured that the participants could only continue with the research if they had read and agreed with the ethical approval. It was ensured that no one other than the researcher would be given the authorisation to access their data. To prevent any issues in terms of potential harm upon completing the online data collection tools, I tried the URL links on my digital devices and have

not seen any discrepancies such as downloading malware and secret applications. I also had two fellow PhD researchers try them on their devices and report if they would come across with any security alert by the web browser, but they did not report any issues with the URL links.

Finally, all the data collected from the participants were stored on a password protected computer.

3.6 Sampling of participants

Researchers commonly choose a participant sampling method that can best serve their research purposes. In this research, a two-level sampling strategy was deemed to be suitable. Firstly, a purposive sampling strategy was applied. In purposive sampling, the aim is to reach participants who are in a position or context where they can "comment on matters of interest to the researcher" (Cohen et al., 2018, p. 219). In this research, the aim was to find out the affordances of digital technologies for autonomous language learning, therefore, participants were expected to have an interest in using technology for learning English as a foreign or second language. With this in mind, initially, a further education college was contacted in the south England which offered courses of English for Speakers of Other Languages (ESOL). This college planned to work towards educating learners to become more autonomous learners according to its 2014-2018 Strategy Plan, and it had been shortlisted by TES Further Education Awards within the category of Outstanding Use of Technology in Further Education. Despite this, the learners in ESOL courses did not show much interest in becoming participants in the research. Also, it was

observed that their level of English was not high enough to engage with data collection instruments. So, other further education colleges which had been shortlisted in the same TES Further Education Awards and offered ESOL courses were contacted, but the outcome was not positive from these schools, either.

Later, an upper-secondary school in Norway called Northview School was found to be suitable in terms of using technology for educational purposes and teaching English as a foreign language. The School and Teacher A were very enthusiastic about the use of technology for educational purposes. Thus, in terms of purposive sampling, learners at Northview School were deemed to be suitable for the study as they had experience in using technology for learning.

To invite the school and its students to participate in this research, Teacher A was first contacted via email and the research aims were explained. In addition to the email correspondence, Teacher A and the researcher met face-to-face at the 2016 British Educational Training and Technology (BETT) annual show in London where more details about this research were provided. Teacher A showed further interest both to participate in this research and to help the researcher to contact her students in Norway.

After selecting Northview School for data collection through purposive sampling, a convenience sampling strategy was applied to recruit participants for four data collection phases. In convenience sampling, the researcher can select participants who are easily "available and accessible at the time" (Cohen et al., 2011, p.156). How participants were found for each phase of data collection will later be described in the relevant data collection phases, but this section will present an

overview of the number of participants in each phase of data collection including key demographic information such as age, gender, and year group (Table 7).

Table 7 Number of participants for each data collection phase of the study

		Data collection phases							
		Online survey N=155		**Semi-structured interview** N=24		**Nominal group technique** N=29		**Q-sorting** N=44	
Key demographics	**Variables**	Pilot Phase n=14	Main Phase n=141	Pilot Phase n=4	Main Phase n=20	Pilot Phase n=5	Main Phase n=24	Pilot Phase n=7	Main Phase n=37
Age	16	11	106	4	17	3	14	6	12
	17	3	35	0	3	2	10	1	4
	18	0	0	0	0	0	0	0	21
Gender	Female	7	93	1	9	2	15	3	15
	Male	7	48	3	11	3	9	4	22
Year group	Year 1	14	141	4	20	5	24	7	12
	Year 2	0	0	0	0	0	0	0	2
	Year 3	0	0	0	0	0	0	0	23

3.7 Chapter summary

This present chapter gave an account of the theory and the principles of Q-methodology. It also described how ethical considerations were addressed and sampling took place. The next chapter continues with a survey of digital technologies which was designed to find out what digital technologies the participant students were using and to recruit participants for the main data collection method of Q-sorting.

Chapter 4 Methodology-2: Survey of Digital Technologies Used in English Language Learning

This chapter describes the first stage of data collection in this research. The main aim of the survey was to discover the digital technologies which participants in this research were using. To arrive at a digital technology-use profile among language learners, questionnaires are commonly used. For example, Winke and Goertler (2008) used a questionnaire in their research to understand which technological devices the students had accessed and for what purposes to support their language learning. Steel and Levy (2013) also employed a questionnaire to the technologies that were used by language learners at a higher education institution. Thus, it is useful for this research to record language learners' current use of digital technologies via a questionnaire.

Questionnaires are commonly used in research studies due to a number of advantages. First of all, questionnaires are easy to administer to many people in a short time. Questionnaires also provide more flexibility to the respondents as they can answer the questionnaire items at a time which is convenient for them. As well as ease of administering, questionnaires can also be more advantageous for respondents to provide anonymous data, thereby protecting their privacy, if the questionnaires are being administered via online or postal means. Finally, particularly when administering questionnaires remotely (e.g. via online

questionnaires), questionnaires can prevent bias against the researcher during data collection since the respondents will not be seeing the researcher in person, which as a result can provide respondents with the opportunity to engage with questionnaire items more objectively (Mligo, 2016). While questionnaires appear to be advantageous particularly in terms of administering, they are also disadvantageous in some respects. First of all, due to the same reason of being easy to administer, the respondents may return their questionnaires in an incomplete and inaccurate form. In addition to that, if a researcher is not administering a questionnaire on a one-to-one basis, the response rate to questionnaires can be very low. As for another weakness, it can also be added that questionnaires make it difficult, if not impossible, to ask follow-up questions based on respondents' answers. This may be particularly disadvantageous for the researchers sometimes to clarify responses to open-ended questionnaire items (ibid., 2016).

Despite its weaknesses, the questionnaire method is preferred to be used in this study to survey the digital technologies being used by the students. To increase the response rate, the online questionnaire in this present study accepted answers for eight days so that the participants could complete it at a convenient time for them. In addition to that, both the questionnaire items and the process of administering the questionnaire were piloted to identify any issues which could have arisen in the main administration of the questionnaire. As a result, by the help of questionnaire method, the overall aim of this survey was to help the researcher make an informed decision about which images of the digital technologies should be included in the photo-elicitation interviews and nominal group technique meetings, which will be

expanded in the next chapter concerning *concourse* building. The overall research question for this first phase of the larger study was:

1. What digital technologies do the students use to help with learning English as a foreign language?

4.1 Questionnaire design and piloting

The questionnaires which were used in other research studies with a similar aim (Duman, Orhon, & Gedik, 2014; Richards, 2015; Steel & Levy, 2013; Winke & Goertler, 2008; Winke, Goertler, & Amuzie, 2010) informed the design and development of the questionnaire in this phase of the research. However, these previous research studies only gave a general idea about the design. The questionnaire in this research was prepared, later administered, in an online format by using Google Forms web application. With regards to the use of online means to prepare and administer questionnaires, advantages exist, such as reduction of costs and access to a greater number of respondents, but also disadvantages are possible, such as technical problems, and sampling and dropout issues (Cohen, 2011). In this research, however, the strength of being able to reach the "difficult populations" made online administration more favourable (Cohen et al., 2011, p. 280) as data collection site was in Norway and the researcher could not travel to the research site due to the technical problems with travel documents of the researcher. Additionally, online means were found to be a beneficial method to administer questionnaires to the participants who "regularly use the Internet" (Kaplowitz, Hadlock, & Levine, 2000, p. 94), which was found to be effective by Cooker (2012). The observation that the students had experiences of using the Internet and

technologies for educational purposes led the researcher to assume that the students would also be using the Internet regularly. Therefore, online means to prepare and administer the questionnaire was preferred.

The online questionnaire of this present research consisted of three parts (see 8.5Appendix A.9). The first part introduced the questionnaire and addressed the ethical considerations. The information about the research and the guidelines were given and participants were required to indicate that they would like to participate. They then proceeded to the next sections by clicking and choosing the relevant boxes at the end of this introductory informative section. The software was designed in such a way that no participant would be able to proceed unless they had clicked all the relevant boxes to indicate that they were informed about the research and participation was voluntary. This first part was also made up of questions regarding the demographic information about the participants. The second part contained the images of the digital technologies that the students were likely to use for English language learning at the time of the administration of the questionnaire. The images of the digital technologies for this part of the questionnaire were selected from Osborne (2014) and the digital technologies that Teacher A used for teaching at the time of the current study. The second part of the questionnaire also included an open-ended question that asked if there were any digital technologies they used other than those presented. The aim was to identify as many digital technologies as possible. Finally, the third part of the questionnaire consisted of questions asking for contact details of the participants who would like to be participants in the photo-elicitation interviews and nominal group technique

meetings. At the end of the questionnaire in this first phase of the overall research, the aims were:

- to choose digital technologies that the participants used or visited for English language learning purposes;
- to add any other digital technologies that the participants were using or visiting other than the digital technologies presented to enhance the coverage of digital technologies repertoire;

and

- to reach participants for photo-elicitation interviews and nominal group technique meetings.

After the questionnaire was designed, it was piloted. Opie (2004) notes that a pilot study is important for questionnaire design, and Oppenheim (1992, p. 47) concurs, stating that "[q]uestionnaires do not emerge fully-fledged; they have to be created or adapted, fashioned and developed to maturity – it has to be piloted". Piloting helps not only with the wording of items but also with procedural issues (Oppenheim, 1992). Additionally, piloting the questionnaire can increase the validity and reliability of research (Cohen et al., 2011). As stated above, two other resources, Osborne (2014) and the digital technologies that Teacher A was using, were benefited for the design of this research, and therefore it was essential to pilot the questionnaire to ascertain whether the instructions could be understood; whether there were any "unclear or ambiguous" questions or items; whether the layout of the paper was clear; and how long it could take to complete the questionnaire (Opie, 2004, p. 105). Piloting was also particularly important because of the large repertoire of the images that were collected from Osborne (2014) and Teacher A's repertoire of digital technologies. The total number of the digital technologies that

were collected and represented with their official logos was 127, and this produced a very long questionnaire. Therefore, piloting was expected to help discard the digital technologies in the questionnaire that the students did not choose as being used for English language learning purposes. As well as aiming to discard un-used digital technologies by the students, the pilot study also aimed at finding out whether there would be any procedural issues in terms of administering the survey in an online format.

Table 8 Number of participants for online survey-piloting phase

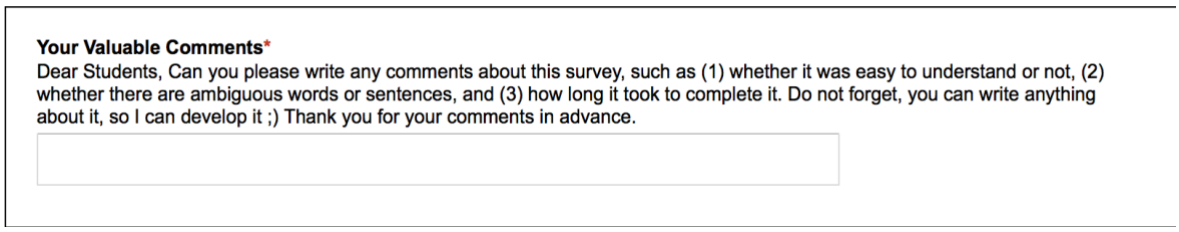
		Online Survey N=155
Key demographics	**Variables**	**Pilot Phase n=14**
Age	16 17 18	11 3 0
Gender	Female Male	7 7
Year group	Year 1 Year 2 Year 3	14 0 0

The questionnaire was designed and administered online using Google Forms for the pilot study. The link to the online form of a questionnaire was shared with Teacher A in Northview School, and participant recruitment was made by her help for the pilot study. She was asked to share the link with 8-10 students in her English

class. As soon as the link was sent to her, 14 students in her English class completed the questionnaire (Table 8). The participants of online survey piloting consisted of seven female and seven male students, and of these students, eleven students were aged sixteen years old and three students were aged seventeen years old. All the participants at this pilot phase were first-year students at their school.

Since the researcher could not be at the school at that time, the students were required at the end of the questionnaire to write their comments about the design, wording and the time needed to complete the questionnaire, and provide recommendations to modify the questionnaire for main administration of the questionnaire (Figure 2). Also, an online Google Docs document was opened by Teacher A where the participants could write their comments and recommendations.

Figure 2 The instruction to the students participating in the pilot study



The responses to the questions that sought the participants' comments and recommendations about the questionnaire showed that the questionnaire took at most fifteen minutes to complete. Comments also showed that the majority of the participants found it easy to complete. However, the participants also added that there were digital technology images that they had never heard of or used. For this reason, some participants found it tiresome to click on the "No" option for the images that they were not familiar with. As such, the pilot questionnaire helped the

researcher to identify and discard the images of the digital technologies which did not receive any "Yes" answers to indicate that they were being used for English language learning purposes. At the end of the descriptive analysis, only 45 images of the digital technologies were left for the main administration (Table 9).

Table 9 Results of the pilot questionnaire

Digital Technology	Yes	No
1. OneNote	14	0
2. Twitter	14	0
3. Wikipedia	14	0
4. ItsLearning	14	0
5. Kahoot!	14	0
6. Skype	13	1
7. YouTube	13	1
8. WordPress	13	1
9. Facebook	12	2
10. Google Docs	12	2
11. PowerPoint	12	2
12. OneDrive	11	3
13. Excel	10	4
14. ClustrMaps	10	4
15. appear.in	9	5
16. Google Maps	9	5
17. Google Drive	8	6
18. Snapchat	8	6
19. Grammarly	7	7
20. Acrobat Reader	6	8
21. Google Earth	6	8
22. Instagram	6	8
23. Prezi	6	8
24. Quizlet	6	8
25. Dropbox	5	9
26. SoundCloud	5	9
27. Duolingo	5	9
28. Google Alerts	4	10
29. Screencast-O-Matic	4	10
30. Google Scholar	3	11
31. TED	3	11
32. Blogger	2	12
33. Bing Maps	1	13
34. Doodle	1	13
35. Evernote	1	13
36. Google Analytics	1	13
37. Google Forms	1	13
38. Google Sheets	1	13
39. Google Slides	1	13
40. Google	1	13
41. Picasa	1	13
42. SurveyMonkey	1	13
43. Vimeo	1	13
44. iTunesU by Apple	1	13
45. WikimediaCommons	1	13

In addition to the items on the questionnaire, the participants also added digital technologies that they were using but were not available on the questionnaire, such as Microsoft Word, PenPal, unibok.no, PressReader, and Teacher-A.com[2]. This showed that participants could also contribute to relevant digital technologies in the main administration of the questionnaire. Also, after the participants wrote Teacher A's website, the researcher visited it and found that there were a number of digital technologies Teacher A recommended. Five more digital technologies were added from this website that, the researcher believed, might also be relevant to the students in the main administration. These digital technologies were Khan Academy website, Spreaker, Google Ngram Viewer, Google Keep, and vocabulary.com. Therefore, a total number of 55 digital technologies were prepared to be presented to the participants in the main administration of the questionnaire (see 8.5Appendix A.9).

Together with this major amendment with the number of the digital technologies, some minor changes were also made with the design and the wording of some sections, particularly in the introduction section that gave information about the themes of the research and its aims.

4.2 Administration of the questionnaire

Similar to the pilot administration of the questionnaire, the main administration of the questionnaire was also conducted via online means. Since the researchers could

[2] Since this website is run by Teacher A, its name is changed with pseudo name.

not travel to the school for collecting data in-person, a convenience sampling strategy was followed. Teacher A was contacted for the main administration of the questionnaire after the piloting stage. The URL-link for the final version of the online questionnaire was sent to her by email. She was asked to share the link with the students who were studying English at the time of the administration of the questionnaire at Northview School. She was also sent a cover letter that included the URL-link to the questionnaire and that could be shared with other English teachers at Northview School. The cover letter included the research aims, why the researcher could not be in the school to administer the questionnaire and what was required of the students with this questionnaire.

The online host for the questionnaire accepted the responses for 8 days between 8th March 2016 and 15th March 2016. Within this period, 141 students completed the questionnaire (10). Of the participating students, 106 were aged 16, and 35 were aged 17. 93 participants were female and 48 participants were male. All of the participants at this main administration of the online survey were Year 1 students. The timestamp that was given automatically by Google Forms showed that the questionnaire was mostly completed during class time. Of the 141 completed questionnaires, only 10 students completed the questionnaire after school hours. The timestamps also showed that students completed the questionnaires at similar times during school time. One possible explanation to this situation could be that the students were given the URL-link to the questionnaire in-class hours and they completed it in the school.

Table 10 Number of participants for online survey-main phase

		Online Survey N=155
Key demographics	**Variables**	Main phase n=141
Age	16 17 18	106 35 0
Gender	Female Male	93 48
Year group	Year 1 Year 2 Year 3	141 0 0

4.3 Data preparation and analyses

After the questionnaire was closed, the results were downloaded from Google Forms in .xls data file format and were exported into Microsoft Excel. A number of columns in the file were removed to make data analysis more manageable. The removed data columns include:

1. *Participant Consent column:* Every participant gave their consent to complete the questionnaire and due to that this column was removed.
2. *Do you take English classes in your school?:* This question aimed to confirm that every participant was studying English as a foreign language in their school at the time of this research. The column of answers to these questions was also removed from the data file since all of the participants answered this question with "Yes".
3. *What year/grade are you in your school now?:* The student participants were asked in which year of school they were studying at the time when they were

completing the questionnaire. Since every student answered this question with "1st year" this column was also removed.

4. *If there are any other digital technologies that you use for learning English, can you please type below?:* This question enabled the participant students to add any other digital technologies that they were using but could not find among the digital technologies that were presented with this questionnaire. Due to the qualitative characteristics of the answers to this question, this column was also removed.

At the end of this process, the responses of 141 participants were prepared for the final analyses of the data in SPSS data analysis software. The final data file was uploaded to SPSS and the results will be presented in the next section.

4.4 Questionnaire findings

The aims of this questionnaire were three-fold:

- Sampling digital technologies to be used in photo-elicitation interviews and nominal group technique meetings;
- enabling the participants to contribute to the sample of these digital technologies;

and

- to reach participants for photo-elicitation interviews and nominal group technique meetings.

Therefore, the results will be presented in this section in the order of the aims.

All of the participants studied English as a foreign language course in their school at the time of the questionnaire (Table 11). In addition to English, the majority of the students studied at least one other foreign language ().

Table 11 The frequency of other foreign languages

Languages	Number of students who study the language
Spanish	62
German	36
French	33
Chinese	14
Dutch	1
Japanese	1

The results relating to the sampling of digital technologies to be used in the next stage of the research indicated that most of the digital technologies presented in the questionnaire were used by the students. Table 12 below shows the frequency of how many participants marked the related digital technology with "Yes" to indicate that she or he used it.

Table 12 The frequency of digital technologies used by the participants

Digital Technologies	Yes	No
Acrobat Reader	86	55
Teacher-A.com	30	111
appear.in	45	96
Bing Maps	3	138
Blogger	34	107
ClustrMaps	12	129
Doodle	0	141
Dropbox	28	113
Duolingo	45	96
Evernote	7	134
Facebook	93	48
Google	22	119
Google Alerts	39	102
Google Analytics	5	136
Google Drive	45	96
Google Earth	25	116
Google Forms	12	129
Google Keep	3	138
Google Maps	48	93
Google Scholar	22	119
Google Sheets	9	132
Google Slides	21	120
Google Docs	136	5
Google Ngram Viewer	4	137
Grammarly	27	114
Instagram	63	78
ItsLearning	132	9
iTunesU by Apple	12	129
Kahoot!	128	13
Khan Academy	7	134
Microsoft Excel	66	75
Microsoft Word	135	6
OneDrive	57	84
OneNote	116	25
PenPalWorld	31	110
Picasa	9	132
PowerPoint	126	15
PressReader	33	108
Prezi	68	73
Quizlet	68	73
Screencast-O-Matic	13	128
Skype	56	85
Snapchat	55	86
SoundCloud	46	95
Spreaker	0	141
Survey Monkey	4	137
TED	30	111
Twitter	51	90
unibok.no	59	82
Vimeo	6	135
Vocabulary.com	44	97
Wikimedia Commons	2	139
Wikipedia	136	5
WordPress	78	63
YouTube	127	14

In addition to these digital technologies, participants also contributed to the sample of digital technologies. The digital technologies that were suggested by the participants were Google Translate, Spotify, Netflix, ordbok+, penpalscchools.com, freerice.com, brettboka.no, reddit.com, iFinger translator, vocabulary.com, ordnett.no, snl.no, ndla.no, vine.com, tumblr.com, and international news websites of BBC and CNN. These results, therefore, provided the opportunity to make informed decisions about what digital technologies to be included in the interviews.

With regards to the third aim of this survey, the intended number of volunteer students could not be reached. Of the 141 participants, only 13 students indicated that they would volunteer to participate in interviews and they provided at least one contact detail of either email address, mobile phone number, or Skype address, yet only 8 of them maintained their interest and took part in the subsequent interview and nominal group technique phases. This figure is relatively small when 20 participants were targeted for one-to-one photo-elicitation interviews and 24 students for nominal group technique meetings. Therefore, the researcher had to look for ways to invite students to interviews on his visit to the school for the second phase of this research which will be explained in the next chapter.

4.5 Chapter summary

This chapter described the first phase of the research. It aimed to find out what digital technologies the learners of English as a foreign language used at the time of research to help them with their language learning. The purpose of sampling the digital technologies was to make informed decisions about which digital

technologies were going to be presented to the participants in the photo-elicitation interviews and nominal group technique meetings to build up the concourse, which comprises one of the steps of data collection in the second phase of the research, as explained in the next chapter. With regards to this, the questionnaire can be considered successful in that it enabled irrelevant digital technologies to be discarded and others used by participants to be added. However, the questionnaire would have been more successful if more participants had indicated participation for the interviews in the second phase.

Chapter 5 Methodology-3: Q-methodology in Practice

Q methodology provides researchers with a systematic way of understanding subjectivity from the first person's perspective. McKeown and Thomas (2013) outline a sequence of how a typical Q-methodological study can be carried out. In such a typical sequence, the researcher first identifies and develops a concourse of communication from which a set of items, Q-set or Q-sample, are extracted to sample the overall concourse. In the next step, the researcher decides on the participants, the person samples or the P-Set. This is followed by the participants expressing their subjectivity via Q-sorting. In the Q-sorting step, the participants rank-order the items in the Q-sort on a grid according to a condition of instruction, thereby reflecting their subjectivity through a Q-sort. The collected Q-sorts are correlated with one another and factor analysed, and finally, the factors are interpreted. This chapter will follow this general sequence to show how data were collected and analysed in this research. Table 13 shows a summary of this sequence. The chapter begins with establishing the domain of subjectivity.

Table 13 Stages of Q methodology

Stages in a Q methodological research	Brief Explanation
1. Establish domain of subjectivity	• Set research question: o What are the affordances of digital technologies for autonomous English language learning to students studying in a Norwegian secondary school?
2. Identify and build the concourse	• Compile a large set of statements about what digital technologies can afford English language learners in terms of autonomous language learning o Literature review; o One-to-one interviews with English language learners (N=20 students); o Nominal group technique meetings (4 group meetings with N=24 students)
3. Select statements for the Q-set: sampling the concourse	• Categorize the statements under themes, write up statements which will be presented to the participants for Q-sorting
4. Select sorters: P-set	• Learners of English as a foreign language (N=37 students)
5. Carry out Q-sort and post Q-sort open-ended questions	• Rank-ordering of the statements in the Q-sample by the participants and each participant is asked an open-ended question to understand the rationale of card placement
6. Factor analysis and factor interpretation	• Resulting patterns of statements analysed using *KenQ* website (data analysis software), interpretation of statements within each factor

5.1 Establishing the domain of subjectivity

The domain of subjectivity refers to the area of the subjectivity of the participants, i.e. the research question to which participants can express their subjective viewpoints (Cooker, 2012). In other words, the participants express their subjective

viewpoints by rank-ordering the statements provided to them in the form of Q-statements as a response to the condition of instruction, and they do so by Q-sorting. In this research, the area of subjectivity to be explored concerns what affordances digital technologies provide to the learners of English for autonomous language learning.

5.2 Identifying and building the concourse

It was stated in the theory of Q methodology that subjectivity is communicable. Communicability refers to "an observable domain of self-referent statements and opinion" (Watts & Stenner, 2012, p. 33). Such subjective expressions can be made about any topic and they constitute a "[a] universe of 'statements' so conceived for any situation or context" (Stephenson, 1986, p. 44). The term concourse is used to refer to this universe of statements in Q methodology. It refers to what can be said about a topic, and in this research, the concourse was designed to consist of any statements about the affordances of digital technologies for autonomous language learning.

The concourse in Q methodological research should represent what could potentially be said about the existing research topic and it should be as comprehensive as possible. According to McKeown and Thomas (2013, p. 18), "concourses[…] arise from shared understandings", but they also argue that the meaning of a topic or content may not be the same for every single person. They may vary according to the "context of subjective communicability" and thereby they can be expected to be almost infinite (McKeown & Thomas, 2013, p. 18). This notion of the infinite nature of a concourse has led to discussions of when a

concourse can be regarded as complete. Watts and Stenner (2005) support the idea that a concourse should only cover the discourse in existence within any research topic. As Cooker (2012, p. 124) states, it is rarely possible that "a concourse can be fully and perfectly delineated". Although it is impossible to grasp every unique viewpoint about a topic or content, this research ensured the coverage of the concourse by using various techniques that will be introduced in the next section.

There are a number of ways that a concourse can be developed on a domain of subjectivity (McKeown & Thomas, 1988, 2013), although these are not exhaustive and can vary according to research purposes and conditions. In naturalistic ways, in-person interviews, written narratives from the participants, and nominal group technique can be used to collect participants' subjective viewpoints about a research topic directly. Likewise, indirect sources such as "Internet discussion boards, […] quoted materials unearthed in newspapers, newsmagazines, book reviews, Internet blogs, and the like" can serve to assemble the concourse in a naturalistic approach (McKeown & Thomas, 2013, p. 20). Such naturalistic ways to develop a concourse have been favoured on the basis that the Q samples derived from such a concourse are likely to "reduce the risk of missing the respondents' meaning or confusing them with alternative meanings deriving from an external frame of reference" (McKeown & Thomas, 1988). However, when the opportunity of the direct derivation of concourse from the participants is not possible, "adapted" (McKeown & Thomas, 2013, p. 20) or "ready-made" (McKeown & Thomas, 1988, p. 26) methods can also be utilized. In this means of developing concourse, "academic journals, newspapers, official documents, television or radio broadcasts, or online sources" can be benefited, in which the concourse is assembled from "sources already in existence and not directly from research participants" (Cooker, 2012, p. 125).

Finally, a third way to develop the concourse over the research topic is a "hybrid" method (McKeown & Thomas, 2013, p. 21). As its name indicates, this method combines both naturalistic and ready-made ways of developing concourse (McKeown & Thomas, 2013).

In light of this, the data for the concourse in this research were collected by naturalistic techniques: interviewing students with one-to-one in-person interview protocol and nominal group technique meetings. In both techniques, images of digital technologies were used as a stimulus to make participants more engaged with the questions and remember their language learning experiences with these digital technologies. Therefore, how images were prepared before the administration of both data collection processes will be explained. In addition to these naturalistic methods of data collection in Q methodological terms, the concourse will be supplemented with existing research studies in the literature that investigated how technological practices could improve learner autonomy.

5.2.1 Preparation for interviews and nominal group technique meetings

To elicit more information from the participants in interviews, questions can sometimes be grounded by using photographs, drawings or diagrams (Prosser, 2011). This is often referred as photo-elicitation, defined by Harper (2002) as "the simple idea of inserting a photograph into a research interview". Harper (2002, p. 13) explains the difference between a photo-elicitation interview and interview by noting that:

> the parts of the brain that process visual information are evolutionarily older than the parts that process verbal information. Thus, images

> evoke deeper elements of human consciousness than do words; exchanges based on words alone utilize less of the brain's capacity than do exchanges in which the brain is processing the image as well as words.

It is understood that photos and images can serve as cues to participants to recall more information. Visual images can both stimulate the interviewees to see and interpret topics more differently and remind the interviewees of experiences that might have been forgotten. Finally, one of the most important contributions of photo-elicitation interviews can be that they can trigger "longer and more comprehensive interviews" (Epstein, Stevens, McKeever, & Baruchel, 2006, p. 2). These points overlap with the aim of developing the concourse in this research. The concourse for the domain of affordances of digital technologies for autonomous language learning was expected to be as large and comprehensive as possible and visual images could be helpful to ensure coverage by stimulating the participants to remember and share their experiences of the use of digital technologies for language learning. Thus, it was thought that inserting visual images of the digital technologies into both the interview protocol and nominal group technique meetings would be useful. The participants would already be given the digital technologies, and thereby the participants would not have to spend extra time during the interviews and nominal group technique meetings to remember what digital technologies they were using. In this way, they could focus on how they used digital technologies and what opportunities they provided for their learning. In a sense, visual images of the digital technologies were expected to serve a common ground between the interviewer and the interviewee and both parties could develop a more meaningful discussion (Harper, 2002).

In the first phase of the research, the digital technologies to be used in the interviews and nominal group technique meetings were identified by a survey of digital technologies as described in Chapter 2. The participants were actively involved in the process of sampling the digital technologies, which had also been represented visually with their logos in the questionnaire. For the interviews, these images needed to be larger. The images of seventy-two digital images were arranged on A3 size papers. In four of the A3 size papers, fifteen images were arranged in five rows and three columns. In the fifth A3 paper, there were twelve images left and they were arranged in four rows and three columns. Each image was bordered with a frame of equal measurements (see 8.5Appendix A.10).

5.2.2 Interviews

As Cohen et al., (2011, p. 409) note, one of the characteristics of using interviews in research is that they enable the knowledge to be produced between humans rather than making it external to the participants in the research. In this regard, the interview participants are not regarded "subjects as simply manipulable", but they become one side of the intersubjective data generation process, with the other side being the interviewer (Cohen et al., 2011, p. 409). The participants are allowed to provide the interviewer with the way they see the world from the point of their perceptions (Cohen et al., 2011). The interviewees express their unique viewpoints according to the interview questions within the interview. In this sense, this neither-subjective-nor-objective understanding of interviews becomes very well-suited for building the concourse for a Q methodological research. Therefore, as McKeown and Thomas (2013, p. 18) suggest, interviews can be thought of as instruments that are "most consistent with the principle of self-reference". For example, a set of

items in a Q-set or interview questions "can be felt and hence show up very differently to another person or the same person at another time" (Watts & Stenner, 2012, p. 31).

The fact that interviews are consistent with the principle of self-reference bring some advantages. First of all, the topics of research can be covered more widely and in a more detailed way since the interaction between interviewer and the interviewee can lead to more probing questions and "natural digressions" can occur within the natural flow of the interview (McKeown & Thomas, 2013, p. 18). That is helpful in a Q methodological research to widen the coverage of the concourse and thus contribute to the increase of the "number of the features relevant for the Q sample" (McKeown & Thomas, 2013, p. 18). The aim of the concourse, namely generating as many statements as possible, can thereby be achieved. Related to this point, the second advantage of the interviews in building the concourse in Q methodology is that the language and the wording of the Q sample, in the end, can be more "naturalistic and operant" (McKeown & Thomas, 2013, p. 18). Therefore, a lower researcher effect can be observed in the wording of the Q-statements. Also, the statements can be more familiar to the participants since they or their fellow participants will have been actively involved in the production of the final set of data collection instruments (Q-sample).

While interviews bring some advantages to Q-methodology, particularly when building up the concourse, interviewing, in general terms, is not without potential weaknesses. One possible weakness of interviews is related to the time that it takes to conduct and transcribe the interviews. While it is not necessary for researchers to audio or video-record interviews, such recordings can prove to be helpful for a robust data analysis at later stages. Yet, transcribing each interview can take more

time than interviewing since it requires a researcher to listen to the interview minute-by-minute and type it at the same time. When the potential difficulty of not being able to understand the recording clearly due to poor recording quality is also added, interviews can be a time-consuming data collection method for researchers (Sharp, 2012). Another weakness of interviews is how the interviewees respond to the interview questions. The participants may provide answers which they think the interviewer would want to hear, and this may lead the participants not to answer the interview questions truthfully and with accuracy (Creswell, 2013). This weakness could be affected from the attributes of the researcher such as "personal identity (e.g. sex, ethnic origin, accent, socio-economic status and professional status), self-presentation (e.g. appearance) and personal involvement (e.g. attentiveness and style)" (Sharp, 2012, pp. 80-81). While it is not possible to judge to what extent the interviewees' answers are accurate and represent their true feelings or beliefs, in this research, I aimed at mitigating such effects to a minimum by conducting the interviews professionally. For example, to mitigate the effects of the professional status of being a researcher from a UK university, I explained to potential participants that I was a research 'student' but at a different level of education. In addition to that, I paid attention to my outlook when I visited the school so that I would dress neither too smart nor too casually. Finally, for interviewees to feel that they are 'really' being listened to, I paid great attention to their responses by nodding and asking follow-up questions to some of their answers.

Although interviews can be very advantageous in building a concourse and consequently a Q-sample, not every Q-researcher uses interviews. As stated above, non-naturalistic or adapted sources can be preferred to interviews. One reason for this is that interviews already stand as one of the main data collection instruments

in qualitative research. Employing interviews as one of the instruments to generate the data for another data collection instrument (Q-sorting) can be exhaustive and time-consuming. Cohen et al. (2011) point out that using interviews can be costly with regards to time. In this particular research, so far it has proved that it is both costly to the interviewer and the interviewee. Thus, Q-researchers can resort to less-time intensive means for concourse building. Nevertheless, there have been Q-research studies that benefited from using interviews. For example, to generate statements for their Q-set, Maxwell and Brown (1999) interviewed the participants in their research that investigated the problems and provided solutions for student misconduct in a faculty environment. Dariel's (2011) research that explored the e-learning adoption in nurse education also utilized a concourse which was developed through interviews.

In this research, a semi-structured type of interview protocol was followed in which a set of questions were prepared in an interview guide before the interviews. The reason for using the semi-structured type of interview was that it provided more freedom to the interviewers to "clarify people's understanding and to ask follow-up questions to explore a viewpoint […]" (Newby, 2014, p. 340). Therefore, the researcher travelled to Northview School in Norway to carry out the interviews. The target number of students for this phase was 24, of which 4 were for piloting the interview protocol and 20 for the main conduct of one-to-one interviews. 8 students for the target number of 24 participants in this phase were recruited through the online survey of digital technologies phase which constituted the first phase of data collection in this research. Of the main 141 participants who participated in the online survey, 13 participants indicated that they would be interested in being participants for the interview and nominal group technique phases, but only 8 of

these students could be reached on the day of interviews when the researcher arrived at the school to conduct the interviews. To recruit further 16 participants, the researcher visited three classrooms with Teacher A and with the permission of other English teachers at the time of the lessons. The researcher first introduced himself telling the students that he was a post-graduate research student visiting from the University of Reading in the UK and doing research about the affordances of digital technologies for autonomous language learning. The researcher gave information about the research and explained what would be required from the participants during one-to-one interview meetings. The researcher also asked if the students had any further questions about the research. At each classroom, the researcher also assured the participants that the participation would be voluntary and that even if the students volunteered to participate in the one-to-one interview meetings, they were free to change their minds at any stage. After having briefed the students about the study, the researcher left the classrooms to give time to students to think about the study and decide whether they would like to participate in the one-to-one interview phase. Later, the researcher visited three classes again without Teacher A and asked if there would be any volunteers to participate in the one-to-one interview phase. From these three classes, 16 participants showed interest and they volunteered to participate in the one-to-one interview phase.

A convenience sampling strategy was followed at this phase to recruit the participants, and in the end, a total of 24 students were recruited for one-to-one interview phase (Table 14), of whom 4 participated in the pilot phase of the interviews and 20 participated in the main interviews phase. 4 participants in the pilot phase were 16 years old and all of these participants were first-year students. 3 of these participants were male and 1 of them was female. When it comes to

participants at the main phase of one-to-one interviews, of the 20 participants, 17 students were aged 16 and other 3 students were aged 17. 11 of these participants were female and the remaining 9 participants were male. All of the participants were first-year students.

Table 14 Number of participants for the semi-structured interview phase

		Data collection phases	
		Semi-structured interview N=24	
Key demographics	**Variables**	Pilot Phase N=4	Main Phase N=20
Age	16	4	17
	17	0	3
	18	0	0
Gender	Female	1	9
	Male	3	11
Year group	Year 1	4	20
	Year 2	0	0
	Year 3	0	0

To conduct the interviews, the school provided a quiet study space in the school library to carry out the interviews. Before carrying out the main interviews, the interview guide was piloted with four students. The aim of piloting the interview guide was to see whether the interview could be conducted smoothly in the provided conditions and whether the images of the digital technologies which were elicited from the survey were successful in understanding how digital technologies were helping students learn English. Each of the four students was invited to the interview room in the school library, where they sat at a large table on which the digital images were displayed. It was observed during the pilot interviews that the

images of the digital technologies displayed succeeded in promoting students to think more about their English learning experiences. It was understood that the students could recognize the digital technologies that they were using and reflect on how they were useful for learning English or supporting their language learning activities. However, a few technical points needed to be changed for conducting the main interviews. One point was how five A3 size papers on which the images were printed should be arranged on the table. In the pilot interviews, five A3 size papers were placed side-by-side on the table. It appeared to be difficult for the participants to see the images on A3 size papers at both ends of the table. This problem was solved by putting one of the A3 size papers in front of the participant and laying two papers vertically on both sides of the participant. This gave the participant an n-shape vantage point from where s/he could see all the images of the digital technologies without trying to lean on the edge of the table. The second condition which needed to be changed was the sitting position of the participant. The study space which was provided by the school in the library had a glass door and wall. In the pilot study, the students sat on the table facing the glass door and wall, and therefore the library. It was observed that the participants could be distracted by other library users. Thus, while conducting the main interviews, the students were asked to sit facing the windows so that they would not be distracted.

After piloting the interview guide, the main interviews were conducted over two days due to the time limitations in Norway. Twenty students were recruited and interviewed individually voluntarily. The interviews lasted between ten to fifteen minutes. In each interview, the interview guide was followed. As suggested by Cohen et al. (2011) to conduct an interview in which participants feel secure to talk freely, the interviewees were informed about what interview protocol involved and

the aims of the research (see 8.5Appendix A.11). An information sheet explained the aims of the research, ethical considerations and how the interview would be conducted with audio-recording (see 8.5Appendix A.5). Also, before starting the interviews, signed consent was taken from the participants (see 8.5Appendix A.6). The questions in the interview were conducted over the images. The interviewees were given time to familiarize themselves with the images of the digital technologies, and they were asked which, if any, of those digital technologies they used to help with their language learning. The interviewees were reminded that they could talk about as many digital technologies as possible and that there were no right or wrong answers. The images of digital technologies proved to be helpful to learn more about the experiences of students regarding the opportunities that the digital technologies provided for language learning. In the meantime, the interviews were recorded on two devices to prevent losing data, and at the end of each interview, the audio-recording of the interview was saved.

5.2.3 Nominal group technique meetings

Although it was acknowledged above that it is impossible to grasp every unique viewpoint about a topic, this research used a second technique, namely a nominal group technique, to increase the coverage of the concourse as much as possible. The other reason for using a second technique was to provide triangulation of the research data. Cohen et al. (2011, p. 195) briefly define triangulation as "use of two or more methods of data collection in the study of some aspect of human behaviour". It is also stated that triangulation can be characterized in different types such as "time triangulation, space triangulation, combined levels of triangulation, theoretical triangulation, investigator triangulation and methodological

triangulation" (Cohen et al., 2011, p. 195). In this research, a multi-method characterization of triangulation was found more relevant to "map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint […]" (Cohen et al., 2011, p. 195). In this research, this refers to the affordances that digital technologies provide to language learners for learning English autonomously.

In Q methodological research, the nominal group technique is used when the researchers want to generate a Q-set for Q sorting in a less time-consuming way (McKeown & Thomas, 2013). The Q-researcher can reach the desired number of Q-statements in a very short time, even in one session with the participants, by following the steps of a highly structured group meeting. It is a technique of structured group meetings which combines participation both at individual and group level. Unlike other data collection techniques, such as focus group meetings, participants work individually for a certain period in nominal group technique meetings (Macphail, 2001). Thus, participants are less likely to be affected by group dynamics and social power relations with each other (Laenen, 2015). It is also useful to prevent dominant participants from taking control over the group interaction and discussion. As Macphail (2001) states, the technique aims to give each participant an equal opportunity to voice his/her own viewpoint about the topic of the meeting. Porter (2013) also suggests that more viewpoints can be generated by employing nominal group technique meetings.

In the light of its advantages concerning it being less time consuming and finding out more viewpoints about a topic, two Q studies can be identified in the literature which used nominal group technique meetings. Kinsey and Kelly (1989) used nominal group technique in a Q study to understand what issues could emerge in a

political campaign process. The nominal group technique played a role in this research to generate a 40-statement Q sample in 2 hours. For Kinsey and Kelly's (1989) research, nominal group technique proved to be a time-efficient way of generating the Q sample for the main data collection step of Q methodology, Q-sorting. In another research, Mattson, Clark, Byrd, Brown, and Robinson (2011) used nominal group technique meetings to generate two sets of Q-sample for challenges and solutions that were experienced by the authorities in the evolution of a national park. The nominal group technique meeting resulted in a 63-item Q-sample for challenges and 58-item Q-sample for solutions. Therefore, nominal group technique meetings were used in the concourse building step both to triangulate the viewpoints identified in the interviews and to identify as many viewpoints as possible about the domain of subjectivity.

While nominal group meetings have some advantages and they are used in Q-methodological studies to build up the concourse much more quickly, they also have some limitations. First of all, the results from a nominal group technique meeting are not generalisable since few participants take place in the meetings (Laenen, 2015). Nominal group technique meetings are also limited in terms of the topics that can be discussed with the participants. Generally, the starting question is presented to the participants at the beginning of the meeting, and no follow-up questions are asked during the meeting. Therefore, the results from a nominal group technique meeting may also lack the "sufficient depth" (Laenen, 2015, p. 8). Finally, the certain structure of nominal group technique can make some of the participants develop a resistance to the rigid structure of the technique due to the lack of flexibility in the format (Steward, 2001). If this study had used nominal group technique only as a data collection tool, the findings could be problematic in

terms of generalisability. Yet, the nominal group technique was is only used to build up the concourse together with interview technique. Therefore, generalising findings from this technique only has not been a concern. When it comes to a fixed structure, this study adapted the nominal group technique to overcome participants' developing resistance to its structure. As it will be explained later in this part, some of the steps of nominal group technique procedure are modified such as not typing every idea generated by the participants to save more time for participants.

In terms of participants recruitment, a similar procedure to recruitment for one-to-one interviews in the previous phase was followed. An on-site convenience sampling procedure was followed. The researcher visited Northview School in two days. In the first day, the researcher visited three classes of English lessons with teacher A and with the permission of English teachers at the time of the lesson. The researcher introduced himself once again telling the students that he was a post-graduate research student from the University of Reading in the UK and doing research about the affordances of digital technologies for autonomous language learning. Having introduced himself, the researcher gave information about what nominal group technique meetings meant and explained how these meetings would be conducted. After explaining the procedure to the students, the researcher also asked if the students had any further questions about the data collection technique, the research itself or about the researcher himself. At each classroom, the researcher made it very clear again that the participation would be voluntary and that even if the students showed interest and wanted to volunteer to participate in the nominal group technique meetings, they had the right to change their minds at any stage and withdraw their consent from participation. Again, after having introduced the students to the study and nominal group data collection technique, the researcher

left the classrooms and gave time to students to think about the study and make a decision whether they would be interested in being participants in nominal group data collection phase. Later, the researcher visited three classes in turn again, but this time without Teacher A, and asked if any students would like to participate in the nominal group technique phase. From these three classes, 29 participants expressed interest and they volunteered to participate in nominal group data collection phase (Table 15). Of the 5 participants who took part at the pilot phase of the nominal group data collection technique, 3 participants were aged 16 and 2 participants were aged 17. 2 of the participants were female and 3 of them were male. All of the participants were first-year students. When it comes to the participants at the main phase of nominal group data collection technique, 14 of the participants were 16 years old and 10 of them were 17 years old. While 15 participants were female, 9 participants were male. All of the participants were Year 1 students in their schools.

Table 15 Number of participants for the nominal group technique phase

		Data collection phase	
		Nominal group technique N=29	
Key demographics	**Variables**	Pilot Phase n=5	Main Phase n=24
Age	16	3	14
	17	2	10
	18	0	0
Gender	Female	2	15
	Male	3	9
Year group	Year 1	5	24
	Year 2	0	0
	Year 3	0	0

Carrying out a nominal group technique meeting requires the researcher to follow a set of steps. Although there is no single procedure, generally a set of guidelines are followed. According to the nature of the research, modifications can also be made in the nominal group technique procedure (Laenen, 2015). In this research, some modifications were made. In Kinsey and Kelly's (1989) and Mattson et al. (2011) studies, nominal group technique was useful to generate the Q-sample in a very short time without dealing with data analysis separately. Since the aim of using nominal group technique in this research was only to identify the viewpoints with regards to the opportunities that digital technologies could provide to learners of English, nominal group technique protocol was slightly modified to serve this aim.

The modification to the nominal group technique was also informed by the results of a pilot meeting with the participants. The nominal group technique meeting

procedure was piloted with five students before the main meetings and it showed that sharing ideas after the silent generation of ideas was time-consuming for the participants. In the pilot nominal group technique meeting, (1) the participants shared verbally each of their ideas as they had written them down on their record templates, (2) these ideas were typed on Word document by the researcher as they were noted down by the participants, (3) the participants shared verbally each of their explanations of their ideas, and (4) the researcher typed their explanations next to the previously shared idea. However, it was understood at the end of the pilot meeting that it would be an inefficient use of time to transfer participants' recorded ideas on their record papers to Word document during the meeting because the researcher was already going to keep participants' papers on which they recorded their ideas. Therefore, in the main nominal group technique meetings, the participants did not share their notes from their papers, but they only shared their explanations of their ideas.

Table 16 presents details of how a traditional nominal group technique procedure (adapted from (Potter, Gordon, & Hamer, 2004) was followed in this research. Each meeting was conducted with six students, and in total four meetings were carried out. As with the sampling for interviews, a convenience sampling strategy was followed for the nominal group technique meetings.

Table 16 Nominal group technique meeting procedure

Nominal group technique protocol steps	Description of the steps	How they were applied in this research
Introduction and explanation	Welcome participants and explain the purpose and procedure of the meeting.	The participants were welcomed and informed about the nature and aims of the research.

Nominal group technique protocol steps	Description of the steps	How they were applied in this research
Silent generation of ideas	Provide each participant with a sheet of paper with the question to be addressed and ask them to write down all ideas that come to mind when considering the question. During this period, ask participants not to consult or discuss their ideas with others. Allow approximately 10 minutes.	Six students participated in each of the four nominal group technique meetings. Each student was provided with a template paper (see 8.5Appendix A.12) to record their viewpoints as answers to the question of "*what opportunities do the digital technologies afford you with learning and improving your English?*". Six students in each group sat around a table on which the same images of digital technologies printed on A3 size papers were displayed to the participants. Students were given ten minutes to record their answers and were reminded not to discuss their ideas with each other (see 8.5Appendix A.13 for a sample completed forms).
Sharing ideas	Invite participants to share the ideas they have generated. The facilitator records each idea on a flip chart using the words spoken by the participant. The round-robin process continues until all ideas have been presented. There is no debate about items at this stage and participants are encouraged to write down any new ideas that may arise from what others share. This process ensures all participants get an opportunity to make an equal contribution and provides a written record of all ideas generated by the group. This stage may take 15-30 minutes.	Each student only shared the name of what digital technology s/he wrote about and the researcher noted each digital technology on a Word document. In the pilot study, noting each idea on Word document appeared to be a very slow process and very little time was left for the group discussion level. It was also observed that the participants felt tired. Therefore, since the record papers of the participants were already going to be collected at the end of each session, these ideas were not transferred verbally to Word document once again. The researcher transferred participants' records of ideas later once each session was finished.
Group discussion	Participants are invited to seek verbal explanation or further details about any of the ideas that colleagues have produced that may not be clear to them. The facilitator's task is to ensure that each person is allowed to contribute and that discussion of all ideas is thorough without spending too long on a single idea. It is important to ensure that the process is as neutral as possible, avoiding judgment and criticism. The group may suggest new items for discussion and combine items into categories, but no ideas should be eliminated. This stage lasts 30-45 minutes.	The participants did not share their raw version of generated ideas, but they were invited to elaborate on their viewpoints by explaining how digital technologies can be beneficial in learning and improving English (see 8.5Appendix A.14 for sample form of clarification of ideas). In a round-robin manner, i.e. each participant taking a turn for each viewpoint, participants briefly explained their ideas and these ideas were noted down on the same Word document, in a separate column next to the name of the digital technology which had been shared in the previous stage.

Nominal group technique protocol steps	Description of the steps	How they were applied in this research
Voting and ranking	This involves prioritizing the recorded ideas concerning the original question. Following the voting and ranking process, immediate results in response to the question are available to participants so the meeting concludes having reached a specific outcome.	This stage was omitted in nominal group technique meetings because the main aim was to reach a comprehensive set of ideas which would be analysed to generate the Q-sample.

At the end of these two techniques, namely the interviews with participants and the nominal group technique meetings, the data were collected for identifying and building the concourse on the domain of subjectivity. The raw data from the interviews and the nominal group technique meetings were uploaded on NVIVO qualitative data analysis program and transcribed. Following this step, cases were created with the names of digital technologies. At the end of the initial analysis, a concourse of 83 statements was generated from the naturalistic resources of interviews and nominal group technique meetings. Those statements were later edited in the light of statements in Cooker (2012) and Tassinari (2012).

5.3 Selecting statements for the Q-set: sampling the concourse

The next step after the data were collected for developing the concourse is to prepare the Q-set that refers to a purposive selection of statements derived from the concourse and that research participants sort on a grid according to a given condition of instruction during the Q-sorting procedure. As has been noted, a concourse is expected to become as comprehensive as possible to reflect all possible

opinions in response to the research question, but "practicality necessitates a reduction in magnitude for research purposes" (McKeown & Thomas, 2013, p. 18). There is not a suggested number of statements for a Q-set, but a set of 40-80 statements is generally accepted as the standard in Q methodology (Watts & Stenner, 2012). So, the concourse of 83 statements needed to be refined.

The main aim of a Q-set is to generate statements from the concourse in a way that Q-set statements will represent or be a sample of that concourse. Thus, two characteristics of successful Q-set statements are "coverage", defined as "broadly representative of the opinion domain, population or concourse at issue" and "balance", which refers to a design that can capture "the full gamut of possible opinion and perspective in relation to your research question" (Watts & Stenner, 2012, p. 58).

Stephenson (1952, p. 223) states that a Q-set can be generated "purely on theoretical grounds, or from naturally-occurring (ecological) conditions, or as required for experimental purposes, to suit the particular requirements of an investigation". So, there can be multiple ways of generating a Q-set. Of those ways, there are generally two which can be followed to sample a Q-set from the concourse: unstructured or structured sampling (Watts & Stenner, 2012). In an unstructured approach, the researcher does not use any experimental design principles, and statements are selected presuming that those statements provide the balance and coverage characteristics of effective statements in Q-set (McKeown & Thomas, 2013). However, it has been noted that unstructured sampling may risk over- or under-sampling of some of the opinions of the participants.

Structured sampling, however, can provide a comprehensive representation of all the relevant opinions with regard to the research question (Adams, 2002). In structured sampling, the Q-sample is generated more systematically and is "given a sufficiently comprehensive and theoretically elaborate experimental design". One of the benefits of this approach is that theories can be tested by creating hypotheses. For structured sampling, the researcher can adopt a deductive design (statements are derived according to "hypothetical or theoretical considerations") or an inductive design (statements are derived from "patterns that are observed as statements are collected") (McKeown & Thomas, 2013, p. 23).

In the light of this description for designing the Q-sample, this research adopted an unstructured sampling strategy as there is no inherent hypothesis to test. During the initial analysis of the interview and nominal group technique meetings data, themes were created, but those themes aimed to organize initial concourse statements rather than comprising the themes for a structured sampling strategy. At this stage, Watts and Stenner (2012, p. 61) suggest writing as many statements as possible to prevent becoming "overly restrictive or dismissive of possible content at too early a stage". So, based on the concourse of 83 statements, a set of steps were followed to elicit the final set of Q-statements.

First, some of these 83 statements were combined since they had a similar proposition with other statements. Particularly, the statements which had a very specific proposition were combined. Additionally, some of the statements were too long since they were taken directly from the interviews and nominal group technique meeting records. These statements were also discarded. As a result of this operation, a set of 60 statements were reached. 60 statements would be within the standards in Q-methodology, but Watts and Stenner (2012) suggest that sometimes

circumstances require using a smaller number of statements. The compelling reason to further refine the statements in this research was the time limitations of the participants. It had already proved difficult in interviews and nominal group technique meetings to recruit participants during class time, and it might be better not to take too much time of the students by populating the Q-set with too many statements.

To refine the existing 60 statements and to see how Q-sorting would work, a pilot study was designed. Originally, Q-sorting was planned to be made face-to-face with the students, but because of unexpected circumstances, the pilot Q-sorting had to be made via online means. To reach students for the pilot Q-sorting, Teacher A was contacted again, and she helped in terms of distributing the URL-link to online Q-sorting among her students in her English class as well as other students in other English classes.

By using the *POETQ* web application, selection of which will be explained in the Q-sorting stage, seven students completed the Q-sorting. It was understood from the pilot Q-sorting that Q-sorting 60 statements could take more than 30 minutes, and more importantly, the participants stated that some of the statements were similar. So, based on this feedback from the pilot Q-sorting, 60 statements were worked on again. In such circumstances, when a researcher aims to employ a smaller number of statements, the statements can be phrased or reworded in more general terms (Watts & Stenner, 2012). Hence, some of the statements were rephrased in a more general way. Finally, a set of 42 statements were generated to be used in main Q-sorting. These statements are as follow:

1. It is fun learning English with digital technologies.

2. I find people better to learn English with on digital technologies.

3. I find out the strengths and weaknesses of my English with digital technologies.

4. I get myself in the mood to learn English better with digital technologies.

5. I am more confident speaking English with digital technologies.

6. I am more focused on learning English with digital technologies.

7. I evaluate the reliability of information from resources on the Internet for learning English.

8. With digital technologies, I evaluate which resources are good for learning English.

9. I create new strategies to help me learn English with digital technologies.

10. I make time to learn English with digital technologies.

11. I am more self-disciplined and organized in learning English with digital technologies.

12. I am more careful about how I am speaking English with people on digital technologies.

13. I explain better why I learn English in the ways that I do with digital technologies.

14. With digital technologies, I explain better why I choose the materials that I use.

15. I collaborate with other students more easily for English with digital technologies.

16. I am more motivated to learn English with digital technologies.

17. I am more relaxed and less stressed about learning English with digital technologies.

18. I feel more supported when learning English with digital technologies.

19. I find more resources easily with digital technologies to help me learn English.

20. I get a sense of what is happening around the world in English with digital technologies.

21. I get frustrated learning English on my own with digital technologies as I need a teacher to tell me if I am learning well.

22. I give feedback to my English teacher and assess her work anonymously with digital technologies.

23. I learn English at any place I want with digital technologies.

24. I learn English at any time I want with digital technologies.

25. With digital technologies, I have courage to try different things in English.

26. With digital technologies, I know better why I am learning English.

27. I learn English at my own pace/speed with digital technologies.

28. I get instant feedback to my language mistakes and errors with digital technologies.

29. With digital technologies, I learn more about the culture of English speaking countries.

30. I select appropriate learning strategies according to my needs in English with digital technologies.

31. I set more achievable objectives/goals while learning English with digital technologies.

32. I find more opportunities to use English with digital technologies.

33. I understand better what works for me when learning English with digital technologies.

34. With digital technologies, I need the encouragement of an English teacher for learning English.

35. With digital technologies, I need a push from my English teacher to study English.

36. With digital technologies, I am less worried about making mistakes in front of other people.

37. With digital technologies, I review what I have learnt in English.

38. Learning English with digital technologies is more natural because I do not feel like "I am sitting down to learn English".

39. With digital technologies, I learn English in ways and with resources that interest me.

40. With digital technologies, I have a better understanding of how I learn English best.

41. With digital technologies, I learn English better on my own without the help of someone.

42. With digital technologies, I monitor my own English learning progress over time.

5.4 Selecting the P-set and Q-sorting phase

Up until this point in the study, interviews and nominal group technique meetings were conducted to ascertain the subjective communicability around the topic of affordances of digital technologies for autonomous language learning from which a Q-set of 42 statements were generated. Of these steps, Q-sorting can be suggested to be the most crucial step in Q methodology. This is because "subjectivity is expressed by participants modelling their viewpoints through the operational medium of a Q sort" (McKeown & Thomas, 2013, p. 5). This is the step in which the participants in this research state which of the Q-set statements represents an

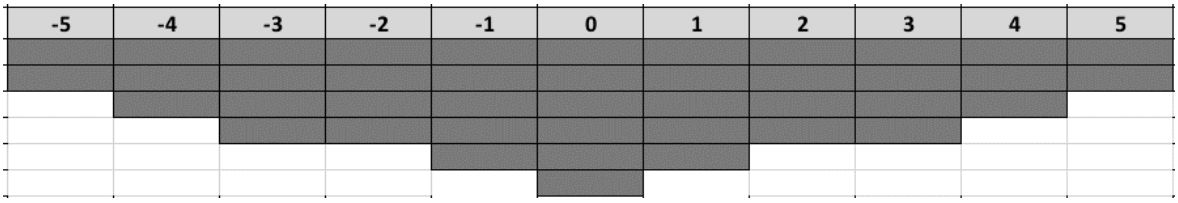
affordance of digital technologies for autonomous language learning. The aim of observing the affordances from the point of view of the participants themselves will be achieved through Q-sorting.

Q-sorting is generally administered by the researcher in-person, but online Q-sorting can also be used on some occasions (Watts & Stenner, 2012). This research first aimed at administering Q-sorting in person with the students by visiting them in Northview School. However, because of unexpected circumstances, an online data collection option had to be chosen. For this online administration, an online tool was needed which could still inherently possess the subtleties of in-person Q-sorting process such as allowing the participants pre-sort the Q-statements into three categories and allowing the participants to see all the statements at the same time and make "relative evaluation" among the statements when Q-sorting. One of the most popular options was *FlashQ* online package. The main advantage of this programme was its being free and replicating the characteristics of an in-person Q-sorting process. However, it required some technical knowledge to run the programme. Another online tool which could be an option was the *Q-Assessor* web application which was also very successful at replicating the subtleties of in-person Q-sorting. However, *Q-Assessor* was not free, and the price of it was not affordable. So, this research used the *POETQ* web application which was developed by Stephen Jeffares and Helen Dickinson and programmed by Greg Hughes. The main advantages of *POETQ* were that it was free and user-friendly. It also allowed the participants to divide the Q-statements into three provisional ranking categories. Although *POETQ* did not allow the participants to sort the statements on a Q-grid, the participants could see all the statements from each category at the same time,

and therefore they could still compare and select the statements relative to each other.

42 statements were uploaded to the *POETQ* web application and a Q-sorting operation was designed. For in-person Q-sorting, the researcher needs to prepare a Q-grid that can be labelled with a scale such as *Least like me to Most like me* (Damio, 2013), *most agree to most disagree; most characteristic to most uncharacteristic; most important to most unimportant* (Watts & Stenner, 2012). It also has to be on a continuum, e.g. (-5) to (+5). *POETQ* lacked this feature of showing a Q-grid to participants and allowing them to distribute their statements onto this Q-grid. Yet in *POETQ*, the researcher still needed to specify the range of values and the length of the column to build the grid into the system. The Q-grid which was set in *POETQ* is as follows (Figure 3):

Figure 3 Q-grid in this research



Q-sorting constitutes the most important stage of data collection in Q-methodology, and therefore, it entails a well-thought sampling of participants. In Q-methodology terminology, sampling of the participants is also referred to as selecting the P-set. P-set in Q methodology refers to the participants who rank-order the Q-set statements. It is the technical term for the participants whose subjectivity is explored by Q-sorting operation.

Brown (1980) suggests that the aim of Q methodology is more "to establish the existence of particular viewpoints and thereafter to understand, explicate and

compare them". Therefore, rather than a large number of participants, "enough subjects [or participants] to establish the existence of a factor [overarching viewpoint] for purposes of comparing one factor with another" has been suggested and applied in Q methodological research studies. Watts and Stenner (2012) state that the number of Q-set statements should be two times the number of participants. For example, for a Q-set of 40 statements, 20 participants will suffice. Besides formulating the number of participants using this ratio, a standard number of participants between 40 and 60 have also been suggested (Watts & Stenner, 2012).

Apart from the careful consideration of the number of participants, particular consideration should also be given as to how these participants are selected. Watts and Stenner (2012) warn against opportunistic sampling. This is because, in Q methodology, each participant is regarded as a variable, and thus participants who may have a "viewpoint to express" *(*Watts & Stenner, 2012, p. 71) and who are selected more based on "theoretical…or dimensional …than random or accidental" (Brown, 1980, p. 192) are more preferable for Q-sorting. Thus, rather than opportunistic sampling, a strategic sampling strategy is recommended. Fulfilling the aim of this research also entailed selecting a P-set or participants who used technology in their language learning context. In the light of these considerations, the students in Northview School were selected as the P-set in this study within the overall framework of purposive sampling. Yet, purposive sampling can be overridden by the "participant's enthusiasm for the subject" (Watts & Stenner, 2012, p. 71), and therefore a convenience sampling strategy can be pursued with the boundaries of purposive sampling. So, since the researcher could not force the students to carry out a Q-sorting operation, the P-set were sampled among the purposively-selected students on a voluntary and convenience basis. In other words,

the ‘circle’ of the participants were narrowed down to the students in Northview School through purposive sampling. The purpose was to collect data from the students who were already using digital technologies for their learning of English as a foreign language. Yet, both due to the above warning that the participants’ willingness and consent can override the purposive sampling and the researcher’s inability to travel to the Northview School himself to administer the Q-sorting phase entailed a convenience sampling strategy to recruit participants among the students who were both voluntary to take part and available at the time of the Q-sorting.

For the recruitment of the participants for Q-sorting, Teacher A helped the researcher. When the study was set up online, the link to the online Q-sorting web application was sent to Teacher A, and she was asked to distribute the URL-link both to the students in her English class and to the students in other English classes in the school. After the URL-link was distributed to the students, a total number of 53 students started online Q-sorting. Therefore, it is possible to state that 53 students were initially recruited for the Q-sorting phase. Yet, not every participant who started Q-sorting continued to the end of the process. This reminds the argument by Cohen (2011) that the online administration of the questionnaires is vulnerable to the drop-outs of the participants. During online Q-sorting process in this phase, only 37 of the 53 participants finished Q-sorting while others dropped-out before completing the process. Table 17 below shows the demographics of these participants. Those finished Q-sorts are finally downloaded and prepared for factor analysis.

Table 17 Number of participants for the Q-sorting phase

		Data collection phase	
		Q-sorting N=44	
Key demographics	**Variables**	Pilot Phase n=7	Main Phase n=37
Age	16	6	12
	17	1	4
	18	0	21
Gender	Female	3	15
	Male	4	22
Year group	Year 1	7	12
	Year 2	0	2
	Year 3	0	23

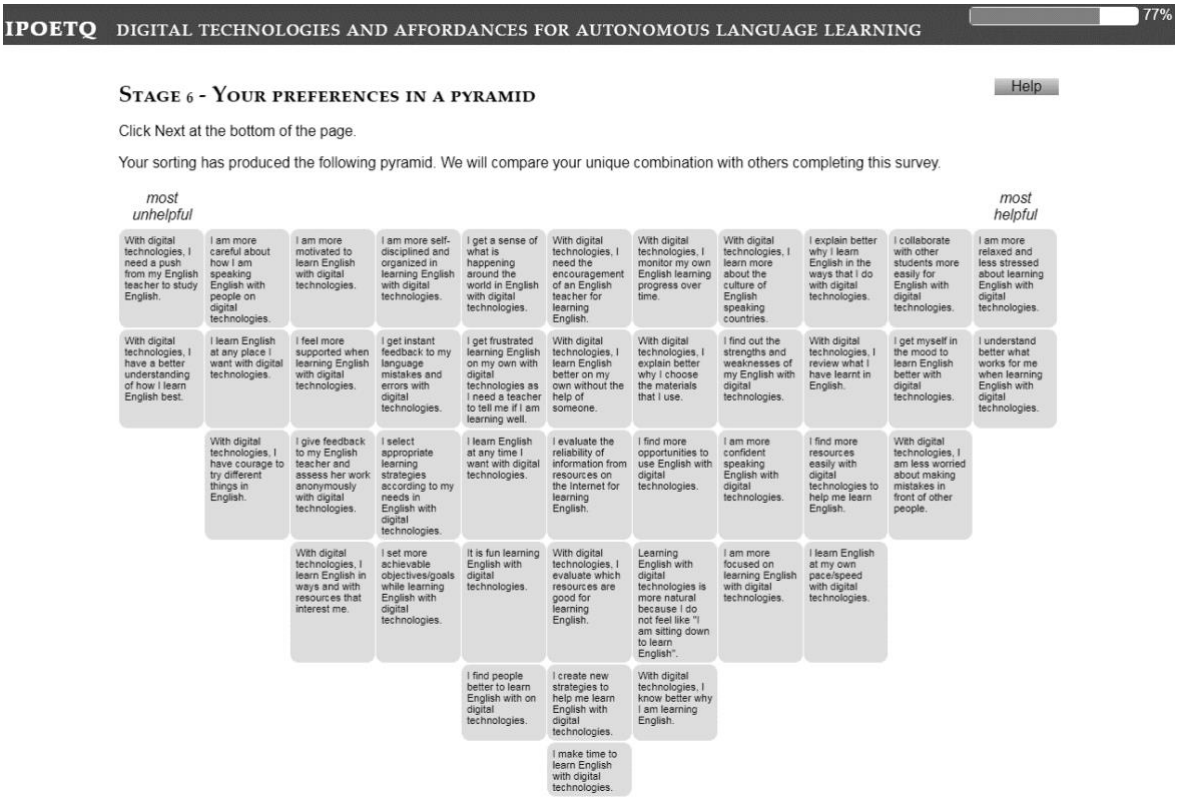
The online Q-sorting process started by informing the students about the research itself together with its aims and the ethical considerations. It later moved to ask demographic information about the participants which involved their age and what class they were in the school. The main Q-sorting operation started by providing the participants with instructions. The participants were first required to divide 42 statements into three ranking categories according to the following condition of instruction:

> Think about the functions (opportunities) in digital technologies below. Which of these functions have helped you learn/study English autonomously without the direct control or influence of your English teacher (for example, to have control over your English learning with self-determined and volitional tasks such as doing online exercises, watching movies and TV series in English, playing online games, writing a blog in English, and many other things you do...)?

> Based on your experiences, put each statement in MOST HELPFUL (agree) or MOST UNHELPFUL (disagree) box.
>
> If you feel unsure or have no idea, then select NEUTRAL.

Once the initial categorization was finished, the *POETQ* system showed the statements from the Most Helpful category and Most Unhelpful category alternatively to the participants until each category was exhausted. At this point, it must be acknowledged that the Q-sorting process was unlike the ideal Q-sorting operation of the in-person data collection procedure. Normally, a participant is provided with the Q-grid and the statements, and the participants distribute the statements directly onto the Q-grid. Although *POETQ* still allowed the participants to refine their preferences for Q-sorting, it lacked this feature. Rather than seeing their Q-sort taking shape in the process, the participants in *POETQ* could only see their finished Q-sort after all the statements were distributed (Figure 4).

Figure 4 A complete Q-sort



Once the Q-sorting was finished, the system brought four questions which asked the participants to elaborate more on why they found the two statements in both ends of the Q-grid most helpful and most unhelpful. In most Q-studies, post-sorting interviews can be conducted with every participant to make the data more rich and better quality (Gallagher & Porock, 2010). The main aim with these follow-up interviews is to dive more into how participants understand the issue and to explore "why they have sorted the items as they have and to get them to focus on the meaning and significance of particularly important and salient items" (Watts & Stenner, 2012, p. 82). In this research, since Q-sorting was made online, four follow-up open-ended questions were asked. The answers to these follow-up questions were also important in this research because they could help understanding why some learners prioritized some affordances of digital

technologies for autonomous language learning and thereby helping with the factor interpretation.

5.5 Factor analysis

Factor analysis is another important step in Q-methodological research studies. Factor analysis consists of "the statistical means by which respondents are grouped -or, more accurately, group themselves- through the process of Q sorting" (McKeown & Thomas, 2013, p. 51). The factor is defined as "an outcome emerging from a cluster of participants whose Q-sorts were statistically similar" and is different from its meaning of "issues influencing behaviour" (Dariel, 2011, p. 11). At the end of this statistical analysis, "family resemblances" are sought to "reduce the multivariate data down to a small number of dimensions of factors", and so data analysis and interpretation are facilitated (Adams, 2002, p. 44). Factors represent the participants who are "like-minded on a topic [and] their Q-sorts will be similar and they will […] end up on the same factor" (Brown, 1980, p. 208). McKeown and Thomas (2013, p. 52) state that factor analysis makes interpretation significantly easier by drawing the attention on the "typological nature of audience segments on any given subjective issue". Thus, it will be this statistical analysis process to yield a number of factors or patterns of viewpoints of participants concerning the affordances of digital technologies for autonomous language learning. The emerging factors from the factor analysis will answer the main research question below:

> What are the affordances of digital technologies for autonomous English language learning to students studying in a Norwegian secondary school?

In this study, the factor analysis was carried out in three consecutive steps: factor extraction and rotation, flagging significantly loading Q-sorts, and preparation of factor estimates and factor arrays.

5.5.1 Factor extraction and rotation

Before the factor extraction, thirty-seven finished Q-sorts were downloaded from *POETQ* web application. In this research, *Ken-Q* web application was used for factor analysis, which is a bespoke data analysis application for Q-methodological data. To stage data for analysis, Q-sort data and Q-sort statements were uploaded onto *Ken-Q* web application. Once the Q-sort data and statements entry was completed, *Ken-Q* application computed the correlations among Q-sorts and created the correlation matrix. This step was for seeing which Q-sorts are similar or dissimilar to one another. The computed intercorrelations among the Q-sorts were then applied to factor-analysis. Two methods are used in Q-methodological factor analysis, i.e. to statistically analyse the correlations between Q sorts and to group them. One is Centroid Factor Analysis (CFA) and the other one is Principal Component Analysis (PCA) (McKeown & Thomas, 2013). It is suggested that CFA and PCA will generally give similar results (Harman, 1976). The main difference between two methods is that PCA will analyse the data into a "best" statistically possible solution and thereby a determinant solution while CFA will not resolve itself into a determinant statistically best solution and allow the researcher to try different theoretical solutions. It is because of this feature of CFA that it is generally the preferred mode of factor extraction in Q methodological research studies. Both of these analysis methods were available features of *Ken-Q* web application. Before settling to a definitive number of factors, numerous iterations of factor analysis

were trialled with CFA and PCA in this research. The aim in each trial was to maximise the number of Q-sorts which loaded significantly on factors, but more importantly to obtain meaningful factors. It was understood after these several trials that PCA was more suitable in this research to extract factors with a meaningful solution. PCA automatically generates eight factors, and the researcher has to decide whether to keep all the eight factors or continue with a lesser number of factors for factor rotation.

Factor rotation is a method by which the researcher attempts to provide that every Q sort has a bigger and significant loading only on one factor and smaller loadings on other factors. The reason for factor rotation is to increase each Q-sort's correlation with only one factor to help with factor interpretation at the next stage (Watts & Stenner, 2012). In this research, three of the first eight factors were kept for rotation, and varimax rotation and judgmental rotation was applied. To determine which factors to keep, generally, the eigenvalue (EV) scores were considered (Watts & Stenner, 2012). The factors with an EV score more than 1.00 could be kept for factor rotation, but all of the eight unrotated factors had an EV score higher than 1.00 in this research. Relying on such a statistical criterion of EV score can lead to keeping "spurious factors" for rotation and interpretation (Brown, 1980, p. 222). Therefore, the main concern became to reach meaningful factors which were not repeating the content of each other. 3, 4, 5, 6, 7 and 8 factors were kept and rotated in iterative trials, and the content of each factor were inspected in each factor solution. It was observed that the viewpoints in the first three factors were clear while the factors beyond that number were either different manifestations of the first three factors or with no clear meaning. Therefore, after extracting eight factors with PCA, three factors were first rotated with varimax.

At the end of the varimax rotation, twenty-eight Q-sorts loaded significantly on a factor. Of the remaining Q-sorts, nine did not load on any of the three factors and three factors were confounded which loaded significantly on two factors. One pair of judgemental rotation was done (Table 18). As a result of this judgemental rotation, Q-sort 1 loaded significantly on factor 2.

Table 18 Judgemental rotation for one pair of factors

Q-Sort Number	1st Factor	2nd Factor	Angle of rotation
1	2	3	4

5.5.2 Factor loadings and flagging

At the end of the analysis of the Q-sorts with PCA, the *Ken-Q* application resulted in a table of three factors on which the Q-sorts, the factors, and the factor loadings were shown. The factor loading refers to each Q-sort's "correlation with each of the identified clusters of factors" (Dariel, 2011, p. 12), and they are represented with their correlation coefficient figures. Factor loadings show "the extent to which each Q sort is similar or dissimilar to the composite factor array […] for that type" (McKeown & Thomas, 2013, p. 53). In the next step, the Q sorts that were significantly loaded on one factor and showed less loading with other factors needed to be flagged. Factor flagging is an operation in factor analysis and it entails the researcher to select factors which are to be used in creating the factor arrays in the later step. The analysis programme *Ken-Q* can make this calculation and automatically flag the significantly loading Q-sorts. Although Ken-Q web application can automatically do flagging, a set of further criteria were applied to reduce the correlation between factors and to reach un-mixed factors which meant that factors with more clear-cut viewpoints. The first criterion was to flag Q-sorts

which loaded significantly and solely onto one factor. The significance level at $p<0.01$ was calculated by the formula of $2.58*(1/\sqrt{42}) =0.398$; where 42 refers to a number of Q statements in this research, and the Q-sorts which had a significance level higher than 0.398 were flagged. If Q-sorts' significance level were higher than 0.398 but was confounded, i.e. loaded significantly at $p<0.01$ level on other factors, these Q-sorts were not flagged. Finally, Q-sorts needed to explain more than half of the communality or the common variance. The communality for each Q-sort is calculated by the sum of its squared factor loadings and it shows "how communal a particular Q sort is, i.e. how much it holds in common with all the other Q-sorts in the study group" (Watts & Stenner, 2012, p. 104). Therefore, flagging a particular Q-sort, which explained more than half of the communality on a particular factor, shows that more than half of the variance of that particular Q-sort was explained by that particular factor.

As a result of this statistical and judgmental factor flagging operation, the final table of the factor matrix with defining Q-sorts flagged was reached (Table 19). A total of twenty-nine Q-sorts were flagged. While two Q-sorts were confounded, six Q-sorts did not load significantly on any factor at $p<0.01$ level. In this outcome, a three-factor solution explained 41% variance. Factor score correlations also indicated that the factors were not correlated with one another at a significantly high level (Table 20). This suggests that three factors had quite distinctive viewpoints.

Table 19 Factor matrix with defining sorts flagged

Q Sorts	Factor 1		Factor 2		Factor 3	
1	0.0479		0.6067	flagged	0.3818	
2	0.5631	flagged	0.058		0.01	
3	0.6244	flagged	-0.2632		0.1384	
4	0.0935		0.5366		0.4843	

Q Sorts	Factor 1		Factor 2		Factor 3	
5	0.265		0.6125	flagged	0.0892	
6	0.3129		0.1947		0.271	
7	0.1068		-0.549	flagged	0.2368	
8	0.3573		-0.2522		0.5421	flagged
9	0.2725		-0.094		0.4792	flagged
10	0.6108	flagged	0.1739		0.3614	
11	0.6437	flagged	0.3114		0.2199	
12	-0.0324		0.6565	flagged	-0.0602	
13	0.708	flagged	0.0364		0.1889	
14	0.1502		0.0593		0.5908	flagged
15	0.5813	flagged	0.2774		0.2401	
16	0.3719		0.1494		-0.0297	
17	0.3587		0.5777	flagged	0.1007	
18	0.4226	flagged	0.2946		0.3488	
19	0.5062		0.5491		0.2897	
20	0.0768		-0.0205		0.6172	flagged
21	-0.154		0.1821		0.7232	flagged
22	0.5935	flagged	0.2929		0.2358	
23	0.3946		0.4689	flagged	-0.0498	
24	0.5916	flagged	0.1447		0.3434	
25	0.6378	flagged	0.308		-0.004	
26	0.2117		0.0401		0.3405	
27	-0.0649		0.2014		0.7776	flagged
28	0.5396	flagged	0.2462		0.3238	
29	0.1534		0.0686		0.081	
30	0.1895		-0.0308		-0.0084	
31	0.4471	flagged	-0.1603		0.2906	
32	-0.0114		0.5973	flagged	-0.0165	
33	0.763	flagged	-0.2834		0.0609	
34	0.5275	flagged	-0.0054		0.0187	
35	0.3791		0.4368	flagged	-0.1228	
36	0.6346	flagged	0.3671		0.0671	
37	0.1526		-0.1542		0.1796	

Q Sorts	Factor 1		Factor 2		Factor 3	
%Explained Variance	18		12		11	

Table 20 Factor score correlations

	Factor 1	Factor 2	Factor 3
Factor 1	1	0.362	0.3257
Factor 2	0.362	1	0.1425
Factor 3	0.3257	0.1425	1

As Watts and Stenner (2012, p. 181) stated, the Q-sorts which loaded significantly onto a factor did "so because they exhibit a very similar sorting pattern or configuration". Therefore, these Q-sorts can be called as factor-exemplars. In the next step, those factor exemplar Q-sorts are merged to form a single ideal-typical Q-sort for each factor called a factor array (Stenner, Cooper, & Skevington, 2003).

5.5.3 Factor scores and factor arrays

In Q-methodological studies, the factors are extracted in the light of the factor scores and factor arrays. Factor scores are used to prepare the factor arrays which refer to "empirical generalisations of a subjective viewpoint shared by those whose individual sorts are significantly loaded on the same factor" (McKeown & Thomas, 2013, p. 60). In other words, a factor array represents an ideal model of Q sort which is a mixture of the Q sorts that load significantly on that factor. Calculating the factor scores and preparing the factor array is important because it enables identification of the distinguishing statements of each factor which refer to statements that are placed in significantly different places than other factors.

Previously flagged significantly loading Q-sorts on a particular factor are used to calculate the factor scores which are subsequently transformed into factor arrays. However, since each flagged Q-sort has a varying degree of loading, they are first weighted according to their factor loading. As Watts and Stenner (2012, p. 143) commented, "the higher the factor loading the greater the contribution made to the final estimate". Weighted factor scores are obtained by multiplying each statement's item ranking by the factor's weight. The weighted scores are later summed across the flagged Q-sorts, and subsequently, the total scores are converted into standard (*z*) scores. The reason for converting into *z* score is to "enable cross-factor comparisons" between the factors (Watts & Stenner, 2012, p. 143). Finally, the *z*-scores for statements are converted back to the original Q-grid scores which were -5 to +5 in this research. In this way, a factor array of an ideal model Q-sort was prepared for each factor. This Q-sort shows how a "hypothetical respondent with a 100% loading on that factor would have ordered the items in the Q-sort" (van Exel & de Graaf, 2005, p. 9). While this ideal Q-sort is helpful to see the overall picture of factors, the Ken-Q web application also yielded a list of statements for each factor which were arranged categorically as highest-ranked statements, positive statements ranked higher in factor array than in other factor arrays, negative statements ranked lower in factor array than in other factor arrays, and lowest-ranked statements. In the next chapter, the factor array both in the form of a Q-grid and as the relative ranking of statements across factors are presented for the interpretation of the factors.

5.6 Chapter summary

The methodology chapter is organised and presented in three chapters. It started with giving an account of the theory and the principles of Q-methodology and discussed why it was suitable for this research in Chapter 2. 0 presented the survey of digital technologies and its results which were used to investigate what digital technologies were being used at the time of the research and to recruit participants for the main data collection methods of Q-methodology. Finally, this chapter presented the data collection and analysis procedures in Q methodology. At the end of data analysis, three factors were retained. In the next chapter, the factor interpretation is presented as the results of this thesis.

Chapter 6 Findings: Factor Narratives

This chapter presents the results of the factor analysis in the previous stage. The findings are presented in the format of factor interpretation. As described in the previous chapter, the *Ken-Q* web application was used to stage data for analysis; to create the correlation matrix among the Q-sorts, and to extract and rotate the factors. The Principal Components Analysis method was used to extract the three factors, which were then rotated by varimax and judgemental rotation to increase the factor loadings and bring similar Q-sorts together. After numerous trials, a three-factor solution was found to be the best option to answer the research question in this research:

> What are the affordances of digital technologies for autonomous English language learning to students studying in a Norwegian secondary school?

In this research, the concept of learner autonomy was defined as "a systematic capacity for effective control over various aspects and levels of the learning process", and to provide participants with a reference point to which they could return and interrogate whether digital technologies provide any affordances, the construct of *control* was used to operationalise learner autonomy. The term *control* is defined as:

> An autonomous language learner is a learner who learns or study English without the direct control or influence of a teacher and takes

> control over his/her learning English with self-determined and volitional tasks and activities.

In the light of this operationalised version of learner autonomy, three factors will be interpreted in this chapter. They represent the different ways in which digital technologies offer affordances to the participants, enabling them to take control over their learning of English. Before moving into the interpretation of the findings, the form in which the findings are presented is introduced in the next section.

6.1 Method for factor interpretation in this research

The description of each factor starts with technical information about the factor. It gives details about how much variance is explained by a particular factor, and also how many participants loaded on it significantly. As discussed in the previous chapter, factor loading refers to how each Q-sort is correlated with three factors found as a result of the factor analysis. Factor loadings show "the extent to which each Q sort is similar or dissimilar to the composite factor array […] for that type" (McKeown & Thomas, 2013, p. 53). Therefore, the participants who have loaded significantly within a particular factor are the ones who make up that particular factor. Later, factor interpretation of the three factors "takes the form of a careful and holistic inspection of the patterning of items in the factor array" (Stenner et al., 2003) which were obtained at the end of factor analysis and the procedure for that was described in the previous chapter. The interpretation is made through a narrative.

Technical information about the factor is followed by the visual representation of the factor array in the format of a Q-sort grid. This enables identification of items are placed at the extreme ends (-5 and +5) on the Q-grid. However, to deliver the

final factor interpretation, a crib sheet will be presented which, as a systematic approach to factor interpretation, was developed by Watts (2001). A factor interpretation crib sheet consists of four categories. The first category comprises the *highest-ranked statements* which refer to two statements ranked at +5 and three statements ranked at +4, and the *lowest-ranked statements* which refer to two statements ranked at -5 and three statements ranked at -4 on the Q-grid. Between these two extreme ends, the positive and negative statements which were ranked higher and lower than any of the other factors are presented. In the latest category, some of the statements can be tied which means that any particular statement can be ranked similarly across two factors. These statements are still included in the interpretation since they contributed to the holistic interpretation of each factor.

Preparing a crib sheet for factor interpretation, or interpreting the affordances of digital technologies for autonomous language learning, is important since the crib sheet format provides the "foundations on which a through and holistic factor interpretation can be built" (Watts & Stenner, 2012, p. 153). In Q-methodological studies, the primary concern is to provide the whole point or the viewpoint within a factor in a holistic manner rather than atomistic (item-by-item) interpretation (Watts & Stenner, 2012, p. 153). Another benefit of the crib sheet is that it enables understanding of the importance of the statements which were ranked close to the centre (0) of the factor array Q-grid. Watts and Stenner (2012, p. 154) warn against presuming these statements ranked towards the middle of the distribution as "indicative of neutrality, total indifference or a general lack of significance or meaning". While this assumption might sometimes be correct, such statements can also act as supporting points for the overall interpretation of the viewpoint within factor.

As stated in the Q-sorting stage, the responses to the four open-ended follow-up questions were also used in the interpretation of the factors. Drawing on Dariel (2011), each of forty-two Q-statements was created as free nodes in the Nvivo software and data from the open-ended questions were coded as quotes under the node of a relevant Q-statement. These quotes were used to "provide the rationale for the interpretation and […] to provide added depth" (Dariel, 2011).

Another point in factor interpretation is that each factor is given an appropriate name so that readers can grasp the essence of a particular factor in a few words (Watts & Stenner, 2012). Therefore, this chapter will now continue with the interpretation of these three factors with their given names as below:

6.2 Factor 1: Affordances from student-led language learning resources

Factor 1 accounts for 18% of the study variance, which is the largest percentage of the total explained variance of 41%. It is defined by fifteen significantly loading participants, which is also higher than the other two factors. Table 21 shows the ideal factor array for factor 1. An overall understanding of factor array and positively and negatively ranked statements suggest that the affordances in this factor are generally related to finding language learning resources on one’s own with digital technologies. This is the reason that the findings in this factor are named with "affordances from student-led language learning resources".

Table 21 Ideal factor array for factor 1

-5	-4	-3	-2	-1	0	1	2	3	4	5
34. With digital technologies, I need the encouragement of an English teacher for learning English.	*< 18. I feel more supported when learning English with digital technologies.	**< 11. I am more self-disciplined and organized in learning English with digital technologies.	10. I make time to learn English with digital technologies.	33. I understand better what works for me when learning English with digital technologies.	3. I find out the strengths and weaknesses of my English with digital technologies.	8. With digital technologies, I evaluate which resources are good for learning English.	* 38. Learning English with digital technologies is more natural because I do not feel like I am sitting down to learn English.	24. I learn English at any time I want with digital technologies.	**> 23. I learn English at any place I want with digital technologies.	**> 19. I find more resources easily with digital technologies to help me learn English.
21. I get frustrated learning English on my own with digital technologies as I need a teacher to tell me if I am learning well.	*> 35. With digital technologies, I need a push from my English teacher to study English.	**< 37. With digital technologies, I review what I have learnt in English.	*< 4. I get myself in the mood to learn English better with digital technologies.	30. I select appropriate learning strategies according to my needs in English with digital technologies.	* 17. I am more relaxed and less stressed about learning English with digital technologies.	14. With digital technologies, I explain better why I choose the materials that I use.	*> 15. I collaborate with other students more easily for English with digital technologies.	*> 29. With digital technologies, I learn more about the culture of English speaking countries.	39. With digital technologies, I learn English in ways and with resources that interest me.	*> 20. I get a sense of what is happening around the world in English with digital technologies.
	*< 12. I am more careful about how I am speaking English with people on digital technologies.	*< 9. I create new strategies to help me learn English with digital technologies.	* 36. With digital technologies, I am less worried about making mistakes in front of other people.	*> 22. I give feedback to my English teacher and assess her work anonymously with digital technologies.	5. I am more confident speaking English with digital technologies.	16. I am more motivated to learn English with digital technologies.	** 7. I evaluate the reliability of information from resources on the Internet for learning English.	32. I find more opportunities to use English with digital technologies.	*> 28. I get instant feedback to my language mistakes and errors with digital technologies.	
		*< 42. With digital technologies, I monitor my own English learning progress over time.	6. I am more focused on learning English with digital technologies.	26. With digital technologies, I know better why I am learning English.	2. I find people better to learn English with on digital technologies.	27. I learn English at my own pace/speed with digital technologies.	*> 41. With digital technologies, I learn English better on my own without the help of someone.	1. It is fun learning English with digital technologies.		
				*< 40. With digital technologies, I have a better understanding of how I learn English best.	13. I explain better why I learn English in the ways that I do with digital technologies.	25. With digital technologies, I have courage to try different things in English.				
					31. I set more achievable objectives/goals while learning English with digital technologies.					

Array Key

***Distinguishing statement-significance level at p<0.01**
****Distinguishing statement-significance level at p<0.05**
>z-Score for the statement is higher than in all the other factors
< z-Score for the statement is lower than in all the other factors

6.2.1 Positively ranked statements

The statements interpreted in this section give an account of what digital technologies afforded the participants who loaded significantly on factor 1 for learning English on their own without the direct support or intervention of their English teacher, thereby taking control over their learning.

Table 22 lists the five statements which were ranked at the highest positive scores on the idealized factor array and together with their z-scores.

Table 22 The Highest ranked statements

Statement Number	Highest Ranked Statements	*z*-score	F1	D/C
19	I find more resources easily with digital technologies to help me learn English.	1.745	5	D
20	I get a sense of what is happening around the world in English with digital technologies.	1.727	5	D*
23	I learn English at any place I want with digital technologies.	1.567	4	D
39	With digital technologies, I learn English in ways and with resources that interest me.	1.509	4	
28	I get instant feedback to my language mistakes and errors with digital technologies.	1.357	4	D*
Key	**F1:** Factor 1 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

Table 23 shows the positive statements which were ranked higher in Factor 1 than the other two factors.

Table 23 Positive statements ranked higher in factor 1 array

Statement Number	Positive Statements Ranked Higher in factor 1 Array than in Other Factor Arrays	*z*-score	F1	D/C
24	I learn English at any time I want with digital technologies.	1.209	3	
29	With digital technologies, I learn more about the culture of English speaking countries.	1.205	3	D*
32	I find more opportunities to use English with digital technologies.	1.003	3	
1	It is fun learning English with digital technologies.	0.961	3	
15	I collaborate with other students more easily for English with digital technologies.	0.761	2	D*
41	With digital technologies, I learn English better on my own without the help of someone.	0.696	2	D*
8	With digital technologies, I evaluate which resources are good for learning English.	0.405	1	
14	With digital technologies, I explain better why I choose the materials that I use.	0.302	1	C*
5	I am more confident speaking English with digital technologies.	0.042	0	C*
2	I find people better to learn English with on digital technologies.	-0.055	0	C*
13	I explain better why I learn English in the ways that I do with digital technologies.	-0.13	0	
31	I set more achievable objectives/goals while learning English with digital technologies.	-0.168	0	
Key	**F1:** Factor 1 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

Table 22 suggests that the significantly loading participants in factor 1 found statement 19 and expressed what they considered to be most helpful about technology for learning English on their own. For these participants, the digital technologies afforded learners of English the opportunity to take control over their learning by finding new resources. In their accounts of the reasons why they found this statement the most useful, Q-sorter 13 stated that it was:

> easier to find resources on the Internet rather than if you are reading a book.

while Q-sorter 22 commented that:

> The Internet is full of information and resources and that helps me learn English.

Another participant, Q-sorter 33, stated that s/he used Google to do his/her search for resources. It is possible to understand from the former two Q-sorters' comments that the ease of access to resources and wide range of resources for learning English facilitated these learners to take advantage of this affordance to learn English autonomously.

Participants defining factor 1 ranked statement 20 as the second most helpful. These participants believed that digital technologies afforded them the opportunity of getting a sense of what is happening around the world in English with digital technologies, thereby being engaged in English even if they did not study it. This statement can be interpreted in light of statement 19. Following news in English in statement 20 might be one of the resources for learning English in statement 19. For example, Q-sorter 3 commented that:

> Because through digital technologies, it is easier to get access to news and information about what is happening in the world.

In a similar vein, Q-sorter 25 justified why s/he found statement 20 as the most helpful for learning English by stating that:

> Because a huge part of learning English is knowing what is going on in the different parts of the world, and there could be huge contrasts for instance between the USA and South Africa.

It is possible to understand from this comment that this particular participant found it useful to follow what happened around the world in English and saw it as an important part of learning English.

What these participants followed in English can also be about the culture of other English-speaking countries. The reason for this interpretation relies on the ranking of statement 29 at +3 in factor 1 array. More importantly, it is a significantly distinguishing statement at $p<0.01$ level which indicates that this statement was placed statistically at a different place in comparison to the other two factors. According to statement 29, the participants believed that digital technologies could afford them the chance to learn more about the culture of English speaking countries. For example, Q-sorter 3 commented that:

> It is easy and quick to find information about culture and history through digital technologies.

Therefore, digital technologies not only provide opportunities to access to materials to study and learn English but also opportunities to be engaged with English by keeping up to date with world events in English including the culture of English-speaking countries, as well.

Participants' interest in the affordance of finding resources for learning English is also manifested in their placing statement 39 at +4 in factor 1 array. These participants believed that digital technologies enabled them to learn English in ways

and resources that interested them. In response to the question of why participants found this statement to be the most useful, they made the following comments. Q-sorter 36 provided a generic account by stating that:

> With digital technologies I can learn English in the ways I found interesting.

Another two participants elaborated more on why they found the affordance in statement 39 helpful for learning English on their own. Q-sorter 13, for example, commented that:

> The world is not filtered as much as school - you should be able to use the resources at school as well as when you are home, to somewhat prepare you for the rest of your life.

Although the participant did not give a full account of what filters were being applied regarding the access to resources at his/her school, the participant likely felt limited about ways and resources s/he was offered and was aware that there were more resources available for learning English beyond the school environment. It seems that s/he was more interested in learning with ways and resources that could prepare him/her for life after school. Therefore, it is interesting to note here that digital technologies afforded to this student a digital environment where s/he could overcome the filtered environment at school, thereby taking control over which resources to use for supporting his/her learning English.

The view of statement 39, that technologies afford the learning of English in ways and resources which participants find interesting, was also echoed by Q-sorter 18. Commenting on this statement, s/he stated that:

> Because with interesting resources it is more fun to really read the language and fully concentrate on the words and grammar in front of me.

For this participant, digital technologies provided an opportunity to learn English in a "fun" way. The underlying reason why s/he found this statement the most helpful for learning English was that the participant could have fun while still focusing on learning English.

“Having fun" when learning English suggests being taught in ways which interest and engage the learner. The importance of this notion can be observed in the fact that statement 1 is ranked at +3. In the other two factors, the same statement was ranked at -1 and +2. Therefore, although it is not a significantly distinguishing statement for factor 1, it was ranked higher than other two factors and can help to explain why the affordance of a fun way of learning English in digital technologies is important. Q-sorter 11, for example, stated that:

> Because you have a bigger variety of places and methods to learn English, like movies and friends in other countries, which makes it easier to find a fun way of learning the language.

It can be understood from this comment that the participant was aware of how to find a fun way of learning English. The participant could take control over the way s/he learnt because digital technologies provided a digital environment where the participant could explore various methods of learning such as watching movies or meeting friends in other countries. In another comment, Q-sorter 22 found statement 1 as the most helpful and explained that:

> Because it was motivating to have fun while learning a subject.

This comment shows that having fun in learning matters because it motivates learners. Accordingly, it can be suggested that digital technologies can also enable learners to take control over their learning English by providing opportunities to

learn English in ways and resources that interest them beyond the classroom environment.

Participants' interest in perceiving the affordance of finding and learning in ways and resources that interest them, such as learning in a fun way and with movies, sheds light on why statement 8 was ranked very close to the neutral point on the factor array at +1. Although the participants on this factor saw it as an affordance, they remained nearly neutral about evaluating the resource they considered to be good for learning English. Therefore, although no participant commented on statement 8, learners considered whether they can have fun when learning English and whether it was interesting for them when choosing resources and materials rather than whether it was good for learning English.

The participants with this view of factor 1 also found statement 28 pointed towards one of the most helpful affordances of digital technologies. It is also worth noting that it is a significantly distinguishing statement at $p<0.01$ level. According to the ranking of this statement, the participants in this factor believed that digital technologies could help them receive instant feedback to their language mistakes and errors. Q-sorter 2 explained further how digital technologies can help him/her with learning English:

> The reason I find this statement most helpful is because I get immediate feedback from my superiors for improvement of mistakes that I've made or just positive feedback on my work that I have submitted.

As the comment also suggests, digital technologies provided an opportunity to correct one's language mistakes. However, it is important to note here that the focus of the Q-sorter was more on getting immediate feedback, whether it was for

correcting a mistake or getting positive feedback, rather than waiting for it. So, it is possible to suggest that digital technologies can also provide the means for learners to control how they manage to receive feedback. Yet, it is not clear who the "superiors" refer to in this comment from whom the participant could receive the immediate feedback. While these "superior" figures could be the teacher, another distinguishing statement, statement 15 in the next paragraph, suggests that they can be fellow learners of this particular student, as well.

Although statement 15 was not ranked very high in the factor 1 array (ranked at +2), it is a significantly distinguishing statement at $p<0.01$ level for factor 1. Other factors ranked this statement at -3 and -2. For such statements which are close to neutral point 0 on the factor array, Watts and Stenner (2012) suggest that interpretation can be made in reference to other statements and comments of the participants for the particular statement. Therefore, the ranking position +2 where statement 15 was placed on factor array 1 can help clarify the idea in statement 28 in the previous paragraph.

According to statement 15, digital technologies provided the participants on this factor the opportunity to collaborate with other fellow learners more easily when learning English. The comments of two participants illustrate how the affordance of collaboration works when learning English. Q-sorter 28, for example, suggested that:

> It's easy to work together, communicate and collaborate on texts.

while Q-sorter 24 stated that:

> With digital technologies it's easier to join each other's work, and look at the same document at the same time, like Google Docs.

These comments firstly show that digital technologies such as Google Docs create a digital environment where the learners can meet, work on the same document and contribute to each other's work. Secondly, the scope of such a collaborative digital learning environment can include giving and getting live feedback on each other's work. When the Q-sort of Q-sorter 2 was inspected, it was seen that s/he placed statement 15 at +4 position right after the first two +5 positions. This suggests that s/he found both statement 28 and statement 15 helpful when learning English. Therefore, the idea that the "superior" figures providing immediate feedback could be the fellow learners of the participants seems more likely. While the "superior" figure could be the English teacher of the participants, it could also be their classmates who they meet in a digital environment and see each other's work and contribution immediately.

Another statement which was ranked relatively higher is statement 41. It is a significantly distinguishing statement for factor 1, which was placed in -2 and 0 in the other two factors. According to this statement, digital technologies afford participants the ability to learn English on their own without the help of someone. Interestingly, statement 41 may look slightly incongruent with statement 15. While the former statement is about learning on one's own, the latter statement involves learning collaboratively. No participant commented on statement 41, so it is difficult to elaborate on how these two statements might have been ranked at the same positions on the factor array +2 at a significantly distinguishing level. One possible explanation is that while the participants loading on this factor takes the advantage of working collaboratively on digital technologies as statement 15 suggested, they are not fully interested in working with other students all the time, as statement 41 suggested. Therefore, the participants may still be learning better

on their own, but, depending on their needs for their learning, they may also be turning to their fellow learners. As well as finding resources easily with digital technologies, the participants might see other fellow learners as "human resources" for learning, as well.

Other than access to resources, the participants who loaded significantly on this factor believed that digital technologies afforded them the opportunity to learn English anywhere they wanted. This is evident from the ranking of statement 23 at +4 in factor array for factor 1. This statement is also distinguishing but at significance level $p<0.05$. Some of the participants elaborated on this statement with the following comments. Q-sorter 10 suggested that:

> it makes it so that I do not feel forced to practice my English skills. it makes it more of a natural part of my daily life.

Q-sorter 15 responded that:

> I am always connected to the internet and can bring my preferred learning platform anywhere I want at any time.

It is possible to see from these comments that digital technologies afford learners the flexibility to learn English anywhere so that they are not confined to a particular place to study and learn English. They do not feel forced to study English at a fixed place, because, as Q-sorter 15 stated, digital technologies provide a digital environment which can be brought along with the participant to wherever s/he wants. Also, the same participant noted the importance of being able to learn English at any time. Therefore, statement 24 can also be interpreted alongside the affordance of learning anywhere. As statement 24 suggests, digital technologies also afforded the participants loading on this factor to learn English at any time they

wanted. It, therefore, suggests that the participants on this factor could take control over the way, the place and the time that they were learning English.

There are also other statements, such as statements 14, 5, 2, 13, and 31, which are still ranked higher than the other two factors. Yet, these statements are ranked very close to the neutral point and no participant commented on them. Therefore, these statements will not be further elaborated on for this factor.

6.2.2 Negatively ranked statements

The statements which were ranked negatively in factor array 1 represent the digital technologies that the participants loading significantly on this factor believed were *not* helpful to them for learning English on their own without the direct support or intervention of their English teacher.

Table 24 presents the statements which were ranked the lowest in factor 1 array.

Table 24 Lowest ranked statements in the factor 1 array

Statement Number	Lowest Ranked Statements	*z*-score	F1	D/C
21	I get frustrated learning English on my own with digital technologies as I need a teacher to tell me if I am learning well.	-2.094	-5	
34	With digital technologies, I need the encouragement of an English teacher for learning English.	-1.925	-5	C*
12	I am more careful about how I am speaking English with people on digital technologies.	-1.518	-4	D*
35	With digital technologies, I need a push from my English teacher to study English.	-1.433	-4	

Statement Number	Lowest Ranked Statements	*z*-score	F1	D/C
18	I feel more supported when learning English with digital technologies.	-1.192	-4	D*
Key	**F1:** Factor 1 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

In Table 25, the negative statements which were ranked lower in the Factor 1 array than the other two factors can be seen.

Table 25 Negative statements ranked lower in factor 1 array

Statement Number	Negative Statements Ranked Lower in factor 1 Array than in Other Factor Arrays	*z*-score	F1	D/C
42	With digital technologies, I monitor my own English learning progress over time.	-1.173	-3	D*
9	I create new strategies to help me learn English with digital technologies.	-1.067	-3	D*
37	With digital technologies, I review what I have learnt in English.	-0.951	-3	D
11	I am more self-disciplined and organized in learning English with digital technologies.	-0.89	-3	D
4	I get myself in the mood to learn English better with digital technologies.	-0.614	-2	D*
40	With digital technologies, I have a better understanding of how I learn English best.	-0.489	-1	D*
30	I select appropriate learning strategies according to my needs in English with digital technologies.	-0.303	-1	
33	I understand better what works for me when learning English with digital technologies.	-0.272	-1	

Statement Number	Negative Statements Ranked Lower in factor 1 Array than in Other Factor Arrays	*z*-score	F1	D/C
5	I am more confident speaking English with digital technologies.	0.042	0	C*
3	I find out the strengths and weaknesses of my English with digital technologies.	0.153	0	
Key	**F1:** Factor 1 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

As can be seen in Table 24, the participants ranked statement 21 at -5 which suggests that they did not believe that digital technologies caused any frustration when learning English on their own without the support of their English teacher. Frustration over learning may already be something which digital technologies should not afford. Yet, it should be remembered that "[t]he *affordances* of the environment are […] what it *provides* or *furnishes*, either for good or ill" (Gibson, 1979, p.127). So, digital technologies might still afford learners frustration, as what they provide or furnish for ill when learning English with digital technologies. As a result, the participants might need a teacher to tell them whether they were learning English well. In this factor, however, that was not the case and the participants disagreed with the idea that it could be frustrating learning English with digital technologies on their own.

The participants who placed this statement at -5 in their own Q-sorts made the following comments. Q-sorter 28, for example, reiterated that s/he does not "[…] need a teacher to tell [him/her] if [s/he is] doing well or not, so [s/he does] not get frustrated using digital technologies". Q-sorter 10 also emphasized that:

> I personally learn things better on my own and in a subject like English I do not rely as much on my teacher as in other subjects.

In a similar vein, Q-sorter 11 commented that:

> I find it easier to learn English without a teacher by reading, hearing and talking to English speakers.

Q-sorter 36 also responded why s/he disagreed with this affordance by stating that:

> It is not so true, I do not need a teacher telling me if I am learning well. if the computer says I'm learning good I think that's good enough.

It can be derived from the strong disagreement with the statement 21 in light of these comments that digital technologies did not afford participants any frustration when learning English, and also digital technologies afforded them to be less dependent on their teacher when learning English. The learners did not need the authority of the teacher to tell them whether the ways they were learning English were good for them or not. It is interesting to note from Q-sorter 36's comment, one particular participant turned to the computer to understand if s/he was learning well. So, there is a departure from being dependent on the teacher towards relying on digital technologies and thereby taking control over how the participants assess their learning without getting frustrated.

The affordance of being less dependent on the teacher when learning English is supported as statements 34 and 35 are ranked on factor 1 array, respectively at -5 and -4. Although they were ranked at very similar positions in other two factors (statement 34 at -5 on factor 2 and -5 on factor 3; statement 35 at -5 on factor 2 and -5 on factor 3), the comments made in respect of these statements helps elaborate why the learners become less dependent on their English teacher.

By placing statement 34 at -5, the participants loading significantly on this factor did not believe that they needed the encouragement of their English teacher to learn English. Commenting on why they disagreed with this statement, Q-sorter 10 stated that:

> I do not need encouragement to learn English as I am already very happy to learn more.

while Q-sorter 2 repeated that:

> I'm easily encouraged by myself for the task that is given.

Q-sorter 11 also believed that s/he could:

> learn English more easily and in a more fun way without a teacher.

Finally, Q-sorter 18 commented that:

> Because I read English online every day, which means that I don't need the encouragement from a teacher to read English.

When it comes to statement 35 ranked at -4, the participants also disagreed that they needed a push from their English teacher to study English. In their accounts of why they disagreed, Q-sorter 2 responded that:

> I don't need a push from my English teacher to study English because I find it fun and fascinating to work with.

Q-sorter 24 also commented that:

> Every teenager is on their phone or their computer most parts of the day, so I believe it's easier to work on English when it's with digital technologies rather than on paper.

It can be observed from these comments that some of the participants were already motivated and encouraged to learn English, but digital technologies afforded

learners to continue learning English in a fun way. This aligns with the statement 1 (It is fun learning English with digital technologies) in the previous section. Also, digital technologies provided opportunities for easy access to materials in English at any time. So, it is possible to deduce that these two affordances enabled learners to become less dependent on their English teacher and therefore do more learning on their own.

The participants loading significantly on this factor also placed statement 12 at -4 which suggests that the participants believed that digital technologies did not afford them to be more careful how they were speaking English with people on digital technologies. This statement is also a significantly distinguishing statement at $p<0.01$ level for factor 1. Being another significantly distinguishing statement at $p<0.01$ level, statement 18 was also ranked at -4 on the factor 1 array. According to this ranking, the participants could not see the affordance of feeling more supported when learning English with digital technologies.

From Table 25, it can also be seen that the participants found some of the statements not helpful for learning English on their own. According to statement 42, a significantly distinguishing statement for factor 1 and ranked at -3, digital technologies did not afford the participants to monitor their own English learning progress over time. The ranking of statement 9 at -3, which is also a significantly distinguishing statement, suggested that the digital technologies did not help create new strategies to help participants learn English. The participants also disagreed that the digital technologies could afford them to review what they have learnt in English, as indicated by statement 37 being ranked at -3 on the factor 1 array. The position of statement 11 at -3 suggested that it was not an affordance of digital technologies for participants in this factor to become more self-disciplined and

organized in learning English with digital technologies. On the contrary, Q-sorter 15 stated that s/he could be "easily distracted". The participants at this factor also differed significantly from the other two factors by placing statement 4 at -2 on the factor array, which was ranked at +4 on the other two factors. This suggests that digital technologies did not provide learners with the opportunity to get themselves in the mood to learn English on their own.

Statements 40, 30, 33, 5, and 3 were also ranked relatively lower in the factor 1 array than the other two factors. Yet, these statements were also ranked very close to a neutral point which suggests that the participants remained neutral or impartial to these statements. Since there were no comments for these statements, these statements will not be elaborated on further.

6.2.3 Factor 1 Summary

Overall, the ranking of the statements in the factor 1 array and the comments made by the participants as to why they ranked particular statements at +5 and -5 on the Q-grid suggest that the participants loading significantly on this factor mostly found the affordance of finding resources the most helpful for learning English on their own without the direct support or intervention of their English teachers. While these resources could be material such as movies or news in English, some participants turned to their fellow learners for collaborative learning when needed, thereby also using human resources. For resources and the ways that the participants made their learning with, the participants considered what interested them and whether it was fun learning English with digital technologies. Finally, these participants showed that they were less dependent on their English teacher when learning English with digital technologies. Therefore, it can be said that factor 1 represents a view that

digital technologies can provide affordances to learners to take control over their learning by learning English in ways and with resources that they find interesting and without the direct control of their English teacher.

6.3 Factor 2: Affordances for self-regulated learning

Factor 2 accounts for 12% study variance, which is the second-largest percentage of the total explained variance of 41%. It is defined by eight significantly loading participants. Factor 2 is a bipolar factor, that is to say, it is "defined by both positively and negatively loading Q sorts because they have exemplar Q sorts positioned near to both their poles" (Watts & Stenner, 2012, p. 165). One of the eight participants, Q-sorter 7, loaded on factor 2 negatively with a correlation rate of r=-0.549. This correlation is moderate, and it does not suggest a total opposition to the other seven significantly loading Q-sorters on this factor. Yet, for some statements, Q-sorter 7 may have opposite ideas. Below, Table 26 shows the ideal factor array for factor 2. It is possible to understand from the factor array and positively and negatively ranked statements that the affordances in this factor are generally related to learners' finding an alternative mode of learning to learn in the classroom. This is the reason that the findings in this factor are named "affordances for self-regulated learning".

Table 26 Ideal factor array for factor 2

-5	-4	-3	-2	-1	0	1	2	3	4	5
34. With digital technologies, I need the encouragement of an English teacher for learning English.	*< 8. With digital technologies, I evaluate which resources are good for learning English.	10. I make time to learn English with digital technologies.	2. I find people better to learn English with on digital technologies.	*< 1. It is fun learning English with digital technologies.	13. I explain better why I learn English in the ways that I do with digital technologies.	40. With digital technologies, I have a better understanding of how I learn English best.	*> 26. With digital technologies, I know better why I am learning English.	24. I learn English at any time I want with digital technologies.	*> 36. With digital technologies, I am less worried about making mistakes in front of other people.	*> 38. Learning English with digital technologies is more natural because I do not feel like I am sitting down to learn English.
35. With digital technologies, I need a push from my English teacher to study English.	21. I get frustrated learning English on my own with digital technologies as I need a teacher to tell me if I am learning well.	15. I collaborate with other students more easily for English with digital technologies.	37. With digital technologies, I review what I have learnt in English.	*< 19. I find more resources easily with digital technologies to help me learn English.	14. With digital technologies, I explain better why I choose the materials that I use.	*< 39. With digital technologies, I learn English in ways and with resources that interest me.	* 29. With digital technologies, I learn more about the culture of English speaking countries.	** 23. I learn English at any place I want with digital technologies.	*> 17. I am more relaxed and less stressed about learning English with digital technologies.	*> 27. I learn English at my own pace/speed with digital technologies.
	22. I give feedback to my English teacher and assess her work anonymously with digital technologies.	6. I am more focused on learning English with digital technologies.	41. With digital technologies, I learn English better on my own without the help of someone.	*< 7. I evaluate the reliability of information from resources on the Internet for learning English.	3. I find out the strengths and weaknesses of my English with digital technologies.	20. I get a sense of what is happening around the world in English with digital technologies.	25. With digital technologies, I have courage to try different things in English.	32. I find more opportunities to use English with digital technologies.	4. I get myself in the mood to learn English better with digital technologies.	
		**< 31. I set more achievable objectives/goals while learning English with digital technologies.	*< 28. I get instant feedback to my language mistakes and errors with digital technologies.	* 9. I create new strategies to help me learn English with digital technologies.	5. I am more confident speaking English with digital technologies.	* 42. With digital technologies, I monitor my own English learning progress over time.	*> 12. I am more careful about how I am speaking English with people on digital technologies.	16. I am more motivated to learn English with digital technologies.		
				** 11. I am more self-disciplined and organized in learning English with digital technologies.	33. I understand better what works for me when learning English with digital technologies.	18. I feel more supported when learning English with digital technologies.				
					30. I select appropriate learning strategies according to my needs in English with digital technologies.					

Array Key

***Distinguishing statement-significance level at p<0.01**

****Distinguishing statement-significance level at p<0.05**

>z-Score for the statement is higher than in all the other factors

< z-Score for the statement is lower than in all the other factors

6.3.1 Positively ranked statements

The statements interpreted in this section give an account of what digital technologies afforded the participants loading significantly on factor 2 for learning English on their own without the direct support or intervention of their English teacher, thereby taking control over their learning.

Table 27 lists the five statements which were ranked with the highest positive scores on the idealized factor 2 array and together with their z-scores.

Table 27 Highest-ranked statements in factor 2 array

Statement Number	**Highest Ranked Statements**	***z*-score**	**F2**	**D/C**
38	Learning English with digital technologies is more natural because I do not feel like I am sitting down to learn English.	2.354	5	D*
27	I learn English at my own pace/speed with digital technologies.	1.929	5	D*
36	With digital technologies, I am less worried about making mistakes in front of other people.	1.777	4	D*
17	I am more relaxed and less stressed about learning English with digital technologies.	1.565	4	D*
4	I get myself in the mood to learn English better with digital technologies.	1.425	4	
Key	**F2:** Factor 2 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level $p<0.01$			

In Table 28, positive statements which were ranked relatively higher than the other two factors can be seen.

Table 28 Positive statements ranked higher in factor 2 array

Statement Number	Positive Statements Ranked Higher in factor 2 Array than in Other Factor Arrays	*z*-score	F2	D/C
24	I learn English at any time I want with digital technologies.	1.316	3	
32	I find more opportunities to use English with digital technologies.	0.738	3	
26	With digital technologies, I know better why I am learning English.	0.678	2	D*
25	With digital technologies, I have courage to try different things in English.	0.509	2	C
12	I am more careful about how I am speaking English with people on digital technologies.	0.353	2	D*
40	With digital technologies, I have a better understanding of how I learn English best.	0.325	1	
13	I explain better why I learn English in the ways that I do with digital technologies.	-0.003	0	
5	I am more confident speaking English with digital technologies.	-0.109	0	C*
Key	**F2:** Factor 2 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

According to Table 27, the top four statements are significantly distinguishing at p<0.01 level at factor 2. Of these statements, statement 38 is ranked +5 on the factor 2 array by the participants loading significantly onto factor 2. They believed that digital technologies afforded them to learn English in more "natural" ways. For these participants, this meant learning English without “sitting down to learn

English". Some of the participants explained why they found this statement the most helpful for learning English on their own with the following comments.

In a very concise manner, Q-sorter 32 stated that it was "more chill and not any press". From this brief explanation, it is possible to understand that the participant felt less pressured when learning English with digital technologies. The view in this statement is also supported by the fact that statement 17 was ranked at +4 on the factor 2 array. It is a significantly distinguishing statement and suggests that learners could become more relaxed and less stressed about learning English with digital technologies. It is, therefore, possible to suggest that digital technologies can afford the participants to overcome the stress and pressure when learning English, and thereby taking control over psychological aspects within their learning conditions.

Q-sorter 12 elaborated on why s/he found statement 38 the most helpful:

> Take me for an example. I don't really like reading, and I think I am not the only 18 years old boy/girl who thinks that. The difference with digital technologies is that you don't get the same feeling of learning you get when you have to read and study a book. It is more fun with digital technologies.

In a similar vein, Q-sorter 35 also commented on statement 38 that:

> I don't know, it's just a feeling I guess. Instead of taking up a book which is boring, u take up a laptop which is fun.

These two comments above illustrate what the participants mean when they report that they do not like sitting down to learn English. It can be seen that the participants on this factor do not prefer learning English by taking up a book and studying it, which might be what they are doing during English classes or for homework after

school. Q-sorter 35 even refers to studying and learning English with a book as boring. Instead, these participants seem to be more interested in learning English in what they refer to as "more natural" ways, rather than by studying in a formal way. So, digital technologies seem to provide these participants with an alternative mode of learning which they can switch to when they find more traditional ways of learning less interesting.

The affordance of providing an alternative mode of learning is also echoed in Q-sorter 17's comment. S/he stated that:

> Digital technologies allow the learning to be more alternative, and perhaps fun and more adapted to individuals.

It is interesting to note from this comment that digital technologies provide opportunities to the learners to adapt learning to suit themselves. Instead of learning English by intentionally studying with books, the participants can find alternative learning methods which suit themselves better. From the comments above, it can be suggested that the alternative learning method which suits the participants better is learning more naturally by having fun and in a less stressed environment.

Being able to learn more naturally with digital technologies can also help understand how statement 4 was ranked at +4 on factor 2 array. With this statement, the participants agreed that they could get themselves more in the mood of learning English with digital technologies. It is possible that feeling less stressed and more relaxed with digital technologies, being able to adapt learning to suit themselves and having fun at the same time may appeal to learners to learn English.

Another high ranked and significantly distinguishing statement for factor 2 is statement 27. By ranking this statement at +5 in the factor 2 array, some of the

participants believed that they could learn English at their own speed with digital technologies. Q-sorter 12 explained why s/he found this statement the most helpful for learning English on his/her own in the following comment:

> Learning English take time, and we all work and learn at our own tempo. With digital technologies, I find it easier to learn, without help from your teacher or fellow students.

Q-sorter 12 draws attention with this comment to the point that each learner may have a different learning pace, thereby suggesting that not every learner can learn at the same speed at the same level. It addresses an individual difference with regard to the time to learn. This comment shows that digital technologies have the potential to afford learners to learn English at their own pace or "tempo', as the Q-sorter puts it. One of the opportunities that might enable learners to learn at their own pace is related to their taking control over time for learning. The participants on this factor agreed with statement 24 and ranked it at +3 on factor 2 array. Although it is ranked at +3, the difference between the *z*-scores of statement 24 and statement 4 which was ranked at +4 is only 0.109. Hence, there is a considerably strong agreement with this statement after the top five highest-ranked statements. With this statement, the participants believed that they could learn English at any time they wanted with digital technologies. They already indicated that they did not prefer sitting down to learn English with statement 38 and showed a preference for being more flexible for learning English. Therefore, when the strong agreement with statement 27 and considerably strong agreement with statement 24 are considered in the light of the interpretation of statement 38 in the previous paragraphs, taking control over learning time and thereby learning at one's own pace can be one of the ways by which learners adapt learning conditions to themselves.

Statement 27 was not, however, seen as an affordance of digital technologies for learning English on one's own by every participant. Since factor 2 is a bipolar factor, Q-sorter 7 showed opposition to this statement. By placing this statement at -5, s/he disagreed that digital technologies could afford learners to learn at their own pace. Q-sorter 7 argued that:

> I don't think I learn English at my own speed with digital technologies, because I have to stick with the rest of the class.

This comment suggests that not every learner takes advantage of the same affordance. Q-sorter 7 felt that s/he had to stick with his/her English class despite the opportunity of adapting his/her learning speed while Q-sorter 12, for example, took advantage of this affordance to individualize his/her learning pace, and thereby taking control over his/her learning.

Another statement which showed that digital technologies afforded the participants to take control over psychological aspects of their learning was statement 36. It was ranked at +4 on the factor 2 array and was a significantly distinguishing statement at $p<0.01$ level. With this statement, the participants agreed that they could become less worried about making mistakes in front of other people with digital technologies. In a sense, digital technologies afford these participants to become more courageous to try using English. The viewpoint of being more courageous is supported with statement 25. Although it is a consensus statement which did not help to differentiate between factors and was only ranked at +2 on the factor 2 array, the comment made by one of the significantly loading participants illustrates how the participants can become more courageous with digital technologies. The Q-sorter 17 stated that:

> Often you are alone while using digital technologies, and you are less afraid of making mistakes and therefore dare to try different things.

It can be observed that digital technologies provided a less threatening learning environment for the participants. They were able to try different things in English because no one could see them and notice their mistakes. That may also be the reason why the participants felt less worried about making mistakes in front of other people. By trying things on their own in English beforehand with digital technologies, the participants could notice their mistakes and possibly correct them, before trying them in front of other people. However, this may not be the case every time. Statement 12 was ranked at +2 on factor 2 array, and it is a significantly distinguishing statement. Although the *z*-score of the statement is very close to zero (0.353), statement 12 suggests that some of the participants could still be monitoring how they were speaking English with other people on digital technologies.

The participants on this factor also agreed with statement 26, which was ranked at +2 on the factor 2 array. It is a significantly distinguishing statement for factor 2 at $p<0.01$ level. It suggests that digital technologies can afford learners to understand why they are learning English. No participants commented on this statement, so it is difficult to elaborate. Also, statements 40, 13, and 5 were ranked higher than the other two factors, but these three statements were ranked at neutral points. This suggests that the participants remained neutral with regard to the affordances stated with these statements.

6.3.2 Negatively ranked statements

The statements which were ranked negatively in the factor 2 array indicate that the participants loading significantly on this factor believed that digital technologies did not help them learn English on their own without the direct support or intervention of their English teacher. Therefore, digital technologies did not enable them to take control over their learning.

Table 29 shows the statements which were ranked the lowest on factor 2 array.

Table 29 Lowest ranked statements in the factor 2 array

Statement Number	Lowest Ranked Statements	*z*-score	F2	D/C
35	With digital technologies, I need a push from my English teacher to study English.	-2.16	-5	
34	With digital technologies, I need the encouragement of an English teacher for learning English.	-1.981	-5	C*
22	I give feedback to my English teacher and assess her work anonymously with digital technologies.	-1.541	-4	
21	I get frustrated learning English on my own with digital technologies as I need a teacher to tell me if I am learning well.	-1.229	-4	
8	With digital technologies, I evaluate which resources are good for learning English.	-1.181	-4	D*
Key	**F2:** Factor 2 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

In Table 30, the statements which were ranked lower in factor 2 than other factor arrays can be seen.

Table 30 Negative statements ranked lower in the factor 2 array

Statement Number	Negative Statements Ranked Lower in factor 2 Array than in Other Factor Arrays	*z*-score	F2	D/C
31	I set more achievable objectives/goals while learning English with digital technologies.	-1.134	-3	D
6	I am more focused on learning English with digital technologies.	-0.937	-3	
15	I collaborate with other students more easily for English with digital technologies.	-0.84	-3	
10	I make time to learn English with digital technologies.	-0.596	-3	
28	I get instant feedback to my language mistakes and errors with digital technologies.	-0.522	-2	D*
41	With digital technologies, I learn English better on my own without the help of someone.	-0.514	-2	
2	I find people better to learn English with on digital technologies.	-0.45	-2	C*
7	I evaluate the reliability of information from resources on the Internet for learning English.	-0.295	-1	D*
19	I find more resources easily with digital technologies to help me learn English.	-0.285	-1	D*
1	It is fun learning English with digital technologies.	-0.273	-1	D*
5	I am more confident speaking English with digital technologies.	-0.109	0	C*
3	I find out the strengths and weaknesses of my English with digital technologies.	-0.081	0	
14	With digital technologies, I explain better why I choose the materials that I use.	-0.009	0	C*
Key	**F2:** Factor 2 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level $p<0.01$			

The participants on this factor showed responses which indicated that they did not need encouragement from a teacher to learn or study English. Statements 35 and 34 were ranked at -5 on the factor 2 array. These two statements were also ranked at similar positions in both the factor 1 and factor 3 arrays. Yet, the reasons why the participants disagreed with these statements can still show the hidden affordances of digital technologies.

As the positively ranked statement suggests, the participants on this factor are already interested in learning in more "natural" ways which they can adapt themselves. In a sense, they would like to be in control of their learning. These participants are also less stressed and worried when learning English with digital technologies, and they have the courage to try using English. From these perspectives, it can be understood why the participants on this factor did not need a push from their teacher to study English, as the strong disagreement with statement 35 indicated. In a similar vein, as the strong disagreement with statement 34 also suggested the participants did not feel the need for encouragement from their teacher to study English, particularly by using digital technologies. The participants' comments shed light on why they disagreed with these two statements.

With regard to statement 35, Q-sorter 1 stated that:

> I do not need a push to do things with digital technologies. I like using digital technologies myself, and therefore no one needs to tell me to use it.

Similarly, Q-sorter 17 responded that:

> We find digital technologies at every corner, I do not need my English teacher to push me to use them - as I use them voluntarily.

These two comments suggest that the participants do not need their teacher to instruct them to use digital technologies for learning English because they already use digital technologies voluntarily and easily. They do not see digital technologies as materials which a teacher should ask them to use for learning, but instead, they are a part of the participants' daily life. This also goes some way to explaining the strong agreement with statement 38 in the previous section. Since the participants can easily access digital technologies and they are part of their daily life, the participants favour learning English in more natural ways with digital technologies, and therefore without the direct push or encouragement of a teacher.

From a different perspective, Q-sorter 12 explained why s/he did not need the support of a teacher to learn English with digital technologies:

> When I am using digital technologies, I do not have my teacher breathing down my neck. I do not have him watching over me, to see if I work. Here, we have trust. He trusts me, to do my work using digital technologies. And I value that trust, so I do my work.

It is clear from this comment that the participant is aware of his/her responsibility when learning English and s/he can perform tasks for learning without the direct control or intervention of a teacher. There is a trust between the teacher and the participant, and it seems that such a trust-worthy environment helps the learner to take more control over his/her learning with the help of digital technologies.

The participants on this factor also disagreed with the statement 21. They do not find it frustrating to learn English on their own with digital technologies because they do not need a teacher to tell them whether they are learning well. This is further support for the notion that digital technologies afford learners to become less dependent on their English teacher. By acknowledging that a teacher can still be helpful, though, Q-sorter 1 made the following comment:

> A teacher can be good to have to tell you where you are, but the internet is just as important. I love using digital technologies, and I never (or almost never) get frustrated using them.

As the phrase "almost never" in the comment above suggests, it is difficult to suggest that learners can learn English independently from their English teacher. The fact that statement 41 was ranked at -2 on the factor 2 array suggests that the participants did not believe that digital technologies afforded them the opportunity to learn on their own without help. The statement is not significantly distinguishing, and it is close to the neutral point with a low *z*-score (-0.514). However, the comment of Q-sorter 7, who loaded on factor 2 negatively, illustrates why learners may still need the support of someone such as their English teacher.

> A lot of the stuff we are learning are quite difficult and therefore I need a teacher to explain as well as the digital technologies.

It can be understood from the comment that the participants need a teacher to explain some topics they were studying, particularly for more complex tasks. Hence, digital technologies can afford learners on this factor to learn without the encouragement of a teacher. In a sense, the participants are already motivated to learn on their own. Yet, when it comes to learning tasks which might be challenging for them, there is a possibility they may turn to their English teacher for support.

On factor 2, the participants also disagreed that digital technologies could afford them to give feedback to their English teacher and assess their work anonymously, as disagreement with statement 22 at -4 level suggests. This could have been an affordance for the participants to express a view about the way their English teacher taught, and thereby gaining some control over how they are being taught. Yet, the participants on this factor did not perceive this affordance.

Finding resources for learning English with digital technologies is another affordance which the participants disagreed on in this factor. Statement 8, for example, was ranked at -4 on the factor 2 array, and it suggests that digital technologies did not afford to be able to evaluate which resources were good for learning. In addition, the participants disagreed with the affordance of finding resources easily with digital technologies to help them learn English by ranking the statement 19 at -1 on the factor 2 array. The participants also did not believe that digital technologies helped them evaluate the reliability of information from resources on the Internet for learning English. This is indicated by their ranking statement 7 at -1 position. Although statements 19 and 7 are very close to a neutral point, they are both significantly distinguishing statements for factor 2 at $p<0.01$ level. Therefore, the participants on this factor differ from the participants on other factors with regard to the affordance of finding learning resources in English with digital technologies.

With regards to statement 7, Q-sorter 7 differs from the other participants in factor 2. Contrary to the other participants, Q-sorter 7 ranked statement 7 at +5 on his/her Q-sort. S/he also justified his/her ranking with the following comment:

> When finding information from different sources on the internet, I have learned to be critical and also evaluate the reliability.

Despite the general disagreement with the idea that digital technologies afford learners to evaluate the information from the resources on the Internet in factor 2, Q-sorter 7 was able to perceive this affordance. Digital technologies helped him/her to become more critical about the information from the sources on the Internet when learning English, thereby taking control over which sources to use for his/her learning English.

Q-sorter 7 also differed from the rest of the participants on factor 2 with regards to statement 28. This statement was ranked by the other participants at -2 and it is a significantly distinguishing statement for factor 2. Q-sorter 7, however, ranked this statement at +5 on his/her Q-sorting procedure. S/he strongly agreed that digital technologies could afford to get instant feedback on learners' language mistakes when learning English, thereby helping with learning English on their own. S/he commented that:

> When I write a task on for instance Word, I instantly get feedback if my spelling is wrong or if there are other language mistakes.

Q-sorter 7 illustrates that digital technologies, such as Microsoft Word in this example, can furnish learners with the opportunity of getting immediate feedback. This can be correcting spelling or grammar mistakes, but it shows that the participants can find a strategy to get instant feedback to his/her language mistakes with digital technologies on their own.

Other statements which were ranked negatively and lower than the other two factors also show what learners did not perceive as affordances of digital technologies for learning English on their own without the intervention or direct control of someone else. By ranking statement 31 at -3 on the factor 2 array, the participants disagreed that they could set more achievable learning goals and objectives for learning English. Participants did not believe that they were more focused on learning English with digital technologies, as statement 6 suggested at a ranking of -3 on the factor 2 array. According to statement 15 being ranked at -3, digital technologies also did not affect whether participants collaborated with other students more easily using digital technologies for learning English. Finally, the participants disagreed with statement 10 by ranking it at -3 on the factor 2 array, which suggests that

digital technologies were not helpful to participants on this factor to make time to learn English.

Statements 14, 3, and 5 were ranked at 0 in the factor 2 array, which shows that the participants on this factor remained neutral for these affordances. It is interesting to note that statement 1 was ranked at -1 as a significantly distinguishing statement. Its *z*-score is, however, very low (-0.273), so it might be considered as a neutral statement, as well.

6.3.3 Factor 2 summary

Overall, the digital technologies afforded the participants on this factor a more "natural" way of learning English, by which they referred to learning English without intentionally sitting down to study with books. Digital technologies provided a less stressful learning environment, and the participants could become more courageous by trying to use English with digital technologies on this factor. The participants could also take control over the time and pace of their learning with digital technologies. However, sticking with the rest of the class prevented one participant from exploiting this affordance.

The participants on this factor did not need encouragement and a push from their English teacher when learning English with digital technologies. Their responses indicated that they could take control over how they used digital technologies for learning English. Yet, for difficult learning topics, they could turn to their teacher for support. Therefore, this does not imply total independence from their English teacher. Finally, the participants on this factor did not find the affordance of finding resources with digital technologies for learning English, but, since factor 2 is a

bipolar factor, digital technologies afforded one participant to improve his/her criticality about resources and get instant feedback to his/her language mistakes.

6.4 Factor 3: Affordances for metacognitive strategies about learning

Factor 3 accounts for 11% of the total explained variance of 41% in this research. It is defined by six significantly loading participants. Table 31 shows the ideal factor array for factor 3. The factor array and positively and negatively ranked statements appear to suggest that the affordances in this factor are generally related to learning in a more systematic and organised way with digital technologies. For this reason, the findings in this factor are named "affordances for metacognitive strategies for learning".

Table 31 Ideal factor array for factor 3

-5	-4	-3	-2	-1	0	1	2	3	4	5
34. With digital technologies, I need the encouragement of an English teacher for learning English.	*<13. I explain better why I learn English in the ways that I do with digital technologies.	*12. I am more careful about how I am speaking English with people on digital technologies.	*<29. With digital technologies, I learn more about the culture of English speaking countries.	27. I learn English at my own pace/speed with digital technologies.	14. With digital technologies, I explain better why I choose the materials that I use.	**>30. I select appropriate learning strategies according to my needs in English with digital technologies.	1. It is fun learning English with digital technologies.	*>11. I am more self-disciplined and organized in learning English with digital technologies.	4. I get myself in the mood to learn English better with digital technologies.	*>16. I am more motivated to learn English with digital technologies.
35. With digital technologies, I need a push from my English teacher to study English.	*<38. Learning English with digital technologies is more natural because I do not feel like I am sitting down to learn English.	*<17. I am more relaxed and less stressed about learning English with digital technologies.	31. I set more achievable objectives/goals while learning English with digital technologies.	25. With digital technologies, I have courage to try different things in English.	5. I am more confident speaking English with digital technologies.	*>10. I make time to learn English with digital technologies.	20. I get a sense of what is happening around the world in English with digital technologies.	*>9. I create new strategies to help me learn English with digital technologies.	39. With digital technologies, I learn English in ways and with resources that interest me.	*>3. I find out the strengths and weaknesses of my English with digital technologies.
	21. I get frustrated learning English on my own with digital technologies as I need a teacher to tell me if I am learning well.	22. I give feedback to my English teacher and assess her work anonymously with digital technologies.	15. I collaborate with other students more easily for English with digital technologies.	*<24. I learn English at any time I want with digital technologies.	*>6. I am more focused on learning English with digital technologies.	*28. I get instant feedback to my language mistakes and errors with digital technologies.	*>33. I understand better what works for me when learning English with digital technologies.	**19. I find more resources easily with digital technologies to help me learn English.	**>7. I evaluate the reliability of information from resources on the Internet for learning English.	
		*<36. With digital technologies, I am less worried about making mistakes in front of other people.	26. With digital technologies, I know better why I am learning English.	37. With digital technologies, I review what I have learnt in English.	*<32. I find more opportunities to use English with digital technologies.	40. With digital technologies, I have a better understanding of how I learn English best.	18. I feel more supported when learning English with digital technologies.	*>42. With digital technologies, I monitor my own English learning progress over time.		
				2. I find people better to learn English with on digital technologies.	*<23. I learn English at any place I want with digital technologies.	8. With digital technologies, I evaluate which resources are good for learning English.				
					41. With digital technologies, I learn English better on my own without the help of someone.					

Array Key

***Distinguishing statement-significance level at p<0.01**

****Distinguishing statement-significance level at p<0.05**

>z-Score for the statement is higher than in all the other factors

< z-Score for the statement is lower than in all the other factors

6.4.1 Positively ranked statements

The statements included in this section give an account of what the participants loading significantly on factor 3 believed to help learn English on their own without the direct support or intervention of their English teacher, thereby taking control over their learning.

Table 32 lists the five statements which were ranked at the highest positive scores on the idealized factor array and together with their z-scores.

Table 32 Highest-ranked statements in the factor 3 array

Statement Number	Highest Ranked Statements	*z*-score	F3	D/C
16	I am more motivated to learn English with digital technologies.	2.242	5	D*
3	I find out the strengths and weaknesses of my English with digital technologies.	1.668	5	D*
4	I get myself in the mood to learn English better with digital technologies.	1.355	4	
39	With digital technologies, I learn English in ways and with resources that interest me.	1.335	4	
7	I evaluate the reliability of information from resources on the Internet for learning English.	1.238	4	D
Key	**F3:** Factor 3 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

In Table 33, the positive statements which were ranked relatively higher than other factor arrays are presented.

Table 33 Positive statements ranked higher in the factor 3 array

Statement Number	Positive Statements Ranked Higher in factor 3 Array than in Other Factor Arrays	*z*-score	F3	D/C
11	I am more self-disciplined and organized in learning English with digital technologies.	1.223	3	D*
9	I create new strategies to help me learn English with digital technologies.	1.193	3	D*
42	With digital technologies, I monitor my own English learning progress over time.	0.873	3	D*
33	I understand better what works for me when learning English with digital technologies.	0.521	2	D*
18	I feel more supported when learning English with digital technologies.	0.456	2	
30	I select appropriate learning strategies according to my needs in English with digital technologies.	0.36	1	D
10	I make time to learn English with digital technologies.	0.327	1	D*
8	With digital technologies, I evaluate which resources are good for learning English.	0.214	1	
40	With digital technologies, I have a better understanding of how I learn English best.	0.21	1	
5	I am more confident speaking English with digital technologies.	0.088	0	C*
6	I am more focused on learning English with digital technologies.	0.067	0	D*
Key	**F3:** Factor 3 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level $p<0.01$			

The participants on this factor ranked statement 16 at the +5 position, and it is a significantly distinguishing statement for factor 3 at $p<0.01$ level. They believe that digital technologies help them to become more motivated to learn English. One reason why these participants found learning English with digital technologies more motivating is related to having "fun" from learning. In a very short response, Q-sorter 20 stated that "it is more fun" learning English with digital technologies. In addition to having fun, the "variety" that comes with digital technologies also motivates the participants, as Q-sorter 8 commented very briefly by stating "[…] it [is] more fun and variety".

To elaborate on what "variety" in Q-sorter 8's comment may refer to, Q-sorter 27's response may be informative. S/he suggested that:

> You can do things the way you want, meaning more fulfilling practices.

It is possible to understand from this comment that the participants can learn English in the ways they choose, and they can find more "fulfilling" activities and exercises to practice English. The ranking of statement 39 at +4 on the factor 3 array also suggests that digital technologies can provide more variety. The participants agreed that they could learn English in ways and with resources that interested them with digital technologies. Q-sorter 14 commented that:

> Handing me a paper with a task is not the best way I learn. Series and other learning methods that are to be found in digital technologies, are much better for me.

The participants are aware that they can find various learning methods and resources for learning English with digital technologies. This comment also shows that one practice, such as giving an exercise on paper, does not fit every learner. So,

digital technologies can afford learners to take control over their learning with a variety of learning methods and resources. Subsequently, such various learning methods and resources to practice with digital technologies motivate learners to learn English.

As well as finding resources, the participants on this factor can also evaluate the reliability of information from the resources on the Internet for learning English with the help of digital technologies. This is suggested by statement 7 being ranked at +4 on the factor 3 array. It is also a distinguishing statement for the factor at $p<0.05$ level. This is an affordance of digital technologies which may help learners to become more critical and selective about the resources for learning English.

The participants on this factor agreed that digital technologies can afford them to become more critical and evaluative about other aspects of their learning, as well. For example, the participants ranked statement 3 at the second-highest position on the factor 3 array. They agreed that digital technologies could provide them with the opportunity to find out their strengths and weaknesses when learning English. This suggests that these participants show an interest in evaluating themselves while learning English. This interest can also be observed in their agreement with statement 42. Statement 42 is ranked at +3 position, and it is a significantly distinguishing statement. This suggests that the participants can monitor their own English learning progress over time. It, therefore, supports the idea that digital technologies can afford learners to take control over their learning by providing the opportunity to self-evaluate their skills in learning English.

In addition to being evaluative and critical about their strengths and weaknesses, the participants also agreed that they could become evaluative about their learning

strategies. These participants agreed with statement 33 by ranking it at +2 on the factor 3 array. It is a significantly distinguishing statement at $p<0.01$ level, and it suggests that the participants on this factor can understand better what works for them when learning English with digital technologies. It shows that they can be critical as to whether a learning resource or a method helps them. In addition, the participants in this factor agreed with statement 30. Although it is only ranked at +1 on the factor array, it is a distinguishing statement for factor 3 at $p<0.05$, and it suggests that the digital technologies can help participants on this factor to select appropriate learning strategies according to their needs. It shows that the participants can analyse their needs with digital technologies by being critical about their strengths and weaknesses in English. They can, therefore, select the appropriate strategies which suit them better for learning English.

In fact, as well as selecting among available appropriate strategies, the participants on this factor can also create new strategies with digital technologies to help them learn English. This is apparent from the participants ranking statement 9 at +3 on the factor 3 array. This statement also significantly distinguishes factor 3 from other factors.

Turning to other statements, agreement with statement 4 at +4 suggests that the participants on this factor can get themselves better in the mood to learn English with digital technologies. This may be related to the affordances of digital technologies for providing a variety of learning resources, methods and strategies on factor 3. In addition, the participants on this factor already agreed very strongly that they could become more motivated to learn English with digital technologies. These affordances may, therefore, attract learners to studying and learning English. Statement 10 also becomes more meaningful within this framework. Although it is

only ranked at +1 position on the factor 3 array, it is a distinguishing statement for factor 3. It, therefore, represents a viewpoint which is different from the other two factors. Agreement with statement 10 suggests that these participants are more likely to make time to learn English with digital technologies. This suggests that the participants on this factor are more "focused" on learning English rather than learning it incidentally or in "natural" ways, as in factor 2.

Statement 11, another significantly distinguishing statement at $p<0.01$ level and ranked at +3, summarises the viewpoints above. This statement suggests that digital technologies can provide opportunities for participants to become more self-disciplined and organized in learning English. Q-sorter 27 commented on this statement that:

> Digital technologies make it easier to organize, and you have many options as to how you can do things. It is possible to customize it yourself, in a way, making it more suited your own style.

It can, therefore, be suggested that, by means of a variety of resources, learning methods and strategies, the participants on this factor can organize their learning in a way which suits them better, thereby taking better control over their learning.

Statements 18, 8, 40, and 5 are also ranked higher on the factor 3 array than other factors. Yet, since these statements are neither a distinguishing statement for factor 3 nor received a comment, they will not be further elaborated. Statement 6 is distinguishing, but it is ranked at the neutral point, and therefore it is possible to suggest that the participants did not have a clear idea about the affordance in that statement.

6.4.2 Negatively ranked statements

The statements which were ranked negatively in the factor 3 array show what the participants loading significantly on this factor thought did not help learn English with digital technologies on their own without the direct support or intervention of their English teacher, thereby taking control over their learning. Table 34 shows which statements were ranked lowest in the factor 3 array.

Table 34 Lowest ranked statements in the factor 3 array

Statement Number	Lowest Ranked Statements	*z*-score	F3	D/C
35	With digital technologies, I need a push from my English teacher to study English.	-2.128	-5	
34	With digital technologies, I need the encouragement of an English teacher for learning English.	-1.703	-5	C*
21	I get frustrated learning English on my own with digital technologies as I need a teacher to tell me if I am learning well.	-1.661	-4	
38	Learning English with digital technologies is more natural because I do not feel like I am sitting down to learn English.	-1.462	-4	D*
13	I explain better why I learn English in the ways that I do with digital technologies.	-1.443	-4	D*
Key	**F3:** Factor 3 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

The statements ranked relatively lower in the factor 3 array than other factor arrays are presented in Table 35.

Table 35 Negative statements ranked lower in the factor 3 array

Statement Number	Negative Statements Ranked Lower in factor 3 Array than in Other Factor Arrays	*z*-score	F3	D/C
36	With digital technologies, I am less worried about making mistakes in front of other people.	-1.414	-3	D*
17	I am more relaxed and less stressed about learning English with digital technologies.	-1.021	-3	D*
26	With digital technologies, I know better why I am learning English.	-0.774	-2	
29	With digital technologies, I learn more about the culture of English speaking countries.	-0.563	-2	D*
24	I learn English at any time I want with digital technologies.	-0.041	-1	D*
25	With digital technologies, I have courage to try different things in English.	-0.033	-1	C
27	I learn English at my own pace/speed with digital technologies.	-0.019	-1	
23	I learn English at any place I want with digital technologies.	-0.007	0	D*
32	I find more opportunities to use English with digital technologies.	0.024	0	D*
5	I am more confident speaking English with digital technologies.	0.088	0	C*
14	With digital technologies, I explain better why I choose the materials that I use.	0.104	0	C*
Key	**F3:** Factor 3 **D:** Distinguishing Statement **C:** Consensus Statement ***:** Significance Level p<0.01			

Similar to the viewpoints in factor 1 and factor 2, digital technologies provided opportunities to the participants on this factor to learn English without the

encouragement and support of their English teacher. The participants ranked statement 35 at -5 on the factor 3 array and very strongly disagreed that they needed a push from their teacher to study when learning English with digital technologies. They also placed statement 34 at -5 and disagreed that they needed to be encouraged by their English teacher to learn with digital technologies. In a similar vein, the participants ranked statement 21 at -4 and disagreed with the idea of needing an English teacher to tell them whether they were learning well or not. The participants believe that they could learn on their own without feeling frustrated about how they were learning. In the light of the ranking of these three statements, it is possible to suggest that digital technologies can provide opportunities for learners to learn English on their own without the support of their teacher. The comments of the participants who loaded significantly on this factor and disagreed with these three statements may also support this suggestion.

For example, Q-sorter 21 commented for statement 34 and stated that:

> I can ensure myself that what I wrote was correct.

Q-sorter 21 also commented on statement 21 and argued that:

> I don’t need someone to tell me I am learning the "right" way, I can ensure myself of that myself.

These two comments show that the participant already has confidence in how s/he is learning. It can also be noted that the participant was able to ensure that his/her writing was correct or not without seeking an opinion of his/her English teacher. Commenting on statement 35, Q-sorter 14, however, shows that a slight "push" from an English teacher may still be needed:

> Having a boring task on your computer is not as fun as Netflix. So, if the task isn't exciting enough, I'll just go on the internet instead. And then I would need a push from my teacher so that I may focus on the task instead.

It is possible to see from this comment that the participant is interested in learning English in a way that will excite him/her in the same way as watching things in English on digital platforms such as Netflix. If learning tasks are not interesting enough, it may discourage learners from completing tasks given to them. Learners can use the Internet to avoid a "boring" task, in their terms. This can illustrate how a learner is taking control over his/her learning by walking away from a learning task, possibly either seeking a way of learning English in his/her own way or taking a break from the task. However, it also shows that the participants can have difficulty in self-regulating their learning time, and digital technologies can afford distraction to learners when learning English. As this comment shows, Q-sorter 14 needs a push from his/her teacher to return to the learning task given by the teacher. It can, therefore, be inferred in the light of these three comments that digital technologies can provide opportunities for the participants to have confidence in the ways they are learning English and in what they have done in English without the support of their English teacher. Digital technologies can also provide a digital environment where learners can take a break if they do not find the learning activity interesting and exciting, and possibly find a way of learning English in more interesting ways. However, if the learners cannot control how much time to spend on this "break" from the task, digital technologies can become a source of distraction, too. This may be an instance of digital technologies providing for ill in Gibson's (1979) definition of the term affordances.

The participants on this factor also disagreed with statement 38, which is ranked at -4 on for the factor 3 array and a significantly distinguishing statement for factor 3. The negative position of this statement clearly distinguishes factor 3 from factor 2, where the participants believed that digital technologies afforded them learning English in more natural ways rather than learning with books more traditionally. The participants on factor 3, however, did not perceive this affordance and disagreed that learning English with digital technologies is more natural. The positively ranked statements in the previous section mostly suggested a more intentional and organized learner profile in factor 3. This may be one reason for learners to learn English more systematically and purposefully rather than seeing it as part of a daily task.

Statements 23 and 24 support the idea that the participants on this factor are more focused on learning with digital technologies. On the factor 3 array, statement 23 was ranked at neutral point (0) while statement 24 was ranked at -1, which is also very close to the neutral point. Nevertheless, both statements are significantly distinguishing statements for factor 3 at $p<0.01$ level. This suggests that even if the participants did not disagree very strongly with these statements, they were neutral about them. The participants can be observed not to have clear ideas about whether they can learn English at any time or any place with digital technologies. So, in the light of one of the positively ranked statements, statement 10 in the previous section, one reason may be that the participants purposefully make time for learning English, which again shows that they see studying and learning English as a task.

The participants in this factor also did not believe that digital technologies could help them explain better why they learnt English in the ways they did. This is

understood from statement 13 being ranked at -4 on the factor 3 array. It is also a significantly distinguishing statement for factor 3 at $p<0.01$ level.

Digital technologies did not help provide learners on this factor with a less stressful learning environment, either. The participants ranked statements 36 and 17 at -3 on the array, and both these statements are significantly distinguishing statements for factor 3. According to the negative disagreement with statement 36, the participants did not believe that digital technologies could make learners less worried about making mistakes in front of other people. For example, Q-sorter 8 stated in his/her comment that digital technologies do not have any effect on how s/he feels in front of other people:

> Digital technologies do not change how I feel when I speak in front of other people. I am nervous with and without digital technology.

From Q-sorter 14's comment, it is even possible to suggest that digital technologies can make the participants more worried about speaking English in front of others:

> If a task tells you to make a video for instance and post it online, the video will be there forever. If you are to present a topic in front of the class, that presentation is just at that time. The video that are to be published can be seen after class and even shown to others as bullying or making fun of the pronunciation that may not be perfect. We are often told to post the video online instead of just showing it in class. That way we can save more time, but it is very uncomfortable.

It is possible to understand from this comment that the worry of the participant is not to speak English when presenting his/her work in front of other learners in the classroom because s/he believes that it is a one-off thing and will be seen only once by his/her classmates. Yet, digital technologies extend the boundaries of the classroom to a digital environment. In this digital environment, a presentation can be seen by others many times, even by foreigners. Apparently, the possibility to be

seen by foreigners is what worries the participant. So, even though digital technologies can help save time by doing presentations, it creates an uncomfortable digital environment in which learners may be worried about making mistakes when speaking English. Digital technologies may, therefore, prevent learners from practising speaking English and trying new things in English.

Disagreement with statement 17 also shows that digital technologies are not helpful for learners to make themselves feel more relaxed and less stressed about learning English. For example, Q-sorter 20 stated that:

> It stresses me because I am always online, and then I start focusing of other things.

It is possible to understand from this comment that the possibility of being distracted by digital technologies is stressful for the participant. So, while digital technologies can afford immediate access to finding resources and materials for learning English, it can also cause a distraction to learners.

With digital technologies, the participants on this factor did not perceive an opportunity to reflect on why they were learning English, as statement 26 being ranked at -2 on the factor array suggests. In addition, the participants on this factor disagreed with statement 29 which suggested that they could not learn more about the culture of English speaking countries.

When it comes to statements 14, 5, 32, 27 and 25, their *z*-scores were very low. This suggests that the participants were neutral about these points. They remained impartial as to whether these statements were affordances for them to learn English on their own without the support of their teacher.

6.4.3 Factor 3 summary

Factor 3 illustrated a more systematic and organized language learner profile. The participants in this factor, for example, disagreed with seeing learning English in more natural ways as an affordance. The participants were understood to be more focused on learning English systematically. For example, digital technologies afforded these participants to become more motivated to learn English. In addition, the participants were critical and evaluative about both themselves and the ways and resources for learning English. As well as providing such affordances for good, the digital technologies provided affordances for ill, too. It was seen that digital technologies could prevent learners from practising and trying new things in English because they provide a digital environment where the learners fear being made fun of due to the way they speak. Digital technologies can also prevent learners from learning English on their own because they are likely to cause a distraction to learners. In this regard, although the participants stated that they did not need a push and encouragement from their English teacher to study and learn English, a teacher can still help to return some of the participants to the learning route.

6.5 Chapter summary

This chapter presented the results of factor analysis in this research. Three factors were interpreted in the light of the positively and negatively ranked statements in each factor. It was seen that digital technologies could provide learners with different affordances to learn English on their own, thereby taking control over their learning. In factor 1, the results showed that digital technologies can provide

learners with an affordance of finding resources for learning English on their own. In factor 2, it was seen the digital technologies can afford learners to learn English in more natural ways which they find more interesting than learning in what can be termed as traditional ways. In factor 3, it was observed that digital technologies helped learners to motivate themselves to learn English and in a more focused and systematic way. While the three factors differed from each other in terms of the statements discussed above, it was a shared belief in all the factors that the learners could learn English without the support or encouragement of their English teacher. In the next chapter, these affordances of digital technologies will be discussed in the light of other studies in the literature to understand how they relate to autonomous language learning.

Chapter 7 Discussion

This chapter turns to a discussion of the findings presented in the previous chapter which constitute an answer to the research question as follows:

> What are the affordances of digital technologies for autonomous English language learning to students studying in a Norwegian secondary school?

These three factors of affordances represent how digital technologies can be supportive of autonomous language learning by providing learners of English as a foreign language in a Norwegian secondary school context with opportunities to take control over their learning. To support the discussion, the relevant Q-statements and their rankings on the factor array will be given in brackets where appropriate (e.g. *Full Q statement, +/- position on factor array, Factor 1/2/3)*. When Q-sorters' answers to open-ended questions are used to support the discussion, the anonymous name of the Q-sorter and what statement s/he reflected will be given in brackets together with the ranking of the relevant statement, as well (e.g. *Q-sorter 1, on [full Q statement], +/- Q-sorter's ranking of the statement).*

The analysis of the factors also showed that there are consensus statements which represent shared perspectives across factors. It is due to such statements that a similar affordance might be discussed between categories of affordances below. Yet, each statement should be considered within its own factor. This is because

factor narratives refer to a holistic discussion of the factor, but not micro-analysis of individual statements.

7.1 Affordances from student-led language learning resources

The results of the first factor show the affordances which learners can get from language learning resources which they find on their own by the help of digital technologies. With the help of digital technologies, learners can find various resources more easily to help them learn English (*I find more resources, easily with digital technologies to help me learn English, +5, Factor 1)*. Finding resources is one of the important constitutive elements in autonomous language learning frameworks and models. In Tassinari's (2012) model of autonomous language learning, for example, being able to choose from a variety of materials and resources is one of the indicators of autonomous language learning. According to the findings in the first factor, the learners stated that they were able to select from a range of resources to help them learn English and that ease of access to resources, as well as the fact that there is a wider range of resources on the Internet than in books, enabled learners to act on this affordance. Comparison of this finding with those of Zhang (2016) and Jitpaisarnwattana (2018) confirms that digital technologies afford learners to take control over their learning by finding their own language learning resources. Therefore, the learners can be allowed more opportunities by their teachers in their language classes to find their own language resources to foster the development of autonomous language learning. Teachers,

for example, can ask their students in their language classrooms to search for materials related to the lesson topic before they come to the class.

In addition to this perceived opportunity, a number of factors seem to come into play when learners act on the affordance of finding learning resources. These factors can also be considered as affordances of digital technologies for autonomous language learning because they also arise from the relationship between learners and digital technologies. Firstly, it was found that digital technologies can provide learners with the opportunity to learn English in ways and with resources that *interest* them (*With digital technologies, I learn English in ways and with resources that interest me, +4, Factor 1)*. The current study found that the learners can, for example, follow what is happening around the world by watching the news in English (*I get a sense of what is happening around the world in English with digital technologies, +5, Factor 1)*. In this sense, this finding supports the finding from Zhang's (2016) study. It shows that one of the language learning resources that autonomous language learners are interested in is following the news in the target language. One reason for such an interest can be that news is easy for learners to access and they are updated regularly which might help them to be exposed to different versions of English. Therefore, language teachers may learn from their students and can adapt the content of their teaching materials based on what is more engaging for the students. Teachers, for example, can also follow what is currently happening in the news, and they can use such news in their lessons. For example, and to be more specific, teachers can use news headlines in their lessons as a warm-up activity. Given the number of students in a classroom, the teacher would not be able to cater to the interests of every student. In such situations, teachers can also opt for delegating the responsibility to the learners themselves and

helping them find their own language learning resources. As a result, the teachers may change their role from being the source of the content to facilitator of the language learning contents brought by the learners based on their own interests. In this regard, teachers can, for example, give their students the target set of vocabulary that they are aiming to teach in their lessons, and then they can ask their students to find how these vocabulary items are being used in the news or in the materials of topics that they are interested in.

In addition to this, digital technologies enable learners to learn more about the culture of English-speaking countries, such as their history (*With digital technologies, I learn more about the culture of English speaking countries, +3, Factor 1)*. In terms of learning more about the culture of English-speaking countries, this finding recalls the finding from Miller's (2019) study in which the learners of Spanish found Twitter as a useful platform to learn more about Spanish culture, and thereby improving their cultural awareness. Although they are different languages, in the light of this finding, it is possible to suggest that autonomous language learners are not only interested in learning their target language with its vocabulary and grammar, but also with its culture. Therefore, this finding may imply for language learning that autonomous language learning practices can be structured in a way in which cultural cues can be embedded. This may motivate learners to learn more about the language as learning more about the culture can invoke more curiosity in the learners.

Using such a selective strategy based on the interests of the learners can be related to one of the important ways that autonomous language learning manifests itself. For example, Macaro (1997) states that the autonomy of choice and action with which the learners can choose independently from a variety of choices and act

accordingly is a constituent of autonomous language learning. As the accounts of the participants in this current study showed in line with the other two studies, digital technologies can afford learners with autonomy in selecting various resources.

It is also worth noting here that digital technologies allow wider access to language learning resources when learners felt limited by the resources offered in the school (*Q-sorter 13, on the statement "With digital technologies, I learn in ways and with resources that interest me", +5)*. As Gonulal's (2019) study also found, language resources that the learners study at their schools may not be sufficient for them, and at that point, the digital technologies can afford them the resources which they cannot access within their classroom. In this regard, the finding in this research is in agreement with that of Gonulal's (2019) study. Therefore, it is possible to suggest that digital technologies afford learners the ability to take control over their learning by finding language learning resources based on their interests and beyond their classrooms.

In addition to the benefit of finding resources based on students' interests, two other findings explain why learners act on the affordance of finding resources with digital technologies. Firstly, the participants noted that they could learn English anywhere and at any time with digital technologies (*I learn English at any place I want with digital technologies, +4, Factor 1; I learn English at any time I want with digital technologies, +3, Factor 1)*. This finding seems to be in accordance with the findings in Kondo et. al. (2012) and Loewen et. al. (2019) in which it was reported that the students can use any time and place more effectively such as break time between classes and waiting for a coffee or food to be served at a restaurant respectively. It would seem that digital technologies can afford learners with the

flexibility (Tassinari, 2012), extending the physical constraints of a classroom environment and time, and as an implication for language learning, such practices with mobile digital technologies can make more practice time for language learners. This flexibility feature of digital technologies can also be harnessed by the language teachers. The teachers may consider assigning homework or after-class tasks to the students who can complete them without having to sit down to do at home.

Secondly, digital technologies can enable learners to learn English in *fun* ways (*It is fun learning English with digital technologies, +3, Factor 1)*. Particularly, and more specifically, it was observed that learning with resources which interest learners can make the learners enjoy reading in English more and fully concentrate on the words and grammar (*Q-sorter 18, on statement "With digital technologies, I learn English in ways and with resources that interest me", +5)*. In this particular instance, this finding supports the finding from Nino's (2015) study in which it was reported that fun and interactive exercises on Duolingo language learning application helped learners improve their reading skills in their target language. Additionally, having fun with learning resources which the learners are interested in can also be a source of motivation for learners while learning a topic in English (*Q-sorter 22, on the statement "I find more resources easily with digital technologies to help me learn English", +5)*. In terms of learning English in fun ways, these findings are also in line with Gonulal (2019) and Shadiev (2018). In both studies, it was reported that fun element was an important factor that affected learners' engagement with the task and their selection of digital technology. According to the learner autonomy model of Cooker (2012), motivation and learners' capacity to motivate themselves to be actively engaged in learning activities is one of the important elements of autonomous language learning. It is

possible to understand that digital technologies can help learners to take control over their learning by furnishing them with the opportunity to find resources, which in turn can afford a fun way of learning English and a source of motivation.

Digital technologies can allow wider access to learning resources which interest learners, but the characteristics of a fun way of learning should be approached cautiously. The learners on this factor generally agreed that digital technologies could give control over their learning resources (*I find more resources easily with digital technologies to help me learn English, +5, Factor 1),* and whether it is fun learning with such resources can be a determining factor for the learners to select them. It can be interpreted that the learners use a strategy when selecting their learning resources, which is having fun. That can even be a reflection of learners showing metacognitive awareness by providing a rationale for materials chosen (Cooker, 2012). Yet, such a selective strategy based on whether learning is fun with digital resources may be obscuring another important element for selecting learning resources, which is evaluating the learning resources for language learning (Tassinari, 2012). The learners on this factor were almost neutral about the statement 14, (*With digital technologies, I evaluate which resources are good for learning English, +1, Factor 1).* A neutral position by the participants on this factor would not necessarily mean that they are not evaluating language learning resources. Yet, it is possible to suggest here that these learners might be prioritising the fun element in learning resources over their appropriateness for learning English. To put it another way, there can be a trade-off between the affordances of experiencing fun with learning resources and evaluating their appropriateness for learning English. In this regard, this finding within this factor differs from the findings in Gonulal's (2019) and Nino's (2015) findings. In both those studies, it

was reported that there had been students who evaluated the language learning value of the content on digital technologies. In Gonulal's (2019) study, for example, some students stated that there might be grammatically incorrect sentences on the Instagram as a social networking platform, and this could even make harm to their language learning. In Nino's (2015) study, some students had to confirm the translations on Google Translate application with other methods to avoid misuse of words and plagiarism. One possible explanation of why students did not evaluate the learning materials can be that the students might have lacked the necessary digital literacy skills. Similar to Castellano et. al.'s (2011) and Li's (2013) studies, even if the students might be interested in learning autonomously, lack of knowledge and skills in sourcing and finding language learning resources through digital technologies might have prevented them from evaluating and finding useful materials which fit into their language learning practices. Therefore, instead of making such an evaluation, the students might have prioritised the fun value when selecting resources for their language learning. It is therefore important when learning a language to look at the educational value that the digital technologies afford rather than solely considering whether learning with digital technology is fun or not. Such a fun-based strategy may be problematic in the long-run for learners. Therefore, to better harness from the affordances of digital technologies, the students who do not consider the pedagogical value of online materials can be taught strategies in which they can learn how to evaluate language learning resources.

Regarding the nature of the resources, digital technologies can also provide learners with the opportunity to access social and discursive language learning resources by interacting with other language learners. The results of this study suggest that the

Internet can become a digital learning environment where learners can meet "friends" from other countries to practice English (*Q-sorter 11, on the statement "It is fun learning English with digital technologies", +5)*. Based on this finding, there is a similarity between this research and that of Gonulal's (2019) in terms of affordance of digital technologies for reaching native speakers of the target language. For language learning, learners need to practice what they have learnt in their classrooms in real life, but classroom and their classmates offer limited opportunities for learners themselves to practice in the language that they are learning. Therefore, digital technologies extend opportunities for practice beyond the boundaries of the classroom and afford learners to reach and practice with native speakers of the target language. While some students can make their initiatives to find such communication opportunities, language teachers can also initiate such communication channels with teachers from other schools in other countries to provide communicative practice opportunities for their students. This might be a challenging task for some teachers because they may not have the network with other teachers and therefore they may not reach out to other teachers for such communicative practice opportunities. Yet, the teachers may even learn from their students on how to find such communicative practice opportunities by the help of digital technologies. Meanwhile, when communicating with 'others' through digital technologies to practise speaking the target language, the safety of students should also be considered. As Manca and Ranieri (2014, p, 12) suggest, social networking platforms such as Facebook can become a place where learners can be exposed to harm from "sexual predators, cyberstalking and cyberbullying" in the disguise of speaking practice. To prevent such harm, both learners and teachers can take extra training to learn how to stay safe on digital platforms.

The Internet can also become a place where learners can communicate and work together with fellow learners on language learning related texts. Particularly, being able to view each other's work on platforms such as Google Docs can help learners to collaborate more easily with each other (*Q-sorter 24, on the statement "I collaborate with other students more easily for English with digital technologies", +5)*. This finding supports the evidence from previous observations in Jitpaisarnwattana's (2018) and Shadiev's (2018) studies where it was documented that the students could contribute to each other's work by leaving comments of feedback on the digital technologies used. Such social and discursive language learning resources can be supportive of the social dimension of language learner autonomy. According to O'Leary (2014), learner autonomy entails control over the social aspect of language learning which manifests itself as creating an informational and collegial learning environment. Tassinari (2012) also suggests that being able to learn with and from others, such as other learners, native speakers and non-native competent speakers, is an important skill for autonomous language learning. It is, therefore, possible to suggest that teachers can also facilitate such learning environment within their classrooms, and beyond their classrooms. The learners can be assigned language learning tasks on which the learners can both work in the classroom or online outside the classroom, and therefore a collaborative learning environment can be created among the learners. This is likely to reduce the workload on the teacher, as well, since the learners can learn from one another rather than coming to their teachers when they struggle with their language learning tasks.

In a narrower scope, the significance of the affordance of accessing social and discursive resources lies in its potential for learners to receive instant feedback on

mistakes in a constructive way. Fuchs (2017) found that limited feedback can discourage some learners from directing and regulating their learning on their own. Therefore, how learners get feedback on their mistakes can play an important role in learners' taking control over their learning. Digital technologies, such as adaptive learning systems, were found to be supportive of giving learners instant scores and feedback which showed them their performance and what skills can be strengthened (Suvorov & Cabello, 2017). This mechanised form of feedback did not differ to a great extent from the feedback which computer programmes provided to the learners in the early phase of Behaviouristic CALL, which only provided learners with endless trials when they received the wrong answer. It is possible to suggest that such solely machine-generated feedback falls short of providing the learners with constructive feedback on their mistakes. This research, however, showed that digital technologies can provide an informational and collegial learning environment where learners can get instant feedback on their language mistakes and correct them immediately (*Q-sorter 2, on the statement "I get instant feedback to my language mistakes and errors with digital technologies", +5)*. In this regard, this finding is in line with Shadiev's (2018) finding in which the learners could leave feedback on each other's mistakes on their works on the mobile multimedia learning system and make recommendations on how to address them. In the light of finding from this research and that of Shadiev's (2018), it is possible to suggest that interaction with fellow learners can be complementary to computer-generated feedback when learning a language, and in terms of autonomous language learning, digital technologies can afford learners by allowing them to get constructive feedback by enabling them to work collaboratively with fellow learners in the school environment. Yet, it should also be considered in such collaborative learning

practices that not every student might be willing to share their work online. As Kamnoetsin (2014) found out, the idea that their written work and posts might be seen by other students and family members might be discomforting for some students. Therefore, they may prefer not to join such collaborative activities due to their social concerns.

While the overall affordance of this factor relates to the benefit of finding resources, as discussed above, it also signals other affordances for autonomous language learning. Firstly, taking control over their learning resources shows that learners are pursuing goals for their learning of English. Setting goals has long been regarded as one of the important elements of autonomous language learning (Holec, 1981; Tassinari, 2012). Palfreyman (2014) suggests that learner autonomy in language learning entails the capacity to use a wide range of learning resources towards a learning goal. While these learning goals can be short-term goals, such as understanding the words of a song in English, they can also be long-term goals, such as becoming a businessperson by mastering language skills in a foreign or second language. Such autonomous learners may not explicitly state what their goals are while making use of such learning resources. Yet, this current study found that digital technologies can provide affordance to learners to set their own goals in language learning. In particular, learners can set short-term goals, such as fully concentrating on words and grammar in English (*Q-sorter 18, on statement "With digital technologies, I learn English in ways and with resources that interest me", +5)*. At the same time, learners can set long-term goals such as preparing themselves for the rest of their lives by finding learning resources on their own (*Q-sorter 13, on the statement "With digital technologies, I learn English in ways and with resources that interest me", +5)*. In terms of setting short term goals, this study

supports the observation made in Nino's (2015) study in which the language learning app Duolingo afforded learners to set goals and do mini quizzes to review their learning progress. Therefore, it would seem that, by taking control over their learning resources through digital technologies, learners also take control over their language learning goals. In other words, learners can set themselves more genuine goals for learning English when they are exposed to a wider range of digital resources.

As for a second affordance related to finding resources, emancipation from teacher control emerged as important. The results showed that learners need less support from their teachers when learning English with digital technologies (*I get frustrated learning English on my own with digital technologies as I need a teacher to tell me if I am learning well, -5, Factor 1)*. For example, they do not rely on support from their English teachers as they would do in other subjects. This situation can be explained with the key main affordance within this factor: taking control over learning resources. As already discussed, learners can find learning resources which interest them, and which offer a fun way of learning English. This effectively motivates learners to learn English without the encouragement of a teacher. The learners can also become less dependent on their teachers by finding alternative ways of getting feedback from their fellow learners in a collaborative way. So, it is likely that learners become less dependent on their teachers and enrich the social human resources whom they can turn to when they need help. These results are in accordance with Little (1991), who argues that the "essential condition" for autonomous language learning is *interdependence*. According to Little (1991), learner autonomy does not totally refer to independent learning since learners are social beings and there is always a balance between independence from and

dependence on others. This study also showed that learners can become less dependent on their teacher with regards to finding resources and encouragement from them for learning English (*With digital technologies, I need the encouragement of an English teacher for learning English, -5, Factor 1)*, but their independence is likely to be balanced by the need to rely on fellow learners and speakers of English for feedback and practising their speaking skills. Hence, it can be suggested that digital technologies can also be supportive of autonomous language learning by providing learners with the opportunity to learn in such an interdependent way.

Overall, this first Q-factor shows that digital technologies can be supportive of autonomous language learning by providing learners with the opportunity to find learning resources. This factor shows that learners demonstrate metacognitive awareness by providing a rationale for selecting learning resources. Also, this factor contributes to the understanding that autonomous language learning with digital technologies cannot be equated with totally independent learning. On the contrary, this factor may help to show that autonomous language learning has a social aspect as well, and digital technologies can be supportive of learners in taking control over this social aspect by working collaboratively with fellow learners. Finally, while it was not clearly stated as an affordance in the results, it can be suggested that digital technologies also help learners to set their own language learning goals, even if these goals are implicit and not stated explicitly.

7.2 Affordances for self-regulated learning

The results of the second factor suggest that digital technologies can be supportive of autonomous language learning by providing opportunities to learn in a self-regulated way. As the learners put it, digital technologies can offer learners a "natural" way of learning English which refers to learning without "having to sit down" to learn English in a classroom (*Learning English with digital technologies is more natural because I do not feel like I am sitting down to learn English, +5, Factor 2)*. For these learners, learning by having to read a book and study for learning English is not the same as learning with digital technologies. These learners do not enjoy learning English much with formal instruction, such as taking a book and studying it. Digital technologies, in contrast, provide a learning environment which is "more chill" and where the learners feel less pressure on them (*Q-sorter 32, on the statement "Learning English with digital technologies is more natural because I do not feel like I am sitting down to learn English", +5)*. In a similar vein, learners feel more relaxed and less stressed about learning English with digital technologies. Also, it seems that as learners feel less stressed and more relaxed, the digital technologies afford learners in this category to get themselves better in the mood to learn English (*I get myself in the mood to learn English better with digital technologies, +4, Factor 2)*. In this regard, this finding further supports the finding in Shadiev's (2018) research in which it was reported that by using a mobile multimedia language learning system, the students had felt less anxious during the language learning process in the classroom. From these findings, it is possible to understand that language learning within a classroom can be a stressful experience, and the learners can feel pressure on them. Given that the teachers also

have a responsibility to accomplish the competency aims, particularly as a requirement of the Norwegian curriculum in this research's context, language classes follow certain rules. Yet, the teachers may still explore ways to make the language learning process as natural as possible. Unlike past, language classes are not the only source for language learning, and learners can improve their language skills from multiple resources outside the classroom which they perceive as a natural way of learning. As an outcome of this, digital technologies afford learners to take control over psychological factors such as stress and pressure, and they open opportunities to learn in less stressful ways. Since the learners have access to digital technologies easily or *in every corner*, in their own words, they can, therefore, take control over their learning by finding such a *natural* way of learning which is an alternative to learning in a classroom environment.

Before moving to a discussion of affordances which can enable the learners in this factor to take control over their learning by finding such an alternative mode of learning, it is worth discussing an interesting finding in this factor. The learners in this factor disagreed that digital technologies can provide an opportunity to set achievable objectives and goals for learning English (*I set more achievable objectives/goals while learning English with digital technologies, -3, Factor 2)*. Yet, there was also a moderate agreement among the learners that, with digital technologies, they could become more aware of why they were learning English (*With digital technologies, I know better why I am learning English, +2, Factor 2)*. These two statements appear to conflict with each other, however, this clash contributes to the understanding of Benson's (2011) argument that learner autonomy is different from learners' natural tendency to take control over their learning. As discussed in relation to the philosophical underpinnings of learner

autonomy, Benson (2011) suggests that learners can naturally take control over their learning, but learner autonomy entails a systematic capacity to control one's own learning towards a self-determined objective and goal. Unless such attempts to naturally control one's learning are in terms of a learning goal, they carry the risk of control over learning becoming "episodic [and] private to the learner" (Benson, 2011, p. 74). This observation is relevant to the affordances discussed in this factor because, while the learners in this factor may have an idea of why they are learning English, their ability to take control over their learning with the help of digital technologies does not seem to be towards a systematic objective or goal, and thereby carries the risk of becoming episodic. This understanding requires strong caution, though. The learners in this factor may explicitly disagree with the idea that the digital technologies encourage them to set learning goals, but they may still have an overall implicit goal which they indicate with being aware of why they are learning English with digital technologies. This finding related to setting explicit own language learning goals has been unable to confirm finding from Nino's (2015) study in which Duolingo language learning application had afforded language learners to set their own language learning goals. Yet, in the scope of this factor, this finding also shows that language learners may do their language learning without explicit goals. Therefore, the following affordances which enable learners to learn in such a natural way with digital technologies as an alternative to learning in a classroom environment can be better understood as the seeds of control from which learner autonomy can grow.

First of all, digital technologies provide learners with the opportunity to learn English at their own speed and pace. That is possibly one of the affordances which the learners regard as different from learning in a classroom environment, and also

one of the reasons for learners to enjoy learning with digital technologies. This finding is also in congruence with the finding from Nino's (2015) study which reported that the practicality and mobility of the digital technologies enable learners to learn at their own time, and as a result at their own pace and speed. This affordance can even be suggested to reveal a limitation of language learning in a classroom. While learners may have different learning speeds and learn at different levels, they can be forced to wait for "fellow learners" in the classroom. As one learner put it, they have to stick with the rest of the class (*Q-sorter 7 [bi-polar loading], on the statement "I learn English at my own pace/speed with digital technologies", -5).* Hence, having to wait for other learners in the classroom can be one of the factors that prevent learners from taking control over their learning. Digital technologies, however, can allow learners to learn at their own speed without having to wait for their fellow learners, as in a classroom environment.

Learners can also take control over time for learning English with digital technologies. It was found in this factor that digital technologies can extend the opportunities for learners to learn English at any time they want, thereby providing the flexibility of time for learning English (*I learn English at any time I want with digital technologies, +3, Factor 2)*. In terms of having control over language learning time, this finding also supports the observation made in Kondo et. al. (2012). The learners in this factor, however, do not make time specifically for learning English with digital technologies. In other words, digital technologies are not supportive of organising time for learning English for these learners (*I make time to learn English with digital technologies, -3, Factor 2)*. These two findings are reminiscent of the idea that, while these learners have a natural tendency to take control over their learning, in terms of learning time in this factor, they do not seem

to use it systematically. This outcome is in contrast to the findings in Shadiev's (2018) and Nino's (2015) studies. While these two studies showed that digital technologies afford learners to set reminders on their digital devices and on the Calendar feature of the digital learning system, this affordance is not taken up by the participants in this factor. Therefore, it can be concluded that one potential of digital technologies for learners to systematically take control over their learning lies in enabling learners to take control over *when* of their learning at a technical level.

Turning to a further affordance, digital technologies can be supportive of learner autonomy by providing learners with opportunities to take control over their learning psychologically and emotionally, which, according to O'Leary (2014), is an important dimension of language learner autonomy. In this factor, the accounts of the learners showed that digital technologies have the potential to support learners in this regard. For example, learners feel more relaxed and less stressed about learning English with digital technologies (*I am more relaxed and less stressed about learning English with digital technologies, +4, Factor 2)*. In addition, learners become less worried about making mistakes in front of other people (*With digital technologies, I am less worried about making mistakes in front of other people, +4, Factor 2)*. As highlighted above, the classroom environment can make learners feel stressed and experience anxiety. One possible explanation for this can be that the learners may fear whether what they will speak in the target language will be correct or not. This explanation can be supported by a finding in Zhang's (2016) study in which it was observed that the students could make as much practice as possible in English by using an English fun dubbing application until they can master the task to a comparable level with the native-like utterances.

This can be the reason why the learners are less concerned about making mistakes in front of others, whether in the classroom or another environment. For language learning, this affordance of digital technologies can be harnessed. The learners can be directed to digital technologies by which they can do pre-course practice on their own, and they can improve language outputs, thereby reducing their anxiety.

Also, digital technologies can support learners to become more courageous to try different things in English (*With digital technologies, I have courage to try different things in English, +2, Factor 2)*. This finding is in accord with a finding from Hattem's (2014) study in which it was reported that the learners of English in an academic English course could *play* with English and try producing different utterances without the limitations of the task requirements. Yet, it should also be taken into consideration that the students in Hattem's (2014) study used English in written forms, i.e. posting Tweets. In this study, it was not explored in what format the students felt themselves more courageous to try different things in English, but another finding from this present research may suggest that the students may not be as comfortable in their speaking English as they are in written formats. The learners in this factor differed from the others by believing that they are more careful about how they are speaking English with other speakers of English on digital technologies. So, while learners may become less worried about making mistakes, they are not without care about the way they are speaking. Similar to Hattem's (2014) finding, digital technologies may afford learners only to become more courageous to try different things in written formats. It could also be cautiously suggested that digital technologies may, therefore, encourage learners to monitor their speaking.

Taken together, though, a less stressful and more relaxed learning environment with digital technologies can prevent learners from worrying about their mistakes when they are practising English. Therefore, as learners take control over the factors which may prevent them from interacting in English, they become more courageous and try different things in English. The learners may gradually be more courageous and approach other speakers of English to increase their chance of speaking practice, as well, because the learners in this factor believed that they could find more opportunities to use English with the help of digital technologies. In terms of the affordance of finding more opportunities to practice to use English is in accordance with the finding from Gonulal's (2019) study in which it was reported that social networking platforms such as Instagram afforded a practical and convenient way of communicating and socialising with other English language learners, and thereby leading to an improvement in their communication skills. In the light of these affordances, digital technologies have the potential to support learners to take control over their learning psychologically and emotionally. By taking control over psychological factors which may affect learning, learners can also take control over their learning management by finding opportunities to use English (Huang & Benson, 2013). Yet, caution must be applied here once again due to e-safety concerns related to such social networking platforms. In the disguise of improving communication skills in English, the students can also be vulnerable to harm from other ill-intended users on such social networking platforms (Manca & Ranieri, 2014).

When the affordances of taking control over learning psychologically and finding more opportunities to use English are taken into consideration together, it seems that digital technologies may support learners to develop their autonomy as

communicators. According to Littlewood (1996, p. 431), developing one's autonomy as a communicator relies on "the ability to use the language creatively and the ability to use appropriate strategies for communicating meanings in specific situations". As discussed above, digital technologies may extend the opportunities for learners to find more opportunities to communicate in English and become more courageous to try different things in using English. In this regard, digital technologies are likely to help learners to improve their confidence by developing their ability to seek out opportunities to speak and use the English, in line with Cooker's (2012) model of learner autonomy. As digital technologies help learners gain more confidence in their use of English by offering more opportunities to use it, learners can subsequently improve their autonomy as communicators in accordance with Littlewood's (1996) framework.

Digital technologies can also make the learners in this factor become less dependent on their teachers. The learners disagreed that they needed encouragement from their teachers to learn English (*With digital technologies, I need the encouragement of an English teacher for learning English, -5, Factor 2)*. It is possible that this affordance is related to learners having the confidence to find opportunities to use English themselves. It was also observed that learners in this factor are more interested in learning English on their own, away from a classroom environment. This may be another reason for learners not to need support from their teacher. It was also interesting to observe that the teachers of these learners also allow space for their learners to exercise control over their learning. One learner noted that there is a trust between them and their teacher. As the learner elaborated, the teacher trusts the learners to do their work in English with digital technologies, and the learners, who are aware of their responsibility and value the trust of their teacher,

carry out their tasks in English (*Q-sorter 12, on the statement "With digital technologies, I need a push from my English teacher to study English", -5)*. So, it is worth noting from this finding that the learners' ability to gain the trust of their teachers may also play an important role in taking control over their learning with digital technologies. Yet, it should also be noted that, even if these learners are interested in learning English in more natural ways by taking control over different aspects of their learning, there is still some room for teacher support. The learners in this factor are still likely to return to their teacher for explanations of difficult topics. In this regard, this finding matches the observations made in Jitpaisarnwattana's (2018) study in which the English teacher provided feedback to students' tasks and acted as a facilitator and counsellor to make students realise their mistakes in their tasks. Therefore, digital technologies afford the learners to take more control over their learning, but they do not retain total independence from their teachers in every aspect.

Two other affordances are also worth noting here. They are different because they were only defined by one single participant who, in one sense, disagreed with other participants in this factor. According to the results, digital technologies can be supportive of learners developing their ability to evaluate the reliability of information from resources on the Internet for learning English (*Q-sorter 7 [bi-polar loading], on the statement "I evaluate the reliability of information from resources on the Internet for learning English", +5)*. While this single participant differed from other participants in this factor, their position in terms of evaluating the reliability of information from online resources is in alignment with findings in Gonulal's (2019) and Teng's (2018) studies. It was observed in both these studies that digital technologies afford students to evaluate whether an English utterance is

grammatically correct or a translation to English is accurate. In terms of autonomous language learning, being able to evaluate materials and resources for learning English is an important skill (Tassinari, 2012), and digital technologies appear to help learners to become more critical in this regard. In addition to being critical and evaluative about learning resources, digital technologies can also provide learners with instant feedback on to their language mistakes (*Q-sorter 7 [bi-polar loading], on the statement "I get instant feedback to my language mistakes and errors with digital technologies", +5)*. Regarding instant feedback, this finding is similar to the first factor in which learners could also take control over their learning by finding a way of getting feedback on their mistakes. However, there is a slight difference between the learners in the first factor and the learner in this second factor. While the learners in the first factor used their social resources, such as fellow learners, in their informational and collegial digital learning environment for constructive feedback, the learner in this factor uses spell-checker in Microsoft Word to get instant feedback on his/her mistakes in a constructive way. In terms of autonomous language learning, this shows that the learner in this factor can select and use different learning strategies, thereby manifesting metacognitive awareness.

Overall, when all these affordances are considered, it is also possible to suggest that they offer what learners cannot find in a classroom. Digital technologies provide learners with a more relaxed and less stressed learning environment. The learners feel less pressure when learning English with digital technologies and they can also accommodate their individual needs better with digital technologies, such as the pace of their learning and the time for learning. In other words, digital technologies provide learners with alternatives and allow them to adapt their learning to suit themselves. Finally, digital technologies enable learners to take control over

psychological factors which may affect their learning, such as anxiety about making mistakes when speaking to others in English. So, the key affordance of digital technologies for autonomous language learning appears to be that learners can take control over their learning by finding a way of learning in English which is more natural than learning in a classroom environment. In other words, learners take control over their learning by finding an alternative way of learning English by which they can be emancipated from the constraints of learning in a classroom environment.

7.3 Affordances for metacognitive strategies about learning

As opposed to the affordances in the second factor, digital technologies helped the learners in this factor to take control over their learning more systematically by providing affordances for metacognitive strategies. The results showed that digital technologies can help learners to become more organised about their learning. In addition, learners can become more focused on learning English with the help of digital technologies. The affordances which encourage a systematic and organized control over learning can be grouped into three main affordances.

One key affordance that digital technologies offer is the opportunity to evaluate and reflect and this takes place in a number of ways. Firstly, digital technologies make learners more aware of themselves as a learner. With the help of digital technologies, learners discover their strengths and weaknesses about learning English (*I find out the strengths and weaknesses of my English with digital technologies, +5, Factor 3)*. These learners also monitor their own English learning

progress over time (*With digital technologies, I monitor my own English learning progress over time, +3, Factor 3)*. In a similar vein, digital technologies enable learners in this factor to reflect on and understand what works better for them (*I understand better what works for me when learning English with digital technologies, +2, Factor 3* These findings are in accordance with affordances of digital technologies reported in Jitpaisarnwattana (2018), Nino (2015) and Shadiev (2018), and they support that language learners employ their own strategies to reflect on and evaluate their learning. It is possible to suggest from these three affordances that digital technologies can encourage learners to become more critical about themselves and monitor their learning over time. These affordances can be related to the development of learner autonomy by digital technologies. According to Schwienhorst (2008), the development of learner autonomy entails an ability to reflect on one's own learning. Particularly, it can be important for learners to be aware of themselves as learners and identify how they are progressing as learners in terms of learning English. This is because such an evaluative and reflective process can also help learners to identify in what aspects they are in control over their learning and in what aspects they are not. Therefore, by the help of digital technologies, the learners can be asked to reflect on their learning and understanding about their progress. While such a task can at first be initiated by the language teacher, in the long term, it can lead learners taking more responsibility for their learning and developing an understanding of their language learning process.

As well as evaluating themselves as learners, digital technologies also give learners opportunities to be evaluative about learning resources. It was found that learners can evaluate the reliability of the information from resources on the Internet for

learning English (*I evaluate the reliability of information from resources on the Internet for learning English, +4, Factor 3)*. In a similar vein, the learners in this factor were more likely to evaluate which resources are good for learning English (*With digital technologies, I evaluate which resources are good for learning English, +1, Factor 3)*. In terms of autonomous language learning, being evaluative about learning resources and materials is also suggested to be an important skill for the development of learner autonomy. According to the model of Tassinari (2012), a learner should be able to reflect on and evaluate the learning materials and resources for self-directed learning. In this way, learners can become more critical and evaluative about themselves as learners and understand what materials and resources work for them and whether they may need to supplement their learning with additional materials and resources. In this regard, digital technologies can support learners to take control over their learning by becoming critical about learning resources and materials, as well.

Another main affordance in this factor is that digital technologies can extend the opportunities for learners to use different learning strategies to manage their learning. The results showed that learners can create new strategies to help them learn English with digital technologies (*I create new strategies to help me learn English with digital technologies, +3, Factor 3)*. In addition, learners can select and use appropriate learning strategies when learning English with digital technologies. This can support the affordance of learners' being able to reflect on their learning, as discussed above. It can be suggested that these learners can reflect on what works for them in terms of learning strategies and create new strategies if they see any strategy is not working for them. In terms of autonomous language learning, selecting appropriate learning strategies is an important constitutive element of

learner autonomy (Cooker, 2012), and by selecting and using appropriate learning strategies, learners can take control over their learning with the help of digital technologies.

How learners use different learning strategies and manage their learning systematically with the help of digital technologies can manifest itself in a number of ways. Firstly, digital technologies enable learners to become more self-disciplined and organized. The accounts of the learners suggest that it is easier for them to organize their learning since they have multiple options to carry out tasks. It is also easier for them to customize and make learning more suited their own learning style (*Q-sorter 27, on the statement "I am more self-disciplined and organized in learning English with digital technologies", +5)*. One possible way for learners to manage their learning and adjust it to suit their style can be through time-management. It was found in this factor that the learners can make time specifically to learn English with digital technologies (*I make time to learn English with digital technologies, +1, Factor 3)*. Therefore, they differ from the learners in the second factor for whom digital technologies afforded to learn English at any time they wanted. However, the learners in this factor appear to be more organised with regard to organising time for learning English, thereby taking control over their learning in a more systematic and organized way. In terms of taking control over their learning time, this finding is in accordance with the findings from Shadiev (2018) and Nino (2015) in which it was reported that the digital technologies afforded learners of English to set reminders for themselves on their digital devices and calendar feature on the digital learning system. Such features of digital technologies can, therefore, be harnessed to make language learning more systematic.

Another way in which learners use learning strategies is in terms of selecting language learning resources. The results in this factor showed that digital technologies allow learners to learn in ways and with resources that interest them (*With digital technologies, I learn English in ways and with resources that interest me. +4, Factor 3)*. This may suggest that learners do not select learning resources randomly, but instead apply a selective strategy based on their interests. It could even be suggested that learners use such a selective strategy as another strategy to motivate themselves for learning English. The strongest agreement within this factor was that learners can become more motivated to learn English with digital technologies because they have access to various resources in which they are interested in (*Q-sorter 8, on the statement "I am more motivated to learn English with digital technologies", +5)*. This finding can be further supported by the findings in Toffoli and Perrot's (2017) study where it was observed that the students engaged more in online activities which were interesting to them. In a similar vein, this research also supports the finding from Zhang's (2016) study that if learners were allowed to find their own language learning materials based on their interests, their motivation level to engage and learn from the tasks gets higher. These findings imply that students' interests can be taken into consideration when designing language learning tasks, and even the students can be involved in this process. In this regard, it is possible to understand that digital technologies can also afford learners to take control of their learning by giving them opportunities to self-manage their learning and discipline themselves for learning English. While doing so, learners use different learning strategies which manifest themselves when selecting resources and arranging a time for learning.

Among these positive affordances, digital technologies can also provide affordances which might be characterised as ill-natured. As discussed above, Gibson (1979, p. 127) defines *affordances* of the environment as "what it *provides* or *furnishes*, either for good or ill". The affordances which were discussed as having the potential to enable learners to take control over their learning in a systematic and organized way can be understood to be in good character. Yet, digital technologies also provide some affordances which may make it difficult for learners to take control over their learning. It was found that digital technologies provide learners with an opportunity and a place where they can escape to when they are given a *boring* task, in their own words, in the classroom (*Q-sorter 14, on the statement "With digital technologies, I need a push from my English teacher to study English", -5)*. In a sense, digital technologies provide a digital environment where learners can wander when they are within the physical boundaries of the classroom. It is possible to suggest that using the Internet to take a break can be a sign of learners' taking control over their learning as they are interested in learning with resources and in ways that interest them. This observation further supports the evidence from Hattem's (2014) study in which the learners spun-off using Twitter in a different way than they are required by their teacher. Hence, they may turn away from resources and activities which are teacher-given or initiated by the help of digital technologies. However, the learners also stated that they turn to their teacher for a push to focus on the task again. These learners may be lost in this digital environment where they have gone for a break or to find learning resources and ways which interest them more, and they cannot focus on their learning task again on their own, thereby posing a challenge to autonomous language learning. Therefore, it is possible to suggest that digital technologies can also provide an

affordance for ill- by distracting learners in the disguise of a break, and the teachers may often need to check how their students are using digital technologies within classroom environments. In this regard, this study is similar to Gikas and Grant's (2013) study in which they also found that digital technologies, particularly the social networking applications, could distract learners from their learning and affect their concentration. While digital technologies can be supportive of language learning autonomously even within the language classroom, totally leaving the students to their own devices in-class time may have negative outcomes for language learning. Therefore, the teachers can consider regularly overseeing the progress of their students in task completion within class time.

As for another ill-character affordance, digital technologies can make learners more worried as speakers of English. It was found that feeling less stressed and more relaxed about learning English was not an affordance for the learners in this factor. In this regard, they differ from the learners in the first factor where it appeared that digital technologies can help learners to take control over their learning by feeling less stressed about it. It was also seen in the second factor that digital technologies have the potential for supporting learners to improve their autonomy as communicators since they may feel less worried about making mistakes when speaking English with digital technologies. This finding also differs from the findings in Shadiev's (2018) in which it was reported that the students feel less anxious and stressful with their language output. Yet, if learners are required by a task to make a video and post it online, digital technologies are likely to put extra pressure on the learners. In this factor, as was observed from the account of one learner, such videos can stay online even after the lesson and the task is finished. Subsequently, the learners who make a video as a task requirement face the risk of

being mocked and bullied because of their English pronunciation (*Q-sorter 14, on the statement "With digital technologies, I am less worried about making mistakes in front of other people", -5)*. As a result, digital technologies can create an uncomfortable situation for learners. In this sense, this finding supports the finding in Kamnoetsin (2014) in which the participants did not feel comfortable sharing their coursework as a post on social network platforms due to the concern that their friends and family members could see them. This finding from this present study also shows that the concerns around e-safety of the students in a digital environment can come true with regard to cyberbullying or bullying on digital platforms. Both Cranner et. al. (2012) and Mance and Ranieri (2014) suggest that digital technologies pose very serious risks to learners, one of such risks is bullying through digital platforms. As can be seen in this finding, such risks may prevent students from benefiting the opportunities of digital technologies for autonomous language learning, and they can be very harmful to students' both school life.

In this regard, this finding can help better understand a finding from Zhang's (2016, p. 7) study in which it was reported that the students could practice in English on their own and "without being noticed by others". Therefore, it is possible to understand that while digital technologies afford learners to practice their language skills on their own, one of their motives can be avoiding the criticism of others such as their fellow learners. In terms of autonomous language learning, the significance of this ill-character affordance of being made fun of one's pronunciation lies in the risk of preventing learners from improving themselves as autonomous communicators as opposed to the learners in the second factor. In terms of Littlewood's (1996) model of learner autonomy, learners should be able to use the language creatively to develop their autonomy as communicators. Schwienhorst

(2008) also suggests that experimentation with the language is an element to facilitate the development of learner autonomy. In other words, learners should be able to use the language creatively by trying out to use the language differently. Yet, digital technologies have the potential to prevent learners from using the language freely and creatively and thereby lose control over *how* they can improve their English. As an implication for language learning, this finding further supports that not every student may be interested in learning a language with digital technologies. Even if they may be interested, the specific technology which is brought by the teacher and asked to be used by the learners may not fit every student. Therefore, the teachers should consider not making usage of digital technologies obligatory and give learners the option not to use digital technology in their tasks. In addition to that, the learners can be reminded of the importance of e-safety and wellbeing of their fellow learners, and they can be warned against such online ill-behaviour.

Overall, the results of the third factor suggest that digital technologies can be supportive of autonomous language learning by providing learners with the opportunity to learn English in a more systematic and organized way by using metacognitive strategies. Learners can find opportunities with digital technologies to be more focused on learning English by using different learning strategies. Yet, this factor also showed that digital technologies can also provide ill-character affordances which may prevent learners from taking control over their learning. The affordances of distraction and being mocked may create challenges for learners to become more focused on their learning in this factor.

7.4 Remapping the present research

This research was not the first in this field to document the relationship between autonomous language learning and technology. Previous research has shown that technology-based approaches could be supportive of autonomous language learning (Gonulal, 2019; Hattem, 2014; Loewen et. al., 2019; Miller, 2019). However, such research has generally focused on one specific technology to understand the relationship between autonomous language learning and technology. These studies show how learner control is institutionalised and other-initiated when it comes to the selection of technology for learning under investigation. At this point, learners not being able to choose the technology freely for learning appears to be in incongruent with having choices in autonomous language learning (Hamilton, 2013). Indeed, the technologies which the learners could suggest themselves could be more valuable to themselves (Conole, 2008), and in this regard, they might be more valuable than the technologies which were dictated by their teachers, the schools, and the researchers. This present research, therefore, aimed to fill a gap in the literature by examining the relationship between autonomous language learning and technology from the angle of multiple technologies which the learners could suggest themselves. By doing so, it aimed to address the calls in the literature to explore the nature of the relationship between autonomous language learning and technology from multiple technological resources and platforms (Lai, 2017). In terms of these aims, this research enabled the learners to be in direct control over the *selection* of the technologies to be explored by transferring the locus of control back to the learners, unlike in previous research. This study surveyed what digital technologies the participants were using

at the time of this research. By doing so, it was possible to explore what opportunities the digital technologies provided learners with for autonomous language learning when they were naturally in control over the digital technologies.

Related to taking control over the selection of the technologies that the students were using, these affordances of digital technologies may also help to show how learners find opportunities to take control over their learning. It was argued in the literature that the mere presence of technologies does not directly lead to autonomous language learning (Stockwell, 2012). Similarly, Arnó–Macià (2012, p. 96) argued that technology may not directly lead to learning languages more autonomously but can help autonomous language learning flourish "as long as appropriate conditions are met, such as providing choices, relevant materials, learning training, reflection, scaffolding, and support". With the help of such appropriate conditions, learners can have the opportunities to take control over their learning (Benson, 2011). Within this context, three factors of affordances, as discussed above, show that these learners can take control over their learning in different ways with digital technologies without waiting to be provided with *appropriate conditions by others.* In other words, these affordances can be understood as the conditions that the learners find themselves in the digital technologies which might help their learner autonomy flourish. So, these three categories of affordances can also be understood to be what the learners would want to see "if" others such as teachers and schools were to design conditions and initiatives to foster autonomous language learning.

As well as moving beyond one single technology, this research also aimed to add to the literature with regards to examining the relationship between technology and autonomous language learning in a non-deterministic way. Reinders and White

(2016) observed that previous studies in autonomous language learning treated new technologies as tools and in a one-directional way. According to this view, new technologies would make learners more autonomous by providing resources and materials to the learners. Yet, it was argued that such one-directional relationship is reminiscent of a cause-and-effect relationship between the technology and the autonomous language learning, in which the learners are not predisposed to learning a language autonomously, and it is the technology which makes the learners more autonomous. This research, however, contributed to the understanding of this relationship within a *relational* character by using the theory of affordances. This research adopted the view that the learners have a natural attribute to take control over their learning, but their non-engagement with technology did not mean that these learners were more or less autonomous. This research showed that digital technologies provided different affordances to the learners, grouped into three categories of taking control over their learning. By doing so, it can also help to support the argument that "the changes wrought by technology far exceeded the designers' original intentions (Hanson-smith, 2000, p. 2, cited in Benson, 2011, p. 149), because video websites such as YouTube and Netflix, for example, can turn into digital platforms where learners find learning resources in English or a place where they might be bullied because of their pronunciation. Therefore, this research contributes to the understanding that digital technologies could have more opportunities to help learners take control over their learning than the designers, teachers, and researchers could embed into digital technologies. For this reason, exploring the relationship between technology and autonomous language learning in a cause-effect understanding fails to account for the potential of digital technologies for autonomous language learning since, as this research suggests,

learners are likely to see opportunities in digital technologies which a third party, such as a teacher or designer, would not see himself/herself.

This research also shows that digital technologies may not always be useful for learners, and they can pose some challenges for autonomous language learning. The most important of those challenges can be about e-safety of the students when using digital technologies. The students may search for resources by digital technologies to improve their speaking, but they can be vulnerable to the risk from ill-natured people such as sexual predators, cyber-stalkers and online bullies in the disguise of practising language skills. The effects of such threats may not be limited to students' school life, and they can affect the personal life of the students after school. For example, if the students live with a fear of being bullied as a result of their pronunciation in the target language, such a fear may prevent them from speaking freely in the future both in physical places and digital platforms as well. Therefore, it becomes critical for students to learn how to safely use digital technologies to fully harness the opportunities they provide.

These affordances of digital technologies also support the view in the literature that autonomous language learning manifests itself in different ways (Benson, 2011; Cooker, 2012). The results showed that learners self-categorise in three categories of affordances, and this suggests that they differ from each other in terms of taking control over their learning. The ways that autonomous language learning manifests itself differently also helps to illustrate *the niches* of the digital environment. As discussed above, Gibson (1979) defines a niche as a set of affordances, and a niche refers to how a living organism lives in its natural environment. For example, many living organisms occupy a niche in the natural environment by taking advantage of different ways of living, such as acquiring food, shelter, and moving around, which

are the affordances in such a natural environment. In the same way that the natural environment enables living organisms to occupy a niche, digital technologies also provide learners with a digital environment where they can take advantage of different opportunities to take control over their learning. Learners occupy different niches on a digital environment which comprise of a set of affordances, and these affordances enable learners to take control over their learning. Table 36 below summarises these affordances of digital technologies which can be supportive of autonomous language learning by providing learners with opportunities, noted by bullet points, through which they can take control over their learning. In other words, these affordances can also be interpreted as what learners find with digital technologies which facilitates them to take control over their learning at their own volition and by self-determined activities.

Table 36 Summary of affordances of digital technologies for autonomous language learning

Affordances for autonomous language learning	
Affordances from student-led language learning resources	• Ease of access • Access to more variety of language learning materials • Learning in ways and resources that interest learners • Learning at any time • Learning at any place • Learning in fun ways • Motivation • Access to social and discursive language learning resources • Receiving instant feedback in a constructive way • Setting both short- and long-term learning goals
Affordances for self-regulated learning	• Providing a more relaxed and less pressure learning environment • Learning English at own speed and pace • Learning at any time • Feeling less stressed about learning English • Feeling less worried about making mistakes when speaking English • Feeling more courageous to try different things in English • Finding more opportunities to use English • Being more careful when speaking English • Evaluate the reliability of information for learning English • Get instant feedback to language errors and mistakes
Affordances for metacognitive strategies	• Being more organized for and focused on learning English • Being more self-disciplined • Managing time • Being more motivated to learn English • Finding out one's weaknesses and strengths

about learning	• Monitoring one's learning English over time • Being evaluative about learning resources • Selecting and using appropriate learning strategies • Distraction • Being bullied

Before concluding this chapter, one more point also needs more elaboration. As could be observed in the results and the discussion, there was a consensus among the learners in all the three factors relating to emancipation from their teacher. Total independence from learners' teachers is not implied, as there was still some room for teacher support for explaining difficult topics and directing learners away from distraction within class hours. This research did not aim to prove that digital technologies make learners more independent from their teachers, and neither did it do so. Yet, the learners' disagreement with the statements that they needed any encouragement from their teacher and that they could get frustrated without a teacher constitutes the foci of this elaboration, and one possible explanation is that learners are taking the locus of control back from their teachers in some aspects when learning English with the help of digital technologies. Benson (2013, p. 840) argues that "learner control [used to be] both institutionalised and other-initiated", but due to technological developments, learners were able to get the locus of control back since the autonomous language learning appeared to be more "self-initiated and carried out without the intervention, or even knowledge, of language teachers". In this regard, the three categories of affordances, i.e. finding their own learning resources through the ease of access to various resources, learning more naturally by especially taking control over their psychological and emotional factors which can affect their learning, and finally learning in a more systematic way by using different but appropriate learning strategies, can also be interpreted as the aspects from which learners are taking control back from their teachers by such self-initiated learning activities and practices. Therefore, viewing learners'

emancipation from their teachers as a transfer of control can explain the relationship between learners and teachers better than simply a matter of gaining independence from their teachers.

7.5 Chapter summary

This chapter discussed the findings of this research and provided an answer to the research question. The findings showed that digital technologies can be supportive of autonomous language learning by providing learners with opportunities to take control over their learning, which could be categorised in three main factors of affordances. In the next chapter, the implications of these findings will be discussed together with the contributions of this research.

Chapter 8 Conclusion

This chapter concludes the thesis by revisiting the aim of the research and summarising the main findings which were discussed in the earlier chapters. It also describes the significance of the research in terms of its contributions to the current knowledge in the field. Finally, this chapter concludes by outlining the limitations of the research and making recommendations for further research.

8.1 Revisiting the research aim, the key concepts and the findings

This study set out to explore the relationship between digital technologies and learner autonomy by investigating the opportunities that digital technologies could provide to learners for autonomous language learning in terms of taking control over their learning. In the pursuit of this aim, this research was built upon three key concepts; learner autonomy, digital technologies, and affordances. The concept of learner autonomy was defined as a learner's systematic capacity to take control over one's own learning (Benson, 2011), and autonomous language learning referred to a mode of learning in which learners take control over their language learning. In terms of technology, this research focused solely on digital technologies, such as websites, software programs and mobile device applications, and conceptualised digital technologies as a digital environment. Instead of focusing on one single

digital technology, as previous studies in the field have done, this research first identified what digital technologies the learners were using at the time of the research through a survey. Subsequently, it explored the opportunities for autonomous language learning based on the digital technologies identified as a result of the survey. To understand the relationship between these two key concepts, this research used the concept of affordances, which enable documentation of the opportunities the digital technologies provide learners with in terms of taking control over their learning. Finally, Q-Methodology was used to address the aim.

It was found that digital technologies can be supportive of autonomous language learning by providing opportunities to learners to take control over their learning. These affordances were grouped into three main categories. First of all, it was observed that the learners can take control over their learning with digital technologies by finding their own learning resources which related to their own interests, such as movies in English, news in English and culture and history of other English-speaking countries. As well as material resources, it was also interesting to find that the learners made use of human resources, for example, fellow learners on Google Docs, as the digital technologies created an informational and collegial digital learning environment. The second main affordance of digital technologies was conceptualised as affordances for self-regulated learning. Digital technologies enabled learners to take control over their learning by providing a mode of learning which, according to the learners, represents an alternative to learning in a classroom environment. Particularly, learners felt less stressed and appreciated the flexibility of learning in a place and at a time of their choice. This opportunity to learn at their own learning pace afforded learners the ability to take control over their learning by, in a sense, finding an alternative but natural mode of

learning. Finally, this research showed that digital technologies can also enable learners to take control over their learning by offering a more systematic way of learning by using metacognitive strategies. Digital technologies can provide opportunities for learners to take control over their learning by becoming critical in several ways. Firstly, they thought critically about themselves as learners by reflecting on their own strengths and weaknesses. In addition, they created learning strategies according to their needs by evaluating their learning resources, organising their learning, and becoming more self-disciplined. A final affordance of digital technologies was that they enabled learners to be less dependent on their teachers in terms of encouragement and support for learning.

8.2 Contributions of the study

Overall, the findings of this research are of interest to teachers and researchers who work within the field of education and have an interest in the use of digital technologies for educational purposes.

Firstly, this research provides an up-to-date account of which digital technologies can be used with regards to learning English. This research surveyed the learners of English as a foreign language and found that learners were using a variety of different software programs, mobile device applications and websites which, as they indicated, can be helpful for language learning. The results of the survey were, therefore, helpful in terms of sampling the digital technologies in this research. Thus, this sample of current digital technologies may be of assistance for future researchers who may want to explore what digital technologies are being used by their research participants in accordance with their research aims.

This study also contributes to existing knowledge in the literature, particularly to the findings of Osborne (2014), in terms of showing that digital technologies can be conceptualised as a digital environment other than tools or tools systems. Conceptualising digital technologies as tools can limit understanding of what can be done with digital technologies (Osborne, 2014). It was observed throughout the analysis of the data that there were signs of understanding technology as a digital environment among the participants. For example, the Internet became a *place* for the learners where they could *go* and collaborate with other fellow learners, and a *place* where they could give each other feedback. Also, the Internet became a place where learners could *visit* when they were physically in the classroom to have a break from the tasks which they did not enjoy. The account of one student showed that the Internet, and particularly video-sharing websites, can even become a place where the learners can face the risk of being bullied or mocked because of their pronunciation in English. The significance of conceptualising digital technologies as a digital environment in this way lies in its potential to explore what other meanings learners can find with digital technologies which the designers of the digital technologies, teachers, and researchers may not think of. Therefore, by contributing to existing knowledge in the literature in terms of conceptualising digital technologies as a digital environment, this research is valuable in that it shows that digital technologies can be approached from a perspective other than simply as tools.

Using the concept of affordances to explore the relationship between learner autonomy and digital technologies is another contribution of this research to the existing literature. The concept of affordances has been used previously to explain the relationship between autonomous language learning and the environment in an

ecological approach. Murray and Fujishima's (2013) study, for example, shows how the concept of affordances can be used to explain what affordances or opportunities a social but physical learning environment can provide to learners for autonomous language learning. This present study, however, contributes to the existing knowledge in the literature of autonomous language learning in that the concept can also be used to explain the relationship between autonomous language learning and digital environment. Therefore, the concept of affordances may be of interest to future researchers in terms of providing a theoretical framework to explore the relationship between digital technology and the concept to be studied.

Another important contribution of this research relates to the research methodology. This research is, to the best knowledge of the researcher, the first study to use Q-methodology to investigate the relationship between autonomous language learning and digital technology. In this research, it was difficult for the researcher, as a third party, to understand what digital technologies could provide learners for autonomous language learning. Because of the relational character of the affordances, what digital technologies could provide for autonomous language learning could only be ascertained from the point of view of the learners themselves. At this point, Q-methodology proved to be useful as it allowed the researcher to understand the affordances of digital technologies from the subjective viewpoints of the learners. Q-sorting as a data collection technique succeeded in providing deep insight into the subjective views surrounding the relationship between technology and autonomous language learning. Therefore, this research may be of assistance to future researchers who may wish to explore the subjective viewpoints of participants in a systematic way.

Finally, this research has extended the existing knowledge of how autonomous language learning can manifest itself differently within the context of digital technologies. It has been suggested in the literature that autonomous language learning could manifest itself in different ways (Cooker, 2012; Murray, 2014), but there have also been calls to look at the relationship between technology and autonomous language learning (Hamilton, 2013) so that more informed decisions could be made in the future if stakeholders, other than learners themselves, were to take action to foster autonomous language learning. This research has provided an answer to these calls by finding out that the learners can take control over their language learning in self-initiated activities and without any intervention from their teachers with the help of digital technologies. Three key affordances of digital technologies can, therefore, be of particular interest to the teachers, institutions and researchers for two reasons. Firstly, they support the argument that there is no single way of describing autonomous language learning in observable behaviours, and secondly, the way that learners take control over their learning can also vary among learners with digital technologies.

8.3 Implications of the study

Although the current study was conducted with a small sample of participants, the findings may have some implications for teachers of English and senior leaders who are interested in fostering autonomous language learning within the Northview school context. The findings suggest that learners can take control over their language learning and are likely to be aware of the importance of directing their learning to prepare themselves for life after school. As the literature review showed, there are several initiatives to use digital technologies to promote autonomous

language learning not just in English as a second or foreign language, but in other languages such as Spanish and French, as well. Therefore, findings from this research may have a bearing on language teachers and school leaders all around the world who are the target audience for the recommendations in this research.

To help learners improve their capacity to take control over their learning, thereby developing their learner autonomy, language teachers, not just limited to teachers of English as a foreign language in this study, should allow space for learners to direct their learning in their own interests. With the advent of digital technologies and their easy accessibility, learners, can, for example, find their own language learning resources not just in English, but in other languages which they are studying. The students can also find these resources outside the school as well, thereby not being limited to school context only. While allowing space to their learners, language teachers can attempt to build up *trust* between themselves and their learners. It was observed in this study that the learners became more aware of their responsibility to carry out and complete tasks when the teacher has trusted them and left them on their own to work digitally. This, however, does not necessarily mean that language teachers should leave the students totally to their own devices. While learning autonomously, the learners still appear to need support from their language teachers regarding understanding difficult topics and particularly directing them away from the distraction on the Internet during classroom hours.

Another pedagogical implication of the findings is related to the selection of digital technologies to foster autonomous language learning in schools. The results suggest that learners already have access to multiple digital technologies, and they are using these digital technologies of their own volition outside the school. This suggests

that learners are taking control over their choice of digital technologies. Therefore, technology-based approaches to foster autonomous language learning in schools through one single technology which is selected by English language teachers may not prove as successful as digital technologies selected by learners themselves. This is reminiscent of Conole's (2008) observation that learners place more value on technologies which they chose themselves. Consequently, school leaders and English language teachers may find it useful to understand what types of digital technologies the learners are already using and then try to plan their initiatives to foster autonomous language learning in school environment around these digital technologies. As has been discussed in the discussion chapter, if students bring their own devices to the classroom, such devices can be used in many ways by the teachers to foster autonomous language learning skills of their students. English teachers can make students find online resources based on their own interests. English teachers can also allow students submit their written work through online means such as an online blog. To increase the collaboration between students, English teachers can encourage their students to work together by using digital technologies. By this way, the students can continue to work together even after the school.

This point leads to another possible pedagogical implication. If school leaders and English language teachers intend to develop initiatives to develop autonomous language learning using technology-based approaches, it should also be remembered that not every student may be interested in learning with digital technologies. As a sign of learner autonomy, learners may choose not to use digital technologies to support their learning English. In this regard, forcing learners to use certain digital technologies to help them learn English may be detrimental to their

capability to improve themselves as autonomous learners. For example, the results of this study showed that some learners may feel uncomfortable when they are asked to make a video of themselves during a task and share it online with the classmates as they feared being mocked because of their pronunciation in English. Therefore, it would be useful for school leaders and English language teachers to bear in mind that one, if any, digital technology may not fit every learner.

Integrating digital technologies in their English teaching may have implications for English teachers' workload and training needs, as well. The findings in this study showed that students can become less dependent on their English teachers by finding their own language learning resources, collaborating with other fellow learners on digital platforms, and by looking at other students' coursework on the Internet. Yet, it is difficult to observe total emancipation from English teachers. Students may still need the support of their English teachers to find useful materials online or how to evaluate such materials. In addition to that, English teachers may need to integrate modules into their teaching which address how to stay safe online and how to improve digital literacy skills. As a result, English teachers will have to deal with additional tasks to foster their students' autonomous language learning skills while at the same time they are busy with delivering the requirements of the English subject curriculum, and in the end, such additional tasks may add up to workload of the English teachers.

As a result of changing landscape of the classroom, English teachers may also need additional training to support their students for autonomous language learning. English teachers should equip themselves with pedagogical knowledge of how to use digital technologies in their teaching. At this point, it may be particularly useful if English teachers can use some of the digital technologies that their students are

using to develop a familiarity of how such digital technologies are working and to get hands-on experience. Such experience can also help English teachers to identify possible threats that these digital technologies might pose for their students. The students may not be aware of the risks posed by digital technologies while they enjoy using them. But English teachers can warn their students against such risks and help them stay safe when learning with digital technologies. For this aim, English teachers will also need additional training about e-safety.

These findings will also bring about institutional responsibilities for the school managers. School leaders may find it useful organising training programmes both for English teachers and the students. One of the topics that these programmes can focus on can be about e-safety. Students can be warned against possible threats of digital platforms which the students may not be aware of. In a similar vein, teachers can also be part of such training, but more comprehensively. Teachers, for example, be offered training courses in which they can learn how to support their students if they feel or observe that any of their students might be facing such threats from online means.

These findings show that the students are already taking control over their learning by using their own devices and accessing various sources in English outside the school. Such practices may contribute to autonomous language learning practices in school context. Yet, students' in-school autonomous language learning practices may improve students' out-of-school autonomous language learning practices, as well. For example, findings suggested that students' own language learning practices outside the school tend to be episodic, i.e. without clearly-set goals at times. These practices can be improved by offering tutorials to students in which they can learn how to organise their out-of-school language learning practices

around more focused learning goals. In addition to that, it was also observed that some students did not evaluate authentic materials in English in terms of their educational values. In a similar way, the teachers in the school context may present students strategies on how to evaluate materials whether they are good for learning English, and therefore the students can make better informed decisions in their selection of language learning resources while learning English autonomously outside the school context.

Finally, these findings also have implications with regards to learners developing their personal autonomy capacity in the future. If learners take control over the digital technologies they want to use, decide their long-term goals, decide when and where to learn, and use learning strategies to overcome any difficulties when learning a foreign language, they can make decisions in the later stages of their life, as well. Such practices of taking control over learning which can be supportive of the development of learner autonomy may lead to learners to be treated as "ends" in themselves, and never as "means" towards other ends" (Benson, 2011, p. 50).

8.4 Limitations of the current study and recommendations for future research

Overall, although this research contributes to our understanding of the relationship between autonomous language learning and digital technologies, there are some limitations to be acknowledged.

One of the limitations of this research is methodological and is based on how the Q-sort data were collected. It could be suggested that Q-sorting is the most important step of the data collection procedure in Q-Methodological research. It is

the step in which the learners actively engage with the statements given to them by sorting them in light of the condition of instruction. For this reason, it is generally desirable to carry out Q-sorting face-to-face with participants so that the participants can ask the researcher for support during the process. Because of external circumstances, the researcher had to carry out the Q-sorting step online. The Q-sort data were collected through the *POETQ* website, and this online means of Q-sorting prevented the researcher from both actively observing the participants when they were engaging with the Q-sort statements and providing support when the learners needed further clarification about the Q-sorting procedure. Also, the in-built feature of *POETQ* prevented learners from seeing their statements placed on the Q-grid as they sorted the statements. Therefore, although online Q-sorting was useful for collecting the Q-sort data, in-person Q-sorting might have enabled both the participants and the researcher to truly benefit from the advantages of Q-methodology.

Online Q-sorting led to another limitation in terms of follow-up interviews. Although it is not obligatory in Q-methodology to conduct a follow-up interview after Q-sorting, such interviews can provide more insight into why the Q-sorters placed certain items in certain places on the Q-grid. The data from these interviews can prove to be especially helpful when discussing the results. Since the Q-sorting was administered online, this prevented the researcher from exploiting the advantages of such interviews. *POETQ* has a feature which enables a researcher to ask open-ended questions to the participants so that they can elaborate more on why they place certain items in the extreme ends of agreement and disagreement. While some students provided a good justification for their Q-sorting, some participants either gave very short and general answer or no answer at all. Thus, this limited the

researcher when discussing some of the statements. Therefore, face-to-face follow-up interviews might have been more advantageous in terms of obtaining more information about the participants' choices.

Online Q-sorting may also have affected how learners understood the condition of instruction for Q-sorting. The researcher explained the Q-sorting procedure and the role of the condition of instruction as clearly as possible. Yet, the students may still have lacked the support they could get if the researcher had been administering Q-sorting in-person. This situation raises a concern about how the participants understood the condition of instruction. The condition of instruction was given so that the learners could turn and interrogate whether the statements given were affordances of digital technologies for taking control over their learning, and thereby autonomous language learning. During the analysis, however, there appeared a concern that the learners might have considered these statements as what digital technologies could *generally* provide to learners. Although it is impossible to control how learners understand the condition of instruction even if it is provided face-to-face, in this context, in-person administration of Q-sorting procedure may have given the researcher the chance to clarify the role of the condition of instruction and what it referred to in this research.

Within the limitations of an online means of Q-sorting, future research could explore the same topic, with Q-methodology, but collect Q-sorting data face-to-face from the participants. This may help support the Q-sorters as they Q-sort and enrich the data with much deeper follow-up interviews.

In addition, this research aimed to show what affordances digital technologies can provide for autonomous language learning. Yet, while it was found what digital

technologies can afford learners to take control over their learning, which particular digital technology matched with which particular affordance was not explored. For example, while it was found that digital technologies can afford learners opportunities to find their own language learning resources, both in material and human nature, this study did not explore further which specific digital technologies provided these affordances. So, future research studies could be designed to identify which digital technologies afford what in terms of autonomous language learning. For example, a future study could question participants about which of the digital technologies found in the survey in this thesis align more with each of the affordances.

Finally, although learner autonomy was defined as taking control over learning in this research, the concept of taking control is also open to discussion. Taking control can mean various things to different learners. Therefore, another Q-methodological research design could explore a concourse of statements from the perspectives of the learners regarding the question "what does taking control over your learning mean to you?".

8.5 Concluding remarks

As stated in the **Error! Reference source not found.** chapter of this thesis, personal autonomy, or individuals being free to control their affairs, can become the ultimate goal of education systems. Yet, as Boud (1988, p. 20) argued, personal autonomy can remain as an abstract goal which is written in policy papers and "divorced from any particular situation". Thus, if personal autonomy is the goal of education, learners should be given chances during their school life to practice taking control.

In this regard, the affordances of digital technologies as found in this research can be viewed as how learners are finding their own opportunities for at least taking control over their language learning, from which personal autonomy may emerge.

List of References

Adams, H. (2002). *Application of Q methodology to the assessment of attitudes to the environment.* (Thesis (Ph.D.)), Keele University, Available from British Library EThOS Thesis Database (uk.bl.ethos.251387)

Arnó–Macià, E. (2012). The role of technology in teaching languages for specific purposes courses. *The Modern Language Journal, 96*(1), 89-104.

Arthur, W. B. (2009). *The nature of technology: What it is and how it evolves*. London: Penguin.

autonomy. (2018). *In Oxford Dictionaries's online English dictionary.* Retrieved from https://en.oxforddictionaries.com/definition/autonomy

Bailly, S. (2010). Supporting autonomy development in online learning environments: what knowledge and skills do teachers need? In M. Villanueva, N. Ruiz et J. Luzon (Eds.), *Genres theory and new literacies: applications to autonomous language learning* (pp. 81-100). Cambridge: Cambridge Scholars Publishing.

Benson, P. (1996). Concepts of autonomy in language learning. In R. Pemberton, E. S. L. Li, W. W. F. Or, & H. D. Pierson (Eds.), *Taking control: Autonomy in language learning* (pp. 27-34). Hong Kong: Hong Kong University Press.

Benson, P. (2000). Autonomy as a learners' and teachers' right. In B. Sinclair, I. McGrath, & T. Lamb (Eds.), *Learner autonomy, teacher autonomy: Future directions* (pp. 111-117). Harlow: Longman.

Benson, P. (2007). Autonomy in language teaching and learning. *Language Teaching, 40*(01), 21-40. doi:10.1017/s0261444806003958

Benson, P. (2008). Teachers' and learners' perspectives on autonomy. In T. Lamb & H. Reinders (Eds.), *Learner and teacher autonomy: Concepts, realities, and responses* (pp. 15-32). Amsterdam: John Benjamins Publishing Company.

Benson, P. (2009). Making sense of autonomy in language learning. In R. Pemberton, S. Toogood, & A. Barfield (Eds.), *Maintaining control: Autonomy and language learning* (pp. 13-26). Hong Kong: Hong Kong University Press.

Benson, P. (2010). Measuring autonomy: Should we put our ability to the test? In A. Paran & L. Sercu (Eds.), *Testing the untestable in language education* (pp. 77-97). Bristol: Multilingual Matters.

Benson, P. (2011). *Teaching and researching autonomy*. London: Pearson.

Benson, P. (2012). Autonomy in language learning, learning, and life. *Synergies France, 9*, 29-39.

Benson, P. (2013). Learner autonomy. *TESOL Quarterly, 47*(4), 839-843. doi:10.1002/tesq.134

Benson, P., & Chik, A. (2010). New literacies and autonomy in foreign language learning. In M. J. Luzon, M. N. Ruiz, & M. L. Villanueva (Eds.), *Digital*

genres, new literacies and autonomy in language learning (pp. 63-80). Newcastle upon Tyne: Cambridge Scholars.

Benson, P., & Chik, A. (2011). Towards a more naturalistic CALL: Video gaming and language learning. *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT), 1*(3), 1-13. doi:10.4018/ijcallt.2011070101

Benson, P., & Reinders, H. (2011). Introduction. In P. Benson & H. Reinders (Eds.), *Beyonfd the language classroom* (pp. 1-6). Basingstoke: Palgrave Macmillan.

Benson, P., & Voller, P. (1997). Introduction. In P. Benson & P. Voller (Eds.), *Autonomy and independence in language learning* (pp. 1-13). London, New York: Longman.

Blin, F. (2004). *CALL and the development of learner autonomy: An activity theoretical study.* (Thesis (Ph.D.)), Open University, Available from British Library EThOS Thesis Databese (uk.bl.ethos.422025)

Blin, F. (2005). CALL and the development of learner autonomy: Towards an activity-theoretical perspective. *ReCALL, 16*(2), 377-395. doi:10.1017/S0958344004000928

Boud, D. (1988). Moving towards autonomy. In D. Boud (Ed.), *Developing student autonomy in learning* (2nd ed., pp. 17-39). London; New York: Taylor & Francis.

British Council. (2013). *The English effect*. Retrieved from https://www.britishcouncil.org/sites/default/files/english-effect-report-v2.pdf

Brown, S. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven: Yale University Press.

Brown, S. (1993). A primer on Q methodology. *Operant Subjectivity, 16*(3/4), 91-138.

Brown, S. (1996). Q-methodology and qualitative research. *Qualitative Health Research, 6*(4), 561-567. doi:10.1177/104973239600600408

Brown, S. (1997). *History and principles of Q methodology in psychology and the social sciences*. Paper presented at the Meeting of the British Psychological Society, London.

Brown, S., & Good, J. M. M. (2010). Q Methodology. In N. J. Salkind (Ed.), *Encyclopedia of research design* (Vol. 3, pp. 1149-1155). Thousand Oaks, CA: SAGE Reference.

Castellano, J., Mynard, J. & Rubesch, T. (2011). Student technology use in a self-access center. *Language Learning and Technology, 15*, 12-27.

Chayko, M. (2008). *Portable communities: The social dynamics of online and mobile connectedness.* Albany: State University of New York Press.

Chayko, M. (2017). *Superconnected: The internet, digital media, and techno-social life.* Los Angeles: SAGE.

Chemero, A. (2003). An outline of a theory of affordances. *Ecological Psychology, 15*(2), 181-195. doi:10.1207/S15326969ECO1502_5

Ciekanski, M. (2007). Fostering learner autonomy: Power and reciprocity in the relationship between language learner and language learning adviser. *Cambridge Journal of Education, 37*(1), 111--127. doi:10.1080/03057640601179442

Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (Seventh ed.). London, New York: Routledge.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (Eighth ed.). London, England ; New York, New Yok: Routledge.

Conole, G. (2008). Listening to the learner voice: The ever changing landscape of technology use for language students. *ReCALL, 20*(2), 124-140. doi:10.1017/S0958344008000220

Cooker, L. (2012). *Formative (self-) assessment as autonomous language learning.* (Thesis (Ph.D.)), University of Nottingham, Available from British Library EThOS Thesis Database (uk.bl.ethos.574615)

Crabbe, D. (1993). Fostering autonomy from within the classroom: The teacher's responsibility. *System, 21*(4), 443--452. doi:10.1016/0346-251X(93)90056-M

Cranner, S., Selwyn, N. & Potter, J. (2009). Exploring primary pupils' experiences and understandings of 'e-safety'. *Education and Information Technologies, 14*, 127-142.

Creswell, J. W. & Plano Clark, V. L. (2011). *Designing and Conducting Mixed Methods Research (Second ed.)*. Thousand Oaks, CA: SAGE.

Creswell, J. W. (2013). *Educational research : Pearson new international edition*. Essex: Pearson Education Limited.

Cruaud, C. (2018). Learner autonomy and playful learning: Students' experience of a gamified application for French as a foreign language. *Alsic, 21,* n.p., doi.org/10.4000/alsic.3166

Dafei, D. (2007). An exploration of the relationship between learner autonomy and English proficiency. *Asian EFL Journal, 24*(4), 1--23.

Dam, L. (1995). *Learner autonomy 3: From theory to classroom practice*. Dublin: Authentik.

Damio, S. M. (2013). *Seeking Malay trainee English teachers' perceptions of autonomy in language learning using Q methodology.* (Thesis (Ph.D.)), University of Nottingham, Available from British Library EThOS Thesis Database (uk.bl.ethos.594590)

Dang, T. T. (2012). Learner autonomy: A synthesis of theory and practice. *The Internet Journal of Language, Culture and Society, 35*, 52-67.

Dariel, O. P. d. (2011). *Exploring e-learning adoption in nurse education: A socio-cultural case study using Q and Bourdieu.* (Thesis (Ph.D.)), University of Nottingham, Available from British Library EThOS Thesis Database (uk.bl.ethos.576801)

Dashti, F. A. & Yateem, A. K. (2018). Use of mobile devices: A case study with children from Kuwait and the United States. *International Journal of Early Childhood, 50.* 121-134.

Data Protection Services. (2018). Frequently asked questions. Retrieved from http://www.nsd.uib.no/personvernombud/en/help/faq.html

Denscombe, M. (2014). *The good research guide: for small-scale social research projects* (Fifth ed.). Maidenhead: Open University Press.

Dickinson, L. (1987). *Self-instruction in language learning*. Cambridge: Cambridge University Press.

Dörnyei, Z., & Ushioda, E. (2011). *Teaching and researching autonomy*. Harlow: Pearson Education Limited.

Duman, G., Orhon, G., & Gedik, N. (2014). Research trends in mobile assisted language learning from 2000 to 2012. *ReCALL, 27*(02), 197--216. doi:10.1017/S0958344014000287

Egbert, J. (2005). *CALL essentials: Principles and practice in the CALL classrooms*. Alexandria, VA: TESOL.

Ellis, R. (2008). *The study of second language acquisition*. Oxford: Oxford University Press.

Epstein, I., Stevens, B., McKeever, P., & Baruchel, S. (2006). Photo elicitation interview: Using photos to elicit children's perspectives. *International Journal of Qualitative Methods, 5*, 1--9.

Eurydice. (2019a). Historical overview. Retrieved from https://eacea.ec.europa.eu/national-policies/eurydice/content/historical-development-54_en

Eurydice. (2019b). Norway overview. Retrieved from https://eacea.ec.europa.eu/national-policies/eurydice/content/norway_en

Everhard, C. J. (2013). Exploring a model of autonomy to live, learn and teach. In A. Burkert, L. Dam, & C. Ludwig (Eds.), *The answer is autonomy: Issues in language teaching and learning* (pp. n.p.). Kent: IATEFL.

Fuchs, C. (2017). Learner autonomy in beginning language MOOCs (LMOOCs): The student teachers' perspective. In M. Cappelini, T. Lewis, & A. R. Mompean (Eds.), *Learner autonomy and Web 2.0* (pp. 168-197). Sheffield: Equinox.

Herrington, J. & Parker, J. (2013). Emerging technologies as cognitive tools for authentic learning. *British Journal of Educational Technology, 44*(4), 607-615.

Gallagher, K., & Porock, D. (2010). The use of interviews in Q methodology. *Nursing Research, 59*(4), 295-300.

Garrison, R. (2000). Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues. *The International Review of Research in Open and Distributed Learning, 1*(1), n.p. doi:10.19173/irrodl.v1i1.2

Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston; London: Houghton Mifflin.

Gibson, J. J. (1982). *Reasons for realism : Selected essays of James J. Gibson*. Hillsdale, N.J.: Hillsdale, N.J. : L. Erlbaum, 1982.

Goldman, I. (1999). Q methodology as process and context in interpretivism, communication, and psychoanalytic psychotherapy research. *The Psychological Record, 49*(4), 589-604. doi:10.1007/bf03395329

Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L., & Freynik, S. (2014). Technologies for foreign language learning: A review of technology types and their effectiveness. *Computer Assisted Language Learning, 27*(1), 70-105. doi:10.1080/09588221.2012.700315

Gonulal, T. (2019). The use of Instagram as a mobile-assisted language learning tool. *Contemporary Educational Technology, 10*(3), 309-323. doi.org/10.30935/cet.590108

Google for Education. (n.d.). *Training*. Retrieved from https://teachercenter.withgoogle.com/training.

Gray, L. (2018). Exploring how and why young people use social networking sites. *Educational Psychology in Practice, 34*(2), 175-194. doi: 10.1080/02667363.2018.1425829

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). Thousand Oaks: SAGE.

Gupta, S. (2017). Ethical issues in designing internet-based research: Recommendations for good practice. *Journal of Research Practice, 13*(2), 1-14.

Hafner, C. A., Chik, A. & Jones, R. H. (2015). Digital literacies and language learning. *Language Learning & Technology, 19(*3), 1-7.

Haglund, L. (2018). *Norwegian upper secondary EFL teachers' attitudes, knowledge and beliefs about learner autonomy.* (Thesis (Master's)), University of Bergen, Available from BORA-UIB (http://bora.uib.no/handle/1956/17706)

Hamilton, M. (2013). *Autonomy and foreign language learning in a virtual learning environment*. London, New York: Bloomsbury Academic.

Hattem, D. (2014). Microblogging activities: Language play and tool transformation. *Language Learning & Technology, 18*(2), 151-174.

Harper, D. (2002). Talking about pictures: A case for photo elicitation. *Visual Studies, 17*(1), 13--26.

Heft, H. (1989). Affordances and the body: An intentional analysis of Gibson's ecological approach to visual Perception. *Journal for the Theory of Social Behaviour, 19*(1), 1-30. doi:10.1111/j.1468-5914.1989.tb00133.x

Herold, B. (2016). K-12 digital citizenship initiative will target state legislators. *Education Week, 36*(11), 1–13.

Herrington, J., & Parker, J. (2013). Emerging technologies as cognitive tools for authentic learning. *British Journal of Educational Technology, 44*(4), 607-615.

Hill, K. (2014). *Understanding and preventing alcohol misuse in young people: Affordances and an ecological approach to cognition.* (Thesis (Ph.D.)), Oxford Brookes University, Available from British Library EThOS Thesis Database (uk.bl.ethos.644590)

Holec, H. (1981). *Autonomy and foreign language learning*. Oxford: Pergamon.

Huang, J. (2009). Autonomy, agency and identity in foreign language learning and teaching.

Hutchby, I. (2001). Technologies, texts and affordances. *Sociology, 35*(2), 441--456. doi:10.1177/S0038038501000219

Internet World Stats. (n.d.). Most common languages used on the internet as of December 2017, by share of internet users. *Statista - The Statistics Portal.* Statista - The Statistics Portal. Retrieved from https://www.statista.com/statistics/262946/share-of-the-most-common-languages-on-the-internet/.

Jiménez, R. M., & Vieira, F. (2015). *Enhancing autonomy in language education: A case-based approach to teacher and learner development*. Berlin; Boston: De Gruyter.

Jitpaisarnwattana, N. (2018). Fostering learner autonomy in foreign language classroom: A digital storytelling project. *Journal of Foreign Language Education and Technology, 3(2),* 136-160.

Kaplowitz, M. D., Hadlock, T. D., & Levine, R. (2000). A comparison of Web and mail survey response rates. *Public Opinion Quarterly, 68*(1), 94-101. doi:10.1093/poq/nfh006

Karaoz, I. (2013). *An investigation of of students' and lecturers' attitudes towards online learning in professional English course in a vocational school of a university in Turkey.* (Thesis (Master's Thesis)), University of Reading, (unpublished).

Kinsey, D. F., & Kelly, T. C. (1989). Mixing methodologies: An aid in developing Q samples. *Operant Subjectivity, 12*, 98--102.

Kitchin, H. A. (2007). *Research ethics and the internet: Negotiating Canada's TriCouncil policy statement*. Halifax & Winnipeg, Canada: Fernwood.

Knaldre, H. (2015). *Learner autonomy promotion: A qualitative document analysis of two Norwegian national curricula.* (Thesis (Master of Philosophy)), University of Bergen, Available from BORA-UIB (http://bora.uib.no/handle/1956/10025).

Kondo, M., Ishikawa, Y., Smith, C., Sakamoto, K., Shimomura, H., & Wada, N. (2012). Mobile assisted language learning in university EFL courses in Japan: Developing attitudes and skills for self-regulated learning. *ReCALL, 24*(2), 169-187. doi:10.1017/S0958344012000055

Kusyk, M., & Sockett, G. (2012). From informal resource usage to incidental language acquisition: Language uptake from online television viewing in English. *ASp, 62*, 45-65. doi:10.4000/asp.3104

Laenen, F. V. (2015). Not just another focus group: Making the case for the nominal group technique in criminology. *Crime Science, 4*(1), 5. doi:10.1186/s40163-014-0016-z

Lai, C. (2017). *Autonomous language learning with technology beyond the classroom*. London; New York: Bloomsbury Academic.

Lai, C. & Gu, M. Y. (2011). Self-regulated out-of-class language learning with technology. *Computer-Assisted Language Learning, 24*, 317-335.

Le, Q. X. (2013). *Fostering learner autonomy in language learning in tertiary education: An intervention study of university students in Hochiminh City, Vietnam.* (Thesis (Ph.D.)), University of Nottingham, Available from British Library EThOS Thesis Database (uk.bl.ethos.580255)

Li, Y. R. (2013). *Informal learning in the Web 2.0 environment: how Chinese students who are learning English use Web 2.0 tools for informal learning.* (Thesis (Master's)), The University of Texas at Austin, Available from https://repositories.lib.utexas.edu/handle/2152/22681

Li, Y. & Ranieri, M. (2010). Are 'digital natives' really digitally competent? A study on Chinese teenagers. *British Journal of Educational Technology, 41*(6), 1029-1042.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, Calif.: Sage Publications.

List, A. (2019). Defining digital literacy development: An examination of pre-service teachers' beliefs. *Computers & Education, 138*, 146-158.

Little, D. (1991). *Learner autonomy: Definitions, issues and problems*. Dublin: Authentik.

Littlewood, W. T. (1996). Autonomy: An anatomy and a framework. *System, 24*(4), 427-435. doi:http://dx.doi.org/10.1016/S0346-251X(96)00039-5

Littlewood, W. T. (1999). Defining and developing autonomy in East Asian contexts. *Applied Linguistics, 20*(1), 71-94. doi:10.1093/applin/20.1.71

Llaven-Nucamendi, M.-E. (2009). *Autonomy in learning languages: What students, teachers and authorities in an institution of higher education understand by autonomy in language learning.* (Thesis (Ph.D.)), University of Essex, Available from British Library EThOS Thesis Database (uk.bl.ethos.499799)

Loewen, S., Crowther, D., Isbell, D., Kim, K., Maloney, J., Miller, Z., & Rawal, H. (2019). Mobile-assisted language learning: A Duolingo case study. *ReCALL, 31*(3), 293-311. doi:10.1017/S0958344019000065

Macaro, E. (1997). *Target language, collaborative learning and autonomy*. Clevedon: Multilingual Matters.

Macaro, E. (2008). The shifting dimensions of language learner autonomy. In T. E. Lamb & H. Reinders (Eds.), *Learner and teacher autonomy: Concepts, realities and responses* (pp. 43-62). Amsterdam: John Benjamins.

Macphail, A. (2001). Nominal group technique:a useful method for working with young people. *British Educational Research Journal, 27*(2), 161--170.

Manca, S., & Ranieri, M. (2014). Does Facebook provide educational value? An overview of theoretical and empirical advancements and critical issues. In G. Mallia (Ed.), *The social classroom: Integrating social network use in education* (pp. 312–338). Hershey: IGI Global. https://doi.org/10.4018/978-1-4666-4904-0.

Mason, R. (2001). Effective facilitation of online learning: The Open University experience. In J. Stephenson (Ed.), *Teaching and learning online, pedagogies for new technologies* (pp. 67-75). London; New York: Routledge Falmer.

Mattson, D. J., Clark, S. G., Byrd, K. L., Brown, S., & Robinson, B. (2011). Leaders' perspectives in the Yellowstone to Yukon conservation initiative. *Policy Sciences, 44*(2), 103--133. doi:10.1007/s11077-011-9127-5

Maxwell, J., & Brown, S. (1999). Identifying problems and generating solutions under conditions of conflict. *Operant Subjectivity, 23*, 31--51.

McKeown, B., & Thomas, D. (1988). *Q methodology: Quantitative applications in the social sciences*. Newbury Park; London; New Delhi SAGE Publications.

McKeown, B., & Thomas, D. (2013). *Q Methodology* (2nd ed.). Los Angeles; London: SAGE Publications.

Microsoft. (n.d.). *Microsoft digital literacy course*. Retrieved from https://www.microsoft.com/en-us/digitalliteracy/home.

Miller, A.M., Morgan, W.J. & Koronkiewicz, B. (2019). Like or tweet: Analysis of the use of Facebook and Twitter in the language classroom. *TechTrends, 63*, 550-558. doi.org/10.1007/s11528-018-0341-2

Mligo, E. S. (2016). *Introduction to research methods and report writing : a practical guide for students and researchers in social sciences and the humanities.* Eugene, Oregon: Resource Publications.

Muls, J., Thomas, V., De Backer, F., Zhu, C. & Lombaerts, K. (2020). Identifying the nature of social media policies in high schools. *Education and Information Technologies, 25*. 281-305. doi.org/10.1007/s10639-019-09971-7

Murray, G. (1999). Autonomy and language learning in a simulated environment. *System, 27*(3), 295-308. doi:10.1016/S0346-251X(99)00026-3

Murray, G. (2014). Autonomy in language learning as a social construct. In G. Murray (Ed.), *Social dimension of autonomy in languaeg learning* (pp. 233-249). Basingstoke; New York: Palgrave Macmillan.

Murray, G., & Fujishima, N. (2013). Social language learning spaces: Affordances in a community of learners. *Chinese Journal of Applied Linguistics, 36*(1), 141-157.

Murray, G., Fujishima, N., & Uzuka, M. (2014). The semiotics of place: Autonomy and space. In G. Murray (Ed.), *Social dimensions of autonomy in language learning* (pp. 81-99). Basingstoke; New York: Palgrave Macmillan.

Newby, P. (2014). *Research methods for education* (2nd ed.). Abingdon: Routledge.

Nina, A. (2015). Language learners perceptions and experiences on the use of mobile applications for independent language learning in higher education. *IAFOR Journal of Education, spec ed,* 73-84.

O'Leary, C. (2014). Developing autonomous language learning in HE: A social constructivist perspective. In G. Murray (Ed.), *Social dimensions of autonomy in language learning* (pp. 15). Basingstoke; New York: Palgrave Macmillan.

Opie, C. (2004). Research procedures. In C. Opie (Ed.), *Doing educational research* (pp. 95-129). London: SAGE Publications.

Oppenheim, A. N. (1992). *Questionnaire design, interviewing and attitude measurement*. London: Pinter.

Osborne, R. (2014). *An ecological approach to educational technology: Affordance as a design tool for aligning pedagogy and technology.* (Thesis (Ph.D.)), University of Exeter, Available from British Library EThOS Thesis Database (uk.bl.ethos.676315)

Oxford, R. L. (2008). Hero with a thousand faces: Learner autonomy, learning strategies and learning tactics in independent language learning. In S. Hurd & T. Lewis (Eds.), *Language learning strategies in independent settings* (pp. 41-63). New York: Multilingual Matters.

Palfreyman, D. M. (2014). The ecology of learner autonomy. In G. Murray (Ed.), *Social dimensions of autonomy in language learning* (pp. 175-191). Basingstoke; New York: Palgrave Macmillan.

Parchoma, G. (2014). The contested ontology of affordances: Implications for researching technological affordances for collaborative knowledge production. *Computers in Human Behavior, 37*, 360--368. doi:10.1016/j.chb.2012.05.028

Porter, J. (2013). Be careful how you ask! Using focus groups and nominal group technique to expore the barriers to learning. *International Journal of Research and Method in Education, 36*(1), 33--51.

Potter, M., Gordon, S., & Hamer, P. (2004). The nominal group technique: A useful consensus methodology in physiotherapy research. *New Zealand Journal of Physiotherapy, 32*, 126--130.

Pring, R. (2015). *Philosophy of educational research* (3rd ed.). London: Bloomsbury.

Prosser, J. (2011). Visual methodology: Toward a more seeing research. In N. K. Denzin & S. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 479--496). Thousand Oaks, California; London: SAGE Publications.

Punch, K. (2005) Introduction to Social Research: Quantitative and qualitative approaches, 2nd edition. London: Sage.

Ramlo, S., & Newman, I. (2011). Q methodology and its position in the mixed methods continuum. *Operant Subjectivity, 34*, 173-192. doi:10.15133/j.os.2010.009

Ramlo, S. (2016). Mixed method lessons learned from 80 years of Q methodology. *Journal of Mixed Methods Research, 10*(1), 28-45. doi:10.1177/1558689815610998

Reinders, H. (2006). Supporting self-directed learning through an electronic learning environment. In T. Lamb & H. Reinders (Eds.), *Supporting independent learning: Issues and interventions* (pp. 219-238). Frankfurt: Peter Lang.

Reinders, H., & Hubbard, P. (2013). CALL and learner autonomy: Affordances and constraints. In M. Thomas, H. Reinders, & M. Warschauer (Eds.), *Contemporary computer-assisted language learning* (pp. 328-342). London.; New York: Bloomsbury Academic.

Reinders, H., & White, C. (2011). Learner autonomy and new learning environments. *Language Learning & Technology, 15*(3), 1-3.

Reinders, H., & White, C. (2016). 20 years of autonomy and technology: How far have we come and where to next? *Language Learning & Technology, 20*(2), 143-154.

Richards, J. C. (2015). The changing face of language learning: Learning beyond the classroom. *RELC Journal, 46*(1), 5-22. doi:10.1177/0033688214561621

Riley, P., & Zoppis, C. (1985). The sound and video library. In P. Riley (Ed.), *Discourse and Learning* (pp. 286--298). Harlow; Essex: Longman.

Sanprasert, N. (2010). The application of a course management system to enhance autonomy in learning English as a foreign language. *System, 38*(1), 109-123.

Schmenk, B. C. F. p. d. M. (2005). Globalizing learner autonomy. *TESOL Quarterly, 39*(1), 107-118.

Schwienhorst, K. (2008). *Learner autonomy and CALL environments*. New York; London: Routledge.

Selwyn, N. (2017). *Education and technology: Key issues and debates* (2nd ed.). New York: Bloomsbury Academic.

Shadiev, R., Hwang, W. & Liu, T. (2018). Investigating the effectiveness of a learning activity supported by a mobile multimedia learning system to enhance autonomous EFL learning in authentic contexts. *Educational Technology Research and Development, 66*, 893–912. doi.org/10.1007/s11423-018-9590-1

Sharp, J. (2012). Conversations with a purpose: research interviews. In *Study Skills in Education Series: Success with your education research project* (pp. 73-82). 55 City Road, London: SAGE Publications, Inc. doi: 10.4135/9781526435811.n6

Steel, C. H., & Levy, M. (2013). Language students and their technologies: Charting the evolution 2006–2011. *ReCALL, 25*(03), 306-320. doi:10.1017/S0958344013000128

Stenner, P., Cooper, D., & Skevington, S. M. (2003). Putting the Q into quality of life; the identification of subjective constructions of health-related quality of life using Q methodology. *Social Science & Medicine, 57*(11), 2161-2172. doi:https://doi.org/10.1016/S0277-9536(03)00070-4

Stenner, P., & Stainton-Rogers, R. (2004). Q methodology and qualiquantology: The example of discriminating between emotions. In Z. Todd, B. Nerlich, S. McKeown, & D. D. Clarke (Eds.), *Mixing methods in psychology* (pp. 99-118). Hove, NY: Psychology Press.

Stenner, P., Watts, S., & Worrell, M. (2008). Q methodology. In C. Willig & W. Stainton-Rogers (Eds.), *The SAGE handbook of qualitative research in psychology* (Second edition. ed., pp. 212-237). London ; Thousand Oaks, California: SAGE Publications Ltd.

Stephenson, W. (1936). The inverted factor technique. *British Journal of Psychology (General Section), 26*(4), 344-361. doi:doi:10.1111/j.2044-8295.1936.tb00803.x

Stephenson, W. (1952). Q-methodology and the projective techniques. *8*(3), 219-229. doi:doi:10.1002/1097-4679(195207)8:3<219::AID-JCLP2270080302>3.0.CO;2-J

Stephenson, W. (1968). Perspectives in Psychology: XXVI consciousness out—subjectivity in. *The Psychological Record, 18*(4), 499-501. doi:10.1007/bf03393799

Stephenson, W. (1986). Protoconcursus: The concourse of theory of communication. *Operant Subjectivity, 9*(2), 37-58.

Stephenson, W. (2014). General theory of communication. *Operant Subjectivity: The International Journal of Q Methodology 37*(3), 38-56. doi:DOI: 10.15133/j.os.2014.011

Stockwell, G. (2012). Mobile-assisted language learning. In M. Thomas, H. Reinders, & M. Warschauer (Eds.), *Contemporary computer-assisted language learning* (pp. 201-216). London: Bloomsbury Academic.

Suvorov, R., & Cabello, A. C. (2017). Development of language learner autonomy in adaptive learning systems. In M. Cappellini, T. Lewis, & A. R. Mompean (Eds.), *Learner autonomy and Web 2.0* (pp. 36-66). Sheffield; Bristol: Equinox Publishing.

Tashakkori, A. & Teddlie, C. (2009). *Foundations of mixed methods research Integrating quantitative and qualitative approaches in the social and behavioral sciences.* Thousand Oaks, CA: SAGE.

Tassinari, M. G. (2012). Evaluating learner autonomy: A dynamic model with descriptors. *Studies in Self-Access Learning Journal, 3*(1), 24-40.

Teng, F. (2018). A learner-based approach of applying online reading to improve learner autonomy and lexical knowledge. *Spanish Journal of Applied Linguistics, 31*(1), 94-123.

The International Society for Technology in Education. (2019). *ISTE standards for students*. Retrieved from https://www.iste.org/standards/for-students.

Thomas, G. (2011) A typology for the case study in social science following a definition, discourse and structure. *Qualitative Inquiry,* 17 (6), 511-521.

Tight, M., (2016). Case study research. In Wyse, D., Selwyn, N., Smith, E., & Suter, L. E. (Eds.), *The BERA/SAGE handbook of educational research* (pp. 376-394). London:SAGE Publications

Toffoli, D., & Perrot, L. (2017). Autonomy, the online informal learning of English (OILE), and learning resource centers (LRCs): Relationships between learner autonomy, L2 proficiency, L2 autonomy and digital literacy. In M. Cappelini, T. Lewis, & A. R. Mompean (Eds.), *Learner autonomy and Web 2.0* (pp. 198-228). Sheffield: Equinox.

Toffoli, D., & Sockett, G. (2015). University teachers' perceptions of online informal learning of English (OILE). *Computer Assisted Language Learning, 28*(1), 7-21. doi:10.1080/09588221.2013.776970

Trebbi, T. (2008). Language learner autonomy in a Norwegian context. In J. Miliander & T. Trebbi (Eds.), *Educational policies and language learner autonomy in schools: A new direction in language education* (pp. 40-52). Dublin: Authentik.

Utdannings-direktoratet. (2019). Videregående opplæring. Retrieved from https://www.udir.no/utdanningslopet/videregaende-opplaring/#114502

Punch, K. F. (2005). *Introduction to social research: Quantitative and qualitative approaches* (Second ed.). London: Sage.

Tight, M. (2016). Case study research. In D. Wyse, N. Selwyn, E. Smith & L. E. Suter (Eds.), *The BERA/SAGE handbook of educational research* (pp. 376-394). London:SAGE Publications.

Thomas, G. (2011). A typology for the case study in social science following a definition, discourse and structure. *Qualitative Inquiry*, *17* (6), 511– 521.

Act relating to Primary and Secondary Education and Training (the Education Act). (1998). No. 61. Retrieved from https://lovdata.no/dokument/NLE/lov/1998-07-17-61

Utdannings-direktoratet. (2011a). *Core Curriculum*. Retrieved from https://www.udir.no/globalassets/filer/lareplan/generell-del/core_curriculum_english.pdf

Utdannings-direktoratet. (2011b). *Quality framework.* Retrieved from https://www.udir.no/globalassets/upload/larerplaner/fastsatte_lareplaner_for_kunnskapsloeftet/5/prinsipper_lk06_eng.pdf

Utdannings-direktoratet. (2013). *English subject curriculum*. Retrieved from https://www.udir.no/kl06/ENG1-03

Utdannings-direktoratet. (2019). *Subject and hourly distribution*. Retrieved from https://www.udir.no/regelverkstolkninger/opplaring/Innhold-i-opplaringen/udir-1-2019/

van Exel, J., & de Graaf, G. (2005). *Q methodology: A sneak preview*. Retrieved from

https://qmethodblog.files.wordpress.com/2016/01/qmethodologyasneakpreviewreferenceupdate.pdf

Vestvik, M. (2020). *Learner autonomy in the Norwegian EFL classroom: A study of high school teachers' facilitation of learner autonomy.* (Thesis (Master's)), University of Bergen, Available from BORA-UIB (http://bora.uib.no/bitstream/handle/1956/22518/VestvikM_MA_Thesis.pdf?sequence=1&isAllowed=y)

Vázquez, B. M. (2016). Learner autonomy as a defensible educational goal in modern language education. *Journal of English and Spanish Studies, 2*(1), 90-106.

Wall, S. (2003). Freedom as a political ideal. In E. Frankel, F. D. Paul, & J. Miller (Eds.), *Autonomy* (pp. 307-334). Cambridge: Cambridge University Press.

Wang, Y.-H., & Liao, H.-C. (2011). Adaptive learning for ESL based on computation. *British Journal of Educational Technology, 42*(1), 66-87.

Waring, M. (2017). Finding your theoretical position. In R. Coe, M. Waring, L. V. Hedges, & J. Arthur (Eds.), *Research methods and methodologies in education* (pp. 15-22). London: Sage.

Warschauer, M., & Healey, D. (1998). Computers and language learning: An overview. *Language Teaching, 31*(2), 57-71.

Watts, S., & Stenner, P. (2005). Doing Q methodology: Theory, method and interpretation. *Qualitative Research in Psychology, 2*(1), 67-91. doi:10.1191/1478088705qp022oa

Watts, S., & Stenner, P. (2012). *Doing Q methodological research: Theory, method and interpretation*. London: SAGE.

Wegerif, R. (2002). *Literature review in thinking skills, technology and learning* (2). Retrieved from https://www.nfer.ac.uk/media/1838/futl75.pdf

Winke, P., & Goertler, S. (2008). Did we forget someone? Students' computer access and literacy for CALL. *CALICO, 25*(3), 482-509.

Winke, P., Goertler, S., & Amuzie, G. L. (2010). Commonly taught and less commonly taught language learners: Are they equally prepared for CALL and online language learning? *Computer Assisted Language Learning, 23*(3), 199-219. doi:10.1080/09588221.2010.486576

Wint, F. (2013). *"Am I bothered?" Using Q-methodology to explore what bothers young people on Facebook.* (Thesis Ph.D.)), University of Sheffield.

Zhang, S. (2016). Mobile English learning: An empirical study on an APP, English fun dubbing. *International Journal of Emerging Technologies in Learning, 11*(12), 4-8.

Appendices

Appendix A.1 Ethical approval from ethics committee

University of Reading

Institute of Education

Ethical Approval Form A (version May 2015)

Tick one: Staff project: _____ PhD _X_ EdD ____

Name of applicant (s): Ismail Karaoz

Title of project: The affordances offered by technology in second/foreign language learning with respect to learner autonomy

Name of supervisor (for student projects): Dr. Berry Billingsley, Dr. Geoff Taggart

Please complete the form below including relevant sections overleaf.

	YES	NO
Have you prepared an Information Sheet for participants and/or their parents/careers that:	x	
a) explains the purpose(s) of the project	x	
b) explains how they have been selected as potential participants	X	
c) gives a full, fair and clear account of what will be asked of them and how the information that they provide will be used	X	
d) makes clear that participation in the project is voluntary	X	
e) explains the arrangements to allow participants to withdraw at any stage if they wish	x	
f) explains the arrangements to ensure the confidentiality of any material collected during the project, including secure arrangements for its storage, retention and disposal	x	
g) explains the arrangements for publishing the research results and, if confidentiality might be affected, for obtaining written consent for this	x	
h) explains the arrangements for providing participants with the research results if they wish to have them	x	
i) gives the name and designation of the member of staff with responsibility for the project together with contact details, including email . If any of the project investigators are students at the IoE, then this information must be included and their name provided	x	
k) explains, where applicable, the arrangements for expenses and other payments to be made to the participants	N/A	
j) includes a standard statement indicating the process of ethical review at the University undergone by the project, as follows: 'This project has been reviewed following the procedures of the University Research Ethics Committee and has been given a favourable ethical opinion for conduct'.	x	

1

k)includes a standard statement regarding insurance: "The University has the appropriate insurances in place. Full details are available on request".	x		
Please answer the following questions			
1) Will you provide participants involved in your research with all the information necessary to ensure that they are fully informed and not in any way deceived or misled as to the purpose(s) and nature of the research? (Please use the subheadings used in the example information sheets on blackboard to ensure this).	x		
2) Will you seek written or other formal consent from all participants, if they are able to provide it, in addition to (1)?	x		
3) Is there any risk that participants may experience physical or psychological distress in taking part in your research?		x	
4) Have you taken the online training modules in data protection and information security (which can be found here: http://www.reading.ac.uk/internal/imps/Staffpages/imps-training.aspx)?	x		
5) Have you read the Health and Safety booklet (available on Blackboard) and completed a Risk Assessment Form to be included with this ethics application?	x		
6) Does your research comply with the University's Code of Good Practice in Research?	x		
	YES	NO	N.A.
7) If your research is taking place in a school, have you prepared an information sheet and consent form to gain the permission in writing of the head teacher or other relevant supervisory professional?	X		
8) Has the data collector obtained satisfactory DBS clearance?	X		
9) If your research involves working with children under the age of 16 (or those whose special educational needs mean they are unable to give informed consent), have you prepared an information sheet and consent form for parents/carers to seek permission in writing, or to give parents/carers the opportunity to decline consent?			X
10) If your research involves processing sensitive personal data[1], or if it involves audio/video recordings, have you obtained the explicit consent of participants/parents?	X		
11) If you are using a data processor to subcontract any part of your research, have you got a written contract with that contractor which (a)			X

[1] Sensitive personal data consists of information relating to the racial or ethnic origin of a data subject, their political opinions, religious beliefs, trade union membership, sexual life, physical or mental health or condition, or criminal offences or record.

specifies that the contractor is required to act only on your instructions, and (b) provides for appropriate technical and organisational security measures to protect the data?			
12a) Does your research involve data collection outside the UK?	X		
12b) If the answer to question 12a is "yes", does your research comply with the legal and ethical requirements for doing research in that country?	X		
13a) Does your research involve collecting data in a language other than English?		X	
13b) If the answer to question 13a is "yes", please confirm that information sheets, consent forms, and research instruments, where appropriate, have been directly translated from the English versions submitted with this application.			X
14a. Does the proposed research involve children under the age of 5?		X	
14b. If the answer to question 14a is "yes": My Head of School (or authorised Head of Department) has given details of the proposed research to the University's insurance officer, and the research will not proceed until I have confirmation that insurance cover is in place.			X
If you have answered YES to Question 3, please complete Section B below			

Please complete **either** Section A **or** Section B and provide the details required in support of your application. Sign the form (Section C) then submit it with all relevant attachments (e.g. information sheets, consent forms, tests, questionnaires, interview schedules) to the Institute's Ethics Committee for consideration. Any missing information will result in the form being returned to you.

A: My research goes beyond the 'accepted custom and practice of teaching' but I consider that this project has **no** significant ethical implications. (Please tick the box.)	X

Please state the total number of participants that will be involved in the project and give a breakdown of how many there are in each category e.g. teachers, parents, pupils etc.

Total Number of Participants: 250 students from English as a Foreign Language course in a secondary school in the south of Norway. They are above the age of 16. This is the only participant category for my research.

Data Collection Procedure will involve:

1. Questionnaire about the use of technology with 250 students

2. Photo Elicitation Interviews

2.1. One-to-one interview with 20 students

2.2. Nominal Group Technique with 8 students from 3 second/foreign language classes, so 24 students

3. Q-Sorting and follow-up interview with 40 students

Participants for Photo-Elicitation Interviews and Q-Sorting will be selected among the participants of Technology-Use Questionnaire.

Give a brief description of the aims and the methods (participants, instruments and procedures) of the project in up to 200 words noting:

Title of project: The affordances of technology in second/foreign language learning for learner autonomy

Purpose of project and its academic rationale: Learner autonomy has gained interest and importance in second/foreign language learning due to the reasons such as enabling learners to take greater control over their learning and maintaining their learning even when they are not learning with a teacher. Thus, there have been attempts to foster learner autonomy among students and one of these attempts has come into prominence with technology-based practices. It was seen that technology has the potential to provide opportunities for learner autonomy, but it has also been argued that mere presence of technological devices and their use for personal needs, particularly beyond the classroom environment, do not necessarily result in learner autonomy in language learning. Thus, it is necessary that we have a clearer understanding about the nature of the relationship between technology and autonomy in order to better design technology-based practices in language education, and this research aims to find out what affordances technology offers in second/foreign language learning with respect to learner autonomy by using Q methodology.

Brief description of methods and measurements:

This research uses Q-Methodology. In Q-Methodology, data collection procedure starts with building *concourse* (which refers to 'any discourse surrounding the subjective viewpoints, perceptions and beliefs about a topic), and it ends with *Q-sorting* and follow-up interview. Within this procedure, data will be collected in the following order:

1. Questionnaire about use of technology (250 students): This questionnaire comprises of a list of digital technologies, and asks students which, if any, of them they use. It also asks information about their age, gender, what language course they study and contact details if they want to volunteer for further interviews.

2. Photo Elicitation Interviews: Both interviews in this category comprises of images sampled from the Technology Use Questionnaire to supplement the interviews. The participants who will be selected from the questionnaire will be asked "Are you familiar with the devices and media on these images; Is there any of them you use; If there is any, can you tell me for what purposes do you mostly use them; Is there any of them you use to help you learn your foreign/second language?"

2.1. One-to-one interview (20 students)

2.2. Nominal Group Technique (8 students x 3 second/foreign language classes, so 24 students)

One-to-one interviews will be audio-recorded and they will be transcribed for further data analysis. For Nominal Group Technique Interview, there will not be a audio-recording, but participants' viewpoints will be recorded on a flip chart and flip chart papers will be collected at the end of each session.

3. Q-Sorting and follow-up interview (40 students): Onto a grid, participants sort or arrange small pieces of cards on which viewpoints about the affordances of technology will have been written. It will be followed by an interview with each participant. These interviews will also be audio-recorded and transcribed for data analysis. These viewpoints will be derived from the photo-elicitation interviews and the relevant literature. Participants will once again be selected among the Technology-Use Questionnaire on a voluntary basis. If they wish, interview participants can also participate again.

Participants:

Recruitment methods: Participants will be recruited from the course of English as a Foreign Language in a secondary school in the south of Norway.

Number: 250 students in total.

Age: 16 and over

Gender: Any gender

Exclusion/inclusion criteria: For Technology-Use Questionnaire, there is no exclusion as long as they are studying in one of the English Language courses and they are willing to participate. For Interviews and Q-Sorting, participants will be selected purposefully based on their answers in Technology-Use Questionnaire.

Consent and participant information arrangements, debriefing (attach forms where necessary): Please see the information and consent forms for School Principal and Students (prepared separately for Questionnaire about use of technology, Photo Elicitation Interviews and Q-Sorting and follow-up interviews).

A clear and concise statement of the ethical considerations raised by the project and how you intend to deal with them: This research will provide full confidentiality for the participants.

Estimated start date and duration of project: Estimated date is 20 February 2016, and it is expected to finish by June 2016.

B: I consider that this project **may** have ethical implications that should be brought before the Institute's Ethics Committee.	N/A

Please state the total number of participants that will be involved in the project and give a breakdown of how many there are in each category e.g. teachers, parents, pupils etc.

Give a brief description of the aims and the methods (participants, instruments and procedures) of the project in up to 200 words.

title of project

purpose of project and its academic rationale

brief description of methods and measurements

participants: recruitment methods, number, age, gender, exclusion/inclusion criteria

consent and participant information arrangements, debriefing (attach forms where necessary)

a clear and concise statement of the ethical considerations raised by the project and how you intend to deal with then.

estimated start date and duration of project

B: SIGNATURE OF APPLICANT:

I have read the Heath and Safety booklet posted on Blackboard, and the guidelines overleaf.

I have declared all relevant information regarding my proposed project and confirm risks have been adequately assessed and will be minimised as far as possible during the course of the project.

Signed: [redacted] Print Name: Ismail Karaoz Date: 16.10.2015

STATEMENT OF APPROVAL TO BE COMPLETED BY SUPERVISOR (FOR UG AND MA STUDENTS) **OR** BY IOE ETHICS COMMITTEE REPRESENTATIVE (FOR PGR AND STAFF RESEARCH).

This project has been considered using agreed Institute procedures and is now approved.

Signed: [redacted] Print Name Andy Kempe Date 22.10.15

* A decision to allow a project to proceed is not an expert assessment of its content or of the possible risks involved in the investigation, nor does it detract in any way from the ultimate responsibility which students/investigators must themselves have for these matters. Approval is granted on the basis of the information declared by the applicant.

Guidance notes for the completion of the risk assessment form

Significant hazards:

- Only list those that you could reasonably expect to cause significant injuries or affect several people
- Will the work require the use of machines and tools? How could you or anyone else be injured? Will injury be significant?
- Will the research take place in a high-risk country?
- Will the work require the use of chemicals? Check safety data sheets for harmful effects and any exposure limits?
- Will the work produce any fumes, vapours, dust or particles? Can they cause significant harm?
- Are there any significant hazards due to where the work is to be done, such as confined space, at height, poor lighting, high/low temperature?

Who might be exposed?

- Remember to include yourself, your supervisor, your participants, others working in or passing through the work area.
- Those more vulnerable or less experiences should be highlighted as they will be more at risk, such as children, people unfamiliar with the work area, disabled or with medical conditions e.g. asthma.

Existing control measures:

- List the control measures in place for each of the significant hazards, such as machine guards, ventilation system, use of personal protective equipment (PPE), generic safety method statement/procedure.
- existing safety measures and procedures in place in the establishment
- Remember appropriate training is a control measure and should be listed.
- List any Permits to Work which may be in force.

Are risks adequately controlled?

- With all the existing control measures in place, do any of the significant hazards still have a potential to cause significant harm.
- Use your judgement as to how the work is to be done, by whom and where.

Additional controls:

- List the additional control measures, for each of the significant hazards, which are required to reduce the risk to the lowest so far as is reasonably practicable.
- Additional measures may include such things as: increased ventilation, Permit to Work, confined space entry permit, barriers/fencing, fall arrest equipment, etc.
- PPE should only be used as a last resort, if all else fails.

Appendix A.2 Ethical approval- amendment

Dear Research Ethics Committee,

I would like to extend my data collection site to a secondary school abroad in Norway. For this reason, I would like to submit the changes in the following table to your consideration. My application was approved in 22.10.2015 and these are the changes I have made on my approved Ethical Approval.

Yours Sincerely,

Ismail Karaoz

	Ethical Approval Form A (Version May 2015)	
What part is changed in the application?	**Approved Version**	**Amended Version**
12a)Does your research involve data collection outside the UK?	No- *Planned to be in south of England*	Yes- *To do data collection in Norway.*
12b) If the answer to question 12a is "yes", does your research comply with the legal and ethical requirements for doing research in that country?	N/A	Yes

Total Number of Participants (p.3)	100	250
Kind of school	Further Education College in the south of England	Secondary School in the south of Norway
Minimum Age of the participants	18	16
The name for "Head of Institutions"	College Principal	School Principal
Why has this school been chosen to take part?	Following our previous correspondence via e-mail, you allowed me to discuss my research proposal with you and you showed an interest to take a part in this research. Additionally, you offer courses of English as a foreign language. What is more important for the scope of this research, your college is among the colleges which expects students to become more autonomous according to the 2014-2018 Strategy Plan and has been shortlisted by TES Further Education Awards within the category of "Outstanding Use of Technology in FE [Further Education]".	Following our previous correspondence via e-mail, you allowed me to discuss my research proposal with you and you showed an interest to take a part in this research. Additionally, you offer courses of English as a foreign language. What is more important for the scope of this research, your school is famous with use of technology for learning.
Why have you been chosen to take part?	Following our previous correspondence via e-mail, you allowed me to discuss my research proposal with you and you showed an interest to take a part in this research. Additionally, you offer courses of English as a foreign	Following our previous correspondence via e-mail, your school kindly allowed me to conduct my research in your school. Additionally, you are registered as a student in English as a foreign language. What is more important for the

	language. What is more important for the scope of this research, your college is among the colleges which expects students to become more autonomous according to the 2014-2018 Strategy Plan and has been shortlisted by TES Further Education Awards within the category of "Outstanding Use of Technology in FE [Further Education]".	scope of this research, your school and students are known for efficient use of technology for learning. Thus, I have thought that students in your school can be informants for my project and that is the reason for I contacted you.

Approved. 21.2.16

[redacted]

Prof. Andy Kempe

Appendix A.3 Ethical approval-Norway

Fra: Ismail Karaoz <I.Karaoz@pgr.reading.ac.uk>
Dato: 17. februar 2016 kl. 11.55.49 CET
Til: "post@etikkom.no" <post@etikkom.no>, "[redacted]@etikkom.no" <[redacted]@etikkom.no>
Emne: research ethic from abroad

Dear Sir/Madam,
I am a research student from University of Reading in England. I am doing my PhD research and I would like to collect data at a secondary school in Norway. I have full ethical approval from the Ethics Committee of my university, but I wanted to check whether I need an ethical approval from the The Norwegian National Research Ethics Committee prior to my research.
As far as I can understand my ethical approval also meets the standards in Guidelines for ethics on your website. Our university also follow similar rules on data collection, protection and privacy.
So I am writing this email to ask whether I, as a PhD research student, will need to submit my research to the committee before I can start my research.

NB: I cite from your website that:

"Obtaining advice prior to a research project is not mandatory, but researchers are encouraged to contact the committee if the project is considered to present challenges in terms of research ethics (see General guidelines for research ethics and Guidelines for research ethics in the social sciences, humanities, law and theology).

I evaluated my research in comparison to these guidelines and it does not present any challenges in terms of research ethics.

Best regards

Ismail Karaoz
Institute of Education,
University of Reading

From: [redacted]
Subject: SV: research ethic from abroad
Date: 17 February 2016 at 17:30
To: I.Karaoz@pgr.reading.ac.uk

VE

Dear Ismail Karaoz,

Thank you for the request. You are right: It is the obligation of the host institution (and host nation) to provide sufficient ethical approval for research projects also when conducted in other countries. Hence, you do not need an ethical approval from us.

However, as you will collect data in Norway, including from children (?), I suggest you contact the Norwegian Data Protection Official of Research to make sure your project is within the legal framework in Norway. http://www.nsd.uib.no/personvern/en/index.html

With regards,

[redacted]nD

Director
The National Committee for Research Ethics in the Social Sciences and the Humanities /
The National Committee for Research Ethics on Human Remains

The National Committees for Research Ethics in Norway
Kongens gate 14, 0153 Oslo
+47 23 31 83 02 / +47 92 20 12 74
http://www.etikkom.no

From: [redacted]
Sent: 27 October 2015 11:25
To: Ismail Karaoz
Subject: Consent Application from England/UK

Dear Ismail

If the data controller is established in an EEA country, it is sufficient to submit a notification of the project to the relevant authorities in the country concerned. It the data controller is located in a country outside the EEA, the notification must be submitted in Norway by a Norwegian institution that undertakes the role of the data controller's representative.

Best regards,

--
Vennlig hilsen

[redacted]
Seniorrådgiver

Norsk samfunnsvitenskapelig datatjeneste AS
(Norwegian Social Sciences Data Services)
Personvernombud for forskning
Harald Hårfagres gate 29, 5007 BERGEN

Tlf. direkte: (+47) 55 58 89 26
Tlf. sentral: (+47) 55 58 81 80
Faks: (+47) 55 58 96 50
E-post: [redacted]@nsd.uib.no
Internettadresse: www.nsd.uib.no/personvern

Appendix A.4 School head teacher consent

University of Reading

Supervisor: Dr. Berry Billingsley
Tel:(0) 118 378 2655
Email: b.billingsley@reading.ac.uk

Supervisor: Dr. Geoff Taggart
Tel:(0) 118 378 2643
Email: g.taggart@reading.ac.uk

Research Student: Ismail Karaoz
Tel: 0755 280 7687
Email:i.karaoz@pgr.reading.ac.uk

SCHOOL HEAD TEACHER CONSENT FORM

Research Project: The affordances offered by technology in second/foreign language learning with respect to learner autonomy

Please circle as appropriate:

- I have read the Information Sheet about the project and received a copy of it.

  Yes / No
- I understand what the purpose of the project is and what is required of me. All my questions have been answered.

  Yes / No
- I consent to the involvement of my school in the project as outlined in the Information Sheet.

  Yes / No

Name and Surname of the Head Teacher: [redacted]

Name of the school: [redacted]

Signed: .....

Date: 05.03.2016

Appendix A.5 Student information sheet for one-to-one interview

Research Project: **The affordances offered by technology in second/foreign language learning with respect to learner autonomy**

Principal Researcher: **Mr. Ismail Karaoz**

Dear Student,

I am writing to invite you to take part in a research study about exploring what opportunities the technology offers with respect to learner autonomy in second/foreign language learning.

What is the study?

Learner autonomy has gained interest and importance in second/foreign language learning due to the reasons such as enabling learners to take greater control over their learning and maintaining their learning even when they are not learning with a teacher. Thus, there have also been attempts to foster learner autonomy among students and one of these attempts has come into prominence with technology-based practices. It has been seen that technology has the potential to provide opportunities for learner autonomy, but it has also been argued that mere presence of technological devices and their use for personal needs, particularly beyond the classroom environment, do not necessarily result in learner autonomy in language learning. Thus, it is necessary that we have a clearer understanding about the nature of the relationship between technology and autonomy in order to better design technology-based practices in language education, and this research aims to find out what opportunities the technology offers with respect to learner autonomy.

The term *learner autonomy* in this research project basically refers to a language learner's taking control over his/her learning, e.g. finding resources to help his/her learning and choosing when and where to study. With the term *technology,* technological tools such as smartphones, tablet PCs, and e-

readers, and media tools such as social networking applications, websites, and online dictionaries are referred.

Why have you been chosen to take part?

Following our previous correspondence via e-mail, your school kindly allowed me to conduct my research in your school. Additionally, you are registered as a student in English as a foreign language. What is more important for the scope of this research, your school and students are known for efficient use of technology for learning. Thus, I have thought that students in your school can be informants for my project and that is the reason for I contacted you.

Do I have to take part?

It is entirely up to you whether you would like to participate or not. You may also withdraw your consent to participation at any time during the project, without any repercussions to you, by contacting the principal research student, Mr. Karaoz, via tel: [redacted], or email: i.karaoz@pgr.reading.ac.uk.

What will happen if I take part?

If you take part, I will ask you a set of semi-structured interview questions about how technology can help you in language learning and their relevancy to learner autonomy in language learning. This interview will be supplemented by sample images of technologies in order to elicit more information about the opportunities that technologies offer for learner autonomy. I will audio-record this interview with you. Then I will transcribe it for data analysis.

The questions that I will be asking you are as follow:

Are you familiar with the devices and media on these images?

Is there any of them you use?

If there is any, can you tell me for what purposes do you mostly use them?

Is there any of them you use to help you learn your foreign/second language?

What are the risks and benefits of taking part?

The information given by you in the study will remain confidential and only I will see it. You will not be identifiable in any published report resulting from the study. A summary of the findings of the study can be made available to you on your request by contacting me.

What will happen to the data?

Any data collected will be held in strict confidence and no real names will be used in this study or in any subsequent publications. All of the collected will be kept private. No identifiers linking you will be included in any sort of report that might be published. You will be assigned a code and will be referred to by that code in all records. Research records will be stored securely on a password-protected computer and only the researcher and my supervisors will have access to the records. The data will be destroyed securely once the findings of the study are written up, after five years. The results of the study may be presented at national and international conferences, and in written reports and articles.

Who has reviewed the study?

This project has been reviewed following the procedures of the University Research Ethics Committee and has been given a favorable ethical opinion for conduct. The University has the appropriate insurances in place. Full details are available on request.

What happens if I change my mind?

You can change your mind at any time without any repercussions. If you change your mind after data collection has ended, I will discard your data.

What happens if something goes wrong?

In the unlikely case of concern or complaint, you can contact me, or if your concern or complaint is about me, you can contact my research supervisors, Dr. Berry Billingsley and Dr. Geoff Taggart at Institute of Education, University of Reading, by the contact details provided at the top of this page.

Where can I get more information?

If you would like more information, please contact me, or my supervisors; Dr. Berry Billingsley and Dr. Geoff Taggart through the contact details provided at the top of this page.

What do I do next?

I do hope that you will agree to your participation in the study. If you do, please complete the attached consent form and we will start our interview.

Thank you for your time.

Appendix A.6 Student consent form for one-to-one interview

Research Project: The affordances of technology in second/foreign language learning for learner autonomy

Please circle as appropriate:

- I have read the Information Sheet about the project and received a copy of it.

  Yes / No

- I understand what the purpose of the project is and what is required of me. All my questions have been answered.

  Yes / No

- I agree to take part in interview.

  Yes / No

- I agree to this interview being audio-recorded.

  Yes / No

- I agree to this interview to be transcribed for further data analysis.

  Yes / No

Name and Surname of Student: _____

Signed:_____

Date: _____

Appendix A.7 Student information sheet for nominal group technique

Research Project: **The affordances offered by technology in second/foreign language learning with respect to learner autonomy**

Principal Researcher: **Mr. Ismail Karaoz**

Dear Student,

I am writing to invite you to take part in a research study about exploring what opportunities the technology offers with respect to learner autonomy in second/foreign language learning.

What is the study?

Learner autonomy has gained interest and importance in second/foreign language learning due to the reasons such as enabling learners to take greater control over their learning and maintaining their learning even when they are not learning with a teacher. Thus, there have also been attempts to foster learner autonomy among students and one of these attempts has come into prominence with technology-based practices. It has been seen that technology has the potential to provide opportunities for learner autonomy, but it has also been argued that mere presence of technological devices and their use for personal needs, particularly beyond the classroom environment, do not necessarily result in learner autonomy in language learning. Thus, it is necessary that we have a clearer understanding about the nature of the relationship between technology and autonomy in order to better design technology-based practices in language education, and this research aims to find out what opportunities the technology offers with respect to learner autonomy.

The term *learner autonomy* in this research project basically refers to a language learner's taking control over his/her learning, e.g. finding resources to help his/her learning and choosing when and where to study. With the term *technology,* technological tools such as smartphones, tablet PCs, and e-

readers, and media tools such as social networking applications, websites, and online dictionaries are referred.

Why have you been chosen to take part?

Following our previous correspondence via e-mail, your school kindly allowed me to conduct my research in your school. Additionally, you are registered as a student in English as a foreign language. What is more important for the scope of this research, your school and students are known for efficient use of technology for learning. Thus, I have thought that students in your school can be informants for my project and that is the reason for I contacted you.

Do I have to take part?

It is entirely up to you whether you would like to participate or not. You may also withdraw your consent to participation at any time during the project, without any repercussions to you, by contacting the principal research student, Mr. Karaoz, via tel: [redacted] or email: i.karaoz@pgr.reading.ac.uk.

What will happen if I take part?

If you take part, I will display a number of sample images of technologies in order to get information about how technology can help you in language learning and their relevancy to learner autonomy in language learning. Once I have displayed these images on the board, I will ask you:

(1) to write as many opinions as possible that you believe the displayed technological artifacts help you with your foreign/second language learning process; and

(2) to read out your notes in turns until everyone finishes their written notes.

While you are reading out what you have noted, I will be recording these notes on flip chart papers. Once everybody has finished sharing their notes and I have noted them, we will discuss these written notes. At the end of this session, I will collect the flip chart papers.

What are the risks and benefits of taking part?

The information given by you in the study will remain confidential and only I will see it. You will not be identifiable in any published report resulting from the study. A summary of the findings of the study can be made available to you on your request by contacting me.

What will happen to the data?

Any data collected will be held in strict confidence and no real names will be used in this study or in any subsequent publications. All of the collected will be kept private. No identifiers linking you will be included in any sort of report that might be published. Research records will be stored securely on a password-protected computer and only the researcher and my supervisors will have access to the records. The data will be destroyed securely once the findings of the study are written up, after five years. The results of the study may be presented at national and international conferences, and in written reports and articles.

Who has reviewed the study?

This project has been reviewed following the procedures of the University Research Ethics Committee and has been given a favorable ethical opinion for conduct. The University has the appropriate insurances in place. Full details are available on request.

What happens if I change my mind?

You can change your mind at any time without any repercussions. If you change your mind after data collection has ended, I will discard your data.

What happens if something goes wrong?

In the unlikely case of concern or complaint, you can contact me, or if your concern or complaint is about me, you can contact my research supervisors, Dr. Berry Billingsley and Dr. Geoff Taggart at Institute of Education, University of Reading, by the contact details provided at the top of this page.

Where can I get more information?

If you would like more information, please contact me, or my supervisors; Dr. Berry Billingsley and Dr. Geoff Taggart through the contact details provided at the top of this page.

What do I do next?

I do hope that you will agree to your participation in the study. If you do, please complete the attached consent form and we will start our interview. Thank you for your time. Yours sincerely

Appendix A.8 Student consent form for nominal group technique

Research Project: The affordances of technology in second/foreign language learning for learner autonomy

Please circle as appropriate:

- I have read the Information Sheet about the project and received a copy of it.

  Yes / No

- I understand what the purpose of the project is and what is required of me. All my questions have been answered.

  Yes / No

- I agree to take part in interview.

  Yes / No

- I agree to my notes being collected on flip chart papers at the end of this session.

  Yes / No

Name and Surname of Student:
_____

Signed:_____

Date: _____

Appendix A.9 Survey of digital technologies

Affordances of Technology for Language Learner Autonomy

*Required

Information about the study

Thank you for taking time to complete this questionnaire. It will take about 5-10 minutes to complete it.

I am Ismail Karaoz, a postgraduate research student at the University of Reading in England. I am doing a research on the relationship between "language learner autonomy and use of digital technologies" and this is the first step of it.

The overall aim of my research is to find out "the affordances offered by technology in foreign language learning with respect to learner autonomy". The aim of this questionnaire is to find out what digital technologies learners use to help them learning English.

The data from this questionnaire will be used in the interviews with the students in the next step. Thus, the data will help me to:

1. discard unrelevant/unused digital technologies.

2. meet students who would like to participate in the interviews after this questionnaire.

Do I have to take part?

No. It is voluntary. It is entirely up to you whether you participate or not.
You may also withdraw your consent to participation at any time during the project, without any direct or indirect consequences to you, by contacting the principal research student, Mr. Karaoz, via tel: 004[redacted] or email: i.karaoz@pgr.reading.ac.uk.

What will happen if I take part?

In this questionnaire, you will see 55 images of digital technologies which can be used for learning English.

-If you are using that digital technology, you will need to click "YES".

-If you are NOT using that digital technology, you will need to click "NO".

What will happen to the data?

Any data will be held in strict confidence. Neither real names nor identifiers linking you will be used

in this study or in any subsequent publications. You will be assigned a code and will be referred to by that code in all records.

The completed questionnaire and contact details will be stored securely on a password-protected computer, and only the researcher, me, will have access to the records.

The data will be destroyed securely once the findings of the study are written up, after five years. The results of the study may be presented at national and international conferences, and in written reports and articles, but again full confidentiality will be provided.

I anticipate that the findings of the study will be useful for you, as well. A summary of the findings can be made available on your request.

Who has reviewed the study?

This project has been reviewed following the procedures of the University of Reading's Research Ethics Committee and has been given a favorable ethical opinion for conduct. The University has the appropriate insurances in place. Full details are available on request.

This project also fulfils the requirements by the Norwegian National Research Ethics Committee and Norwegian Social Science Data Services (NSD).

What happens if I change my mind?

You can change your mind at any time without any direct or indirect consequences. If you change your mind after data collection has ended, I will discard your data.

What happens if something goes wrong and where can I get more information?

In the unlikely case of concern or complaint, you can contact me through the following contact details:

Research Student: Ismail Karaoz
Tel: 0044 7[redacted]
Email: i.karaoz@pgr.reading.ac.uk

If your concern or complaint is about me, you can contact my research supervisors, Dr. Berry Billingsley and Dr. Geoff Taggart at Institute of Education, University of Reading, UK, by the contact details provided:

Supervisor: Dr. Berry Billingsley
Tel:0044 118 378 2655
Email: b.billingsley@reading.ac.uk

Supervisor: Dr. Geoff Taggart
Tel:0044 118 378 2643
Email: g.taggart@reading.ac.uk

What do I do next?

Please be sure you have read the information above.

If you agree to participate, please confirm your consent by clicking on the relevant statements below. Then click "Continue" button at the bottom of this page to start the questionnaire.

At the end of the questionnaire, you should click "Submit" to finish the questionnaire.

1. **Participant Consent** *
   Clicking on the boxes indicates that you agree.
   Tick all that apply.

   - [ ] I have read the information above about the research.
   - [ ] I understand the purpose of the project and what is required of me. All my questions have been answered.
   - [ ] I agree to complete this questionnaire.

Skip to question 8.

About You

In order to help me better interpret and classify your answers, would you mind telling me about yourself?

Please choose one option below for each question.

2. **Do you take English classes in your school?** *
   Mark only one oval.

   - ◯ Yes
   - ◯ No

3. **Are there any other foreign languages you learn or study (other than English)?** *
   Mark only one oval.

   - ◯ Yes
   - ◯ No

4. **If Yes, please choose below the language(s) you learn and study.**
   If it is not here, click "Other" and write the language you study.
   Tick all that apply.

   - [ ] Italian
   - [ ] German
   - [ ] Spanish
   - [ ] French
   - [ ] Chinese
   - [ ] Japanese
   - [ ] Russian
   - [ ] Other: _____

5. **What year/grade are you in your school now?** *
   Mark only one oval.

   - ◯ 1st year
   - ◯ 2nd year
   - ◯ 3rd year

6. **Gender** *
   Mark only one oval.

   - ◯ Male
   - ◯ Female

7. **Age** *
   Please write in numbers

   _____

Skip to question 65.

Digital Technologies for English Language Learning

Please consider the digital technologies based on your experiences/practices while "LEARNING / STUDYING ENGLISH".

If you are using that digital technology for LEARNING / STUDYING ENGLISH, please choose "YES".

If you are NOT using that digital technology for LEARNING / STUDYING ENGLISH, please choose "NO".

8. **I understand what is required of me in this section.** *
   Tick all that apply.

   - ☐

==========

9. **Appear.in** *
   Instant online web conferencing
   Mark only one oval.

   - ◯ Yes
   - ◯ No

==========

10. **Acrobat Reader** *

A reader and annotator for PDF files

Mark only one oval.

- ◯ Yes
- ◯ No

==========

11. **Bing Maps** *

Interactive maps and turn by turn driving directions

Mark only one oval.

- ◯ Yes
- ◯ No

==========

12. **Blogger** *

Blogging tool with customisable templates and layouts

Mark only one oval.

- ◯ Yes
- ◯ No

==========

Doodle®

13. **Doodle** *

Meeting and other appointment scheduler
Mark only one oval.

- ◯ Yes
- ◯ No

==========

Dropbox

14. **Dropbox** *

Web based file storage, working and sharing
Mark only one oval.

- ◯ Yes
- ◯ No

==========

15. **Evernote** *

Web based note taking service with powerful mobile apps
Mark only one oval.

- ◯ Yes
- ◯ No

==========

16. **Microsoft Excel** *
Spreadsheet software
Mark only one oval.

- ◯ Yes
- ◯ No

==========

17. **Facebook** *
Social network with powerful collaboration and extensibility
Mark only one oval.

- ◯ Yes
- ◯ No

==========

18. **Google Alerts** *
Email alerts when new search results are found for your queries
Mark only one oval.

- ◯ Yes
- ◯ No

==========

19. **Google Analytics** *
    Web analytics to measure your websites performance
    Mark only one oval.

    - ◯ Yes
    - ◯ No

==========

20. **Google Docs** *
    Create powerful documents
    Mark only one oval.

    - ◯ Yes
    - ◯ No

==========

21. **Google Drive** *
    Web based file collaboration and storage
    Mark only one oval.

    - ◯ Yes
    - ◯ No

==========

22. **Google Earth** *
    3D simulations of Earth, Mars, Moon and the stars
    Mark only one oval.

    - ◯ Yes
    - ◯ No

==========

23. **Google Forms** *
    Create robust forms
    Mark only one oval.

    - ◯ Yes
    - ◯ No

==========

24. **Google Keep** *
    Cloud-based listing tool
    Mark only one oval.

    - ◯ Yes
    - ◯ No

==========

25. **Google Maps** *

Zoomable maps focused on an address or post code

Mark only one oval.

- ◯ Yes
- ◯ No

==========

Google books
Ngram Viewer

26. **Google Ngram Viewer** *

Plot occurrences of words and phrases over time

Mark only one oval.

- ◯ Yes
- ◯ No

==========

27. **Google Scholar** *

Search scholarly literature across many disciplines and sources

Mark only one oval.

- ◯ Yes
- ◯ No

==========

28. **Google Sheets** *
Create powerful spreadsheets
Mark only one oval.

- ◯ Yes
- ◯ No

==========

29. **Google Slides** *
Create impactful presentations
Mark only one oval.

- ◯ Yes
- ◯ No

==========

30. **Google+** *
Google+ aims to make sharing on the web more like sharing in real life
Mark only one oval.

- ◯ Yes
- ◯ No

==========

31. **Instagram** *
Capture and share the World's moments
Mark only one oval.

- ◯ Yes
- ◯ No

==========

32. **Khan Academy** *
Free, world class education for everyone, everywhere
Mark only one oval.

- ◯ Yes
- ◯ No

==========

33. **OneDrive** *
On-line storage, sharing and working
Mark only one oval.

- ◯ Yes
- ◯ No

==========

34. **OneNote** *
Digital note taking software
Mark only one oval.

- ◯ Yes
- ◯ No

==========

35. **Picasa** *
Fast and easy photo sharing
Mark only one oval.

- ◯ Yes
- ◯ No

==========

36. **PowerPoint** *
Slide presentation software
Mark only one oval.

- ◯ Yes
- ◯ No

==========

37. **Prezi** *
Web-based presentation software using a single zoomable canvas
Mark only one oval.

- ◯ Yes
- ◯ No

==========

38. **Screencast-O-Matic** *
One-click screen capture recording via the web
Mark only one oval.

- ◯ Yes
- ◯ No

==========

39. **Skype** *
Video and voice calls, instant messaging and file sharing
Mark only one oval.

- Yes
- No

==========

40. **SoundCloud** *
Create, record and share audio clips
Mark only one oval.

- Yes
- No

==========

41. **Survey Monkey** *
Create and publish online surveys in minutes
Mark only one oval.

- Yes
- No

==========

42. **TED** *
A collection of talks and articles on a wide range of topics
Mark only one oval.

- ◯ Yes
- ◯ No

==========

43. **Twitter** *
Real-time social network limited to 140 characters
Mark only one oval.

- ◯ Yes
- ◯ No

==========

vimeo

44. **Vimeo** *
High-quality video uploading and sharing website
Mark only one oval.

- ◯ Yes
- ◯ No

==========

YouTube

45. **YouTube** *
Share your videos with friends, family, and the world.
Mark only one oval.

- ◯ Yes
- ◯ No

==========

46. **iTunes U By Apple** *

Educational audio and video files from universities, museums and public media organizations

Mark only one oval.

- ◯ Yes
- ◯ No

==========

47. **Wikipedia** *

Multilingual, web-based, free-content encyclopedia

Mark only one oval.

- ◯ Yes
- ◯ No

==========

48. **ClustrMaps** *

A real-time map of your visitors from around the world

Mark only one oval.

- ◯ Yes
- ◯ No

==========

49. **WordPress** *

You can create a free website or easily build a blog.

Mark only one oval.

- ◯ Yes
- ◯ No

==========

50. **Wikimedia Commons** *

An online repository of free-use images, sound, and other media files.

Mark only one oval.

- ◯ Yes
- ◯ No

==========

51. **Snapchat** *

Lets you easily talk with friends, view Live Stories from around the world , and explore news in Discover

Mark only one oval.

- ◯ Yes
- ◯ No

==========

52. **Vocabulary.com** *
Combines the world's smartest dictionary with an adaptive learning game
Mark only one oval.

- ◯ Yes
- ◯ No

==========

53. **Spreaker** *
Covers every step of the podcasting process, from simple recording and broadcasting apps to analytics on your audience
Mark only one oval.

- ◯ Yes
- ◯ No

==========

54. **ItsLearning** *
Allows educators to create, use and manage a wide variety of digital resources
Mark only one oval.

- ◯ Yes
- ◯ No

==========

55. **Grammarly** *
It checks for more than 250 types of spelling, grammar, and punctuation errors, enhances vocabulary usage, and suggests citations.
Mark only one oval.

- ◯ Yes
- ◯ No

==========

56. **Duolingo** *
Free language-learning platform that includes a language-learning website and app.
Mark only one oval.

- Yes
- No

==========

57. **Quizlet** *
An online learning tool.
Mark only one oval.

- Yes
- No

==========

58. **Kahoot!** *
Kahoot! is a free game-based learning platform that makes it fun to learn – any subject, in any language, on any device, for all ages.
Mark only one oval.

- Yes
- No

==========

59. **Microsoft Word** *

A word processor developed by Microsoft

Mark only one oval.

- ◯ Yes
- ◯ No

==========

60. **PenPalWorld** *

A website where one can meet pen pals from other countries

Mark only one oval.

- ◯ Yes
- ◯ No

==========

61. **Unibok.no** *

Unibok represents a new generation of digital textbooks with more flexible views of learning material and automatically adapt to different screen sizes.

Mark only one oval.

- ◯ Yes
- ◯ No

==========

62. **PressReader** *

PressReader delivers the world's newspapers and magazines to readers.

Mark only one oval.

- ◯ Yes
- ◯ No

==========

[redacted]

63. [redacted] *
A useful website for education, lesson plans, and technology
Mark only one oval.

- Yes
- No

64. **If there are any other digital technologies that you use for learning English, can you please type below?** *
for example; websites, smartphone apps, tablet PC apps, etc.

_____

_____

_____

_____

_____

Skip to question 2.

Would you like to participate in an interview?

Next step in my research is interviews. I will interview voluntary students and I will ask how the digital technologies may help learning English, particularly regarding "language learner autonomy".

It is expected to last 10 to 15 minutes and I will use the images of the digital technologies from this questionnaire.

65. **If you would like to participate in an interview, please write your name and a contact detail so that I can contact you after the questionnaire.** *
Mark only one oval.

- Yes
- No *Stop filling out this form.*

How can I contact you?

Please choose a preferred contact detail and type it so that I can contact you.

66. **Name-Surname** *

_____

67. **Email address**

_____

68. **Mobile phone number**

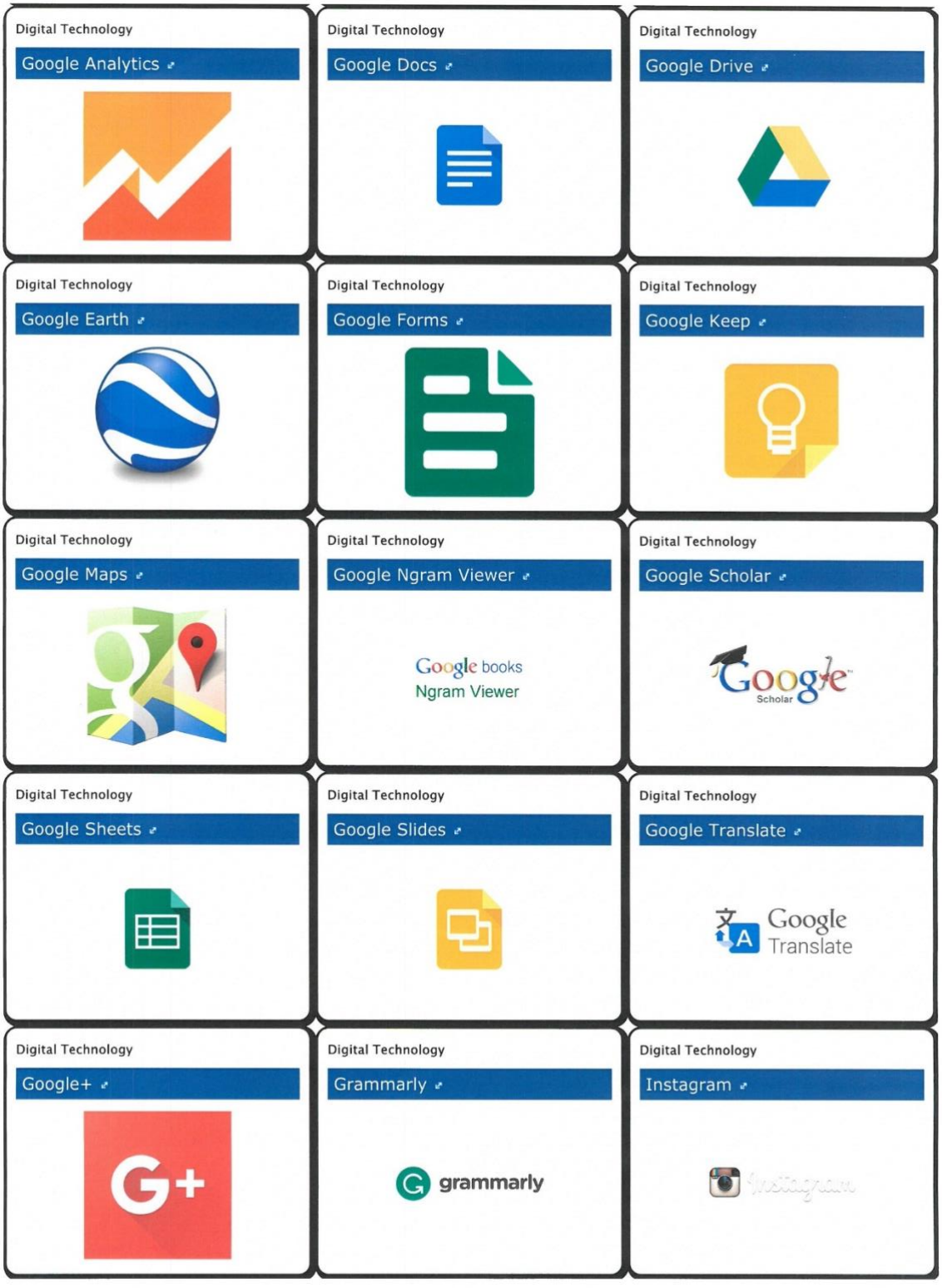
_____

69. **Skype name**

_____

Powered by
Google Forms

Appendix A.10 Images of digital technologies



Digital Technology

Skype

Digital Technology

Snapchat

Digital Technology

SoundCloud

Digital Technology

Spotify

Digital Technology

Spreaker

Digital Technology

Survey Monkey

Digital Technology

TED

Digital Technology

Thesaurus.com

Digital Technology

Twitter

Digital Technology

Unibok

Digital Technology

Viaplay

Digital Technology

Vimeo

Digital Technology

Vocabulary.com

Digital Technology

Wattpad

Digital Technology

Wikimedia Commons

Digital Technology

ItsLearning

Digital Technology

Kahoot!

Digital Technology

Khan Academy

Digital Technology

Netflix

Digital Technology

OneDrive

Digital Technology

OneNote

Digital Technology

Ordnett

Digital Technology

PenPal World

Digital Technology

Penpalschools.com

Digital Technology

Picasa

Digital Technology

PowerPoint

Digital Technology

PressReader

Digital Technology

Prezi

Digital Technology

Quizlet

Digital Technology

Screencast-O-Matic

Digital Technology

Acrobat Reader

Digital Technology

Appear.in

Digital Technology

BBC News

Digital Technology

Bing Maps

Digital Technology

Blogger

Digital Technology

Brettboka

Digital Technology

CNN News

Digital Technology

ClustrMaps

Digital Technology

Doodle

Digital Technology

Dropbox

Digital Technology

Duolingo

Digital Technology

Evernote

Digital Technology

Excel

Digital Technology

Facebook

Digital Technology

Google Alerts

Digital Technology

Wikipedia

Digital Technology

Word

Digital Technology

WordPress

Digital Technology

YouTube

Digital Technology

[redacted]

[redacted]

Digital Technology

freerice.com

Digital Technology

iBooks

Digital Technology

iFinger

Digital Technology

iTunes University by Apple

Digital Technology

ndlo.no

Digital Technology

reddit.com

Digital Technology

tumblr.com

Appendix A.11 Sample interview protocol

Interview Protocol

Project: The affordances offered by technology in second/foreign language learning with respect to learner autonomy

Time of interview:

Date:

School:

Interviewer: Ismail Karaoz

Interviewee:

Interview procedure

You are being asked to participate in a research study investigating how digital technologies can afford/provide opportunities for learners to learn English as a foreign language autonomously. During this interview, you will be asked to respond to some open-ended questions. You may choose not to answer any or all of the questions. The procedure will involve audio-recording the interview, and the record will be transcribed later. Your results will be confidential, and you will not be identified individually.

Informed Consent

Please sign the informed consent form signalling your willingness to participate.

General Terms:

Digital Technologies: The technological apps and websites represented here with their logos and can be visited for English language learning purposes.

Learner Autonomy: It means taking control over your learning.

Questions

1. What foreign languages do you learn or study at the moment? Do you like languages or have you always been interested in languages?
2. Are there any times that you take control over your English learning, i.e. you do something for learning/studying English without the direct suggestion of your teacher? If yes, what are they?
3. Now look at the images of these technologies. Is there any of them you use? **Allow some time to familiarize themselves.**
4. Can you please tell about learning English experiences especially when you are using any of these technologies?

   For each digital technology the interviewee talked about, ask the following questions:

How do you use/interact with this digital technology?
How do you learn from this digital technology?
How do you view the learning experience with this digital technology?
What roles does this digital technology play in your language learning?
How does it contribute to your learning?

5. Now, do you feel you are in control of your learning while you are using any of these digital technologies?
6. In addition to the ones that you use, are there any digital technologies here available to you and that might be helpful to your learning but you choose NOT TO USE? WHY NOT? (That is a good question to see why some other digital technologies provide opportunities for the exercise of learner autonomy?)
7. What challenges or frustrations have you encountered in using digital technologies for language learning?
8. Does anyone influence/affect you to use any of these digital technologies while learning/studying English?
9. Does your teacher have any impact on your use of these digital technologies for language learning? How?
10. How do you think learning English with one of these digital technologies differ from learning English in the classroom?

Closing the interview

Thank you for participating in this interview. I appreciate you taking the time to do this. I may contact you in the future for the purpose of follow up data collection tools. Again, let me assure you of the confidentiality of your responses. If you have any questions, please feel free to contact me by the contact details provided on the information sheet.

Appendix A.12 Nominal group technique template

Dear Participant,

Please read the statement and the question below carefully:

Think about the ways you have used or visited these digital technologies to help you learning and improving your English, however, most of the times without direct support or direction of your English teacher. You can think about your experiences both at school and outside the school.

Based on your experiences, think about the following question and write your ideas in the table below:

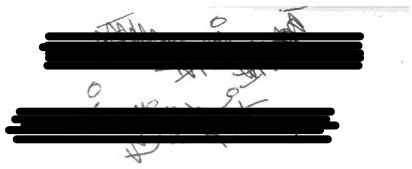
The Question: ***What opportunities*** **do these digital technologies* afford you with learning and improving your English?**

***Digital Technologies** refer to the technological apps and websites represented here with their logos, and they can be visited for English language learning purposes.

The digital technology you use	What opportunities do these digital technologies afford you with learning and improving your English?

You can continue to next page

Appendix A.13 A sample completed form of nominal group technique



Dear Participant,

Please read the statement and the question below carefully:

Think about the ways you have used or visited these digital technologies to help you learning and improving your English, however, most of the times without direct support or direction of your English teacher. You can think about your experiences both at school and outside the school.

Based on your experiences, think about the following question and write your ideas in the table below:

The Question: ***What opportunities*** **do these digital technologies* afford you with learning and improving your English?**

***Digital Technologies** refer to the technological apps and websites represented here with their logos, and they can be visited for English language learning purposes.

The digital technology you use	What opportunities do these digital technologies afford you with learning and improving your English?
Wikipedia	I use wikipedia to obtain more knowledge concerning history and literature. I use Wikipedia both at home and during schools
Youtube	I watch English Speaking videos, and that helps me in expanding my vocabulary.
Wordpress	I use wordpress to write in english on my blog about many different topics.
Grammarly	Grammarly helps me correcting my Spelling mistakes and this helps me further learn English.
SKYPE	I use SKYPE to practice my English with my English Speaking friends.
~~Unib~~ Snapchat	I use Snapchat on a daily basis to engage in discussions with my English Speaking friends.

You can continue to next page

Dear Participant,

Please read the statement and the question below carefully:

Think about the ways you have used or visited these digital technologies to help you learning and improving your English, however, most of the times without direct support or direction of your English teacher. You can think about your experiences both at school and outside the school.

Based on your experiences, think about the following question and write your ideas in the table below:

The Question: ***What opportunities do these digital technologies* afford you with learning and improving your English?***

***Digital Technologies** refer to the technological apps and websites represented here with their logos, and they can be visited for English language learning purposes.

The digital technology you use	What opportunities do these digital technologies afford you with learning and improving your English?
Google translate	I use google translate to translate words and sentences. By using the website I learn new words, and I expand my vocabulary. When we get tasks or have to write texts I am dependent on using a translater to find synonyms or just to get an imput on what to write.
Google Docs	I use google docs to write texts and practice on writing english. When I write english I learn new words, and I improve my english.
Google Slides	I used google slides in middle school to make presentations, which helps me practice my English.
Wikipedia	I use wikipedia to get informantion about the subjects i have to write about. As well, I learn from reading what others have written and I expand my vocabulary.
Youtube	We often use Youtube to watch movies or videos in class, and I learn from hearing others speak and I learn common terms from how americans or englishmen talk.
Wordpress	We use wordpress at school because we have blogs, where we post the posts or texts we write for homework. We practice or English by writing and learn about new subjects.

You can continue to next page →

Appendix A.14 Sample complete for of clarification of ideas

The Digital Technology you use	The clarification of your idea
Google translate*****	It helps me with learning and expanding my voc. It helps me finding synonyms. It is an easier and quicker way of checking the meaning and spelling.
Vocabulary.com****	I can find synonyms and learn the meaning of the words. It also helps me with spelling.
Viaplay* Netflix	It provides opportunities for improving speaking and listening English. It helps me learn daily usage of words and phrases in English.
Ordnett Pluss*	I can easily and quickly check the meaning of a word.
Wikipedia*****	I can access information about a topic that I will write in English. It also expands my vocabulary.
Wordpress**	It helps me improve my writing in English.
OneNote	It helps me to organize the structure in my English writing. It is both accessible and easy to take notes.
YouTube****	I can find opportunities to improve my speaking and listening. It improves my vocabulary.
Word***	I can check and correct my writing before I publish it.
Google docs***	I can easily collaborate with other students and get instant feedback on the same document rather than sending and waiting for feedback.
Google slides	Similar to google docs.

TED**	It helps me learn how other speakers of English pronounce words and helps me with listening.
Facebook	I can find chances to practice speaking English and to read in English since there are a lot of English groups.
Itslearning***	It is a platform where I can access to tasks and information and assignments (e.g. exams and homework).
Duolingo	It is an app that helps me with vocabulary. It is a mobile way of learning vocabulary.
PDFs*	-
Kahoot***	It is fun way to learn new words and expand vocabulary.
PowerPoint**	It is helpful with the keynotes when making a presentation.
Prezi*	It is a good way to keep the group interested in my presentation.
BBC news	It helps me to find new formal words.