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Undergraduate Students' Perceptions of Flipped Learning in a Saudi University: An Exploratory Investigation

By

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Dedication

This thesis is dedicated to my mother Haya, my father Mohammed, my husband Nader and my son Meshal, who supported me constantly during this study. I would like also to dedicate this work to the soul of my grandfather Mesaar.

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This thesis would not have reached its current shape without support of some very special people. I am heartily thankful to my supervisor, Dr. Julia Davies, for her magnificent support and encouragement, valuable feedback and suggestions, and professional guidance in all phases of the research, and the way that she has kept my enthusiasm alive during my PhD journey.

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Abstract

The purpose of this study was to explore Saudi female undergraduate students' perceptions of advantages, challenges, and the future of flipped learning from their experiences as participants in a flipped learning course at a Saudi university. To accomplish this aim, I designed and carried out an intervention case study in two classes in the same course at a Saudi university in Riyadh City, Saudi Arabia. I applied an exploratory qualitative case study design to gain descriptive data to explore the phenomena. I used a social constructivist approach and employed Pintrich's framework of self-regulated learning theory (2000) as well as Mayer's principles of multimedia design (2009). I collected the data through observation, an open-ended questionnaire, and focus group interviews. I used inductive and deductive thematic analysis.

This study shows how participant students reacted to this innovation in education and how it affected the quality of their learning experience. Deducing from the students' perceptions, I found the main advantages of flipped learning included enhancing their engagement and making them more active learners, encouraging more peer-assisted learning through classroom activities, benefiting from technological affordances, and enhancing their personal responsibility. The profile of education in the home became more pronounced and visible. In addition, students' perceptions showed that the key challenges of flipped learning were related to problems with technology, including: the digital divide; learning-management system (Blackboard) glitches; and poorly designed videos. Other challenges can be poorly designed class activities, learners who have less ability to regulate their learning, change resistance, and Saudi female students' circumstances as wives or mothers. Furthermore, regarding the future of flipped learning in Saudi Arabia, students' perceptions can be typified as: Firstly, participants who feel motivated and enthusiastic about the future adoption of flipped learning for some motivations; secondly, participants who are not enthusiastic about flipped learning and report some limitations; and thirdly, participants who see the potential of flipped learning, but with adaptations. Additionally, the study findings revealed that flipped learning could help participants to develop some habits that related to self-regulated learning. Recommendations for future research and practices are provided, as well as some suggestions to address possible challenges.

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Abbreviations

FLN	Flipped Learning Network
IBL	Inquiry-Based Learning
ITD	Instructional Technology Department
ITL	Integrating Technology in leaning Environment Course
KSU	King Saud University
MKO	More Knowledgeable Other
PBL	Problem-Based Learning
TEAL	Technology-Enabled Active Learning
ZPD	Zone of Proximal Development

CHAPTER 1: INTRODUCTION

In this introductory chapter, I provide the study's rationale and background. The chapter provides an overview of flipped learning and describes my positional journey to the research focus. Also, it provides the study aims, questions, significance, and context, and the last sections provide an outline of the thesis structure and the conclusion.

1.1 Overview of Flipped Learning

Arguably, lecture-based pedagogy is the key teaching strategy associated with traditional classrooms, relying on the teacher as the source of given knowledge, while students just listen to their teacher (Geist, 2011). Lectures may take a large part of class time and leave little space for other activities and interactions. According to Foertsch, Moses, Strikwerda and Litzkow (2002), it would be better if class time were used to observe students' engagement with specific material rather than for listening to lectures. It has been argued that students learn more by "doing", rather than listening (Butt, 2014)—this is the essence of active learning. Butt (2014) identifies the shortcoming of lecture-based strategies as being teacher-centred, with little regard for student needs.

Moreover, Geist (2011) indicates that "teacher-focussed, one-way, and one-size-fits-all" teaching is no longer appropriate with students raised in the digital era. Roehl, Reddy and Shannon (2013) argue that there are currently global changes in learning environments involving "millennial students" who have grown up with technology (p. 45). Students in this age grew up with an "always-on" culture (Bergmann and Sams, 2012). According to Bergmann and Sams (*ibid.*) students like to do their homework while sending messages or listening to music at the same time, and many of them are told that they should turn everything off while at school because carrying devices is not allowed. It is time to adapt technology to education, not only by equipping classrooms with advanced technology, but also by using these technologies in ways that may engage students during the learning process. Educators have started to think about flipped learning, which combines active learning and using technology in education. Within flipped learning, students are allowed to use their digital equipment to access learning resources while they are engaged in activities (Bergmann and

Sams, 2012), which may encourage them to learn.

According to Tucker (2012), during flipped learning, students can, in their homes, access interactive lessons and recorded videos created by a teacher, thus benefitting from using the class time to engage in collaborative activities, problem solving and high-level concepts. Flipped learning consists of two parts. The first part involves outside class activities, such as using online materials or recorded videos that may catch the attention of "millennial students" (Roehl *et al.*, 2013, p. 45). The second part involves inside-class activities and is based on student-centred learning theories, during which students interact with each other and apply active learning (Bishop & Verleger, 2013; Roehl *et al*., 2013).

It might be argued that active learning can be adapted to suit any classroom without employing flipped learning. Active learning takes a period of a class time to implement, which may be offered by flipped learning when students build a learning foundation for any topic outside the classroom, and when class time is freed up for more interaction and active learning. Hence, students can carry on their learning constructions and move through the learning zone as described by Vygotsky's (1978) ZPD theory (see the Theoretical Framework, Section 2.4).

Flipped learning is not a completely new idea (November & Mull, 2012). This concept is reported to have begun at Harvard University with Mazur (1991), who sent his lecture notes to his students before their classes so they could first study them at home. He asked his students in a physics course to read these lecture notes, as well as the textbook; and then, in class he helped them recognize the meaning of everything they had read by teaching through questioning rather than teaching by telling (Harvard University, 2012).

From this beginning, Mazur continued his research into flipped learning and found that the classroom became a fruitful place for collaboration, active learning and projects. As a result, he suggested that his colleagues could try directing their efforts to helping students with difficulties rather than lecturing (Harvard University, 2012). Thus, students became involved in active learning, increased their interaction with the teacher, and received direct input on their work rather than listening to the lectures.

The modern concept of flipped learning developed with the advent of digital technologies, when Baker (2000) talked about using web-based course management tools to become *"the guide by the side"* (p. 9) rather than *"the sage on the stage"* (p. 9), which indicates a shift from teacher-centered to student-centered practices. He used new technologies and provided students with all the learning materials online for their attention out of class, and then involved them in learning activities in the classroom.

In 2004, Salman Khan began recording mathematics videos for some of his family members to study. After that he created an online academy that consisted of a website that taught mathematics lessons by using online methods like videos and giving one-to-one teaching. This method has now been widely used by teachers and parents all over the world to conduct flipped learning (Parslow, 2012).

Moreover, while many teachers from different disciplines and learning levels have applied flipped learning for a long time, this approach is frequently associated with Bergmann and Sams, high school chemistry teachers from Colorado, who made podcasts and screencasts for their students in 2007. They worried about students who missed their classes after enrolling in school competitions and events. They recorded lectures for their students using video and screencasting software and uploaded them onto YouTube, and used class time for more activities. After that, Bergmann and Sams noted that their students had become more interactive during class (Bergmann and Sams, 2012). In 2012, they published their book *"Flip Your Classroom: Reach Every Student in Every Class Every Day"* and established the Flipped Learning Network (FLN). FLN is a free website that provides other educators with the knowledge needed to implement flipped learning (Hamdan *et al.*, 2013). In 2014, they published *"Flipped Learning: Gateway to Student Engagement,"* in which they focused on flipped learning theories and applications (Bergmann & Sams, 2014).

1.2 Positional Journey to the Research Focus

According to Wellington and Szczerbinski (2007), one of a researcher's tasks is to ask self-reflective questions related to one's "own values, ideas, knowledge, motivation and prejudices. For example, what's my own position in relation to this research? What are my relevant experiences and prior knowledge?" (p. 54). Consequently, the researcher plays a fundamental role in any research. "In social research, the researcher

himself, or herself, is the key 'instrument'" (Wellington & Szczerbinski, 2007, p. 51). I consider myself the main tool in this research. My educational and professional background and my ontological and epistemological assumptions are the primary factors that may play considerable roles in defining my position as a researcher in education. Therefore, "where I am coming from as a researcher" (Sikes, 2004, p. 19) describes my research interests, and all of my research choices reflect my previous experiences and knowledge.

My home is the Kingdom of Saudi Arabia. I was born into an Arab Muslim family, and I received all of my education, at every level, in single-sex institutions. My interest in teaching and using technology in education started when I was studying for my first degree in the computer sciences college at King Saud University (KSU). My younger sister had broken her leg, and her teacher allowed her to keep up with her studies from home by studying through computer-based educational programmes and chatting on Messenger (2003). From that moment, I started thinking about how technology could help meet students' individual needs.

A year later, I had to choose my degree major, and because of this experience, I chose to study computers and education, which means "how computers could be applied in education." After I completed my degree, I stayed on this path and became a staff member in the Instructional Technology Department at KSU. This path led me toward my Master's degree. My Master's research project focused on the effects of Wiki technology on the cooperative learning skills of education students.

These experiences led to my interests in e-learning, teaching, and technology in many ways, including using social media and other technologies in education and blended learning, adapting education delivery through innovative technologies tailored to individual differences of learners, and supporting simultaneous cooperative learning. I also thought that technologies could help teachers solve problems creatively. I had always tried to apply pedagogies that adapt technologies to my students' learning processes. Moreover, I was interested in their perceptions about any teaching model that I used with them. Hence, my current research is related to flipped learning as a pedagogical approach that adopts technology, and I am very interested in students' perceptions about it.

As a Saudi lecturer, I have found that many of my colleagues and I are unable to meet

our students' needs under the umbrella of social constructivism theory and active learning, which I discuss later in the thesis (see Chapter 2). Some of our students seem disengaged, and it seems as if the lecturer is the one doing all of the talking. Typically, a lecturer spends the majority of the class time lecturing students about facts, concepts, principles, and theories. Thus, I started to think about flipped learning to create time in class for activities and interacting and to invest in ideas associated with constructivism.

In 2013, I was given a scholarship for an English language course and PhD study in the UK by King Saud University; thus, in September 2013, I arrived in the UK to pursue my postgraduate journey. Then, I proposed this study, which sought to try flipped learning in a Saudi higher education context and helped students to enjoy lectures and then investigated their perceptions regarding that. Therefore, this research focus is students' perceptions of a flipped learning course in a Saudi university.

1.3 Aims of the Study

This study aimed to investigate how Saudi female undergraduate students experienced and perceived flipped learning and its future through their experience of a flipped learning course in Saudi Arabia. It piloted and evaluated the process of flipped learning in Saudi higher education through a flipped-learning course in a Saudi university (an intervention case study). More specifically, it sought to explore the issues impacting the participants' views of the flipped-learning environment to enhance the educational process. I identified these issues by investigating the students' experiences and perceptions about the advantages and challenges of flipped learning as well as their views regarding the future of flipped learning in Saudi Arabia. In addition, the study provided a detailed analysis and discussion of the self-regulated learning within the flipped-learning context, which revealed the contribution of flipped learning in promoting students' self-regulated learning and developing some habits that related to their self-regulated learning as well.

1.4 Research Questions

In relation to the Saudi undergraduate students I studied, I explored the following questions:

Q1. How do the students perceive flipped learning?

a. What are the advantages of flipped learning for students?

b. What challenges do students of a flipped learning course encounter?

Q2. How do the participants perceive the future of flipped learning in Saudi Arabia?

a. What are the motivations for the adoption of flipped learning?

b. What might limit the adoption of flipped learning?

c. What practices might improve flipped learning?

Q3. Can flipped learning help students develop habits related to self-regulated learning?

I developed the first and second research questions by reviewing literature on the topic of flipped learning; this was before collecting the research data. I found that the search for advantages and challenges of an educational experience through students' perceptions might provide an understanding of the fundamental critical factors of a certain phenomenon, which was flipped learning in a particular context, specifically Saudi higher education. In addition, I was interested in students' perceptions toward the future of flipped learning in Saudi Arabia, but also, I could say that the second question evolved over time. I had only the over-arching second question before data collection, and then, my data influenced the question in which the students' perceptions came in three directions, which made three sub-questions.

Furthermore, I delayed writing the third research question until I collected the data to provide a response to issues that may have appeared during or after data collection. This method was supported by Lincoln & Guba (1985): "What will be learned at the site is always dependent on the interaction between investigator and context, and the interaction is not fully predictable; and because the nature of mutual shapings cannot be known until they are witnessed." (p. 208). Consequently, through my investigation

and in the fieldwork particularly, I found that my participants were providing me with data that related to their habits when they studied during the course, their time and effort management, their motivations, metacognition knowledge, and their learning context. Also, through my observations of the classes, I began to observe that students were now coming to the class with notes, printed screenshots of the videos, and mind maps. At that stage, I was not sure about the importance of these data, but when I started the analysis, I made an extensive read and research to find the relation between all of these data, and finally, I found it under the umbrella of "self-regulated learning" (see for example, Section 2.7).

1.5 Significance of The Study

At the outset, I hoped that this study would be important because it focused on students' perceptions regarding flipped learning, a pedagogy which had not yet been widely introduced or explored in Saudi universities. This study derived its importance from containing both theoretical and practical significance. First, in regard to the theoretical significance, this study explored students' perceptions about flipped learning and also the issues that influenced their perceptions so I could understand how to enhance students' educational experiences. I identified these issues by exploring the students' perceptions of the advantages, the challenges, and their views regarding the future of flipped learning in Saudi Arabia. Fundamentally, new educational practices are usually not adopted officially without a good understanding of their effects on the learning process (Alebaikan, 2010). Consequently, I thought that the exploration of the issues that promote or challenge the students' experience and their views regarding the future of flipped learning, in terms of motivation, limitations, and possible improvements that could be introduced to the innovation (Alebaikan, 2010). Furthermore, learners' perceptions helped to inform other issues regarding the higher education system in Saudi Arabia.

In addition, I conducted this study by using the qualitative paradigm, which gave the study some uniqueness, because the literature I reviewed showed that a considerable amount of research exploring flipped learning in general and students' perceptions toward it in particular were quantitative studies with only a few qualitative studies (see Chapter 2). Moreover, this study is significant because it is, to the best of my knowledge, the first one that explored all of the aspects of self-regulated learning

within flipped learning through students' experiences and perceptions. These aspects were cognitive regulation, motivational regulation, behavioral regulation, and contextual regulation (see Chapter 2)

Secondly, and regarding the practical significance, this study provided a variety of pedagogical practices that could be used within the flipped learning context and students' perceptions towards them; this I hoped, could potentially benefit educators in general and those interested in the field of flipped learning in particular. Also, I hoped to provide a set of principles for short video design within flipped learning. In addition, I wanted to locate recommendations to deal with the challenges of flipped learning.

Lastly, I hoped that my findings would be useful to different stakeholders in higher education, including students, teachers, educational organizers, and decision makers to assist in determining both the usefulness of and training for this method. It was my hope that this study would make a significant impact to contemporary international debates about flipped learning and possibly constitute a call for other researchers to implement further research in this field. I have at least to an extent, been able to fulfil these aims, as I show in this report of my work.

1.6 Context of The Study

1.6.1 Saudi Higher Education and Saudi Universities

Saudi Arabia is located in the Middle East and occupies most of the Arabian Peninsula. Riyadh City is the capital of Saudi Arabia. The official name of the country is the Kingdom of Saudi Arabia (KSA). The area of Saudi Arabia is about 2,250,000 square kilometers (868,730 square miles), with a population of 28.83 million in 2013. Most people in Saudi Arabia are native speakers of Arabic. In addition, Saudi Arabian culture is strongly affected by being the site of the birth of Islam (Alebaikan, 2010, pp. 15–16).

> The Kingdom of Saudi Arabia was established in 1932. It was a poor country, and there was a small educational program comprising 12 schools with 700 students. This situation changed dramatically after 1938, when oil was discovered in huge amounts in Saudi Arabia . . . [consequently,] the Ministry of Higher Education in Saudi Arabia has increased significantly as the price of oil increased in the last couple of years. (Alamri, 2011, pp. 88–89)

Every year, Saudi universities admit a huge number of students. For example, according to the Ministry of Higher Education (2011) 297,632 students were admitted to the universities in 2010. All undergraduate and graduate students in the public universities are offered financial support and free education (Alebaikan, 2010, p. 24). The higher education system at KSA is sex-segregated in accordance with Islamic principles and values; each gender has its own separate campus at the university. Direct communication between females and males "who are not close relatives" is not allowed, apart from rare specified events. "Female campuses are run by female staff and taught by female lecturers or by male lecturers via closed-circuit TV" (Alebaikan, 2010, p. 16).

The real starting point of higher education in the Kingdom of Saudi Arabia was sixty years ago, when the College of Islamic Law was founded in 1949. After that, other colleges and universities continued to be established, and today, Saudi higher education involves 32 public and private universities (MoHE, 2011, p. 19).

The Saudi higher education system encourages teachers and institutions to adopt new learning innovations, pedagogies, or technologies; it also encourages research in these fields. For instance, educational planners and policy makers in Saudi higher education are aware of the importance of e-learning and the requirements for developing it.

> Both e-learning and distance learning rely on optimal utilization of the Internet, development of the teaching process, change in the performance style of both teacher and learner, and realization of interaction between them in a paperless world, and through educational institutions without fences and what is known as smart or virtual classes or e-classes. (MoHE, 2011, pp. 35–36)

King Abdulla Ibn Abdulaziz believed in education and technology, and even after his death in January 2015, his legacy still provides continuous support for higher education; he started a national information technology plan and the employment of e-learning and distance learning in the higher education system in Saudi Arabia. He also established a national center for e-learning and distance learning to provide technical support, resources, and assistance needed to "develop the content of digital education—an integrated educational system that relies on the technologies of e-learning and distance learning was established" (MoHE, 2011, p. 36). In addition, as technologies have become essential in the contemporary age (Brusilovsky & Peylo, 2003), all university departments give compulsory "introductory computer courses"

(Alebaikan, 2010, p. 26) to ensure that university students in Saudi Arabia have the required technology skills. Furthermore, in 2000, all public high schools started to teach "computer literacy" as a compulsory subject (Alebaikan, 2010, p. 25; Doheash & Aloreani, 2001).

Currently, the education system in Saudi Arabia supports university teachers and encourages research to improve higher education and meet students' needs in the twenty-first century. Also, it tests most research to investigate their effectiveness in the Saudi context, and universities try to adopt innovations in learning and teaching practices and to proceed toward active learning models based on constructivist theories of learning. This thesis, which evaluates flipped learning in the Saudi context, comes as a result of this continued support for research.

Very few teachers and researchers in Saudi Arabia have explored flipped learning, and to the best of my knowledge, no higher education institution has officially adopted flipped learning to date. Thus, it is highly probable that this research is one of the early studies in the KSA targeting flipped learning in Saudi universities and exploring students' perceptions about it. The findings of this research may help researchers to conduct other studies in this field in order to explore flipped learning as pedagogy that employs technology and other educational practices.

1.6.2 King Saud University (KSU)

This study was carried out at one of the leading universities in the Middle East, which is the oldest university in Saudi Arabia, King Saud University (KSU), and more specifically, in the Department of Instructional Technology (ITD) on the KSU female campus. This university was established in 1957 in the capital city, Riyadh. It is a state institution in Saudi Arabia, comprising 7,612 faculty members and hosting a population of approximately 66,020 students (Ministry of Education, 2016). KSU's mission is to "provide students with a quality education, conduct valuable research, serve the national and international societies and contribute to Saudi Arabia's knowledge society through learning, creativity, the use of current and developing technologies and effective international partnership" (KSU, 2016). To achieve this mission, KSU always seeks to produce academic research and support researchers inside and outside of its contexts. Also, it encourages faculty members to experience innovations in education. This location was therefore receptive to my study, and

relevant for the consideration of how to improve the educational experiences of women in attendance there.

1.7 Organization and Structure of the Study

This study contains five chapters. In the current chapter, I have introduced the study and its background, aim, focus, research questions, its intended significance and finally, the context.

In the second chapter, I provide a review of the literature concerning the study topics. I start with discussion of the term "perception" and then the concept of "flipped learning". In addition, I present the study's theoretical framework. Furthermore, I discuss the learning theories on which the study is based. Also, I discuss the pedagogical practices that are adopted within flipped learning and the use of technology.

In the third chapter, I have presented the philosophical assumptions embedded within qualitative inquiry, the study paradigm, the study design, and data collection methods. In addition, I discuss the analysis process and ethical considerations. I also provide all of the required justifications for my decisions and actions.

In the fourth chapter, I present the results that emerged from students' perceptions through the open-ended questionnaire, focus group interviews, and my observation notes. In addition, this chapter includes discussion of topics through relevant literature.

The fifth and last chapter contains the study's conclusion and limitations and my future recommendations in light of the present study.

1.8 Conclusion

In this preliminary chapter, I present my study topic with an explanation of the study's background. In addition, I discuss the study's aims, focus, and research questions. I then discuss the study's significance and context. At the end of this chapter, I provide the study's structure and organization with short summaries that describe the chapters' contents.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

"[I]t is worth reminding ourselves that we need to find out what is already 'known' in our area of research, what's been done before and, just as important, how it's been done," and to remind ourselves of that, we need to review literature in the research topic field (Wellington, 2015, p. 55). According to Hart (1998), "the researcher needs to know about the contributions others have made to the knowledge pool relevant to their topic" (pp. 26–27). As a researcher, my "job is not just to mould [my] own brick but to slot it into the wall of existing understanding in that field" (Wellington, 2000, p. 34).

Consequently, this chapter aims to discuss the theoretical framework of the study and also to provide a review of the relevant literature related to the topics under consideration, which are students' perceptions of flipped learning from their experience as participants in a flipped-learning course at a Saudi university. It is worth mentioning that most of the reviewed literature in this chapter relevant to flipped learning draws from research within Western institutions, because there is a relative lack of such studies on this topic in Saudi Arabia due to the later emergence of flipped learning in Saudi Arabian institutions.

This chapter helped me understand the matters surrounding my research focus. The final shape of this chapter is the result of a long process of reading and writing, which passed through multiple stages. I wrote some parts before the fieldwork and data collection, which helped me to develop the first and second research questions and also helped me to design the intervention, my pilot study, and the research methods. Nevertheless, I added more parts during data analysis and discussion which were in relation to emergent themes, and I also updated the previously existing parts. The literature review also helped me to develop the third research question, which was influenced by the data.

Therefore, in this chapter, I start with a discussion of the term "perceptions" and then the concept of "flipped learning" within this study. Next, I discuss the study framework and its justifications. I then provide a discussion of social constructivism as the main theory on which the study relied. This is followed by a review of student

engagement and active learning and the constructivist pedagogical practices that were adopted within flipped learning. I then discuss the use of technology and videos within flipped learning. In addition, I discuss the cognitive theory of multimedia learning and the principles of multimedia design based on this theory as a supportive theory within the study's theoretical framework. Furthermore, I discuss other technology applications within this study, which are social networks, learning management systems (Blackboard), and mobile devices. This is followed by a discussion of the self-regulated learning theory and its phases and strategies, which is also another supportive theory within the study framework. Finally, I explain Pintrich's (2000) framework for understanding self-regulated learning.

2.2 Understanding the Term "Perceptions"

As this study is about students' perceptions of flipped learning from their experiences as participants in a flipped course at a Saudi university, the reader may need to know what I mean by the term *perceptions*. Thus, this section attempts to explain the meaning of the term perceptions in this study. According to the *Dictionary of Philosophy*, the word *perception* means "the faculty of apprehending the world specifically through the senses, or the general exercise of it, or particular cases of its exercise" (Lacey, 1996, p. 246). In addition, Roth and Frisby (1986) stated that "the term *perception* refers to the means by which information acquired from the environment via the sense organs is transformed into experiences of objects, events, sounds, tastes, etc." (p. 81).

Throughout my review of many social science research studies, I found that the term *perceptions* might be used differently from one researcher to another. Therefore, this section is concerned with explaining the meaning of the term *perception* in the current research. First of all, *perception* in this research refers to the assumption that individual perceptions may affect a person's behaviour (Alebaikan, 2010). The behaviours that can result from perceptions are termed *attitudes* (Alebaikan, 2010). According to Pickens (2005):

> Attitude is a mind-set or a tendency to act in a particular way due to both an individual's experience and temperament. . . . Attitudes are a complex combination of things we tend to call personality, beliefs, values, behaviors, and motivations. . . . Attitudes help us define how we see situations, as well as define how we behave toward the situation or object.

> … attitudes include feelings, thoughts, and actions. (p. 44)

In addition, Pickens (2005) stated, "Typically, when we refer to a person's attitudes, we are trying to explain his or her behavior" (p. 44). The relationship between individuals' behaviours and attitudes about matters took a considerable period to study psychologically (Chen & Bargh, 1999). Pickens (2005) stated that attitudes consist of three components, which are thoughts, actions, and feelings. These three components also appear in Eagly and Chaiken's (1993) classifications of the processes of attitudes, which are cognitive, behavioural, and affective (as cited in Alebaikan, 2010).

> Consequently, attitudes may affect individuals to adopt or reject specific behaviours. According to Eagly and Chaiken, attitudes and perceptions share a similar component which is the cognitive perspectives. This interpretation clarifies why the two terms *perception* and *attitude* are used interchangeably and interpreted similarly by some authors. (Alebaikan, 2010, pp. 39–40)

To sum up, in this study, I saw my participants' behaviours—attitudes—in the flipped learning course that I observed during the fieldwork or that they told me about as a reflection of their perceptions (Alebaikan, 2010). In addition, "although the feeling and belief components of attitudes are internal to a person, we can view a person's attitude from his or her resulting behavior" (Pickens, 2005, p. 44). Therefore, in the current study, any participants' observed feelings or beliefs expressed through behaviours, self-reported feelings, self-reported beliefs, self-reported motivations, or self-reported actions are also considered to be under the umbrella of perceptions.

Having discussed the term perceptions, the following section is concerned with the concept of flipped learning within this study.

2.3 The Concept of Flipped Learning

The earlier definitions and practices of flipped learning were focused on switching the location of the required tasks from the students at home or in the classroom (Bishop & Verleger, 2013). Thus, flipped learning was described as "school work at home and home work at school" (Yarbro *et al.*, 2014, p. 5), with no attention paid to the active environment within the classroom. In this situation, teachers record lectures about course topics, and students watch these lectures outside the classroom, and then the class time is devoted only to doing their homework, with no more activities to

engage students; possibly, nothing different occurs during class time (Yarbro *et al*., 2014, p. 5). This way can benefit the learning process by permitting students to ask if they struggle with any question instead of facing the task of learning difficult questions alone at home. An example of the earliest definitions is by Lage *et al.* (2000), as cited in Bishop and Verleger (2013), who stated that flipped learning "means that events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa" (p.32). This definition placed flipped learning in the template of swapping learning task locations only.

Later definitions and practices of flipped learning paid great attention to providing active learning in the classroom. For instance, Bishop and Verleger (2013) defined flipped learning as "an educational technique that consists of two parts: interactive group learning activities inside the classroom, and direct computer-based individual instruction outside the classroom." (p. 4). Bishop and Verleger's (2013) definition paid considerable attention to the active learning inside of the classroom and the use of technology to provide instruction outside of the classroom. Therefore, the development of the flipped-learning concept represents the transition of focus from the abstract exchange of tasks' places (home and school) to providing an active environment in the classroom.

Furthermore, the Flipped Learning Network (FLN) defines flipped learning as

> a pedagogical approach in which direct instruction moves from the group learning spaces to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter. (FLN, 2014).

This study adopted this definition because it is one of the few definitions that described flipped learning as "a pedagogical approach" and clarified the basic components of it. It mentioned the transformation of "direct instruction" from the classroom to outside of it, and it then freed up the class time for "dynamic, interactive learning." In addition, it mentioned the teacher role within flipped learning as a guider (FLN, 2014, online).

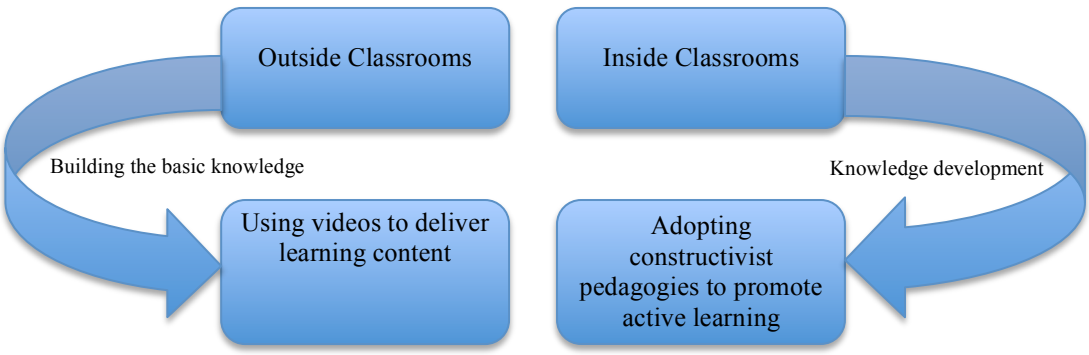
However, I rejected the FLN (2014) argument that the use of the term *flipped classroom* means the use of the earlier concept of flipped learning. There are many studies in this field that used the term "flipped classroom" with an interest in active

learning. For example, Bishop and Verleger (2013), Butt (2014), Tucker (2012), and Herreid and Schiller (2013).

Moreover, this study adopted the flipped learning definition that was presented by Bishop and Verleger (2013) and which is mentioned above, because it emphasized technology use within the direct instructional part outside of the classroom and, in particular, the use of the educational video, and the current study adopted videos to conduct flipped learning as well. In addition, the concept of flipped learning in this study was based on the theories and pedagogical practices that were explained within Bishop and Verleger's (2013) conceptual framework.

According to Bishop and Verleger (2013), the conceptual framework that supports flipped learning is focused on the causes for engaging lectures outside of the classroom and freeing up class time for more activities. Flipped learning is founded on ideas derived from Vygotsky's social constructivist theory of learning (1978). Flipped-learning enthusiasts have engaged with student-centered learning theories that emerged from social constructivist ideas along with continued research regarding active learning (Roehl, Reddy, & Shannon, 2013).

Figure (1): The Concept of Flipped Learning



Flipped learning "pushes passive learning out of the classroom while correspondingly pulling in active learning, in the time previously used for instructor lectures" (Love *et al.*, 2014, p. 319). Consequently, it consists of two parts. The first part involves watching the video lecture at home and forming a knowledge base; this part is based on teacher-centered approaches (Bishop & Verleger, 2013) in which students receive information from the teacher through the video. The second part involves attending the classroom and continuing the knowledge-building by doing some tasks with

colleagues in an active environment; this part is based on student-centered approaches (Bishop & Verleger, 2013), in which teaching and learning goals improve from only recalling information and shallow learning to intense learning through constructive practices and active learning (Ritchhart *et al.*, 2011). The outside class basic knowledge building in flipped learning can be the core of student-centered (active learning) practices in flipped learning. However, we also do not deny that creating a short video lecture for all learners at different levels is a kind of teacher-centered practice. Teachers are therefore advised to make these videos as interactive and student-centered as they can and to accompany them with other activities such as questions or assignments.

Therefore, in regard to the teacher role, Tuker (2012) argued that the role of the teacher through flipped learning is to prepare learning materials and make video lectures, or he/she may find suitable existing videos. In addition, they design learning activities for class time (Bergmann & Sams, 2012). Teachers may also facilitate, monitor, and direct the learning process (Bergmann & Sams, 2012) as well as encourage their students to use technologies while learning (November & Mull, 2012). In addition, compared to a traditional classroom, flipped learning puts greater pressure on teachers to keep students under constant observation, offer pertinent feedback, and evaluate learning performances during class time. On the other hand, learners take responsibility for studying at home to build a knowledge base by watching lectures and doing homework and then participating in paired or group activities to continue their knowledge building together and negotiate (Bergmann and Sams, 2012; Hamdan *et al.*, 2013; Roehl *et al.*, 2013).

It is worth mentioning that the current study committed to use the term *flipped learning* and used the term *flipped classroom* to refer to the class time within the flipped learning. Additionally, the use of *flipped course* means the course that applied the flipped learning pedagogy. Furthermore, in some contexts within this study, the terms *inverted* and *flipped* are used interchangeably, and *educational videos*, *learning videos*, and *video lecture* all meant the learning content that was sent to learners before class time as short videos.

Having discussed the concept of flipped learning, the next section discusses the theoretical framework of the study.

2.4 Theoretical Framework of the Study

In this section, I discuss the theoretical and conceptual frameworks of the study as they are intertwined, and I use the term *theoretical framework* because it is more comprehensive in my point of view. The theoretical framework provided me with the guidance to frame or inform many aspects in my thesis. It assisted in research like "an anchor" and helped in the interpretation stage (Baxter & Jack, 2008, p. 553). Also, it explained the relationships that could appear based on theory, logic, or experience (Miles & Huberman, 1994). Consequently, it helped me to organise the ideas of the study and achieve its purposes. It took its final shape through the reviewed literature, the collected data, and the inductive and deductive analysis stages in particular.

> A theoretical framework refers to the theory that a researcher chooses to guide him/her in his/her research. Thus, a theoretical framework is the application of a theory, or a set of concepts drawn from one and the same theory, to offer an explanation of an event, or shed some light on a particular phenomenon or research problem. (Imenda, 2014, p. 189)

By "theory," I mean "a metaphor, a model or a framework for understanding or making sense of things which happen in education" (Wellington, 2015, p. 38). Consequently, the study's theoretical framework was based on three key theories, which were the theories of social constructivism (Vygotsky, 1978) and self-regulated learning (Pintrich, 2000), and the principles of multimedia design (Mayer, 2009), based on the cognitive theory of multimedia learning (Mayer & Moreno, 2003). In addition, I would like to mention that many other theories could contribute to this study, but the used theories impacted the study most significantly. Therefore, I provide in this section the justifications for using these theories in the framework.

First of all, as my intention in this study was to explore and understand Saudi undergraduate students' perceptions of the advantages, challenges, and the future of flipped learning from their experience as participants in a flipped learning course in a Saudi university, I considered social constructivism as the main theory in the framework; I discuss the characteristics and premises of each theory in due course. The meanings and understanding of the phenomena were created through my interactions with the participants and with the learning context, and I considered their perceptions about their experience as a source of knowledge (Orey, 2010). In addition, flipped learning itself and its pedagogical practices are rooted from the social constructivist learning theory ideas, which show that learning can be developed

in social contexts when students interact with peers, teachers, and learning resources (Orey, 2010).

Secondly, concerning the third branch under the second research question, which is about the practices that might improve flipped learning in the future, the creation of this question as I mentioned before, was influenced by the data (see Chapter 1). Some participants were enthusiastic about the future adoption of the flipped learning but with some improvements. One of the suggested improvements in their perceptions was the "appropriate," "convenient," and "well design" of learning videos, as they described it, through their language. They reported some of the design principles directly, which made it easy to analyse inductively. However, I found it essential to look again at the data and analyse them deductively to understand the meaning of appropriate, convenient, and well design in their perceptions and to search the other principles. Throughout this process I found some principles strongly related to Mayer's (2009) principles of multimedia design based on the cognitive theory of multimedia learning (Mayer & Moreno, 2003). This led me to involve these theories in the theoretical framework, and also I used Mayer's (2009) principles' names as themes in my findings.

Thirdly, data analysis of the participants' perceptions about their experience of the flipped course revealed evidence regarding cognition regulation, motivation regulation, behaviour regulation, and context regulation. I then started to question whether flipped leaning helped them to develop habits that were related to self-regulated learning. Consequently, I found that the self-regulated learning theory might be a solution to analyse the data and provide the essential interpretations. Further, self-regulated learning has many models and frameworks, and this study adopted Pintrich's (2000) framework. In my view this framework suited my data and was the most appropriate framework of all the available options. It contains all the aspects of self-regulated learning that appeared in the data, which were the cognitive, motivational, behavioural, and contextual aspects, as many of the frameworks were lacking in motivational aspects (Pintrich, 2000).

Figure (2): Theoretical Framework of the Study

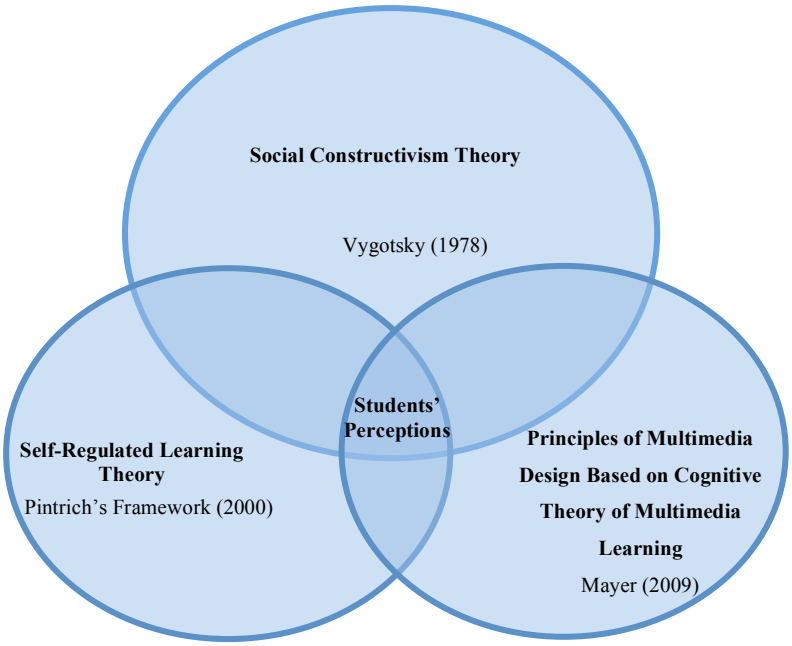


Figure (3): Students' Perceptions within the Theoretical Framework

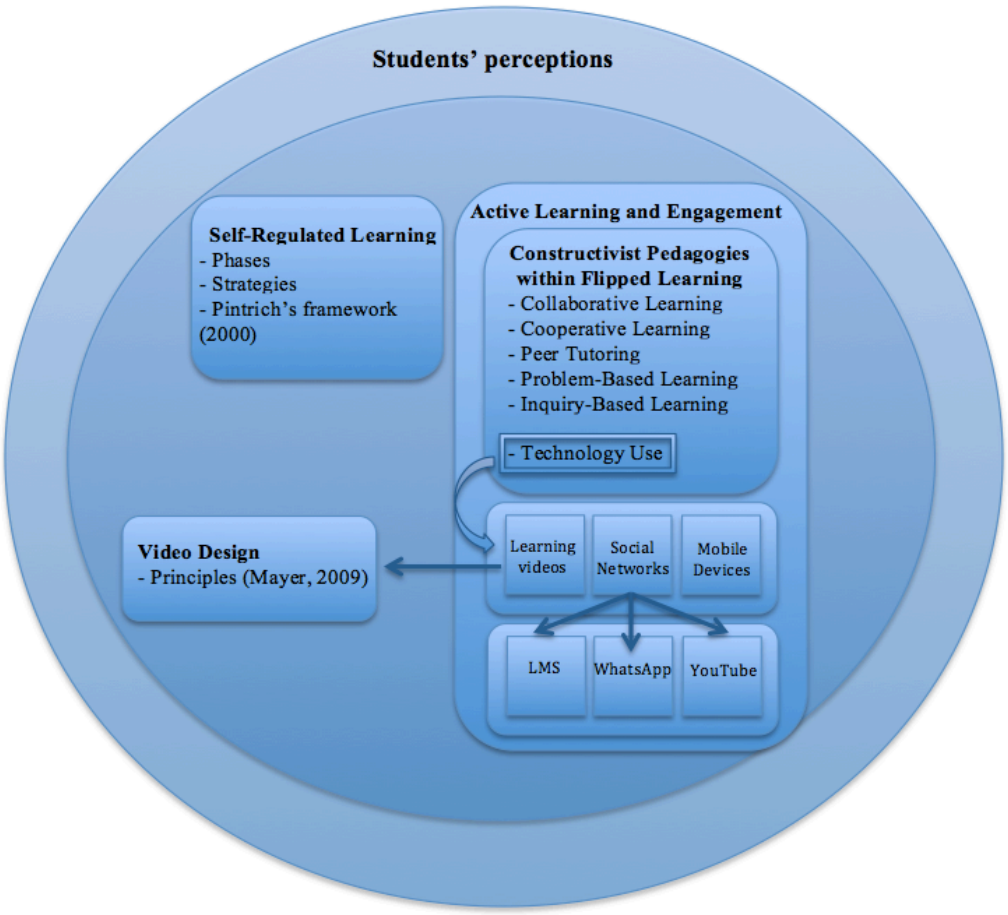


Figure 2 is a graphic that presents how the three theories fit together to provide the study's theoretical framework. It also describes the relationships among these theories. The larger circle is social constructivism, which formed much of the theoretical framework for this study, and represented the major contributing theory; the smaller circles are the other two theories that supported the larger theory. At the centre of this figure is the intersection of the circles, which represents the students' perceptions area in this study. Figure 3 shows this area in detail.

To sum up, these three theories helped me to build the theoretical framework of the study, develop the research questions, and to conduct the analysis and interpretation of data. They provided insight into how students might perceive flipped learning from their experience as participants in a flipped course at a Saudi University, which was the phenomenon investigated in this study.

Having presented my theoretical framework, in the following sections, I start with social constructivism and then the related concepts of the theory applied in this study, as shown in Figure 3. Therefore, I discuss, first, student engagement and active learning, second, the constructivist pedagogical practices adopted within flipped learning, and, third, technology use within flipped learning.

After that I move to the videos within flipped learning as part of the technology use. In the learning video design section, I present the cognitive theory of multimedia learning and then the principles of multimedia design. In addition, within the technology use, I discuss the use of social networks in education, which includes WhatsApp and YouTube. Also, I discuss mobile devices.

Finally, the last sections are related to self-regulated learning theory, self-regulated learning phases, strategies, and Pintrich's framework (2000). Throughout the sections I review literature that reveals how students perceive flipped learning.

2.5 Social Constructivism Theory (Cultural tools, ZPD, and MKO)

"In all constructivist teaching-learning scenarios, the traditional telling-listening relationship between teacher and student is replaced by one that is more complex and interactive" (Prawat, 1992, p. 357). According to social constructivism, learning is a social activity (Vygotsky, 1978). Students construct their knowledge and develop understanding when they interact with each other and use learning tools in a

meaningful context (Vygotsky, 1978). Vygotsky (1978) stressed that all learning is situated in a social, cultural, and historical context.

> Knowledge is not just an individual possession but also the creation and shared property of members of communities, who use "cultural tools" (including spoken and written language), relationships and institutions (such as schools) for that purpose. From this sociocultural perspective, the nature of thinking, learning and development can only be understood by taking account of the collective, historical nature of human life. (Mercer and Howe, 2012, p. 12)

In his work regarding thought and language, Vygotsky found that learners develop their language through social interaction. He explained that learning language is not only about teaching words but it is also a connected process between thought and language. Vygotsky (1978) suggested that each function of the learner's educational development occurs twice: first, when the learner interacts with other people (interpsychological) and second, when it occurs inside the learner as inner speech (intrapsychological), which is developed from the outside speech and considered a self-speak that directs learner behaviour (Fosnot, 1996; Steffe & Gale, 1995).

Vygotsky (1978) proposed that inner speech plays a crucial role as a tool of intellectual growth by which learners can control their behavior, differentiate between thought and language, and being able to communicate logically with others (Fosnot, 1996). Therefore, constructivist teachers should encourage students to be involved in conversations with their teachers and colleagues (Callison, 2001). Also, teachers should use questions to direct their students' thinking (Callison, 2001; Pritchard & Woollard, 2010). Social constructivism emphasises the importance of dialogue as a tool of learning (Pritchard & Woollard, 2010). Fosnot (1996) argued that dialogical learning and the role of peers' and adults' conversations, questions, negotiations, and explanations in the learning process can improve student learning. Hence, Brophy (2002) suggested that according to social constructivism, learning and teaching should be considered a dialogic inquiry, which is constructed by students and teachers to guide students to a higher level of thinking.

In flipped learning, students are encouraged to participate in different discussions and debates through peer tutoring that could promote student discussions and improve their thoughts. Also, through inquiry-based learning pedagogy during class time, and

within flipped learning, students participate in negotiations and discussions to answer different questions (Mazur, 1997).

Another significant element of Vygotsky's work is his influential theory of the "Zone of Proximal Development" (ZPD) (Vygotsky, 1978, p. 86). The main idea of this theory is that cognitive and learning development depends on the successful movement through a notional area of learning. This area or zone is an ideal space of cognitive development that follows the current level of learning. Students can move across this zone when they have outside assistance and social interactions (Vygotsky, 1978). According to ZPD, teaching appears through peer tutoring, teacher feedback, or "scaffolding" (Wood *et al.*, 1976, p. 90) (Pritchard & Woollard, 2010). The term "scaffolding" means all the types of assistance and support that are presented in the classroom to facilitate student learning (Wood *et al.*, 1976). The main reason for assistance and support is to prepare students to cope independently with their learning in the future without support and to have responsibility over their own learning (Brophy, 2002). Thus, ZPD asserts the important role of a teacher as a scaffolder and as a learning facilitator for student learning (Pritchard & Woollard, 2010).

However, it is important to mention that not only teachers or adults provide assistance in the ZPD but it can also be a group of students or paired workers in the classroom or outside it (Brophy, 2002; Pritchard & Woollard, 2010). Therefore, ZPD encourages teachers to use pedagogies that apply cooperation and collaboration among peers working to help their students express their inner ideas and thoughts (Fosnot, 1996; Pritchard & Woollard, 2010). Encouraging students to engage with lectures outside of the classroom in flipped learning makes the base knowledge of students about various topics. Additionally, the purpose of freeing up class time for social interaction is to co-construct students' knowledge to move across the learning zone and provide a deep understanding for the topic that they already read or watched a video about.

Moreover, there are two primary standards of Vygotsky's (1978) work, which are the zone of proximal development (ZPD) and the "More Knowledgeable Other" (MKO) (Orey, 2010). MKO "refers to someone who has a better understanding or a higher ability level than the learner" (Orey, 2010, p. 48). This more knowledgeable other is not always a teacher; it can be a peer or an electronic tool which can support learners

during their learning process and can work as a tutor for them (Orey, 2010). For example, it may be a classmate who knows more about a concept, process, or task (Orey, 2010). Today, research supports this concept and highlights its importance in the educational process by advocating for a social and collaborative atmosphere among learners (Cicconi, 2014).

Furthermore**,** "Recent interest in talk and learning in the classroom has encouraged a new metaphorical use for the term 'scaffolding'" (Maybin *et al.*, 1992, p. 186). Scaffolding is a result of Wood *et al.*'s (1976) works regarding the temporary support through an "interactive system" of learning that a teacher can employ to help learners move through their learning process.

> Scaffolding, as most people know, is placed around the outside of new buildings to allow builders access to the emerging structure as it rises from the ground. Once the building is able to support itself, the builder removes the scaffolding. The metaphor of scaffolding has been widely used in recent years to argue that, just as builders provide essential but temporary support, teachers need to provide temporary supporting structures to assist learners to develop new understandings, new concepts, and new abilities. As the learner acquires these skills, so teachers need to withdraw that support, only to provide further support for extended or new tasks, understandings and concepts. (Hammond & Gibbons, 2005, p. 8)

According to Orey (2010, p. 227), scaffolding is kind of support which is presented by a teacher or peer to maintain learning. Learners may not master an assigned task individually the first time. Consequently, the teacher can provide a support, but only for the skill or concept that is beyond the learner's current competence, and "when the student takes responsibility for or masters the task, the teacher begins the process of 'fading', or the gradual removal of the scaffolding, which allows the student to work independently" (Zarandi and Rahbar, 2014, p. 344). In addition, throughout the scaffolding process, errors are expected, and continuous feedback is needed to reach the goal (Orey, 2010). Also, scaffolding is a lively intervention, which means that the assistance offered by the teacher within scaffolding intensely relies on the features of the situation, such as the learner's response or the type of learning task. Thus, scaffolding changes from case to case and certainly does not appear similar in various states (Van de Pol *et al.*, 2010).

Mercer (1994) suggests some principles that let teachers differentiate between

scaffolding and any other educational practices. These principles are as follows:

- Learners need their teacher's involvement in order to succeed.

- There is an aim to improve a learner's independent capability.

- There is a target skill or concept in the teacher's mind that he or she wants the learner to master.

- It is necessary to have an indication that a learner is successfully carrying out the specific assigned learning task.

- Also, it is necessary to have evidence that students are now able to do this task autonomously with future connected jobs or difficulties (Hammond & Gibbons, 2005).

Therefore, "Scaffolding is actually a bridge used to build upon what students already know to arrive at something they do not know. If scaffolding is properly administered, it will act as an enabler, not as a disabler" (Benson, 1997, p. 126, as cited in Orey, 2010, p. 227).

Scaffolding can be implemented through a teacher as a one-to-one interaction, a peer, or even a piece of technology as discussed later in this chapter. Sanders and Welk (2005) argued that modelling, feedback, instructing, questioning, and cognitive structuring are strategies that can be used to scaffold student learning by applying Vygotsky's ZPD. They discussed these strategies as follows:

1. **Modelling:** Can be carried out when teachers act as a role model and offer oral or non-oral behaviours that students can copy, as well as when they add special details to the classroom or create a simulation learning environment, which may help students in the case of shortage of understanding.
2.
3. **Feedback:** Providing students with some assistance that can support them or extend their knowledge, for instance, referring to a criterion or standard such as a page number in a book or citing lecture notes. In addition, supplying students with self-assessment tools such as a rubric to grade themselves and compare, which may enhance learner dependence on inner judgment of criteria.

4. **Instructing:** "Use guided notes with videotapes, CDs, and computer-assisted instruction to provide 'academic voices' for later student recall and application" (Sanders and Welk, 2005, p. 204). Also, making charts, forms, outlines, and notes, which may primarily offer the needed support but at the same time are not mandatory to reach the desired stage of performance. Moreover, encouraging the use of learners' notes that they create by themselves or summaries as momentary scaffolds of learning.

5. **Questioning:** Frequently asking questions to judge and find out where they need to help and support their students and provide the needed scaffolds. Also, supporting learners' metacognition by inviting them to participate and talk about their new understandings and experiences, which may help their classmates to learn. In addition, having direct and instant meetings with learners who have low achievements to learn their weaknesses or lack of knowledge so that inaccurate understanding is not present in future practice. Moreover, offering the needed reviews before exams that may help learners study.

6. **Cognitive structuring:** Making concept maps with different designs and methods in order to discover how learners think so that the needed support can be provided. Additionally, "Promote tutor selection whereby the tutor can stress both the learning process as well as the content. Hold a faculty-student-tutor meeting to help analyze the learning situation for individualised student progress toward self-assistance" (Sanders and Welk, 2005, p. 204).

Moreover, Orey (2010) mentions some scaffolding tools, which may facilitate learning. For instance, cooperative learning can be employed, which encourages dialogue amongst peers and fosters teamwork, questioning, breaking the learning task into small parts so that the learner can manage it easily, providing hints, modelling, or asking a learner to think out loud (Orey, 2010). Orey (2010) emphasizes the importance of open dialogue with the learners to learn about their understanding and way of thinking in order to support them in case of any mistakes and to personalize teaching.

The constructivist pedagogies that are adopted in flipped learning to allow for active

learning, which are discussed later in this chapter, can use all of the mentioned types of scaffolding strategies to let students move through their ZPD. For example, collaborative learning can provide the modelling strategy. A student can observe other group members and take them as a model to perform (Grabau *et al*., 2015). In addition, peer tutoring can offer the needed scaffolding by providing instant feedback for a learner (Goodlad & Hirst, 1990). Also, short videos used within flipped learning can be a kind of instructional scaffold (Bergmann & Sams, 2014). Further, inquiry-based learning is one of the flipped learning pedagogies in which students can receive the needed scaffolds through questions and answers, such as using the clicker method, which is the use of small devices as an audience response system (Bates & Galloway, 2012; Mazure, 2009). Lastly, the cognitive structuring strategy of scaffolding can be provided through concept and mind maps, which can be problem-solving tools within flipped learning (White *et al.*, 2017).

In this section I discussed the social constructivism theory perspectives of learning and its applications with regards to flipped learning. The aim of the next section is to discuss student engagement and active learning.

2.5.1 Student Engagement and Active Learning

Student engagement is the backbone of the home-based studying and in-school active learning that should happen in the classroom. Students' engagement is "the range of action students take to advance from not knowing, not understanding, not having skill, and not achieving to knowing, understanding, having skill, and achieving" (Reeve, 2013, p. 580). According to Taylor and Statler (2013), "Less emotion means less learning and more emotion means more learning" (p. 9). Thus, they argue there is a strong relationship that connects students' learning and emotions, which means that the student who is not involved in discussions or does not receive any feedback during class time will not benefit from any learning materials (Jamaludin & Osmans, 2014). Herreid and Schiller (2013) argue that flipped learning can engage students' learning through active learning.

Flipped learning may engage learners in different activities like watching recorded videos, being involved in discussion with the teacher, performing hands-on activities, taking assessments and working in learning groups (Bergmann & Sams, 2012). Many trials and pieces of anecdotal evidence have reported that flipped learning can help

teachers boost student engagement, whereas few studies have actually measured students' engagement level (Millard, 2012). For instance, McLaughlin *et al.* (2013) implemented this study in 2012 to investigate whether flipped learning could improve students' performance, engagement, and perception. In McLaughlin *et al's* study, 22 satellite students on two different campuses were taught a basic pharmaceutics course in the UNC Eshelman School of Pharmacy in North Carolina by using flipped learning. Students were encouraged to watch a recorded video before the lecture. Twenty-five videos were uploaded to the course website, and each of them was about 35 minutes long on average. Students also participated in active learning activities during class time. These activities included clicker questions (clickers are small devices that can be used as a classroom response system to enhance peer instruction (Bates & Galloway, 2012; Bruff, 2009)), think-pair-shares, student presentations, and quizzes. The researchers found that although academic performance did not change after the flipped classrooms, flipped learning could improve the quality of satellite students' experiences. Students reported that they preferred the flipped learning classes and that it improved their learning, and they showed a high quality of interaction and engagement during class time.

Moreover, a study was conducted by Vaughan (2014) to investigate the impact of the flipped learning on students' engagement in an introductory teaching course. This study also examined the management strategies that are needed to implement flipped learning successfully. The researcher used journals, discussion notes on a discussion board through Blackboard, and participant observation for three classes to observe students' interactions, attendance, and assignment completion. The findings determined that learners showed an advanced level of engagement through their reflections and inquiry in their coursework, as well as more collaboration, discussion, and good questions during class time. In addition, the researcher found that the most important considerations for implementing flipped learning in a successful way are understandable instructions and good preparation before class time to engage with in-class activities.

Furthermore, student engagement can play a fundamental role within active learning. Active learning involves any pedagogy that encourages learner engagement through meaningful activities in a learning process (Prince, 2004). This term is typically used in contrast to traditional classrooms in which students act as passive receivers (Prince,

2004). Chickering and Gamson (1989), in "Seven Principles for Good Practice in Undergraduate Education", claimed that students can learn when they engage with the learning materials during active learning, and that "Learning is not a spectator sport. Students do not learn much by sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers" (p. 4). Instead, they need to read, write, discuss, reflect, and connect their learning to previous experiences and then apply it to their future lives.

Active learning is not a new concept. Dewey (1915) established this idea when he discussed "learning by doing" (p. 70) or experiential learning. Dewey (1916) assumed that school is not only a place of preparation for future life but it is also a part of the students' real life. Thus, he argued, education should represent a societal life and connect to students' habitats and environments such as the home and business. Also, schools should provide educational environments that support the four natural inclinations of students to improve their skills and knowledge (Dewey, 1956; Dewey, 1915). These inclinations include the desire to accomplish; communicate with others; explore; and utilise artistic expression (Dewey, 1956; Dewey, 1915). As a result, students need to learn via active engagement through meaningful activities and experiences that satisfy their natural inclinations in the school, both cooperatively and collaboratively, and the duty of the school is to take life experiences and organise them for students as lessons (Dewey, 1915). Hence, students will take all the learned experiences, knowledge, and skills and apply them to solve problems outside of the school (Dewey, 1915; Dewey, 1916). Additionally, Dewey (1956) emphasised student critical thinking, and he thought that the school's task was not only to provide knowledge and skills but the school was also the place in which students should develop their thinking, ethics, and perspectives.

Furthermore, Dewey (1915) argued that:

> The teacher and the book are no longer the only instructors; the hands, the eyes, the ears, in fact the whole body, become sources of information, while teacher and textbook become respectively the starter and the tester. No book or map is a substitute for personal experience; they cannot take the place of the actual journey. (p. 74)

Based on Dewey's ideas, teachers are advised to work as facilitators for student learning, and they should prepare the learning environment for their students and

guide them during the learning process (Dewey, 1915). In addition, Dewey (1956) established the idea of reading textbooks as homework to prepare students for the next lesson, to be engaged in the class discussions, and to find time for these discussions. Dewey's works in this area pre-dates but overlaps with the main idea of the flipped learning and his theories justify the reason for encouraging students to engage with materials outside the class to maximise the time for active learning in class time.

However, although research shows the effectiveness of active learning in learning outcomes, faculty members in universities still adapt a lecturing pedagogy (Johnson, 2011). For instance, Liu, Qiao, and Liu (2006, p. 77) argue that "while learner-centered language teaching has been advocated in higher education in recent years, teacher-centered teaching styles may be still dominant in actual practice". One challenge of using active learning is the limited class time (Bonwell and Eison, 1991). Therefore, teachers may use traditional teaching methods and avoid active learning to try to save class time and cover the required learning content. Flipped learning can be a solution for this issue (McDonald and Smith, 2013; Zainuddin and Attaran, 2016). Specifically, "The major argument behind the use of the flipped model is to increase the time students have to actively engage in collaborative activities and decrease the time students passively listen to a didactic instructor" (Sletten, 2015, p. 8). Providing active learning environments in the classroom is a major aim of flipped learning (Roehl *et al.*, 2013). In addition, there are pedagogies that may promote active learning within flipped learning. For example, peer tutoring, problem-based learning, cooperative learning, collaborative learning (Bishop & Verleger, 2013) and inquiry-based learning (Mazur, 1996).

One component of flipped learning is integrating technology before and after class time to promote active learning (Holmes *et al.*, 2015), which is discussed later in this thesis. Active learning cannot be accessed by providing classrooms with modern technology and equipment alone. It is important to look at the most important content: the student. Thus, the equipment should be used alongside appropriate teaching methods, well-designed activities, and appropriate evaluation (Holbert & Karady, 2009). Teachers are advised to supply learning experiences that encourage students to construct their knowledge and achieve active learning goals. For example, a teacher may ask her/his students to build a database on a specific topic, which can engage

them mentally in meaningful learning (Keengwe *et al.*, 2009). This activity may start with brainstorming to help suggest some ideas with which a group of learners can plan the database, and then collecting the needed data, designing the database, and lastly implementing it (Keengwe *et al*., 2009). Within this process, learners can practise describing relations between various concepts, making notes, forming exploration processes, arranging and likening data, and producing final reports (Keengwe *et al*., 2009).

In some previous studies, learners expressed their satisfaction about interactive activities during active learning within the flipped learning context. Roach (2014) conducted a study to explore university students' perceptions of flipped learning in an economics course over one term (for more than 100 students). He asked the students to watch a video each week, which was attached to a blog each Friday. Multiple choice questions were attached to each video as well as open-ended questions that students had to answer. Students needed to attend the classes each Monday or Wednesday as usual, but should participate in the active-learning activities. These activities could involve problem-based learning, case studies, and discussions. To collect students' perceptions, the researcher used two types of surveys. First, an open-ended survey was conducted in the middle of the term to update his method and videos. Second, at the end of the term he gave another survey that involved questions to be answered on a Likert-type scale to collect the actual perceptions. In Roach's (2014) study, students' perceptions of flipped learning were positive. Seventy-six per cent of them said that flipped learning videos assisted them in learning. Also, 94% reported their satisfaction with the interactivity that they found in the class compared to their other traditional classes. In addition, the researcher found that the application of a flipped design allowed the time needed to implement active leaning and completely cover the fundamental course materials, leading to a deeper understanding. Also, students appreciated the use of media more than textbooks.

Another study was conducted in this area by Bates and Galloway (2012), who inverted their introductory physics course at the University of Edinburgh. It is a compulsory physics course for the physics degree, and the study was applied on about 200 students. There was no laboratory component within the course. The study was applied for one semester, and each week had three class sessions, and each session's duration was one hour. The course materials were sent to students before the class

time. These materials included textbooks, electronic materials, and web resources. Students would send in their assignments before lecture time, and these assignments required them to produce quiz answers based on their readings and to describe any difficulties they had experienced with the pre-class reading. During class time, teachers focused on these difficulties or problems, including discussion and peer instruction. The researchers found that 80% of the surveyed students preferred the flipped approach to a traditional approach. Also, they found that students achieved a high quality of learning, which was apparent in the final exam results; the feedback collected from students showed a high level of satisfaction regarding the course style. In addition, Bates and Galloway (2012) provided evidence of high student engagement with the reading assignments and quizzes as well as good classroom attendance.

However, one of the challenges that students may face within flipped learning is that it requires more time and work outside the classroom to prepare for the classroom activities. For example, Strayer (2007) compared a flipped learning class and a traditional class that received traditional instruction (lecturing) for two statistics courses in Ohio. In flipped learning, an online system was used to share learning materials and the curriculum content outside of the classroom. The students were engaged in activities related to the materials in the classroom. In the traditional classroom, the students joined lectures that involved PowerPoint slides and produced homework after reading their books outside of class. The researcher reported that students in the flipped classroom "preferred and experienced a higher level of innovation and cooperation in their classroom" (p. 106). However, these students were less satisfied with the methods used during the course to qualify them for their tasks, which they felt were missing, whereas students in the traditional classroom did not feel this. Also, the students in the flipped learning class felt that they had too much responsibility, as they needed to prepare for the class time and complete assignments. In addition, Strayer provided some suggestions for teachers to consider when they apply flipped learning. For example, it is important to give students an opportunity to reflect on their own learning. Also, in order to avoid the learner's sense of loss during class time, it is better to provide them with activities that are explained step by step.

Moreover, Khanova *et al.* (2015) carried out a qualitative study to explore students' experiences through 10 flipped courses within one curriculum between 2013 and 2014 in the University of North Carolina. In addition, the researchers explored the advantages and challenges based on students' perceptions. The primary source of the data was students' responses to open questions in the middle and at the end of the term. The researchers collected 6,010 students' comments, and analysed these thematically. They developed four themes, and under each theme they included its advantages and challenges. "Overall course format" was the first theme, and the key advantages under this theme based on students' perceptions were the ability to understand and apply learning materials, high level of engagement during class time, and enjoyment of active learning. However, students had concerns regarding the implementation of the class sessions. For example, they expressed that the classroom experience could have been more engaging. "Preclass learning" was the second theme. The main advantages under this theme were the students said they needed time to study and process information; the materials could be watched many times, and students were able to better participate in class time because they understood the content better. Nevertheless, the pre-class studying and preparation increased the workload, especially in the case of multiple flipped courses. "In-class learning" was the third theme. Students appreciated the alignment of the preclass material and classroom activities. However, some students reported the existence of occasional redundancy, which means that class time activities sometimes presented the same content of the preclass materials and did not work to expand their knowledge. Some students wanted a mini lecture in the class to clarify some points or questions, more interaction with the teacher in the classroom, and more clarifications and assistance. "New pedagogy calls for changes in assessments" was the fourth theme. Students thought that although they were very prepared before exams, it was not fair that the exams contained questions that were not covered very well during class time (Khanova *et al.*, 2015, pp. 1041–1044).

Although students reported that engagement and active learning are an advantage of flipped learning, they claimed that the low-level design of the activities can sometimes lead to low engagement, which is another challenge that they encountered within flipped learning classrooms. In addition, the missed or inadequately covered learning content was another challenge. For example, while studying at home,

learners may encounter information that needs further clarification, but the weak feedback outside the classroom forces them to struggle alone, and then they may also forget to ask the teacher about it when they meet in the classroom. In the same vein, Triantafyllou and Timcenko (2015) reported that students may "miss just-in-time explanation" (p. 2573) within the flipped learning context, which means there is a need for (face-to-face) explanation in some urgent cases, such as when students are faced with the difficulty of understanding information at home.

In addition, Zainuddin and Attaran (2016) evaluated 13 Malaysian students' perceptions of flipped learning in the University of Malay. They conducted their study on a course of Research in Education for part-time and full-time students. They used quantitative and qualitative methods, which were a questionnaire survey based on a Likert scale, one-to-one interviews, and a focus group interview. The flipped course used short video lectures (10–50 minutes) and interactive face-to-face class time of 3 hours each week. The majority of the students had positive perceptions of flipped learning. In addition, they recommended flipped learning for other courses. Also, students suggested that videos could be shorter and more engaging. However, part-time students reported that they had difficulty attending and preparing for classes because of lack of the time. Although the participants of this study were postgraduate students and the current study focuses on undergraduate students, I found that the research findings could provide support for the current study's findings, especially the findings that related to students' challenges based on their perceptions of flipped learning because scant research mentioned that.

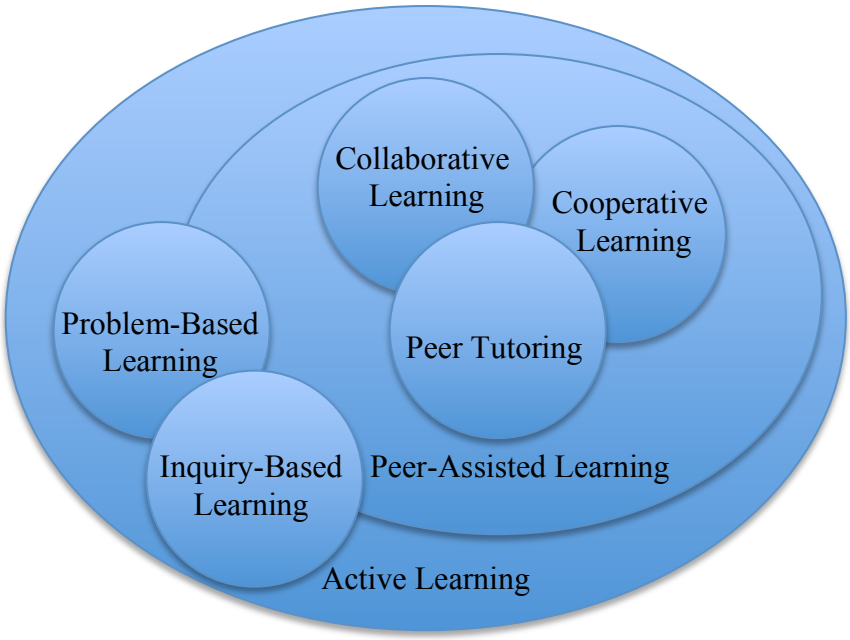
Having discussed student engagement and active learning, the next section concerns constructivist pedagogical practices adopted within flipped learning that can support active learning.

2.5.2 Constructivist Pedagogical Practices Adopted Within Flipped Learning

There are some pedagogical practices that are adopted within the flipped learning classroom that are also adopted in this study through the flipped learning case study. Through my review of the flipped learning literature, I found that educators usually adopt peer-assisted learning methods such us collaborative learning, cooperative learning, and peer tutoring, which are discussed in the following sections (Bergmann & Sams, 2014). In addition, problem-based learning (Hamdan *et al.*, 2013) and

inquiry-based learning are also discussed (Crouch & Mazur, 2001; see Figure 4 regarding the constructivist pedagogical practices adopted within flipped learning that were inspired by Bishop and Verleger (2013, p. 7)). I would like to mention that more literature regarding these practices is embedded and discussed in the findings and discussions (see Chapter 4), as students provided many perceptions and comments regarding their experiences of these pedagogies. I found it appropriate to discuss their views alongside the theoretical arguments about learning.

Figure (4): Constructivist Pedagogical Practices Adopted Within Flipped Learning



2.5.2.1 Peer-Assisted Learning

Human interaction and relationship building are key components of flipped learning. Flipped learning may give teachers the needed time to interact more with their students and to build relationships with them (Bergmann & Sams, 2014). In addition, peer-assisted learning is a practise of flipped learning during class time; it is "the acquisition of knowledge and skills through active helping and supporting among status equals or matched companions" (Topping & Ehly, 1998, p. 1). Peer-assisted learning has various forms, such as collaborative learning, cooperative learning, and peer tutoring. The following sections discuss these forms.

2.5.2.1.1 Collaborative Learning

Collaborative learning refers to a group of learners who work together to achieve a

goal and that a facilitator helps them focus on their task. This kind of learning may lead to deep learning when students help each other and provide the needed support and clarification. In this environment, students receive many different points of view; thus, they may learn how to express their views and advocate them (Kulikovskikh, Prokhorov, & Suchkova, 2017). Therefore, through collaborative learning, students may learn to listen to others, offer the required support to their peers, gain needed understanding, and engage in knowledge construction. This construction can achieve a zone of proximal development as described by Vygotsky's (1978) theory. This construction may involve interactions and discussions that can promote knowledge building. Hence, 'a general concern in collaborative learning is to improve the probability of interactions which enable learning happen.' (López-Yáñez *et al.*, 2015, p. 939). In addition, this type of learning may improve students' critical thinking because of their active role in debates and discussions and boost students' ability to solve problems (López-Yáñez *et al.*, 2015). With regards to flipped learning, many studies applied collaborative learning through classroom sessions, and students had positive perceptions towards collaborative learning, such as in the studies by Roach (2014), Love *et al.* (2014), and Bates and Galloway (2012).

2.5.2.1.2 Cooperative Learning

Cooperative learning differs from collaborative learning. Thus:

> Cooperative learning is carefully structured group work. Although details of the activities (e.g., size of group, duration of the grouping, formal vs. informal activities, evaluation methods) vary widely, cooperative learning activities share several key elements that distinguish them from traditional forms of group work. (Emerson *et al.*, 2016, p. 23)

Cooperative learning is characterized by personal accountability and individual responsibility, positive interdependence, and equal involvement (Johnson & Johnson, 2009). Therefore, in an educational context, the students in a group participate equally, and each member should accomplish a part of the main task; then, they combine their results to achieve success (Emerson *et al.*, 2016). According to Johnson *et al.* (2014), cooperative learning can offer a base for different types of active learning, such as collaborative learning and problem-based learning. For example, collaborative learning is less structured if we compare it with cooperative learning, which may cause ambiguity in the teacher's and students' roles. This ambiguity in

turn can lead to ambiguity in the definition of collaborative learning. This dilemma is not new, but has occurred over the history of collaborative learning; thus, cooperative learning can be employed as a clear basis for collaborative learning (Johnson *et al*, 2014). As there may be no strong positive interdependence within a collaborative learning group, students may meet to work and may feel free to talk frequently, but in the strict structured groups within cooperative learning, each member is accountable for part of the whole task (Roger & Johnson, 1994). In Strayer's (2007) study, which is previously mentioned in the student engagement and active learning section, students expressed their preference for classroom activities within the flipped learning context, including cooperative activities.

2.5.2.1.3 Peer Tutoring

Peer tutoring includes students offering assistance to each other to learn, which assigns some teaching responsibilities to students (Goodlad & Hirst, 1990; Loke & Chow, 2007). This idea is not intended to solve any teacher shortage, and some teachers do not want all the responsibility, but this approach has other education-based purposes. First, evidence supports the advantages of peer tutoring, and these advantages involve improved self-confidence, better communication, higher cognitive achievement, and more social interactions (Loke & Chow, 2007). Second, peer tutoring can help students better their understanding, because they may know about the learning issues of classmates better than the teachers (Loke & Chow, 2007). However, Goldschmid and Goldschmid (1976) argued that although peer tutoring has many benefits, it is not a remedy for all educational issues. Actually, it is better when it is used with other learning and teaching methods. It can be especially applicable when a teacher attempts to improve students' responsibility for their own learning and engage them through the learning process or attempts to promote their social skills and cooperation. I agree with this argument; peer tutoring can have a good effect on the teaching and learning process, and this study's findings strongly support this, but it is not a panacea for all educational problems as presented by some researchers. Peer tutoring is discussed in detail in the findings and discussion chapter (see Chapter 4). Peer tutoring is employed within flipped learning sessions in many of the studies and in the current study. Examples of these studies include Bates and Galloway (2012) and Mazur (2012).

2.5.2.2 Problem-Based Learning (PBL)

Problem-based learning (PBL) is a student-centred learning approach that encourages students to solve problems in critical ways. It involves appropriate learning resources in collaborative groups so that individuals can identify problems, suggest the best solutions, observe and evaluate the outcomes, and provide reflections (Seng *et al.,* 2000). In addition, teachers play a very important role in PBL as facilitators and directors who present problem scenarios to students, encourage discussions, and support the students (Savin-Baden & Major, 2004). Adapting PBL can be beneficial for students. First, it encourages students to gain new knowledge by themselves, and this supports lifelong learning concepts (Savin-Baden & Major, 2004). Furthermore, students use a high level of thinking when they try to solve problems because they need to acquire new knowledge before solving the problems, which was acknowledged by Kingsland (as cited in Baturay & Bay, 2010).

Hamdan *et al.* (2013) argued that during flipped learning, teachers use several methods to help students understand content, and PBL is one of these methods. For example, PBL was conducted within flipped learning classroom activities in the studies Bates and Galloway (2012), and Mazur (2012). This involves grouping students for PAL during class time to solve some problems critically, and this can increase their understanding of the content and shape the application of PBL within flipped classrooms. In the current study, PBL took the form of case studies, which are activities that are "very closely related to PBL. With this activity the instructor gives students a real-world account and asks the students to respond to it by answering questions, discussing amongst groups, or comparing the case to the topic of the video-lecture" (Roach, 2014, p. 97).

2.5.2.3 Inquiry-Based Learning (IBL)

In IBL, students are encouraged to learn through open-ended questions about their disciplines and to answer questions that are posed by other students, their teacher, or which have arisen from discussions. Students are encouraged to answer based on the knowledge that they already have and new knowledge that they acquire during a learning process in a collaborative or individual way. Moreover, they are encouraged to support these answers with suitable evidence, analyses, justifications, and reflections (Kahn & Rourke, 2005). In addition, IBL is rooted in constructivist theory,

as well as both cognitive and social perceptions (Cox *et al.*, 2008). Significantly, there is an overlap between PBL and IBL because IBL involves PBL elements. However, in PBL, problems or questions are established by teachers or students (Kahn & Rourke, 2005).

Regarding flipped learning, IBL is one of the possible student-centred learning pedagogies involved in flipped learning, and it was implemented by Mazur (1996), who, as detailed earlier, introduced flipped learning at Harvard University. Moreover, in his lectures, Mazur established the "Concept Test" (p. 970), in which he used class time for peer tutoring; this involves a sequence of brief presentations by students who present the main points of a lesson. After each presentation, a question is posed to assess students' understanding, and then each group of students answers the question cooperatively by using clickers (Crouch and Mazur, 2001; Mazur, 1996). Furthermore, in a recorded video of Mazur talking about his experiences in flipped learning (Mazur, 2012), he explained his way of integrating flipped learning with peer tutoring in both IBL and PBL. He stated that he asks his students to post their questions and discuss their difficulties on Facebook after viewing videos or completing online quizzes before class time. Based on their questions, problems, and discussion points, Mazur modifies class activities so that students can overcome any difficulties and not simply repeat what they have already understood (November & Mull, 2012). In addition, Bates and Galloway's (2012) classroom sessions were built around multiple clicker questions; many of these questions were used as a foundation for peer tutoring. According to Bates and Galloway (2012), students showed a high level of engagement through class activities, and the "questionnaire indicated a high level of student satisfaction with the course design" (p. 5).

Having discussed the constructivist pedagogies that are adopted within flipped learning, in the next section I discuss the use of technology within flipped learning.

2.6 Using Technology within Flipped Learning

Nowadays, technology has advanced and students can access online resources everywhere, at any time (Bergmann & Sams, 2012). According to Holmes *et al.* (2015), higher education systems today have access to technologies that involve software and hardware to assist with active learning. Technologies like laptops, tablets, smartphones, desktops, and other devices help in the learning and teaching process inside and outside the classroom, including in online learning, face-to-face,

blended, and flipped learning (Holmes *et al.*, 2015). Also, teachers can use technology to produce videos, PowerPoint slides, and printed learning resources that may facilitate teaching and learning, and universities also provide technology to support teaching and communications between teachers and students such as learning management systems (LMSs) and email (Holmes *et al.*, 2015). With regards to flipped learning, technology plays an important role by being used to present the learning content before class time (Davies *et al.*, 2013) and also to promote active learning during class (Long *et al*., 2016).

The use of technology in education can provide great accessibility of unrestricted information (Ng & Gunston, 2002; Talebian *et al.*, 2014). The use of technology in flipped learning may provide students with the needed flexibility and accessibility (Murray *et al.*, 2015; Zainuddin & Attaran, 2016). Murray *et al.* (2015) conducted a survey to explore 85 students' perceptions of flipped learning. Students were enrolled in the Introduction to Servers Environments and Architectures course at Murdoch University, which was 2 hours a week. The teacher delivered videos before classes, and the class time was based on interactive activities. The first 20 minutes of each class was spent in discussions about the topics or the videos. Researchers used an online survey to measure students' perceptions, and 76 of the students completed the survey. As revealed through the research findings, flipped learning received a positive reception from students, especially concerning the flexibility and convenience of the videos, as they appreciated the ability to access the videos anytime and anywhere.

In addition, students may benefit from multimedia and visual clarifications that can be presented through technology within flipped learning, especially through learning videos. For instance, Triantafyllou and Timcenko (2015) carried out a study to explore 50 students' perceptions of online materials within flipped learning and how these materials contributed (if at all) to their motivation and learning of mathematics. The flipped course was a prerequisite course at the Media Technology Department of Alborg University, Copenhagen, Denmark. Researchers used online materials that were shared with students before class time such us screencasts, quizzes, lectures notes, and online readings. They also used an online survey with a Likert scale, and the survey also contained two open-ended questions. The findings showed that students' perceptions were very positive regarding online resources because these

resources helped them through detailed visual clarifications, and also they had a positive effect on their motivation. In addition, they criticized the validity and quality of some of the learning resources.

Moreover, when teachers use technology in flipped learning classrooms, it may support scaffolding, enable active learning, and improve group collaboration (Talebian *et al.*, 2014). With the current interest in active learning, educators in higher education and technologists are cooperating to find effective ways to employ technology in the teaching and learning processes that support active engagement both inside and outside the classroom (Holmes *et al.*, 2015). Some activities within active learning, such as problem-solving and collaborative learning, are favoured in a technology-enabled active learning (TEAL) classroom, which is "a small capacity classroom equipped with multimedia projectors, white boards, laptops, and tablets, and utilizes modular tables for flexibly configured working arrangement" (Long *et al.,* 2016, p. 46). TEAL can play a crucial role for promoting active learning in flipped learning classes, but it should not be seen as an essential element or fundamental focus of flipped learning sessions because the main focus is the active learning itself, and technology may distract learners if it is not used properly (Long et al., 2016). For example, "without active learning in the classroom, the students may be distracted by the computer and begin to surf the Web or check their e-mail" (Holbert and Karady, 2009, p. 33).

Thus, the planning and execution of flipped learning are suggested to meet the students' demands in terms of choosing the needed technologies, resources, and learning activities (Long *et al.*, 2016). Zhang *et al.* (2006) argue that the availability of various technologies in the classroom allows learners to interact through activities and to find things by themselves, in line with constructivist perspectives of learning, which stress and give greater attention to searching for answers than to the validity of the answer itself. Social constructivism sees tools as strong facilitators of learning; these tools can involve speech, graphs, computers, maps, and signs to simplify knowledge building for students (Windschitl, 2002). Thus, "many constructivists call for richer learning environments that contrast with the typical less interactive classroom environments relying on instructors, textbooks, and lectures. Graphics, video, and other media can help by interesting and engaging learners" (Zhang *et al.*, 2006, p. 16). Becker (2001) states that teachers with greater constructivist emphases

are more able to employ technologies in the classroom with their students and in their lives as well. Constructivism views technologies as tools that can help learners to interact and build knowledge, access experts who may be more knowledgeable others (MKOs), and then move through their ZPD. Therefore, the application of technology should not be surface use; rather, it "should serve as a set of tools for knowledge construction" and encourage learners to build deep relations with the learning materials through drills, practice, hypermedia, and simulations (Overbay *et al.*, 2010, p. 105).

Doolittle and Hicks (2003, pp. 88–92) suggest six strategies for teachers who use technology based on constructivism and to construct knowledge in social studies:

1. Teachers and students should be prepared to implement technology as a tool for inquiry.
2. Teachers should use technology to create authenticity, which facilitates the process of student inquiry and action.
3. Teachers should use technology to foster local and global social interaction such that students attain multiple perspectives on people, issues, and events.
4. Teachers should facilitate student knowledge construction by using technology to build on students' prior knowledge and interest.
5. Teachers should enhance the viability of student knowledge by using technology to provide timely and meaningful feedback.
6. Teachers should cultivate students' academic independence by using technology to foster autonomous, creative, and intellectual thinking.

To sum up, technology's support for education depends on teachers' utilisation of the available technologies (Rogers, 1999, as cited in Keengwe et al., 2009). If teachers adopt it properly, technology may boost learners' attention in learning, facilitate teaching, and make students more motivated (Hurree, 2005). Learning should be the first pillar for which technology is used (Bitner & Bitner, 2002). This makes both teachers and students responsible in the learning process and shifts the teaching paradigm from a teacher-centred paradigm to a learner-centred paradigm. Thus, the learner becomes not only a recipient of the information but a participant in its construction. Learners can be active in their learning process, communicate and collaborate with their colleagues and teacher, and be able to solve problems and these skills may lead them to be active in their society (Bitner & Bitner, 2002).

On the other hand, there are some challenges that teachers and students may encounter when using technology among teaching and learning processes, such as the

need for considerable support, technical problems, and unreliable information (Ng & Gunston, 2002), as well as the lack of feedback through technology (Khanova *et al.*, 2015). In addition, shortages of equipment and software with appropriate features, a lack of training programs, resistance to change, and a lack of assistance from administration (Keengwe *et al.*, 2008; Wachira and Keengwe, 2011).

Roger (2000) argued that there are some challenges that may stop teachers and students from using technology in teaching and learning processes or prevent the successful use of technology. These challenges involve "the availability and accessibility of necessary hardware and software, the presence of technical personnel and institutional support, and a program for staff development and skill building" (p. 459). According to Bates (2005), the cost of visual and audio productions and Internet bandwidth are limitations to using technology in learning and teaching practices. In addition, the fast changes in contemporary technologies make equipment outdated very quickly, making it difficult for schools and universities to pursue and buy new equipment; additionally, the belief that "our traditional values that challenged by technology" is a challenge (Dynneson *et al.*, 2003, as cited in Cemalettin, 2006, p. 20).

Teachers and students may have fears or concerns related to the change when technology is being integrated (Bitner & Bitner, 2002) because change is sometimes not easy for humans to accept. Consequently, teachers and students may resist innovations in the teaching and learning process and may need help controlling these fears (Bitner & Bitner, 2002). This may explain the expected resistance to new pedagogies that employ technologies such as flipped learning. Therefore, teachers and students should receive training on the basic, necessary knowledge to adopt technology. For example, they need to master basic computer skills such as copying, deleting, and printing. The use of personal productivity skills through graphics or word processing software may promote technology, make them more comfortable with using computers, and help them drop some of their worries regarding computers (Bitner & Bitner, 2002, p. 96). Further, teachers need support at the technical and curriculum levels when they integrate technology (Bitner & Bitner, 2002; Ertmer, 1999).

Furthermore, Johnson (2013) argued that flipped learning may not be beneficial for some students who have limited access to resources. Consequently, digital divide, "which is commonly defined as the gap separating those individuals who have access to new forms of information technology from those who do not" (Gunkel, 2003, p. 499), can be a serious challenge that students may face within flipped learning. Bergmann and Sams (2014) and Fulton (2012) argued that some technology solutions can resolve this problem, such as downloading lessons onto DVDs, flash memory, CDs or open computer labs in the educational institution (Bergmann & Sams, 2014; Fulton, 2012; November & Mull, 2012).

Having discussed the use of technology within flipped learning in general, in the next section I provide information on educational video within flipped learning and video design principles (Mayer, 2009), based on the cognitive theory of multimedia learning (Mayer & Moreno, 2003) as a component of the study's theoretical framework.

2.6.1 Videos and Flipped Learning

Videos are being used progressively more often in higher education systems to support learning and engagement (Sherer & Shea, 2011). Attention to videos for teaching and learning has expanded, and nowadays many students learn from videos by using devices such as tablets, phones, and desktops (Giannakos, 2013). Videos allow learners to watch real events, or listen to narration, which may improve their engagement and learning efficiency (Zhang *et al.*, 2006). Within flipped learning, educational videos can help students to build a learning basis, and students can continue to build their learning during class, thus giving teachers the needed freedom to interact with their students and engage in class activities (Bergmann & Sams, 2014).

A learning video within flipped learning can be a combination of text, images, audio, and any other interactive content that can be considered multimedia video. Gantt (1998) summarizes some benefits of multimedia learning:

- Multimedia learning works in the same way that the human brain does, in terms of thinking; remembering; proceeding from written language to pictures to sounds; and presenting clarifications, explorations, and analyses.

- The availability of different forms of media in one multimedia lesson may allow learners to study in a more natural way and choose the best way of learning for them, such as learning by hearing or seeing.

- Combining media components like sounds, images, and words with interactive practices and necessary feedback may allow learners to expand their experiences and exploration by themselves. Thus, they become active rather than passive learners. Moreover, these multimedia programs can include indirect feedback to direct learners if they show any mistakes and also provide reinforcement for correct answers.

- Some well-designed multimedia programs provide learners with features like branching, stopping, and pausing for additional opportunities for handling, examination, or development. These interactive choices can support learners' thinking and improvement.

- The integration of graphics, audio, words, and pictures in multimedia programs can allow students " to learn by using sight, hearing, and touch" (Gantt, 1998, Online).

- Educational technology can help learners to improve life skills like collaborative working and problem solving.

- Using multimedia programs as teaching and learning aids can allow teachers or trainers to give their students further care and attention to meet their demands (Gantt, 1998, Online).

With regards to the production of flipped learning videos, there are different styles or formats for the videos. The most famous styles are "lecture capture," "voice-over presentation," "picture-in-picture," and "Khan-style" video lecture (Chen and Wu, 2015, p. 110). All of these kinds of video lecture are recorded to be used as web videos to improve teaching and learning and are integrated into any e-learning system, and they can be distributed between the students or workers in an institution to benefit from them (Chorianopoulos and Giannakos, 2013).

First, the lecture capture style uses a digital camera to film a teacher. Thus, teachers' sound and picture appear together in the video in an actual classroom, including any

teaching tools they are using during the lecture (e.g., PowerPoint slides or boards). After this filming, teachers can use the resulting video any time and make it available to the learners online. This type of lecture shows the learners' interactivity during the class lecture and provides a picture of the students' impression when receiving information during the class and their questions (Chen & Wu, 2015). According to Chorianopoulos and Giannakos (2013), this style is usually used within distance learning platforms and combined with some other characteristics such as discussion forum and quizzes.

Second, voice-over presentation is a type of video lecture that employs a slide presentation with the lecturer's voice. For instance, during a PowerPoint slideshow, a lecturer's voice comments on these slides and explains them through screencasts (Chen and Wu, 2015; Chorianopoulos and Giannakos, 2013). This style was adopted in the present study through the intervention stage. "In 2004, John Udell defined the term 'screencast' as 'a digital movie in which the setting is partly or wholly a computer screen, and in which audio narration describes the on-screen action'" (Udell, 2004; Woolfitt, 2015, p. 31). Mullamphy *et al.* (2010) argued that there are some benefits to using screencasting within teaching and learning processes. For example, learning materials presented by this style can be reused again and again (Mullamphy *et al.*, 2010). Nevertheless, the learning context is absent in this style of videos, and certain elements such as classroom occurrences and student reactions do not exist (Chen & Wu, 2015), and this style has been adopted in previous studies such as Love *et al.* (2014). There are many free software tools that the lecturer can use to make screencast videos such as Screencast-o-matic, Jing, Screenr (Woolfitt, 2015, p. 31), or CamStudio, which was used by the current study intervention. There are also commercial options such as Camtasia Studio (Woolfitt, 2015, p. 31).

Third, picture-in-picture is a very complex style that involves a lecturer picture and voice, PowerPoint slideshow, and some flash animation, and this kind of video lecture is usually used in massive open online courses (Chen and Wu, 2015).

Fourth, Khan-style is a video lecture in which the instructor uses a sketch board such as a whiteboard with her or his voice as a form of personal tutoring (Chorianopoulos and Giannakos, 2013). This style takes its name from the "Khan Academy, an online repository of thousands of instructional videos that has been touted by Bill Gates and

featured prominently in the national media" (Tucker, 2012, p. 5), and this style can be used within flipped learning videos, such as in Triantafyllou and Timcenko (2015).

Table (1): Benefits and shortcoming of the available video lecture presentation styles, source: (Chorianopoulos and Giannakos, 2013, p. 164).

Video lecture style	**Benefits and shortcomings**
Talking head and board	Simple to capture and share but less usable by the students Example: iTunes U, MIT Open Courseware
Picture-in-picture (Hybrid style)	Provides usable cuts between the instructor's video feed and the slides or drawing board, but it requires elaborate postproduction Example: Coursera
Drawing board	Video capture of the drawing board with the instructor's voice over simulates private tutoring Example: Udacity, Khan Academy
Slides and animations	Includes voice-over and screencast, so it is simple to capture, but it might be less friendly without the video feed of the instructor Example: TED Ed, webcasts, how-to videos

With regards to students' perceptions about videos within flipped learning, literature has demonstrated students' appreciation for the learning videos. According to Roach (2014), students are more likely to prefer watching videos than reading outside classes within flipped learning. Also, they reported the ability to rewind or pause videos to concentrate more when they became muddled.

In addition, Love *et al.* (2014) explored students' perceptions of a flipped algebra course. This study involved 55 students in two classes; one class applied flipped

learning, and the other applied the traditional method of classroom lecturing. In the flipped class, the teacher asked the students to prepare for class time by watching screencasts made by the teacher and reading the teacher's notes or the textbook. At the end of the course, the researchers measured students' understanding of the learning materials in both classes through three midterm exams and the final exam results. They found that the performance of the students in the flipped course had considerable growth between the tests compared to the students in the traditional class. However, no differences were found in their performances in the final test. In addition, the researchers monitored flipped-course students' perceptions by using a survey. Students' perceptions towards the flipped course experience were positive (74%). Ninety-six per cent of them appreciated collaboration and learning videos, and they thought the videos helped them to learn the course materials and course concepts. Also, "about one-third watched them multiple times" (p. 323).

Moreover, Triantafyllou and Timcenko (2015), who used screencasts of Khan Academy videos, revealed students' appreciation for the videos. They showed through their questionnaire that a majority of participants thought the screencast videos helped them to improve their understanding "82% and 81%, respectively" (p. 2576). Also, the participants thought the screencasts contributed to their understanding of the course content and made mathematics easier (78% and 77%, respectively; p. 2576).

Bergmann and Sams (2014) argued that many teachers today conduct flipped learning for various topics, and they have had successful experiences and have shared their video lectures for anyone to use, including other teachers. On the other hand, producing videos or finding suitable ready-made videos is not a random process and may consume teachers' time. According to November and Mull (2012), some teachers are concerned about video production because they do not have the needed experience. In addition, Triantafyllou and Timcenko (2015) argued that "poor quality video production" is one of the criticisms to the flipped learning approach (p. 2573). Some previous researchers have shown a dissatisfaction among learners regarding some aspects of the quality or design of the educational videos in the context of flipped learning. For instance, according to Murray *et al.* (2015), "Significant efforts to produce high quality and engaging videos were made, but the survey suggested that students learnt the most during tutorial time" (p. 57). Students enjoyed the classroom

activities that adopted active learning pedagogies and also appreciated the flexibility and availability of the videos. However, some students reported issues with the videos (e.g., that the long videos were boring). In addition, some videos were computer based, which means they could not be played on other mobile devices, which might have limited the mobility feature. Furthermore, based on students' perceptions in Triantafyllou and Timcenko's (2015) study, within the screencast videos, they missed out on the opportunity for just-in-time explanations because the videos were short and involved simple and uncomplicated language. In addition, according to Zainuddin and Attaran (2016), students suggested that videos could be shorter and more engaging.

Having introduced the use of videos within the flipped learning context, as well as students' perceptions towards videos through the literature on flipped learning, in the following sections I discuss the cognitive theory of multimedia learning (Mayer & Moreno, 2003) and the principles of multimedia design by Mayer (2009).

2.6.1.1 Cognitive Theory of Multimedia Learning

I read this part of the literature after I had collected my data and after I had spoken to my students. I added this part to this chapter at a later stage because it proved to be so important and so relevant to what my participants were saying. I found a connection between their perceptions and the principles of multimedia design by Mayer (2009) that are based on the cognitive theory of multimedia learning (Mayer & Moreno, 2003).

According to Chen and Wu (2015, p. 109), educational video design is based on cognitive load theory (Chandler & Sweller, 1991) and the cognitive theory of multimedia learning (Mayer & Moreno, 2003). The two theories had an impact on the current study. However, the study is focussed on the cognitive theory of multimedia learning by Mayer and Moreno (2003) and the principles of multimedia design by Mayer (2009) because of the direct impact of the theory and principles on the study, in that they contributed to framing the participants' answers in the third sub-question of the second main research question. Consequently, the study considered this theory and the principles as components of the study's theoretical framework, as mentioned in section (2.4).

Cognitive load theory "is concerned with the manner in which cognitive resources are

focused and used during learning and problem solving" (Chandler & Sweller, 1991, p. 294). It proposes that teaching materials should "[facilitate] learning by directing cognitive resources toward activities that are relevant to learning rather than toward preliminaries to learning" (Chandler and Sweller, 1991, p. 293). Thus, teachers are advised to design flipped learning video lectures in a clear and organised way that makes them relevant to the lesson's goals. Presenting the information in a complex manner may overwhelm learners with the amount of information components that they need to process in their working memory, which has limited capacity. Hence, teachers should avoid these high loads to achieve meaningful learning (Paas *et al.*, 2004). For instance, they can do so with techniques like connecting the new tasks with previous information that is stored in massive long-term memory (Paas *et al.*, 2004). According to Abeysekera and Dawson (2015), learning videos within flipped learning can allow students to cope the cognitive load through student pacing features allowing them to stop or skip any content of the lecture if they do not need it or already comprehend it, or rewind to watch videos many times.

Furthermore, Moreno and Mayer (2007) argue that learning videos are multimodal media, which use more than one type of mode, whether verbal or nonverbal, to represent learning content. Thus, videos contain visual objects, audio objects, and text objects: "the most effective learning environments are those that combine verbal and non-verbal representations of the knowledge using mixed-modality presentations" (Moreno and Mayer, 2007, p. 310). However, they also argued that multimedia learning always risks the possibility of cognitive overload that may limit meaningful learning. This means an intense understanding of the learning material, which involves joining significant parts of the existing material, rationally managing it into a logical cognitive construction, and integrating it with the related current knowledge. Thus, they argue, instructional designers have to consider the limited capacities of learners' cognitive processes when they design multimedia resources (Mayer & Moreno, 2003, p. 43).

> [B]ecause human cognitive architecture includes independent, limited capacity, processing channels, the presentation of verbal and non-verbal materials in the visual modality alone is more likely to overload students' cognitive capacity during learning as compared to the presentation of verbal materials in the auditory modality and non-verbal materials in the visual modality (Low and Sweller 2005; Mayer 2005b). (Moreno and Mayer, 2007, p. 310)

Therefore, Moreno and Mayer's multimedia theory is based on three assumptions. First, there are two unrelated channels for the human processing information system: one channel for the verbal materials and the other for the visual materials. Second, these channels have limited processing capacities. Third, meaningful learning needs a considerable amount of cognitive processing to take place in the supposed channels, and this learning is procedure of organizing, selecting, and linking based on prior knowledge (Mayer and Moreno, 2003).

As a result, the use of video can be very positive but should be designed or selected to minimise cognitive overloads. The videos need to be carefully structured and kept fairly simple so that the media does not distract from the content (Mayer & Moreno, 2003). Mayer (2009) suggests specific principles for successful multimedia design. These principles are classified in three main categories—which are intended to reduce extraneous processing; manage essential processing; and foster generative processing. In this research study, and as I mentioned previously, I adopted Mayer's (2009) framework because there were clear connections between the themes that were generated from the students' perceptions and some of the principles in the framework. In the following section, I discuss the principles of multimedia design.

2.6.1.2 Mayer's Principles of Multimedia Design (2009)

2.6.1.2.1 Principles for Reducing Extraneous Processing

Extraneous materials include any information that is related to the lesson but that learners do not need to reach their learning goals. These materials may cause extraneous processing, which is the cognitive processing of extraneous materials, and this processing can reduce the cognitive capacity for processing the essential information (Mayer, 2009, p. 85). This is what Mayer refers to when he talks about 'cognitive overload'. As a result, he advises that educators design learning materials in a way that reduces extraneous materials which are distracting and lead to unnecessary cognitive overload.

Coherence Principle

According to the cognitive theory of multimedia learning, inserting good and stimulating information that is not related to a multimedia learning material may cause an overload in one of the channels, and this may affect the processing of the

information and impact meaningful learning. Thus, the coherence principle means that multimedia production can contain the basic and relevant knowledge because learners may learn more deeply from an uncomplicated and basic form than from an extended and detailed form of a multimedia production; all extra text, pictures, or sounds could be excluded from the multimedia presentation (Mayer, 2002).

Redundancy Principle

This principle means that students learn better from visuals and narration than from visuals, narration, and on-screen text (Mayer, 2002). However, there is another proposal regarding multimedia presentations that suggests it is essential to present the printed text on the screen, with pictures and the words narrated aloud, all relating to the same content and message. Students can choose the most suitable way for their learning styles. The cognitive theory of multimedia learning acknowledges that presenting all of these elements together may cause a competition between the pictures and the on-screen text in the visual channel. Paying attention to both of them may lead to a negative effect in the processing of both of them and may cause mental exertion while the students try to make connections between the arriving streams of written and pronounced text (Mayer, 2002). Accordingly, this principle encourages multimedia material designers that it may be better not to mix visuals, narration, and on-screen text together but to display visuals and narrations.

Signalling Principle

This principle means that students may learn well when cues that emphasize the organization of the fundamental material are inserted (Mayer, 2009). Signalling decreases inessential processing by focusing the attention of the learner on the necessary information and main elements in the presented content (Mayer, 2009). Examples of signalling include outlining main sentences, using arrows, placing vocal stress on significant words, or using order words such as first, second, and so on. (Mayer, 2009; Wouters *et al.*, 2007). According to Eick and King (2012), students appreciated the cues that can appear within YouTube videos, which can support memory.

2.6.1.2.2 Principles for Managing Essential Processing

Essential processing is the cognitive processing of the essential learning materials.

Essential materials are the key information from the learning content, which are necessary for reaching the learning goals. Essential processing can be overloaded sometimes when there is no more cognitive capacity available to process the essential materials. This may happen when the learner does not have enough experience with the content, when the content is complex, and when the presentation of knowledge is quick-paced (Mayer, 2009). Mayer (2009) found three principles—segmenting, pre-training, and modality—that can help to manage essential processing, and my participants emphasized the importance of these principles.

Segmenting Principle

"People learn better when a multimedia lesson is presented in user-paced segments rather than as a continuous unit" (Mayer, 2009, p. 268). Some students cannot fully comprehend presented information in a continuous way. As a result, they need content in small units or segments (Mayer, 2009). The segmenting principle can be implemented in some multimedia through the implementation of hyperlinks or lists. In other streamed multimedia such as animations or videos, some features such as play, pause, rewind, and fast-forward may provide the learner with the needed segmentation to learn according to his or her pace. In many of the previous studies on flipped learning (e.g., Love *et al.*, 2014; Murray *et al.*, 2015; Roach, 2014), students appreciated the ability to pause, rewind, and play features of videos, which allowed them to learn according to their own pace. Zhang *et al.* (2006) argued that some videos that are used in e-learning are not interactive because students cannot move to specific parts of the video easily, which makes watching such videos harder than looking through a textbook because learners need to see and hear all the video content to search for a particular part. Hence, they define "interactive video as the use of computer systems to allow proactive and random access to video content based on queries or search targets" (Zhang *et al*., 2006, p. 17). Consequently, a segmenting principle can provide interactivity.

Pre-training Principle

This principle means that students learn better from a multimedia presentation when they know the characteristics and terms of the key concepts:

> Thus, pre-training works by providing appropriate prior knowledge of key concepts in the lessons. By moving the learning of key terms to a pre-training episode, learners can engage more fully in cognitive processing of the causal explanation when the multimedia explanation is presented. Prior knowledge is the single most important individual difference dimension in instructional design. If you could know just one thing about a learner, you would want to know the learner's prior knowledge in the domain. (Mayer, 2009, p. 193)

Within flipped learning, and when students start to watch a video, they may need to activate their prior knowledge regarding some facts, concepts, or any learning object that they had already studied, but they must remember them to move onto the next content. Therefore, throughout the videos, teachers sometimes refer to other readings or links or provide extra supportive videos as advanced organisers. Advance organizer theory was defined by Ausubel (1968), who believed that meaningful learning is based on what learners already know and that the learning process should be based on advance organizers or "introductory materials", which "are introduced in advance of the learning material itself and are also presented at a higher level of abstraction, generality, and inclusiveness" (p. 148). Consequently, in flipped learning, besides the basic videos, the additional optional videos can work as advanced organisers to explain topics for students in a general way and "bridge the gap between what the learner already knows and what he needs to know before he can successfully learn the task at hand" (Ausubel, 1968, p. 148). Then, during class time, students can construct their knowledge and move through their zones of proximal development (Ausubel, 1978, p. 148; Vygotsky, 1978).

Modality Principle

This principle means that "People learn more deeply from pictures and spoken words than from pictures and printed words" (Mayer, 2009, p. 200). The main reason for this principle is that, in the case of the existence of pictures and printed text, the visual channel will be overloaded, which may affect the cognitive system in a negative way. However, in the case of pictures and spoken text, the load will be distributed between the visual and verbal channels (Mayer, 2009). Consequently, based on this principle, it may be better to design the screens of educational videos in a way that displays pictures and spoken text together rather than pictures and printed text.

2.6.1.2.3 Principles for Fostering Generative Processing

Generative processing is mental processing that is intended for creating meaning from the resource. It shapes the entering material into rational constructions and integrates these constructions together with previous knowledge (Mayer, 2009). According to Mayer (2009), there is a group of techniques or principles that can foster the generative processing, and they are implemented with the students to help them to use the material more intensely. These principles are the multimedia principle as well as the personalization, voice, and image principles.

Multimedia Principle

This principle means that individuals can learn better from a combination of images and words than from words only. The main reason for this is that presenting images and words together can give a learner a chance to build pictorial and verbal mental representations and to construct links among them, and this process may foster generative processing (Mayer, 2009).

Personalization, Voice, and Image Principles

Personalisation means that students may learn better from multimedia materials when the language has an informal style instead of a formal style. Thus, when students think that the maker is speaking to them, they are more likely to consider the maker as a conversational partner and consequently will work hard to try to understand the other party who is speaking in the educational presentation. Moreover, According to Mayer's (2009) voice principle, "People learn better when the narration in multimedia lessons is spoken in a friendly human voice rather than a machine voice" (p. 268). In addition, Mayer's (2009) image principle is that students may not necessarily learn better from a multimedia presentation when the speaker appears on the screen by means of adding his or her image.

Lastly, a reader may feel that some of Mayer's (2009) principles are intuitive, so the researcher does not need to list them. However, as I mentioned previously, the participants' answers in this study revealed a strong endorsement of these principles, which caused me to adopt these principles as a frame for their perceptions. In addition, this study may remind educational designers about some of the multimedia design principles.

Having discussed the cognitive theory of multimedia learning and the principles of

multimedia design, the next sections of this study are concerned with other technology applications within flipped learning, which are social networks, learning management systems, and mobile devices.

2.6.2 Social Networks

Social networks may allow students within flipped learning to interact and give their views and opinions, which could let them collaborate in solving difficulties and try together to reach their learning goals. In addition, learning videos can be uploaded to social networks sites such as YouTube or blogs. *Social networks* are defined as

> web-based services that allow individuals to (1) construct a public or semi- public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site. (boyd & Ellison 2007, p. 211)

Thus, social networks sites allow users to communicate with each other, collaborate, share and publish their ideas, and manage content. This may include publishing and sharing tools like blogs, wikis or Facebook and content management platforms like Blackboard and Moodle (Mao, 2014). Today, many students are engaging in social networks sites such as Twitter and Facebook through their advanced cell phones and tablets. According to the Pew Research Center, 91% of American people between the ages of 18 and 29 use YouTube, and 27% of those people use WhatsApp (Pew Research Center, 2018). Social networks can improve students' experiences, engagement and pedagogical practises in Higher Education, so that many students gain distinctive and great information, share their knowledge and collaborate (Grosseck, social media 2009). For example, they can discuss many topics with their teachers and ask questions through blogs. However, increased communication through social networks puts teachers under pressure, since they may spend long periods answering students' questions and meeting their needs (Keeton & Scholar, 2004).

The following part discusses two social networks tools, which are WhatsApp and YouTube. In the current study's intervention, WhatsApp was used as an announcement tool for the new lessons as a second option to Blackboard, as some students who faced technical problems through Blackboard suggested using it, and the

teacher agreed. The teacher assigned a representative student for the WhatsApp group, and she sent the student video links or news. The representative put the information in the WhatsApp group.

2.6.2.1 WhatsApp

WhatsApp is a smartphone messaging application that allows individuals to communicate and supports group communications (Amry, 2014). Furthermore, with this application, users can send a wide diversity of media, such as images, sounds, and texts (Amry, 2014). Recently, WhatsApp has been widely used in education, and this has been noticed in the Saudi higher education environment (Eid & Al-Jabri, 2016). "WhatsApp has been found to be the most used tool for online chatting and discussion, instructors should focus on using it for encouraging group discussion, followed by YouTube and Facebook" (Eid & Al-Jabri, 2016, p. 24). From my observations and through chatting with some Saudi friends who work in the education field, I learned that many teachers in public education use WhatsApp to communicate with students' parents. According to Alabdulkareem's (2015) study about the usage and effects of social media on learning and teaching science in Saudi schools, WhatsApp represents the key application that teachers and students use, and use is 100% by teachers and 73% by learners. WhatsApp has furthermore become frequently used at universities, and when the students proposed the establishment of the WhatsApp group for the flipped course in this project, they mentioned that most of their teachers have set up a WhatsApp group for them. Bouhnik and Deshen (2014) carried out a qualitative exploratory study, and they interviewed 12 teachers who use WhatsApp to communicate with their students. The researchers found that teachers use this application for four main reasons: to be in touch with learners, to support sharing between learners, to enhance the social atmosphere; and to encourage discussions. In addition, the participants reported some benefits of using WhatsApp in the educational context: WhatsApp is not expensive, it is easy to run, it is direct and instant when sending or receiving information, and it has good availability. Also, the academic advantages can be summarized in the availability and accessibility of the educational materials, the availability of the teacher, and the ability to learn outside classroom walls. However, many irrelevant messages can annoy teachers, and teachers cannot be available 24 hours, seven days a week.

In regards to Saudi higher education, Alsurehi and Youbi (2014) saw that "the use of social networking applications is quite prevalent among major Universities in Saudi Arabia . . . privacy and security concerns continue to remain the biggest challenges inhibiting the usage of social media applications" (p. 217).

2.6.2.2 YouTube

YouTube is a widely known video website where individuals can view, upload, or share video clips (Duffy, 2008).

> YouTube is the most prominent user generated content provider and also the world's largest video sharing service with approximately, 100 hours of video uploaded to the server every minute, over 6 billion hours of video watched each month by more than 1 billion unique monthly visitors (YouTube). (Buzzetto-More, 2015, p. 55)

Today, YouTube is used commonly by teachers (Duffy, 2008), and in regards to higher education, teachers may use this platform easily when they post their recorded videos (Burke *et al.*, 2009), and this happened in this study. In addition, teachers find it easy to cut and paste any video URL that they need from YouTube and embed it within their PowerPoint presentations or in learning management systems, such as Blackboard or Moodle (Burke *et al*., 2009). In addition, within flipped learning, teachers may use premade videos on YouTube as learning resources. Eick and King (2012) conducted a study to explore students' perceptions about the role of YouTube videos in their engagement, in their understanding of science, and in their interest in science. The analysis of the survey responses indicated that students perceived that videos supported their attention, improved their interest in science, and helped in their understanding of science. Also, students valued the cues and relationships provided in the YouTube videos, which supported their memory.

In the current study's intervention, the teacher created a YouTube channel for the video lectures to ensure that the videos were available in one place and to make it easy to put the links on Blackboard. Also, she sometimes referred students to existing videos on YouTube.

2.6.3 Learning Management System (Blackboard)

Blackboard is a learning management system that is used to manage and deliver e-

learning services; it allows teachers to send announcements, deliver content, and show grades (Mouakket, 2015, p. 492). In this study, Blackboard was used as a delivery tool by the teacher to link the video that she recorded and post it on a YouTube channel, to attach each lesson's goals, to attach each lesson's questions, and to refer to any extra learning materials. Blackboard as a learning management system has some advantages and drawbacks, which are described in the literature. According to Chawdhry *et al.*'s (2011) survey which explored students' perceptions of Blackboard's benefits and drawbacks, 83% of 119 students referred to the accessibility of the course's learning materials, 31% of students found that it enhanced group discussions, and 23% found that it encouraged gaining needed feedback from the teacher and other students. However, in regards to the drawbacks, 62% of students reported the unsteady use of Blackboard by teachers, 49% of students stated the ineffective use of Blackboard by teachers, and 31% mentioned technology problems and troubles accessing content. In this project, Blackboard made flipped course materials available to learners 24 hours a day, seven days a week, and allowed students to access and get what they needed at their convenience. On the other hand, one of flipped learning challenges that was reported by the study's participants was the technical problems among Blackboard, such as its slow speeds, its slow downloads, and how it occasionally froze.

2.6.4 Mobile Devices

Mobile technology is defined "as any wireless technology that uses radio frequency spectrum in any band to facilitate transmission of text data, voice, video, or multimedia services to mobile devices with freedom of time and location limitation" (Al-Fahad, 2009, p. 112). These days, mobile learning has become a significant component within higher education contexts, and it allows learners to learn, share their thoughts, and collaborate in more convenient and flexible ways (Al-Emran *et al.*, 2016). Hence, through mobile devices, individuals can access network information anywhere and anytime (Hahn, 2008). "Mobile devices can support flexible learning in a variety of educational contexts. Traditional classrooms can also be transformed into new learning spaces with mobile devices" (Chen *et al*., 2012, as cited in Yang, Li, & Lu, 2015, p. 293). These devices may include smartphones, tablets, and laptops (Valk *et al.*, 2010). Mobile devices can allow learners to access the needed information speedily and permit a diversity of learning methods (Gikas & Grant, 2013). However,

mobile devices can also cause distraction; when students use their devices to complete a learning task, they may try to check their social media applications and respond if they have messages (Gikas & Grant, 2013). According to Jaradat's (2014) study that explored undergraduate students' perceptions about using mobile phones to do further readings within a French language course in Princess Nora University in Saudi Arabia, mobile learning was found to enhance learners' performance outside and inside the classroom. The key advantage of mobile learning based on students' perceptions was the ability to use their devices anytime and anywhere. Students also thought that mobile learning should be adopted to boost learners' education and interaction experiences. Regarding flipped learning, according to Zainuddin and Attaran's (2016) study, 41% of students used their laptops outside the classroom to watch the videos, and 27% used their smartphones.

2.7 Self-Regulated Learning Theory

Self-regulation "is not a mental ability or an academic performance skill; rather it is the self- directive process by which learners transform their mental abilities into academic skills" (Zimmerman, 2002, p. 65). Self-regulated learning theory supposes that learners are active members in their own learning, which means that they plan, monitor, and regulate their learning in the cognitive, behavioural, and emotional aspects (Pintrich, 2000; Zimmerman, 1990). Self-regulated learning is rooted in social-cognitive theory and studies that have researched successful student characteristics and strategies employed to achieve goals within the learning process (Bandura, 1986, 1991; Zimmerman, 1990, 2002). According to Barnard-Brak *et al.* (2010), learners who are self-regulated in their learning seem to reach more positive educational results than learners who do not exhibit self-regulated learning actions. Zimmerman (1990) describes self-regulated learners by saying:

> Undoubtedly, all learners use regulatory processes to some degree, but self-regulated learners are distinguished by (a) their awareness of strategic relations between regulatory processes or responses and learning outcomes and (b) their use of these strategies to achieve their academic goals. (p. 5)

Thus, self-regulated learners are learners who have the knowledge of strategies to regulate their learning process and choose the most appropriate strategy to use in the appropriate circumstance. Because flipped learning requires learners to prepare for

classes by carrying out tasks such as watching a video lecture and doing some home tasks, learners may need to be conscious of their engagement level with the assignment and be able to regulate their motivation to be properly prepared for their classes (Sletten, 2015).

In addition, students' positive perceptions about flipped learning could positively predict their use of self-regulated learning strategies. In this regard, Sletten (2017) carried out a study on 76 undergraduate students in a flipped introductory biology course. The main aim of this study was to examine the connection between students' perceptions of flipped learning and their self-regulated learning behaviors and to observe the effects of these variables on students' achievement within flipped learning. Students were asked about their perceptions and the self-regulated learning strategies that they used throughout flipped learning. Sletten (2017) collected perceptions using a survey, whereas she used the Motivated Strategies for Learning Questionnaire to measure self-regulated learning strategy. In addition, she considered students' achievement through their grade reports. Students' perceptions of flipped learning gave a positive prediction of their use of self-regulated learning strategies. Nevertheless, Sletten's research data did not show a connection between perceptions and achievement. Research findings indicated class sessions were successful because active learning successfully activates among constructivist pedagogies. Furthermore, students might be required to exercise self-regulated learning skills to learn efficiently from the video lectures. Consequently, students' perceptions of flipped learning in the current study may predict their use of, development of, or lack of strategies or habits associated with self-regulated learning.

Furthermore, Ramnanan and Pound (2017) reviewed 26 articles published between 2012 and 2016 on the topic of undergraduate medical students' perceptions of flipped learning. The main purpose of this study was to discover flipped learning's advantages and limitations based on students' perceptions. The review showed that medical students' generally expressed their preference for flipped learning compared to traditional education. Also, they had strong admiration for the preparation activities before class time, and they appreciated the engaging and interactive activities in the class. In addition, some students thought that flipped learning can support lifelong "self-directed learning skills" (Ramnanan & Pound, 2017, p. 63). However, some students reported issues within flipped learning such as lack of direction through the

active learning in the class. Therefore, flipped learning may support students' self-regulated learning skills, as it may support self-directed learning skills. A learner "needs self-regulation to become a capable self-directed learner" (Cosnefroy & Carré, 2014, p. 5). It is worth mentioning here the meaning of self-directed learning, which is

> a process in which individuals take the initiative, with or without the assistance of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (Knowles , 1975, p. 18)

Therefore, within self-directed learning and lifelong learning, learners have more control over their learning process.

Moreover, Sun (2015) explored the role of self-regulation within flipped learning. He conducted his exploration on 151 undergraduate students in a mathematics course at a Midwest U.S. public university. Also, he conducted two online surveys during the term to explore the relationship between the self-regulatory constructs, including self-efficacy, use of learning strategies, and prior domain knowledge. Then he investigated the relationship between these constructs and students achievement in the context of flipped learning. The researcher found that self-regulatory constructs had a positive impact on math achievement, especially self-efficacy. Also, he found that help-seeking strategies had a positive relationship with student achievement. Consequently, self-regulatory constructs such as prior knowledge activation, self-efficacy, and the use of help-seeking strategies could have positive impacts on student achievement within flipped learning.

2.7.1 Self-Regulated Learning Phases

Zimmerman (2002) showed the three phases of self-regulated learning as a cyclic process: the forethought phase, the performance phase, and the self-reflection phase. The forethought phase concerns the procedures and beliefs that happen before the actual engagement in the learning tasks and that will impact the performance of a task. It includes task analysis such as setting goals and making learning plans. In addition, it involves self-motivation assessment such as self-efficacy beliefs, intrinsic task interest, task value, goal orientation, and outcome expectations.

In the next phase, the performance phase, students start to actually engage in the performances needed to achieve the goals and concentrate on self-control. Thus, students monitor their learning and the improvement and employ strategies that may help them to achieve their goals and self-observation (Zimmerman, 2002).

Lastly, in the self-reflection phase, which comes after each learning effort, learners evaluate and judge themselves concerning their performance, attributions, and outcomes. After the last stage, and throughout the whole process, learners may react in ways connected to the first phase of the self-regulated learning (Zimmerman, 2002). It is worth mentioning that all the elements mentioned in this section are discussed in detail in Chapter 4's data analysis according to Pintrich's (2000) framework. Therefore, I do not discuss them here in detail to avoid repetition and because discussing them with the presence of data may enhance understanding.

2.7.2 Self-Regulated Learning Strategies

As mentioned in the performance phase, learners may use strategies that help them during the learning process to reach their educational goals, and these strategies can regulate learners' cognition, behaviour, or learning environment (Zimmerman, 1990). Zimmerman and Pons (1986, p. 615) define self-regulated learning strategies as "actions directed at acquiring information or skill that involve agency, purpose (goals), and instrumentality self-perceptions by a learner". Some researchers have tried to identify and explain a diversity of self- regulatory strategies, such as Pintrich (1999); Wolters *et al.* (2005); Zimmerman (1990); and Zimmerman and Pons (1986). Also, they classify these learning strategies into cognitive, behavioural, and motivational scopes, as follows.

2.7.2.1 Cognitive Regulation Strategies

The cognitive strategies involve metacognitive and cognitive activities that can help a learner to regulate his or her cognition (Wolters *et al.*, 2005). "Metacognition is defined as the awareness of and knowledge about one's own thinking" (Zimmerman, 2002, p. 65).

Cognitive regulation strategies can include:

- Organizational strategies, which means arranging knowledge into figures, concept maps, mind maps, and more.
- Elaboration strategies, which means short, brief material in the learner's own words, such as taking notes or making summaries.
- Rehearsal strategies, which means repeating information again and again until committed to a learner's memory.
- Monitoring of metacognition, which is assessing understanding and development of the educational goals (Wolters *et al.*, 2005).

Within flipped learning, students may employ some of these cognitive strategies. For example, students may watch a video repeatedly if they need to (Love *et al.*, 2014), which can be considered a rehearsal strategy. In addition, students can take notes when they watch videos or find relationships between concepts (Keengwe *et al.*, 2009), which can be elaboration strategies.

2.7.2.2 Motivational Regulation Strategies

Learners use different strategies to regulate their motivation and encourage themselves to learn (Zimmerman & Pons, 1986). According to Wolters *et al.* (1998), students reported that they practiced various strategies to regulate their motivations. Students might manipulate their reasons, goals, or desires to carry out a task. For example, they give themselves another reason to do a task, such as rewarding themselves with a nap or TV program (Wolters *et al.*, 1998). In addition, they might build an extrinsic motivation by telling themselves about the importance of a task or exam. Another way is to boost their extrinsic motivation by increasing the value of the task or their interest in the learning materials and trying to link them to their own lives (Wolters *et al*., 1998).

Wolters *et al.* (2005, pp. 17–19) summarize the motivational regulation strategies in the following categories:

1. "Self-consequating", when learners create and give themselves an extrinsic reward after their engagement in learning tasks.

2. "Interest enhancement strategies", which focus on activities that can increase students' intrinsic motivation for a learning activity, via either personal or situational interest.

3. “Situational interest strategies”, or the immediate pleasure they experience when carrying out a task. For example, when learners turn their studying into a game or make it a fun situation.

4. “Relative ability self-talk”, which means that students regulate their motivation by talking with themselves about their abilities or compare them with other peers’ abilities.

5. “Mastery self-talk”, which means that students may talk with themselves to motivate and challenge themselves to do learning activities. For example, a student may say to himself or herself, “I have to work as much as I can to succeed in this course”.

6. “Relevance enhancement”, which is when students link topics to their own lives.

7. “Environmental structuring” explains learners’ efforts to focus on the learning materials and decrease interruptions in the learning environment. For example, a student might study at a specific time or in a specific place, or he or she might drink something in order to concentrate.

2.7.2.3 Behavioural Regulation Strategies

According to Wolters *et al.* (2005, p. 24) behavioural regulation “is an aspect of self-regulation that involves individuals’ attempts to control their own overt behavior”. There are some strategies that learners usually use to regulate their behaviours, which are seeking the needed help, regulating the time and environment of studying, and effort regulation (Wolters *et al.*, 2005). Zimmerman and Pons (1986) reported that learners put in effort to get the needed assistance from their teachers, peers, or other adults, and might restructure their learning environment as a self-regulated learning strategy. In the flipped learning literature, students showed a desire for more clarifications from the teacher in class, and they sought help when they needed it (Khanova *et al*., 2015; Vaughan, 2014). Also, they sought help from each other within all the peer-assisted learning forms (Bergmann & Sams, 2014). Also, they may manage their time and environments when they choose the suitable time and place to watch the videos (Murray *et al.*, 2015).

2.7.3 Pintrich’s General Framework for Self-Regulated Learning

Pintrich (2000) suggests a general framework for self-regulated learning. According to Pintrich (2000), this framework combines the most shared assumptions and characteristics that were presented in the previous frameworks, such as those by Butler and Winne (1995), Schunk (1994), Schunk and Zimmerman (1994), Winne (1995), and so on. In addition, this framework links some motivational aspects to self-regulated learning, while some previous frameworks, such as that by Pintrich, Marx, and Boyle (1993), added these motivational aspects to the self-regulation only (Pintrich, 2000).

Pintrich (2000) discusses four key assumptions of self-regulated learning that are agreed upon in all models. These assumptions are the following:

1. All the models see students as active members who build their goals, meaning, and strategies by using the available information in their environment and their own brains. Thus, they are not passive learners, who receive knowledge from their teachers or any other adults, but they also construct the knowledge.

2. All the models consider that students can possibly monitor, control, and regulate definite attributes of their own motivation, cognition, and behaviour, as well as some aspects of their environments. This hypothesis does not mean that they will monitor, control, and regulate in all situations, but there is a possibility for that. Moreover, all the models have an awareness of the diversity of learners' contexts, biology, and developments, which may affect their self-regulation.

3. All the models consider that there is a goal, standard, or reference assessment, which is based on the work of Miller, Galanter, and Pribram (1960, as cited in Pintrich, 2000), which can be used as a comparison tool to decide whether to move forward in the process or if there is a need for change. In other words, learners should have goals, and they need to monitor their progress towards their goals and then regulate their motivation, cognition, and behaviour to achieve these goals.

4. All the models assume that self-regulatory actions are intermediaries between individual and contextual features and real accomplishment or performance. Thus, it is not only learners' culture or individuals' characteristics that can impact achievement immediately, nor is it only the contextual features of the learning environment that can form achievement, but the learners' self-regulation of their

motivation, cognition, and behaviour arbitrates the association between the learner, context, and achievement.

Therefore, Pintrich (2000) defined self-regulated learning as "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features in the environment" (p. 453). In addition, Pintrich (2000) summarizes his framework in a table (Table 2), which categorizes the different stages and aspects of self-regulated learning. The following section reviews Pintrich's (2000) framework.

2.7.3.1 Regulation of Cognition

In Pintrich's (2000) table (Table 2), the column of cognition has four cells that signify the self-regulated learning phases within the cognition area. In addition, there is no solid hypothesis of a linear process, which means that these phases may interfere with or happen at the same time as the other components and processes. The following section explains each cell in the cognition column.

Cognitive Planning and Activation

Some cognitive activities can happen through planning and activation, such as goal setting, prior knowledge activation, and metacognition knowledge activation. Goal setting can happen any time during execution, and can even be changed through monitoring, control, or reflection procedures (Pintrich, 2000). The activation of the prior knowledge process may happen routinely without any conscious thought, but some students who have high self-regulating or metacognitive activity may start to seek the appropriate prior knowledge in their memory before the actual start of the learning task (Pintrich, 2000). In addition, learners may ask themselves questions to activate the prior knowledge, such as "What do I know about this domain [?]" (Pintrich, 2000, p. 457). Metacognitive knowledge activation involves the stimulation of suitable cognitive strategies and knowledge of cognitive activities (Schneider & Pressley, 1997, as cited in Pintrich, 2000), for example, a learner's knowledge of "how the task variations can influence cognition", or knowledge of cognitive strategies such as problem solving, elaboration, rehearsal, or memorizing, and this

process can happen automatically or with the full consciousness of the learner (Pintrich, 2000, p. 458).

Cognitive Monitoring

The cognitive monitoring stage involves learner awareness and monitoring of the different features of his or her cognition and metacognition (Koriat & Goldsmith, 1996; Pintrich, 2000). Monitoring operations and metacognitive decisions that happen here are more dynamic and imitate metacognitive activities that learners may participate in when carrying out a task (Pintrich, 2000), for instance, when a student states that he or she does not understand something he or she just read. Also, learning judgments can be made when students try to memorize information and then judge themselves (Pintrich, 2000).

Cognitive Control and Regulation

The cognitive control and regulation phase includes cognitive and metacognitive activities that learners engage in to alter or adjust their cognition, and it is a result of the monitoring activities (Pintrich, 2000). For example, when a student reads something, then he or she tests his or her understanding (as a form of monitoring), but if he or she finds that he or she does not understand very well, then the student might change his or her reading strategy, which is a regulation process (Pintrich, 2000). Thus, choosing and employing suitable cognitive strategies is a crucial control and regulation aspect (Pintrich, 2000). These strategies can be elaboration, rehearsal, or organizational strategies (Pintrich, 2000).

Cognitive Reaction and Reflection

Cognitive reaction and reflection involves evaluations and reflections of students regarding their performance. In this stage, learners may try to explain their weak effort or unsuitable strategies that they used (Pintrich, 2000).

2.7.3.2 Regulation of Motivation and Affect

Students can regulate their motivations and affect as they regulate their cognition (Pintrich, 2000). This kind of regulation involves efforts to regulate motivational beliefs such as self-efficacy, goal orientation, individual interests, and value beliefs (Pintrich, 2000).

Motivational Planning and Activation

Goal orientation, judgments of self-efficacy, ease of learning judgments, perceptions of task difficulty, task value activation, and interest activation are the keys of the motivational planning and activation phase. Goal orientation is "a desire to develop the self by acquiring new skills, mastering new situations, and improving one's competence" (VandeWalle, 1997, p. 1002). In addition, Bandura (1986) defined perceived self-efficacy as "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). Learners' judgments of their abilities to complete a task have results for performance, learning, and effort (Pintrich, 2000). These judgments can be changed based on learners' real performance and response, and learners try to regulate their judgments (Pintrich, 2000).

Learners' ease of learning judgments rely on metacognitive knowledge of the learners themselves, as well as metacognitive knowledge of the task according to the past execution of the task (Nelson & Narens, 1990; Pintrich, 2000). Based on learner self-efficacy judgments and ease of learning judgments, learners can develop perceptions of the task difficulty (Pintrich, 2000).

Task value beliefs involve learners' perceptions of the utility, relevance, and significance of the task. Students are more likely to be involved in a task when they believe that the task is important to achieve their goals, relevant, or useful for them in general (Eccles, 1983; Liem & Nie, 2008; Pintrich, 2000). Thus, in regard to self-regulated learning, students attempt to regulate their value beliefs (Pintrich, 2000).

In addition, students have perceptions of their interest in the field of the learning task. Task and contextual features can activate interest, and a student can regulate that interest (Pintrich, 2000).

Motivational Monitoring

Motivational monitoring means the awareness and adaptation of one's own motivation. This is very important for the control and regulation of motivation and affect (Pintrich, 2000).

Motivational Control and Regulation

In the motivational control and regulation stage, students use strategies that can help them to control and regulate their motivations (Pintrich, 2000). For instance, students might use positive self-talk (Zimmerman & Schunk, 2008) to increase self-efficacy and improve their motivation, or they might raise their extrinsic motivation with a reward such as watching TV after a task performance (Pintrich, 2000). In addition, they might try to increase their extrinsic motivation by making the learning task more interesting for them, such as when they turn it into a game (Pintrich, 2000; Wolters, 1998).

Motivational Reaction and Reflection

Motivational reaction and reflection involves evaluations and reflections of students regarding their emotions**.** After carrying out a learning task, students have emotional responses towards their achievement, and they might also have explanations for their results. The explanations that students provide after their performance may produce more emotions such as guilt, pride, or shame, and these emotions can be considered self-regulation consequences (Pintrich, 2000).

2.7.3.3 Regulation of Behaviour

Learners are able to observe their behaviour, monitor it, control it, and regulate it. Thus, all these activities lead them to regulate and control their behaviour through a self-regulation process (Pintrich, 2000).

Behavioural Forethought, Planning, and Activation

In the behavioural forethought, planning, and activation stage, learners attempt to plan or manage their effort and time (Pintrich, 2000). For example, they might set schedules for the learning tasks and engage in time-management actions (Zimmerman & Pons, 1986). Students might make a plan to study from 1 to 2 hours every night during the term, but they might increase their time and effort before final exams or quizzes (Pintrich, 2000). In addition, in this stage, learners might plan to observe themselves (Pintrich, 2000; Zimmerman, 2002). “Self-observation refers to self-recording personal events or self-experimentation to find out the cause of these events. For example, students are often asked to self-record their time use to make them aware of how much time they spend studying” (Zimmerman, 2002, p. 68).

Behavioural Monitoring and Awareness

In the behavioural monitoring and awareness stage, learners try to monitor their effort level and time management and then change to be appropriate for the learning activity (Pintrich, 2000). This monitoring can help learners to be aware of their behaviours, which can lead to the next phase.

Behavioural Control and Regulation

As mentioned before, students might set a time to do a learning task, but when they start studying, they might realize that this task requires more time than they set aside. Thus, they will alter their effort to be appropriate to the task and might change the time (Pintrich, 2000).

Thus, students use some strategies that help them to regulate their behaviour (Pintrich, 2000). They increase or decrease efforts and persist with self-speech, such as saying to themselves, "Keep trying; you'll get it". "Of course, because effort and persistence are two of the common indicators of motivation, most of the motivational strategies . . . will have direct implications for the behaviors of effort and persistence" (Pintrich, 2000, p. 468). Another strategy that students might use to regulate their behaviour is to seek help (Pintrich, 2000).

Behavioural Reaction and Reflection

Learners can make a judgment about their behaviour and can make reflections that help them in their self-regulation, such as when they reflect on effort or time that they spent performing a learning task (Pintrich, 2000). These reflections may help them with future choices (Pintrich, 2000).

2.10.3.4 Regulation of Context

According to (Pintrich, 2000), regulation of context is an important aspect of self-regulated learning. "Contextual control and regulatory processes involve efforts to control and regulate the tasks and context the college student confronts in the classroom" (Pintrich, 2000, 399).

Contextual Forethought, Planning, and Activation

The contextual forethought, planning, and activation phase involves learners' perceptions about the learning task and context. These perceptions can be about the nature of the task, task performance procedures, or general knowledge of task types. Moreover, a student's perception of the classroom environment is another piece of contextual information that needs to be activated, for example, "working with others is cheating" or "no bias on the basis of gender or ethnicity" (Pintrich, 2000, p. 470).

Contextual Monitoring

Learners can monitor contextual features and learning tasks. This monitoring includes their awareness and monitoring of task needs, rewards systems, and classroom laws (Pintrich, 2000).

Contextual Control and Regulation

The contextual control and regulation phase is a result of the monitoring phase. It regularly involves trying to adjust or shape the learning environment or task to achieve goals. Students attempt to engage to control some features of the learning tasks and context when they negotiate. For example, in traditional classes, the teacher has a high level of control, so students may try to negotiate with the teacher to lower assignment requirements or to allow them to use their notes in the exam (Pintrich, 2000). In addition, in student-centred learning classrooms, students are more involved in the process of control and regulation of the task aspects and classroom environment structure. For instance, they work with their teacher to find the best evaluation method, and they try to organize their place of study through context regulation (Pintrich, 2000).

Contextual Reaction and Reflection

The contextual reaction and reflection phase involves evaluations that learners make regarding the task and context.

To sum up, self-regulated learning theory is the theory that concerns learners' planning, monitoring, controlling, and regulating of their learning in the cognitive, behavioral, and emotional contexts. This theory served as a framework through which I analysed and interpreted the data for the third research question. In particular, I used Pintrich's (2000) framework.

Following the discussion of self-regulated learning theory and Pintrich's (2000) framework, the aim of next section is to provide a conclusion for the literature review.

Table (2): Phases and Areas for Self-Regulated Learning, source: (Pintrich, 2000, p. 454).

Areas for regulation				
Phase	**Cognition**	**Motivation/affect**	**Behaviour**	**Context**
1. Forethought, planning, and activation	Target goal setting Prior content knowledge activation Metacognitive knowledge activation	Goal orientation adoption Efficacy judgments Ease of learning judgments (EOLs); perceptions of task difficulty Task value activation Interest activation	[Time and effort planning] [Planning for self-observation of behaviour]	[Perceptions of task] [Perceptions of context]
2. Monitoring	Metacognitive awareness and monitoring of cognition (FOks, JOLs)	Awareness and monitoring of motivation and affect	Awareness and monitoring of effort, time use, need for help Self-observation of behaviour	Monitoring changing task and context conditions
3. Control	Selection and adaption of cognitive strategies for learning, thinking	Selection and adaption of strategies for managing motivation and affect	Increase/decrease effort Persist, give up Help-seeking behaviour	Change or renegotiate task Change or leave context
4. Reaction and reflection	Cognitive judgments Attributions	Affective reactions Attributions	Choice behaviour	Evaluation of task Evaluation of context

2.8 Conclusion

In this this chapter, I discuss literature related to my study. I begin by explaining the term perceptions and then the concept of flipped learning used in this study. Then I shed light on the study's theoretical framework and provide justification for this framework. This justification is followed by a discussion of the social constructivism theory, which is the basis for this study. After that, I discuss student engagement and active learning, followed by the constructivist pedagogical practices within flipped learning. In addition, I discuss the use of technology, the learning videos, the cognitive theory of multimedia learning, and the principles of multimedia design. I also discuss other technology applications, which are social networks, learning management systems, and mobile devices. Later, I present and discuss the self-regulated learning theory and Pintrich's (2000) framework.

The literature shows diverse students' perceptions of flipped learning. Students' reactions range from positive perceptions; satisfaction (Day & Foley, 2006; McLaughlin *et al.*, 2013); and interest in collaborative, interactive learning (Fulton, 2012) to worrying about the significant shift in responsibilities during flipped learning (Strayer, 2007). In addition, students faced some challenges in flipped learning, including the poor design of flipped learning videos and class activities.

Generally speaking, from my review of most of the literature on flipped learning, I discovered that many researchers adopted experimental or quasi-experimental designs, where they used experimental and control groups. Giving a set of privileges to one group but not to another group may be morally questionable (Wellington & Szczerbinski, 2007) and was something I was keen to avoid in my work.

In addition, despite flipped learning's growing popularity, it still lacks supporting research, particularly regarding students' perceptions. In the same vein, Brewer and Movahedazarhouligh (2018) point out that "although flipped learning has grown in popularity, research and resources are still needed to support educators in transitioning their teaching to using a flipped learning approach" (p. 6). Furthermore, regarding some aspects of students' self-regulated learning, studies that link flipped learning with self-regulated learning are significantly lacking.

Regarding the Saudi higher education context when I began my study, the adoption of and research on flipped learning was scant, and I could not locate work that specifically considered the students' perceptions. My research deals with this unique perspective. Consequently, as I mentioned before, the purpose of this study is to qualitatively explore Saudi undergraduate students' perceptions of flipped learning from their experience as participants in a flipped learning course in a Saudi university.

The literature review played an important role in this study, as it influenced my decisions concerning the study's methodology, particularly when I designed the study intervention. Previous research showed me the various pedagogical practices and theories that addressed the adoption of flipped learning. Furthermore, the literature review, constructivist learning theories, and other supportive theories helped me interpret my findings and understand my participants' perceptions.

CHAPTER 3: METHOLODOGY

3.1 Introduction

Research methodology plays a fundamental role in achieving research objectives and answering its questions. It is concerned with the methods and the procedures by which the researcher acquires the required knowledge (Hammond & Wellington, 2013). According to Crotty (1998), methodology is "the strategy, plan of action, process, or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes" (p. 3).

Sikes (2004) argues that methodology itself can be employed "to denote the overall approach to a particular research project, to the overarching strategy that is adopted. Thus case study, life history, and action research are examples of methodological approaches" (p. 16). This section focuses on methodological issues relating to the study and explains how the research questions will be addressed. Thus, in this section I present my philosophical assumptions within qualitative inquiry, the research design, data collection procedures, participants, data analysis, ethical considerations, and the trustworthiness issue.

3.2 Philosophical Assumptions within Qualitative Inquiry

Research design is associated with the researcher's philosophical assumptions, which can shape research paradigms. Defining a researcher's ontological, epistemological, and methodological assumptions can help define the research paradigm (Guba & Lincoln, 1994).

Ontology is concerned with the ideas "about the nature of being and existence" (Hammond & Wellington, 2013, p. 114). I see people's knowledge, experiences, interactions, understanding, and perceptions as "meaningful properties of the social reality" (Mason, 2002, p. 63). Therefore, my research question was designed to explore a property, which was students' perceptions regarding a particular socio-educational phenomena (flipped learning).

On the other hand, epistemology is "the theory of knowledge embedded in the theoretical perspective and thereby in the methodology" (Crotty, 1998, p. 3). In other

words, it is concerned with the methods of how knowledge is developed and the relationships between researchers and their areas of study (Creswell, 1998). "[Y]our epistemology helps you to generate knowledge and explanations about the ontological components of the social world, be they social process, social actions, discourses, meanings, or whatever, which you have identified as central" (Mason, 2002, p. 16). Examples of epistemological postures are positivism and interpretivism (Sale, Lohfeld, & Brazil, 2002). According to Hammond and Wellington (2013), "positivism and interpretivism are often held up as paradigms in social research" (p. 172). Positivism supports the concept of reality as independent of human perception, and it trusts experience as a usable source of knowledge (Cohen *et al.*, 2011). Also, positivism holds that social science research should use natural science methods and methodologies and maintain objectivity (Hammond & Wellington, 2013). On the other hand, interpretivism is an anti-positivist (Cohen *et al.*, 2011, p. 17) outlook in which knowledge is socially constructed and continuously changing (Sale *et al.*, 2002). My personal view regarding the nature of knowledge is that it is subjective and can be observed, generated, and constructed by observing or participating in the social world. As a human, I have a mind to think, devise, and interpret, to build communities and construct the universe.

Furthermore, methodological assumptions are important for devising methods that will be used for research data collection (Creswell, 1998). The nature of the research questions and the focus of this study drove me to employ an exploratory intervention case study methodology, which seems to have been a suitable method for exploring and bringing elaborated views of the experience of participating students. This methodology is explained in detail in the following sections.

Now, following the above description of my philosophical assumptions, I discuss my research paradigm. A paradigm is "a set of basic beliefs (or metaphysics) that deals with ultimates or first principles" (Guba & Lincoln, 1994, p. 107). In his book, *The Structure of Scientific Revolutions* (1970), Kuhn suggests that a paradigm is a set of recognised techniques and rules of the research community that help identify and clarify a problem, provide a way to solve it, and provide results and justifications that are suitable to the research community. Each paradigm has its own benefits and drawbacks (Cohen *et al.*, 2011; Feyerabend, 1975), but the most important things to consider when choosing methods for study are research needs and purposes (Cohen *et*

al., 2011; Mason, 2002).

Therefore, according to my ontological, epistemological, and methodological assumptions, I can describe myself as an interpretive researcher who "accepts that the observer makes a difference to the observed and that reality is a human construct. The researcher's aim is to explore perspectives and shared meanings and to develop insights into situations" (Wellington, 2000, p. 16).

Additionally, according to Cohen *et al.* (2011), interpretive researchers study individuals with a diversity of human attitudes, opinions, and behaviours. Hence, after extensive consideration, I chose an interpretivist rather than a positivist approach, as the former was better suited for my research interest and would enable me to answer my research questions. Also, it enabled me to listen as a researcher to Saudi undergraduate students' perceptions of flipped learning. Therefore, I considered their perceptions and my own interpretations of the primary data sources for this research.

It is worth mentioning here that some researchers use other concepts to describe the interpretivist paradigm. For example, Denzin and Lincoln (1998) use the term "constructivist paradigm" (p. 242), and Creswell (1998) uses the term "social constructivism" (p. 24) for the same concept. According to the social constructivist view, individuals can "develop subjective meanings of their experiences…and these meanings are varied and multiple, leading the researcher to look for the complexity of views rather than narrow meanings into a few categories or ideas" (Creswell, 1998, p. 24). Thus, I too can identify my approach for this research as following a social constructivism model, as I was interested in understanding multiple perceptions, which is socially constructed knowledge. In practical ways, a researcher should use open-ended questions, which may allow participants to make better construction of the meaning. The researcher should listen wisely, closely observe participants' interactions, and concentrate on the particular context of the work or life to recognise the historical and cultural features of the setting, which may influence participants (Creswell, 1998, p. 25). As a result, in this study, I utilised an open-ended questionnaire and open-ended questions in the focus group interviews, which might have helped participants construct meanings. Further, I applied in-class observations to allow me to address participants' interactions and help me provide in-depth interpretations.

Creswell (1998) argues that "researchers recognize that their own background shapes their interpretation, and they "position themselves" in the research to acknowledge how their interpretation flows from their own personal, cultural, and historical experiences" (p. 25). Thus, the following section draws an overview of the qualitative research approach.

3.3 Qualitative Research Approach

Qualitative research enables researchers to explore the social world, understand it, and use some methods that "celebrate richness, depth, nuance, context, multidimensionality and complexity" to generate required knowledge (Mason, 2002, p. 1). According to Creswell (1998), qualitative research is

> an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyses words, reports detailed views of informants, and conducts the study in a natural setting. (p. 15)

In addition, Stake (2010) suggests that qualitative research "is sometimes defined as interpretive research" (p. 36). Supporting this view, Wellington (2000) states that, within the interpretive paradigm, "data will generally be qualitative and based on fieldwork, notes, and transcripts of conversations/interviews" (p. 16). In this research, I adopted a qualitative approach for multiple reasons. First, the research question and aim guided me to adopt a qualitative approach, which is more effective in exploring perceptions and subjective meanings within a culture (Creswell, 1998). Furthermore, I believed that a qualitative approach was appropriate for this study to better understand phenomena (in this case, flipped learning) and to explore students' perceptions by using qualitative methods that might provide me with rich descriptive data, including observations, focus groups, and questionnaires (Mason, 2002). As argued above in Section 2.8, I chose not to use a control group for ethical reasons. Moreover a control group requires that the researcher controls stimuli to which participants are exposed. I was aware I could not control all input that students would access out of the class and I could not monitor what and 'control group students' were exposed to before any given class.

Having explained the approach underpinning this study, in the next section I discuss the study design, the participants, and the data collection procedures, which involve

the flipped learning programme that was used for the intervention, observation, open-ended questionnaire, and focus group interview. Also, I explain the pilot study.

3.4 Case Study Research Design

This study applied a case study design. A case study is an intensive, rich, and in-depth study that produces a single instance of actual individuals in actual events (Cohen *et al.*, 2007; Yin, 2009). Also, "it allows investigators to retain the holistic and meaningful characteristics of real-life events, such as individual life cycles [and] small group behavior" (Yin, 2009, p. 4). According to Stake (1995), there are three types of case studies: intrinsic, instrumental, and collective (Wellington, 2000, p. 92–93; Baxter and Jack, 2008, p. 544–559). In the current exploratory investigation, I engaged in an intrinsic case study because "the purpose is not to come to understand some abstract phenomenon," but rather the "study is undertaken because of an intrinsic interest in" the topic (Stake, 1994, p. 237). I had a real interest in the case, and my interest way students' perceptions of flipped learning in Saudi universities.

Moreover, this research employed the interventional case study approach. I designed and implemented a flipped learning programme, which consisted of 12 teaching sessions during one academic term in two classes in a university in Saudi Arabia, which conflicts with Stake's (1995) view, which emphasises case studies' naturalistic settings. However, I view mine as an authentic case study because of its depth and intensity and the methods used, which could provide rich, detailed, and descriptive data (Mason, 2002).

3.5 Setting and Participants

Sampling or a sample is "the smaller number of cases, units or sites selected from a much larger population. Some samples are assumed to be representative of the wider population" (Hammond and Wellington, 2013, p. 174). Qualitative research usually uses purposive sampling, which means that the researcher chooses individuals and locations for research because they may purposefully provide the required understanding of the fundamental phenomenon in the research and the study problem (Creswell, 2013, p. 156). Thus, researchers use this method of sampling when they need rich information on the phenomenon being researched (Patton, 1990).

The participants in this research are 27 students from two classes. I labelled these classes A and B. I had 14 participants from class A and 13 from class B. All the participants were native Arabic speakers, and their ages ranged from 19 to 21.

I carried out this study in Riyadh at a Saudi university (female campus), College of Education's Instructional Technology Department (ITD). More specifically, I did so in two of the classes of the (242 ITE: Integrating Technology in leaning Environment) course, which is currently offered for College of Education students in the third level (one lecture of two hours per week). I chose my participants from this particular city, university, department, and course for a few reasons or criteria, as I used a criterion-based or purposive sampling approach.

The first criterion I used was being a student who will agree to participate in a flipped learning course. As the flipped learning—within the limits of the researcher's knowledge—was not applied at that time based on this study's definition, I needed any university instructor to agree to apply a flipped learning programme to her course for an entire term. Finding this teacher was not easy, as applying flipped learning took more than three months and involved serious preparation, such as creating pre-lesson resources, creating and checking weekly assignments, and designing in-class activities. Thus, a teacher who would agree to my proposal would be one who believed in change, development, new pedagogies, and technology integration. After a long search by phone and email to several Saudi universities, no one agreed to participate. During the Christmas holiday of 2015, I visited the department where I work at KSU, whereupon I met some colleagues and explained how I could implement my research in one of their classes, but most of them declined because they were very busy doing their PhD studies in addition to their work or had other circumstances, such as maternity leave at the same time that I intended to conduct my study. I tried again with other universities, but I received no responses. Finally, I received a response that one of the teachers in my department would volunteer to work with me, and I started the access permission procedures directly.

Second, Riyadh, the capital of Saudi Arabia, was chosen for this research for two reasons.

1. in Riyadh, university teachers and students are more familiar with researchers. Thus, this might have helped me quickly obtain access permission and provided me convenient access to volunteer participants.

2. Riyadh is the city where my family lives; therefore, it was more convenient for me, as I needed to stay more than three months for the fieldwork and visit the university regularly.

Third, criterion sampling allows a researcher to "meet some criterion; useful for quality assurance" (Creswell, 2013, p. 158). One significant and useful criterion that put my department on my list of departments when I was searching was the availability of classrooms equipped with necessary technologies and an appropriate pedagogical design for in-class activities.

I would like to mention that I planned and arranged with the cooperating instructor to apply the programme for only one class of 24 students, as I was informed during study preparation that the number of students in each class must be between 24 and 30, although the next term they changed the policy. The department decided that the maximum size should be 15 students. I was fine with this number and I understand that

> In ethnographic or qualitative research it is more likely that the sample size will be small. Sample size might also be constrained by cost in terms of time, money, stress, administrative support, the number of researchers, and resources. (Cohen *et al.*, 2011, p. 145)

Also,

> Sample size in qualitative research is not only to study a few sites or individuals but also to collect extensive detail about each site or individual studied. The intent in qualitative research is not to generalize the information, but to elucidate the particular, the specific (Pinnegar and Daynes, 2007). (as cited in Creswell, 2013, p. 157)

However, I wanted more students in order to collect a larger data set. The volunteer teacher had two classes of around 30 students in the beginning of the term, and after the new decision, she had four classes of around 14 to 15 students. She volunteered again to apply the programme to two classes, which were on the same day, and the department head gave me permission for this configuration. I applied my study on class A of 15 students in the first week, which was reduced to 14 students in the

seventh week, and class B of 14 students in the first week, which became 13 students in the third week. The two students who did not continue participating withdrew from the entire semester for special circumstances. Thus, I had 27 total participants from two classes. Table (4) displays all students who participated to the end of the study. In sum, purposive sampling fit my aim for the group, or sample, I chose and it provided me with the information I needed. A reader may argue that a case study can be not representative. However, the process of the selection meant that this was, as far as can be ascertained, a regular group of students from the School of Education. They are students similar to those who we can find in any Saudi university, in regular classes, and in regular courses at a standard Saudi university; the fieldwork was done during the months of the Saudi academic year. Thus, I think that the sample used in this study was also a representative sample of female Saudi undergraduate students. Therefore, the findings of this study can be useful for other cases.

Regarding the backgrounds of the participants, the students were from the Education College at King Saud University; this may have had an impact on the students' appreciation of the research, and their responses in general, since they were clearly students who had an interest in pedagogy and learning. Their interest in these issues was evident in their opinions during the research. I attributed this interest also, to the widespread interest in technology resulting from the so-called ‘digital revolution’, where there has been heightened interest in technology. As has been reported widely, this has impacted on all age groups and social strata (Castells, 2014) Through the students' conversations, I felt the obvious impact on the language of social networking sites, such as Twitter, where many Saudis discuss educational issues. For instance, some words, such as “creativity,” may appear as a result of engaging in social networks or being influenced by media vocabulary. Moreover, words such as “flexibility” and “individual differences” can appear in someone's language if he/she has an educational background. Thus, the talk was rich and intellectual, as one will see later in Chapter 4. In addition, I would say that all of this enriched the discussions through the interviews and gave me a deeper understanding of the issues surrounding flipped learning from the students' points of view. Finally, their educational backgrounds and the language they used also facilitated the analysis process and the coding, as the repeated use of some educational terms helped with forming some themes more easily at times. Moreover, their discussion and questionnaires included

descriptions of "good video," as they called it, which made me analyze the data again deductively to look for video design principles from their points of view.

Table (3): Research Participants

Pseudonym		Class A		
		Observation	**Open-ended questionnaire**	**Focus group interview**
1	Noor	✓	✓	✓
2	Ghada	✓	✗	✓
3	Suaad	✓	✓	✓
4	Majda	✓	✓	✗
5	Amal	✓	✓	✓
6	Shahd	✓	✓	✓
7	Rawan	✓	✓	✓
8	Atheer	✓	✓	✗
9	Mai	✓	✓	✓
10	Moneera	✓	✓	✓
11	Farida	✓	✓	✗
12	Alaa	✓	✓	✓
13	Lana	✓	✓	✓
14	Rand	✓	✓	✓
Total		14	13	11 (Group A: 6 students, Group B: 5 students)
Pseudonym		**Class B**		
		Observation	**Open-ended questionnaire**	**Focus group interview**
1	Mona	✓	✓	✓
2	Maha	✓	✓	✓
3	Noha	✓	✓	✓
4	Ghosson	✓	✗	✓
5	Rana	✓	✓	✓
6	Dalal	✓	✓	✓
7	Sahar	✓	✗	✓
8	Reem	✓	✓	✓
9	Hanan	✓	✓	✗
10	Fai	✓	✓	✓
11	Sarah	✓	✓	✓
12	Saleha	✓	✓	✗
13	Hala	✓	✓	✓
Total		13	11	11 (Group C: 6 students, Group D: 5 students)

3.6 Course Description (242 ITE course)

242 ITE is the Integrating Technology in Learning Environments course, which is currently offered for third level College of Education students by the Instructional Technology Department.

> This course seeks to acquaint students with theoretical concepts of the learning technologies field and the most notable theories underlying it such as communication theory, the systems approach, and instructional design. Students are also informed about the classification of instructional aids according to various criteria. They also learn about innovations in technologies used in teaching and learning and the best ways to use them. (Instructional Technology Department website, 2016)

This course involves one 2 hours lecture per week. Students are provided with a complete description of the course syllabus and assignments at the beginning of the semester. The current study used the same syllabus (lessons) other teachers used in the same semester. In addition, this course is a 16-week course, including 32 hours of face-to-face lectures, but I conducted this study for 12 weeks, including 24 hours of active learning sessions for two classes, due to scholarship conditions. This course's assessments include midterm and final exams, which constitute 60% of the semester grade, in addition to 40% from various assignments during the term.

3.7 Data Collection Procedures

The primary focus of this section is the description of the different methods I used for data collection. This research study used participant observation, focus group interviews, and open-ended questionnaires to collect the data. It was my hope that these methods would help me answer my research question. Therefore, this part begins with a description of the flipped learning programme that was conducted during the course.

3.7.1. Flipped Learning Programme

> Flipped learning isn't a set process; it allows expressions of the model. There is no single strategy that works in every classroom, for every teacher, and for each student. However, flipped learning is adaptable to your style, methods, and circumstances. Each teacher can personalize their version of flipped learning for their students. (Bergmann & Sams, 2014, p. 7)

In this programme, the cooperating teacher produced 12 short video lectures of 10 to 15 minutes each, and she followed the curriculum for the flipped course. These videos

were produced using screencast software, which contained audio and teacher comments to be compatible with the Saudi culture. This is a common method of flipped learning, even in Western countries, as mentioned in the literature review of this study. The current study used "CamStudio" which is a free software tool that can be used to make screencast videos. The teacher and I chose this software because it is free and easy to use to produce videos. These videos focussed on the foundation of any lesson, such as new concepts, facts, or skills. Each video had one topic and contained the basic content of the lessons presented in the course (see the Setting and Participants section). Please note that the detailed account of how I worked with the teacher to develop videos is provided in Appendix 9.

In addition, different online materials were provided to students. These materials and videos were published on Blackboard, which is KSU's learning management system. See the Blackboard screenshots of the course content (Figures 5, 6, and 7), which show some course topics' folders. Also, the Blackboard page contains links to the YouTube channel for the teacher-created videos to ensure that the videos were available in one place and to make it easy to put the links on Blackboard (see Figure 8). In addition, she sometimes referred students to existing YouTube videos.

Additionally, for each lesson, the teacher attached assignment questions about the video content and other online materials and asked students to answer them and submit answers via email before the end of the class period. The aim of these questions was to give the teacher an initial idea about students' prior knowledge and to determine which points need extra support during future class meetings. Also, the aim was to ensure that students had studied the course materials and were prepared to engage in class activities. Moreover, class time was freed up for other activities. The class started with a discussion of the questions followed by related activities. The teacher had to devise her own materials and design class activities, which might have been a significant challenge for her, as the usual university instruction method in Saudi Arabia is lecturing. I really appreciate what she did during the course; she was excited and loved exploring innovations in education.

During the class time, many pedagogical approaches were adopted, including peer instruction (Mazur, 2013), and other collaborative, cooperative, problem-based learning activities. Students were allowed to use their tablets, smart phones, and the

available classroom technologies (desktop computers and available applications) during some class activities, Finally, I would like to mention that the students had their regular teacher the entire time, and she was responsible for their assessments and all other student-related issues. Hence, my research did not affect student assessments, or outcomes.

Table (4): Structure of the teaching / research phase

Time	Teacher's tasks	Students' tasks	Researcher's tasks
Introductory phase	- Consults with the researcher about the teaching aims and class activities, and prepares the first video. - Prepares the course syllabus - Note: course topics included educational communication, teaching and learning aids, classifications of teaching aids, educational design, WebQuests and its design, learning environment and educational technology, innovations in the field of educational techniques, and preparing educational presentation by using PowerPoint.		- Consults with the teacher - Provides the teacher with any needed training or materials. - Plans for the induction meeting with the students - Plans for the pilot study
Two weeks before class	- Records videos - Prepares hard-copy resources for the classroom - Designs in-class activities - Prepares assignment questions		
One week before class	- Uploads videos (may be one or two videos) into YouTube, then links them to Blackboard - Uploads the assignment into Blackboard - Uploads any extra online materials - Delivers announcement - Sets the deadline for the assignment	- Watches the video - Answers questions - Sends answers to the course email before the deadline.	
The day before the class	- Enforces the assignment deadline - Checks the course email (who sent and who did not) - Checks the answers and identifies the understanding weaknesses		
Flipped Learning Classroom	20-25 min	- Teacher sets the group work - The teacher and students together give a review and a conclusion of the lesson goals, videos, and any other	- Observation - Prepares

<table>
<tr><td rowspan="6">(Two hours)</td><td></td><td colspan="2">learning materials
(for example, each group draws a concept map, flowchart, brainstorming sheet, or summaries)</td><td rowspan="6">notes directly after class</td></tr>
<tr><td>20-25 min</td><td colspan="2">- The teacher and students discuss the assignment questions and answers as a group
- They discuss the common questions submitted by students via WhatsApp group, or email.</td></tr>
<tr><td>5-10 min</td><td colspan="2">Break</td></tr>
<tr><td>35-40 min</td><td>Leads students in activities</td><td rowspan="2">Engages in activities (for example, group discussions, problem solving, or peer tutoring); through these activities, they reflect on, discuss, and practice what they have learned</td></tr>
<tr><td>15-20</td><td>Consolidates with extra exercise, discussion, or any activity before the end.</td></tr>
<tr><td>Next day after class</td><td colspan="2">- Evaluates the last flipped learning class and discusses any issues with the researcher or provides any needed clarification; start planning for the next lessons.
- She set two office hours for students if they need any help in this day.</td><td>They may visit the teacher during the office hour</td><td>- Checks the issues that need clarifications from teacher</td></tr>
</table>

Table (5): Fieldwork Time Line

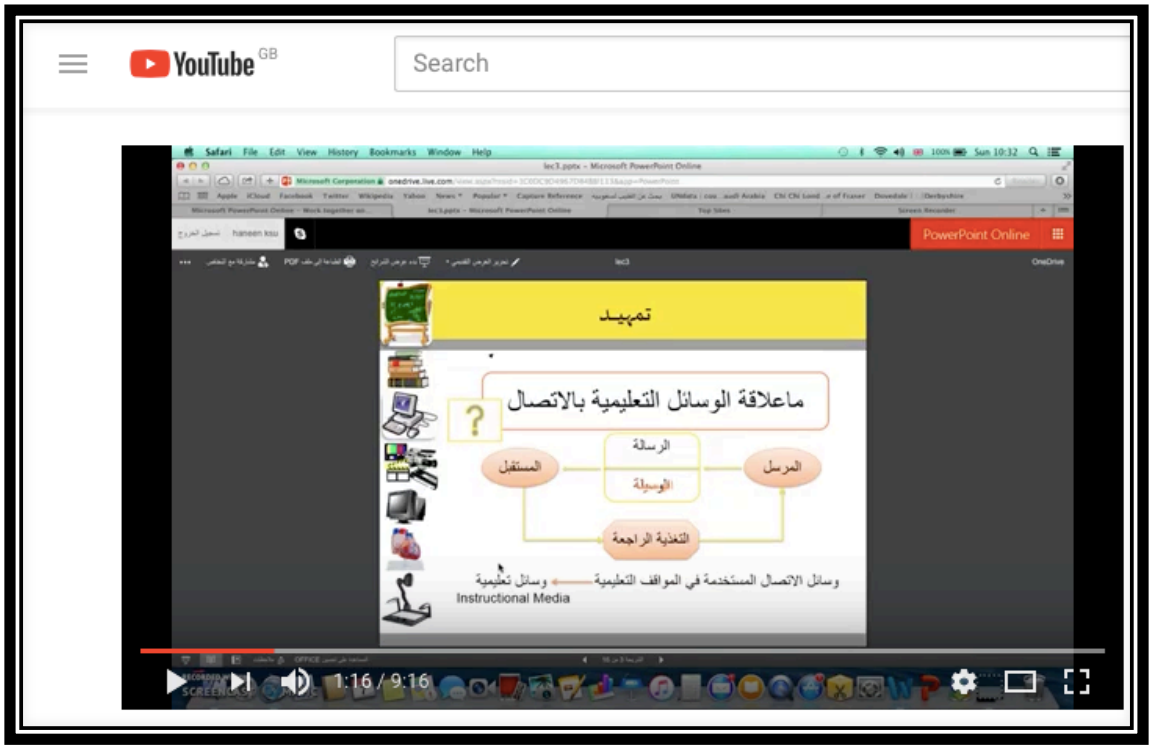
Fieldwork Time Line	Date	Action
Week 1	20/1/2016	Induction
Week 2	27/1/2016	Flipped learning programme start, Pilot study
Week 3	3/2/2016	
Week 4	10/2/2016	Major study observation start
Week 5	17/2/2016	Observation
Week 6	24/2/2016	Observation
Week 7	2/3/2016	Observation
Week 8	9/3/2016	Observation
Week 9	16/3/2016	Observation
Week 10	23/3/2016	Mid Term Holiday
Week 11	30/3/2016	Observation
Week 12	6/4/2016	Observation + Open-ended questionnaire distribution
Week 13	13/4/2016	Observation
Week 14	20/4/2016	Observation + Focus group interviews (group A, and group C)
Week 14	21/4/2016	Focus Group Interview (group B, and group D)
Note: Term start date: 17/1/2016 Last Teaching Week: 24/4/2016		

Figure (5): Blackboard Screenshot Shows Content of the Course

Figure (6): Blackboard Screenshot Shows Home Assignments

Figure (7): Blackboard Screenshot Shows Videos Links

Figure (8): Screenshot of a Video



3.7.2. Observations

Based on my ontological assumption, I see human "actions, reactions and behaviors, and the way people interpret these, act on them, and so on, as central" (Mason, 2002, p. 85). In addition, according to my epistemological assumption, I believe that knowledge is "socially constructed, subjectively experienced, and the result of human thought as expressed through language" (Sikes, 2004, p. 20). As a result, I used the observations to catch different actions and behaviours in the classroom and discern what kind of immediate feedback students gave while they engaged in flipped learning activities. For this study, observations might have provided me with the kinds of data that could not be generated by other methods. I used the observation method to allow for further exploration of elements that might be missed in the open-ended questionnaire or focus group interviews, so it might enable me "to see things that might otherwise be unconsciously missed, [and] to discover things that participants might not freely talk about in interview situations" (Cohen *et al.*, 2011, p. 456). In the same vein, Hammond and Wellington (2013) argue that observation can be beneficial to capture the whole situation, which cannot be fully measured through other methods, such as interviews and questionnaires. Through observation, I was allowed to watch authentic behaviours that could be different from those reported by participants, and I was also allowed time for in-depth interpretation.

Consequently, observation in this research captured a rich picture of the setting (context and process) for the researcher and reader (Mulhall, 2003). An additional purpose was catching nonverbal gestures, meanings, and feelings (Cohen, 1998), which included students' hand and head movements, facial gestures, smiles, gazes, and laughter.

Furthermore, in this research I am an interpretive researcher, and based on my epistemological assumption, I see that meaningful knowledge requires me to learn via observation because it provides social-context data in multidimensional ways (Mason, 2002, p. 85).

There are different methods of observation that can help a researcher understand particular phenomena. Arguably a researcher can be a participant observer or a nonparticipant observer. Participant observer means that a researcher becomes a part of the group being observed and engages in research settings and activities (Cohen *et*

al., 2011, p. 465). However, a non-participant research observer is not part of the observed society and "stands to one side and views an experience or an organization" (Rowley, 2004, p. 211). Thus, the non-participant only observes the activities, events, and students from a distance. Consequently, I can suggest my role during observation was as a non-participant observer because I was not a part of the situation that I observed. However, I think that when the researcher is an observer, the researcher must in some way participate and have an effect on the context; hence, the impact of the researcher's presence cannot be ignored. Thus, I think my presence in the classroom had an effect, which I will explain later, and because I designed this project, of course I had an impact on it. I reported that I consider myself to be the main instrument in this research; therefore, I am very aware that my vision, observation focus, interpretations, and what I write depends on my background, experiences, knowledge, and my positionality in general. A researcher's interests and perspective can play important role in in the study's development. In addition, any other researcher we put in the same context may have different views and interpretations.

During the observation, I observed all the students because all of them agreed to be observed. However, "Observation of human interaction, seemingly so simple, is incredibly complex. Your perspective on what you see and hear and how you make meaning of it is critical" (Lichtman, 2013, p. 223). In the beginning of my observation, and particularly in the first week of the pilot study, my observation took the style of "go in and look" (*ibid.*, p. 227), but when I attended to observe, I found it very difficult, and it did not work well. After this I decided to focus on some details of learners' interactions to study. I tried to do my best, but I always know that observation cannot be fully completed. I did not go to the class with an actual agenda, but at least I trained myself to be more observant and sensitive towards students' feedback, interactions, discussions, and reactions during the various activities. I made these issues my priorities because sometimes there were several different things occurring simultaneously. For example, my observations gave priority to student interactions in pairs or groups during classroom activities, such as doing peer tutoring, asking for help or feedback from a teacher, and working on their arguments. If one of the groups was receiving regular feedback from the teacher and another group was refuting the reasons for a case study, I spent more of my time observing the group to

the group discussing the reasons to see how they built their knowledge and moved through the ZPD (Vygotsky, 1976).

But I can still call my observation "open-ended and unstructured" (Wellington & Szczerbinski, 2007 p. 80). Observation can be unstructured or structured. Unstructured observation is a type of observation that can be implemented, without having any structure before the observation; thus, it is open, and the observer has full freedom to gather data. Conversely, the structured observation is conducted using previously-defined items (Mulhall, 2003). In addition, Mulhall (2003) states that "unstructured observation is used to understand and interpret cultural behavior. It is based within the interpretist/contructivist paradigm that acknowledges the importance of context and the coconstruction of knowledge between researcher and 'researched'" (p. 306). As this research adopts a social constructivist paradigm, unstructured observation was the most suitable method of observation. I also paid significant attention to their Saudi cultural and historical backgrounds, which can affect the educational context. For example, no pictures were taken of the students during the observation, because taking photographs of the students is not allowed by the university or by the students for religious and social reasons.

Merriam and Tisdell (2015) state that observation relies on the research problem and the questions that the researcher intends to answer. Thus, as I mentioned, I tried to look to the students' different actions through class activities and the class atmosphere in general, as my research focus was student perceptions. I wanted to be aware of everything that students talk about when they report their perceptions, and I also believe that behaviours are reflections of students' perceptions. However, my focus improved during the course observation to involve students' perceptions regarding their learning practices within flipped learning. This view is clearly supported by Merriam and Tisdell (2015), who state that

> Where to begin looking depends on the research question, but where to focus or stop action cannot be determined ahead of time the focus must be allowed to emerge and in fact may change over the course of the study. (p. 140)

As a result, my observation helped me form my third question, which concerned the self-regulated learning aspects within flipped learning through the students' perceptions. My observations also helped me make in-depth interpretations during the

analysis process.

I took headlines during the class, and afterwards I wrote my field notes (see Appendix 6), which included all the important events, actions, and conversations that I observed, and my own reflections, for which I relied upon memory. The class time was two hours, and I observed the students during this time. Furthermore, once I arrived at the class, I sat in a place where I could see and hear everything—usually at the back of the classroom—and I avoided creating any distractions for the teacher and the students.

I was very aware that "things are not always as they seem. If people know you are observing them they might want to look good" (Lichtman, 2013, p. 228). Sometimes individuals tend to change their behaviours when they know that they are being observed, and this is what researchers call the observer or Hawthorne effect (Diaper, 1990).)."Evans (1978), in a dictionary of psychological terms, states that the Hawthorne Effect '...showed that workers increased their output, largely unconsciously, when they were being studied'" (Diaper, 1990, p. 261). The Hawthorne effect was a concept derived from a study of factory workers' behaviour at Western Electric's Hawthorne Plant during the 1920s and 1930s, whereupon the researchers found that workers increased production when they were aware that another party was observing them. It emerged that whatever changes were introduced in the factory, it had a positive effect on the workers. This effect has become a significant part of the methodology of research experiments and has been commonly used in social science research, especially in educational psychology (Jones, 1992, p. 451). In a same vein, Oswald, Sherratt, and Smith (2014) state that "this effect can contaminate the natural social environment being studied, and hence overcoming any adverse effects of this phenomenon is very important" (p. 57).

In my research, and in the first class meeting of the pilot study, particularly during the first hour, I noticed that students were trying to be "perfect", and I felt that, based on my experience as a teacher, it was not an authentic classroom atmosphere. In the second class of the pilot study, I found the students to be more natural, but I saw a real change after conducting the focus group interviews with them and piloting the questionnaire, and I think it was because I talked with them for a long time, clearly explained to them the purpose of my research, and offered them reassurance. I saw

them respond very naturally, and this icebreaker was one of the pilot study advantages. Even though we had an induction meeting—the teacher introduced me to the participants, I talked with them, and everything seemed to be fine—I nonetheless found that the pilot study played an especially important role in my successful observations and possibly overcoming the Hawthorne effect. The pilot study's focus group meetings were especially helpful (I discuss the pilot study in details later, in section 3.7.5). They decreased or eliminated shyness, unfamiliarity, or awkward worry, which helped to overcome the Hawthorne effect.

Last, I found that flipped learning was positively received by the students. I am aware that this could be seen as the Hawthorne effect. However, in trying to find reasons for students' perceptions, it may be possible that positive perceptions were not entirely due to the Hawthorne effect.

3.7.3 Questionnaire

A questionnaire is one method to collect the data required for this research. It is a research instrument that is usually implemented by asking questions (Gillham, 2000). I used an open-ended questionnaire for deep understanding of students' experiences and perceptions about flipped learning. It is a kind of questionnaire in which the researcher "puts open-ended questions and leaves space (or draws lines) for a free response" (Cohen *et al.*, 2011, p. 392). The open-ended questionnaire could encourage students to provide extensive answers about their experiences and feelings during the course or to supply any information that was missed or unaddressed during observation and to support focus groups to address the issues. Many statements made in the open-ended questionnaires were used for improving the main and probing questions of focus groups besides other aspects from the observation. The questionnaire provided me with extra ideas about the situation, so I amended the focus group questions before the focus groups took place. Hence, the questionnaire was conducted before implementing the focus group interview, where I distributed the questionnaire to all the students, and not all of them returned it (only 24 participants). In addition, when participants had seen the questionnaire before the focus group interviews, I think it made them more relaxed regarding the project and its aims and also made them more relaxed and honest during the interview. The data obtained from the questionnaires involved data about participants' experiences, thoughts,

behaviours, and perceptions. Thus, it supported the other methods and also provided participants full freedom to add what they wanted without shame because they remained anonymous; nevertheless, most of them had added their names to the questionnaire.

I chose the open-ended questionnaire and not the closed-ended one because of the advantages of this type. According to Reja *et al.* (2003),

> The advantages of the open-ended questions include the possibility of discovering the responses that individuals give spontaneously, and thus avoiding the bias that may result from suggesting responses to individuals, a bias which may occur in the case of close-ended questions. (p. 161)

In the same vein, Esuli and Sebastiani (2010) think that the open-ended questionnaire can provide researchers with richer data because it provides participants the full freedom to add any viewpoints that the researcher did not expect before; hence, it may supply a new focus. Nevertheless, there are some disadvantages to this kind of questionnaire. It may lead to considerable coding which consumes time, and participants may not respond to all the questions, which is what I faced (Reja *et al*., 2003). In addition, there is another challenge, which is that short answers may cause a lack of understanding through coding processes and that there is no chance for "follow-up questions" for better understanding, as provided in interviews (Jackson & Trochim, 2002, p. 308).

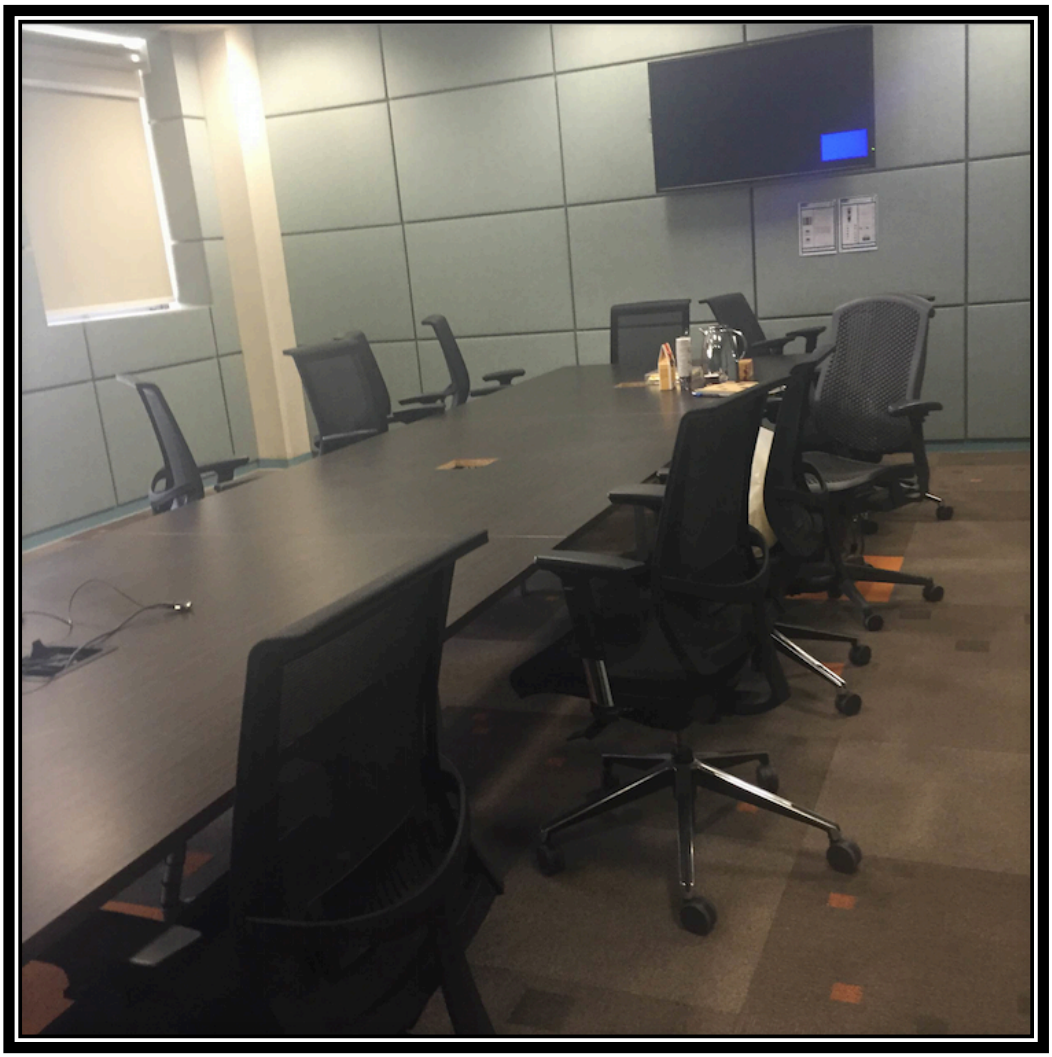
3.7.4 Focus group interviews

Interviews are commonly used in qualitative research (Mason, 2002). According to Wellington (2000), "Interviewing allows a researcher to investigate and prompt things that we cannot observe. We can probe interviewees' thoughts, values, prejudices, perceptions, views, feelings and perspectives" (p. 71). In addition, "it should not be taken for granted that interviewing is best done one-to-one"; thus, group interviews and focus group interviews also have many benefits (Wellington & Szczerbiński, 2007, p. 87). These are interviews with "a small group made up of perhaps six to ten individuals with certain common features or characteristics, with whom a discussion can be focused onto a given issue or topic" (Wellington, 2000, p. 124). After observation and the open-ended questionnaire, focus group interviews were conducted with volunteer students in order to address students' perceptions. I used the

focus group method to allow interaction between interviewees with different perceptions in order to get the required information and to further investigate the raised issues in the open-ended questionnaire. Also, I think using focus group interviews was useful in understanding how students responded to and thought about flipped learning. I conducted four focus groups: two groups from each class of between five and six students, depending on the number of students in the class. This number of members provided the chance for each of them to participate in a more manageable small group (Peek & Fothergill, 2009). In addition, I set a convenient date and time with volunteer students. Then, I assigned the students in each group according to their convenience and schedules, and I didn't follow any particular rules in selecting them. The focus group interviews ranged in time between 50 to 75 minutes each.

Furthermore, focus groups were organised in a very convenient, quiet meeting room, which was one of the staff meeting rooms in the school of education. The interview protocol incorporated an "icebreaker" form, where I tried to create a convenient environment for the participants. Next, group rules were established, and information about the aim of the interview was clarified. Then the participants introduced themselves and shared some of their interests. Once we broke the ice, discussions became natural and smooth.

Figure (9): Focus group interview room



In the current study, the focus group questions were general questions that could allow for discussion amongst focus group participants (see Appendix 7). I attempted to concentrate on the advantages of flipped learning, the difficulties encountered, and its future. Nevertheless, probing questions were used as essential to foster the dissections and helped me to gain useful insights into different sides of flipped learning, such as the peer tutoring, which was mentioned during the discussion.

Overall, I found that focus group sessions were very helpful in understanding the advantages, challenges, and future of flipped learning from students' perceptions.

Table (6): Focus Group Interviews Summary

Class A				
Name	**Size**	**Participants**	**Duration**	**Date**
Group A	6	Rand, Ghada, Alaa, Amal, Noor, and Shahd.	Group A 53 Group B 61	20/4/2016
Group B	5	Suaad, Rawan, Mai, Moneera and Lana.		21/4/2016
Class B				
Group C	6	Fai, Hala, Ghosson, Maha, Rana, and Sahar.	Group C 64 Group D 76	20/4/2016
Group D	5	Mona, Noha, Dalal, Reem and Sarah.		21/4/2016

3.7.5 Pilot Study

Pilot studies are

> mini versions of a full-scale study (also called 'feasibility' studies), as well as the specific pre-testing of a particular research instrument such as a questionnaire or interview schedule. Pilot studies are a crucial element of a good study design. (Teijlingen & Hundley, 2002, p. 33).

According to Yin (2009), pilot studies "help you to refine your data collection plans with respect to both the content of the data and the procedures to be followed" (p. 92). Consequently, a minor version of this study was conducted as a pilot study before implementing the main study. The goal of performing the pilot study was to review the research design and formulate the focus group and the questionnaire's questions. I started my preparation with the course teacher before the start of the term. I invited her to sign the consent forms, and we arranged an induction meeting for the students in the first week. In this meeting we discussed in detail the research, intervention, observation, focus group interviews and recording, and open-ended questionnaire. Then I told them that I would observe them by the next week (first week of the intervention) if they agreed, that I would conduct a mini version of the final interviews and questionnaire after the second week, and that they were welcome to

get involved. In this meeting, they also had the opportunity to read the information sheet regarding my research and ask any questions. After that, I invited them to sign the consent forms. I was very lucky because all the students agreed to be involved in all the research aspects.

The pilot study took place on 27/1/2016 and 3/2/2016. The first and second classes were the pilot study. I observed all the students in these two weeks. I attempted not to distract the teacher or the students during the observation, and I was very quiet. After these two weeks, I piloted the open-ended questionnaire, and I received about 22 questionnaires from the students in both classes. "A questionnaire, and the questions within it, can be developed from prior research methods, but the use of a pilot is still essential…A pilot questionnaire is therefore a key stage in design and construction" (Wellington, 2015, p. 196).

After that, I conducted focus group interviews of three groups. There were two groups from class A of six students and one group of five students from class B, and the duration of the interviews was about 35-40 minutes. In addition, I set a convenient date and time with volunteer students. Then, I assigned the students in each group according to their convenience and schedules, and I didn't follow any particular rules in selecting them. It was difficult for some students in class B to get involved because of the time conflict. All the focus group interviews were carried out in a very nice, convenient, and quiet room, which was one of the staff meeting rooms in the educational technology department. All three focus group interviews were recorded by using a digital sound recorder.

I used my observations for the first and second teaching sessions to update the open-ended questionnaire questions and also used some statements from the open-ended questionnaire to update the focus group questions. I used students' focus group interview responses to update my questions again for the final open-ended questionnaire and final focus group interviews. Also, I was planning to modify the main study if the pilot study demonstrated the need to do so.

Through the pilot study, I was able to learn about the classroom environment, the available equipment and technologies, and the interaction of the students in class with the teacher, colleagues, or equipment and technologies. Furthermore, during the pilot

study interviews, some of the students presented the difficulties encountered during the previous two weeks, and the most important was the difficulty in watching the video through the learning management system (Blackboard). They found that it was slow and difficult to open the video link from Blackboard, and they suggested another solution, which was using the WhatsApp application in addition to Blackboard for those who liked it. After a discussion with the teacher, she agreed to the students' proposal, and she asked them to choose a group representative who would be responsible for communication between the teacher and the students in the WhatsApp in order to include any announcements for new videos, links to these videos, or quizzes.

To sum up, the pilot study fulfilled a helpful role in the arrangement for the main focus group interview part of the study and for editing the open-ended questionnaire, and it also drew my attention to several issues during the observation. The pilot results were not considered in the results and discussions, but I considered the two weeks of its implementation to be a beneficial experience, besides the 10 weeks of the major study, since the design of the flipped course in the pilot study was the same as the major study. Thus, students had 12 weeks of experience. Lastly, despite the fact that the lessons I learned from my pilot study were very particular and could not be applied to other studies, "sharing the reflexive accounts in the pilot exercise may inform researchers of the methodological problems typically experienced when carrying out this type of research" (Kim, 2011, p. 203).

Table (7): Pilot Study Summary

Date	Duration	Observation	Open-ended Questionnaire	Focus Group Interviews
27/1/2016-3/2/2016	Two weeks	All participants	22	3

Table (8): Focus Group Interviews Summary for Pilot Study

Class A				
Name	**Size**	**Participants**	**Duration**	**Date**
Group A	6	Rawan, Shahd, Suaad, Amal, Moneera, and Alaa.	35-40	4/2/2016
Group B	6	Mai, Lana, Rand, Farida, Majda, and Ghada.		7/2/2016
Class B				
Group C	5	Maha, Mona , Noha, Reem, and Dalal.	35-40	7/2/2016

Having explained the procedures that I used to collect the data, in the next sections, I explain the data transcription, translation, and analysis of data.

3.8 Transcription of Data

I used a digital recorder to record the focus groups, which allowed me to transcribe them. All the discussions were in the Arabic language, and then I transcribed and analysed them in Arabic; after that, I translated the findings to the English language. During the interviews, I documented some notes to explain any issues that may cause uncertainty in the transcription. Directly after each focus group, I was very careful about the recorders, and I was using double voice recorders, and registering the duration of each interview. At the end of the day, I attempted to listen to the interview and write any other notes that I might forget.

I directly started the process of data transcription when I finished collecting the data, and then I returned to the UK after the fieldwork journey. During the fieldwork in general, and after every session or focus group interview, I wrote key field notes to remind me of the details that I might forget if I did not write them down. I listened to the focus group interviews many times. Listening to and transcribing the interviews were complex and time consuming. It was not an easy process because it required extreme attention and focus; students sometimes interrupted each other or spoke at the same time, which forced me to stop the recording so I could listen again and again. Although this process was not very easy, it gave me the chance to become more

involved with my data, and I became familiar with it. “The process of transcription, while it may seem time-consuming, frustrating, and at times boring, can be an excellent way to start familiarising yourself with the data (Riessman, 1993)” (Braun & Clarke, 2006, p. 17).

In addition, some of my codes began to emerge during this process when taking notes and while I was listening. According to Braun and Clarke (2006) “it is a good idea to start taking notes or marking ideas for coding that you will then go back to in subsequent phases” (p. 17).

3.9 Translation of Data

The translation process started before the fieldwork when I translated the materials used for data collection from English to Arabic for the university administration side. According to Esposito (2001), “In qualitative research, the first major task is also to translate the researcher’s questions and meanings (such as open-ended, closed-ended, or focus group interviews) into a form that is understood by the participant” (p. 573). Thus, this was done in order to obtain the access permission and to use them with students who only spoke the Arabic language. I translated the materials by myself and then asked two of my friends to review the translation, one of whom is an Arab who specialises in English. Furthermore, I chose to analyse my data (focus group interviews, open-ended questionnaire, and observation notes) in the original language, which is the Arabic language, and at the end of my analysis, I translated the findings to English, which might have reduced the influence of the translation on my data. This effect may appear due to missing some small details and any meanings that might enrich the research findings among the translation of the raw data. Esposito (2001) argued that “Both quantitative and qualitative researchers are faced with the challenge of producing meaning-based translations rather than word-for-word translations. Because not all concepts are universal, not everything is translatable” (Jones & Kay, 1992, in Esposito, 2001, p. 572). Thus, analysing the data in Arabic and then translating the findings to English may help decrease cross-cultural research impacts. Twinn (1997) conducted a study to explore the impact of translation on the validity of results from in-depth interviews with Chinese women who were not English speakers. The researcher analysed two versions of the data: She analysed an English version herself and used another researcher to analyse the data in the original

Chinese. After this analysis processes, she compared the final findings from both versions and found that the key themes were same, but some small themes emerged individually in one of the versions. The researcher said that these small differences might be due to the researchers themselves, not the language of the data. However, I think the difference in language may also have an impact, which led me to analyse my data in the original language. In many cases, the meaning of words in the native language won't carry over to the new language, as there are often cultural meanings attributed to certain words that can't be included in a translation.

Again, I asked my friends to check my final translation, one of whom was not Arab. I asked them to explain the meaning that they understood in order to confirm my translations. In addition, through the meetings with my supervisor, we discussed many quotes, and I found that she understood them in the same meaning in Arabic. This process was very challenging for me. I was aware that some data might be missing through translation because of cultural and language variances that can influence the translation. Some meanings might be hidden under students' voice, intonation, and local words, which caused me to dedicate extra effort in finding the corresponding words. Sometimes there was no relation, and then I tried to use the closest word that could deliver the required meaning. This is supported by Temple and Young (2004), who argue that

> Many writers with an interest in the power of the written word and the process by which it is produced, have argued that there is no single correct translation of a text. Meaning is constructed through a discourse between texts. (p. 61)

Hence, while there is no single correct translation, I tried my best to make a translation that provided the meaning in a way that keeps the one in the original language.

3.10 Data Analysis Process

After collecting data and transcribing, I started the analysis process, as this study adopted a qualitative, interpretive approach. Consequently, I used thematic analysis to analyse the data obtained from the focus group interview transcripts, questionnaires, and observations. According to Braun and Clarke (2006), thematic analysis is "a method for identifying, analysing, and reporting patterns (themes) within data" (p.

79).

In addition, “Codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study” (Miles & Huberman, 1994, p. 56). It “enables the researcher to identify similar information” and “retrieve the data in terms of those items that bear the same code” (Cohen *et al*., 2011, p. 559). Thematic analysis can be conducted in two different approaches, which are inductive and deductive approaches. Inductive analysis is “a process of coding the data without trying to fit it into a pre-existing coding frame, or the researcher’s analytic preconceptions. In this sense, this form of thematic analysis is data-driven” (Braun & Clarke, 2006, p. 83), while deductive analysis is “a ‘theoretical’ thematic analysis [that] would tend to be driven by the researcher’s theoretical or analytic interest in the area, and is thus more explicitly analyst-driven” (Braun & Clarke, 2006, p. 84).

This research is an exploratory qualitative case study. Most commonly, and according to my observation, exploratory case studies employ the inductive thematic analysis approach only, but in this study I also employed the deductive approach, and it seemed sensible to use a deductive approach across my coding process.

My main focus was not to test the theories, and I did not apply the deductive approach directly at the beginning of the data analysis, which may have blinded me from what is in my data and what students really reported, or it could have caused me to focus on what the previous literature claimed. However, although a number of themes emerged from the data, I thought that more themes might be hidden in the data. Thus, I did not directly start with the deductive analysis. I used the deductive approach once I had finished my inductive coding. I made further analysis on my data, and it may have made sense at that point to ask how my findings corresponded with or extended the existing theories. For example, I used the deductive coding when I felt that my participants passed some of the elements that, for example, related to “self-regulation” (Zimmerman, 1990) in their conversation and also in the field notes obtained from the classroom observations, but I did not know how I could include all of these elements under one umbrella, which may have helped me understand and interpret their perceptions. Thus, I tried to find a theory or a framework that connected these scattered elements. It took me around three months to incorporate the self-regulated learning general framework by Pintrich (2000). Also, I found strong links between the

students' perceptions about their needs within flipped learning videos and the 12 principles of media learning by Mayer (2009), which caused me to explore the theory, and my participants also added extra principles which I could deem the inductive side in the same question. As a result, in the previous example, I used a "hybrid" approach, where I started with a deductive thematic coding system, but with the extra choice of inserting new themes inductively, as mentioned in Fereday and Muir-Cochrane's (2006) work.

Braun and Clarke (2006) suggest six phases of thematic analysis that serve as a guide for researchers when they start the analysis process. These phases are as the following:

First of all, "Familiarizing yourself with your data" (p. 87). I think I passed this phase when I was reading the raw data many times in the beginning, and when I was transcribing the interviews.

Second, "Generating initial codes", In this phase, the researcher tries to group data that have the same features, and an "initial code can be a word, a phrase, or the respondent's own words" (Lichtman, 2013, p. 252). This stage was the most messy and excited stage.

Third phase is "Searching for themes", which means grouping the codes together that have some relation or origin into categories and giving each group a name or phrase, and this makes a theme. In addition, "certain codes become major topics, while others can be grouped under a major topic and become subsets of that topic" (Lichtman, 2013, p. 252).

In "Reviewing themes", which is the fourth phase, I reviewed my themes many times, removed redundancies, and found that some themes can be combined.

Fifth phase is "Defining and naming themes", I attempted to define each theme, and I gave a name or phrase for each one. I reviewed these names with my supervisor until we reached the final names that appear in the current final version, and we tried to make them clear and simple (see Appendix10).

In "Producing the report", the final production of the analysis journey is the final report that involves all the themes, evidences, and required explanations.

In addition, I would like to emphasise that I adopted Braun and Clarke's (2006) thematic analysis guide to analyse all of my data; in other words, to analyse the data acquired from the focus group interviews, my field notes obtained from classroom observations, and the students' answers gained from the open-ended questionnaire.

Furthermore, the data analysis process is a flexible process and is not linear: "analysis is not a linear process of simply moving from one phase to the next. Instead, it is a more recursive process, where movement is back and forth as needed, throughout the phases" (Braun & Clarke, 2006, p. 86). The same view is supported by Wellington (2015):

> [I]n my own experience, the activity of analyzing qualitative data is often more messy and complicated…To put it crudely, it involves taking all the data in, digesting them, taking them apart, then putting them back together again (leaving lots of bits lying around unused at the end) and sometimes returning to collect more. (p. 261)

Therefore, I attempted to be flexible during my analysis while also keeping in mind that the high-quality qualitative research analysis follows a "systematic" and "rigorous" system that can help a researcher to answer research questions (Seers, 2012, p. 2).

I would add here that my analysis process began with the organisation of the raw data. I made three files for the observation notes, focus group interviews, and open-ended questionnaire. In this phase, I felt that I became very familiar with the data because I interviewed students, observed them, transcribed all interviews myself, and read my data repeatedly. Thus, I started analysing each file separately by determining the codes and then organising a group of codes in a theme format.

Moreover, in the beginning of the analysis, I thought about NVivo as a software package that may help me carry out the analysis, and I had already attended a couple of workshops at Sheffield University on this subject before my fieldwork. I started using this package and then changed my mind. I felt that I could better deal with my data in the method that I employed in my Bachelor and Master's degrees, which worked well, and it allowed me to feel very close to my data. This method involves using Microsoft Word, long tables, a lot of highlighters (which creates a rainbow effect on my computer screen), and continuous cutting and pasting commands.

When I finished analysing all the material files, I created a long table in Word that contained all the themes collected from the three files. I then tried to categorise the similar themes together and gave them a unified name. Finally, I organised each group of themes under a concept or main theme, and in the end I had a very long table that contained my key themes, subthemes, and the evidence with a mention to a material source.

Having explained the data analysis processes, in the following sections, I aim to discuss the ethical considerations, and the issue of trustworthiness.

3.11 Ethical Considerations

There has been significant growth in the awareness of ethical issues in social research throughout the last few years. According to O'Leary (2017),

> It is now recognized that research and, therefore, researchers are responsible for shaping the character of knowledge. The responsibilities associated with this knowledge production have led to a growing recognition and acceptance of the need for ethical and political awareness to be a mainstream consideration in research. (p. 55)

As a result, ethics play an important role in social research. Ethics refer to moral principles that concern people's actions and behaviours (Wellington, 2013). Significantly, "in social research, ethical questions often concern respect shown to others, the purpose of the research, who the research benefits and how it is reported" (Wellington, 2013, p. 167). There is a popular misunderstanding that ethical issues should only be considered during the data collection stage, while they should be considered over all the research stages (Creswell, 2013).

This research followed the University of Sheffield's ethical review procedures, which emphasise respect for research participants and their privacy, suitable attitudes in the conducting of research, and honesty within the data and the research report. Thus, my research was evaluated and obtained ethical approval by my supervisor and the Research Ethics Committees at the School of Education, University of Sheffield (see a copy of the ethical approval in Appendix 1).

The main focus of this section includes some of the "fundamental" ethical issues, such as: informed consent; official permission for the access; confidentiality, privacy

and anonymity; power relations (Cohen et al., 2011, p. 76-104); avoiding harm; and data storage procedures.

3.11.1 Seeking Access Permission and Recruiting Potential Participants

Prior to carrying out the study in an institution like a college or a university, the researcher should "seek college/university approval on campus"; hence, he or she needs to "submit for institutional review board approval" (Creswell, 2013, p. 58), and this is what I followed to gain official permission to access King Saud University. In order to request official access permission to conduct the study at the Education College at King Saud University in Riyadh, I submitted a letter in which I explained my research aim and provided its full picture to the dean of the college, as I required consent for conducting the study, which was given. When I received the permission, I visited the university, met the course teacher before the term started, and explained my research to her. I provided her with the information sheet of what she would be asked to do, the level of risk, the anonymity and confidentiality that she should worry about, and the consent letter to sign, and she approved. Also, during this visit, I received a better understanding of the course content and structure. After that, and during the first week of the semester, the teacher and I arranged an orientation meeting with the students in the first week of the term. I introduced myself as a researcher. I also indicated that the research findings would be used in the development of flipped learning implementation in Saudi Universities in order to encourage honesty in their expressed views (Alebaikan, 2010). Furthermore, participants were informed they would be able to view the entire research results if they were interested (Alebaikan, 2010). They had a clear image of what I expected from them regarding their provided data as well as the level of risk, confidentiality, and anonymity they should be concerned about when signing the consent letter, which was attached with an information sheet (see a copy of the ethical approval in Appendix 2, 3, and 4). Also, I answered all of their questions. Participants were also informed that they had the right to withdraw from the study at any time.

3.11.2 Informed Consent

"Participants (or authorized relatives/carers) should give written, informed consent prior to taking part in the project" (Wellington & Szczerbinski, 2007 p. 62). I provided research participants (the teacher and her students) with an informed consent

form that asked them to engage optionally in this research. I provided them with an information form that explained my research to them and their role and made sure they understood the aim of the study. I attempted to make sure that the informed consent and information form were understandable and free of complex terminology. Participants' consent was voluntary; no one felt obligated to say yes, and they were free to withdraw at any time from participation in the research if they said yes. If anyone did not consent or wanted to withdraw, I was ready to exclude her from my observation, focus groups, and questionnaire, although she would be able to complete the course and benefit from the flipped learning advantages, but all of them approved to engage.

3.11.3 Confidentiality and Anonymity

According to Cohen *et al.* (2011), participants should be protected, which means keeping their privacy, the "promise of confidentiality" and anonymity (p. 92). As a result, this research did not identify or name any participant and gave him or her the "right not to take part in the research, not to answer questions, not to be interviewed" (Cohen *et al.,* 2011, p. 91). Participants were informed that their names would only be used by the researcher to identify each focus group interview. They were also informed that their names would never be used in my research. In addition, I allowed them to use their real names if they wished, but I wanted explicit permission for this, and that is why it is mentioned on the agreement form. Also, as in all focus groups, the discussions were recorded after gaining permission from participants. I informed them that any recorded audio for interviews or any documents would be saved confidentially and securely and that my supervisor and I would be the only people to see or hear them. For the purposes of the dissertation and any subsequent possible publications, only anonymised data would be used that could not identify the students or their teacher. Also, I asked if I could review my results with the students who provided their contact details.

3.11.4 Avoiding Harm

One of the important ethical rules is: "no attempt should be made to force people to do anything unsafe, or do something unwillingly" (Wellington, 2015, p. 57). "This includes emotional or psychological harm as well as physical harm" (O'Leary, 2017, p. 70). I was very cautious about conducting the study without any kind of harm or

risk to the participants, whose consent was voluntary and who were free to withdraw from participation in the research at any time. If anyone wanted to withdraw, I was ready to exclude him or her from my observation, focus groups, and questionnaire, and she still benefited from the flipped learning advantages. Also, participants had another choice. Their teacher had another class on the same day that did not conflict with their schedule, and she gave them the freedom to switch to that class if they did not want to be involved in the flipped learning experience. In addition, students had their own teacher, and she was responsible for their assessments. Hence, participants did not feel that I had a power that could influence their results or learning outcomes because I only needed their perceptions. Furthermore, I did my best to let them feel comfortable during the observation and also when they gave their answers during the focus group interviews, as I avoided ambiguity in questions or sensitive questions. Moreover, I had the teacher's permission from the beginning, and she was also free to withdraw at any time. However, creating learning videos might have consumed her time and effort, but I provided her with all the needed materials and training. However, I am hoping she benefited from the flipped learning advantages as a teacher and that it developed her skills. This experience also encouraged her, as she told me that she had registered in a flipped learning workshop at the end of the term. In addition, there was no issue of personal safety because the university which I was collecting data from is where I studied for my BA and MA and where I am now a teacher. This means that I was already familiar with it. This study took place in an ordinary classroom, on ordinary days, and in a safe environment as usual without any additional risks. Also, the planned activities did not pose any risk to the participants or researcher.

3.11.5 Data Storage

The hard copies of materials were stored in a locked drawer and were shared with the supervisor only. Also, the recordings and other materials of collected data were only shared with my supervisor, and no other party had access to them. The materials were stored on the university drive in my personal account at the University of Sheffield. All the recordings will be destroyed after the end of this project.

3.12. Issue of Trustworthiness

"Rigor, in qualitative terms, and reliability/validity, in quantitative terms, are ways to

establish trust or confidence in the findings or results of a research study" (Thomas & Magilvy, 2011, p. 151). Agar (1986) claims that reliability and validity can be used within quantitative research, but they are not appropriate for the qualitative research. In the same vein, Golafshani (2003) argues that "Since reliability and validity are rooted in positivist perspective then they should be redefined for their use in a naturalistic approach" (p. 597).

"[Q]uality, rigor and trustworthiness" are some concepts that numerous researchers employ to judge the quality of studies and their findings in the qualitative paradigm (Golafshani, 2003, p. 602), and this research adopted the term "trustworthiness" and used Lincoln and Guba's (1985) model to ensure the trustworthiness of this research.

Lincoln and Guba (1985) suggest a model that involves some methods for ensuring trustworthiness in qualitative research projects. They "were the first to address rigor in their model of trustworthiness of qualitative research" (Thomas & Magilvy, 2011, p. 151). Based on this model, trustworthiness consists of four elements, which are credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985).

Triangulation is one of the strategies that can support the credibility through qualitative researches (Flick, von Kardoff, & Steinke, 2004; Patton, 1999; Tuckett, 2005). Esterberg (2002) demonstrates the term of triangulation as the following:

> Triangulation is often used to mean bringing different kinds of evidence to bear on a problem (Denzin 1989). Thus, if you have access to interview data, observational data, and historical documents, your analysis is likely to be much sounder than if you rely on only one source of evidence. This is because each kind of evidence has its own strengths and weaknesses. With observation, you can actually see how people behave; it allows you to see a whole process unfold over time. With interviews, you can gain insight into their feelings or reasons for behaving in a certain way. Using multiple kinds of data allows you to balance the strengths and weaknesses of each. (p. 176)

The employment of triangulation in the current study

> is based on the premise that no single method ever adequately solves the problem of rival explanations…Combinations of interview, observation, and document analysis are expected in much fieldwork. Studies that use only one method are more vulnerable to errors linked to that particular method (Patton, 1999, p. 1192)

The whole idea of triangulation is to reveal that the absolute reality has been thrown away. Some people feel that if you talk about being a qualitative researcher and if you talk about being an interpretivist and not a positivist, then the idea that there is no an absolute reality to examine cannot be true. So, people often talk about triangulation after they have talked about interpretivism, and those two things do not actually go together, because interpretivism says that there is often not an absolute reality in research. In my classroom observations, I wrote what I thought was important, and in the interviews, I looked for the parts that seemed relevant and important to me. For example, FL advantages and disadvantages. All of these things create a particular type of reality, including my research questions and the moods that my students were in on a specific day. If they were in a good mood, they might be more positive about things, and on another day, they might react in a different manner if they are upset, but they would not be lying; it is just a different interpretation of their experience. Thus, if we think about an interpretivist approach, we must look at as many perspectives and dimensions as possible to make our description trustworthy. People in classrooms and in real life situations have different moods, and there is no true answer. Thus, we cannot say that flipped learning is wonderful; the best we can say is that flipped learning looks like a method that really engages the students in this study, and that might not be the case 10 years from now, because maybe students will be bored with flipped learning. We are looking for ways to teach, and people change; they are not robots. In summary, this research does not use triangulation to show the results of the study as universal facts that can appear across all research methods, such as from a positivist's perspective, but triangulation was employed because it is my belief as a qualitative researcher that the use of more than one method may increase the credibility of a study, as described by Lincoln and Guba (1985).

Therefore, I established a stringent data collection procedure for this research that involves multiple data collections methods to raise the credibility (Alebaikan, 2010). First, I used the open-ended questionnaire after the observation and before the focus group interviews. Thus, I can use my observation to update my questionnaire, and the focus group interviews will allow me to reduce the ambiguity that may appear over the information collected from questionnaire, and this information also helped me to develop the main and probing questions for deeper discussions through a focus group. I used this kind of arrangement to increase the data credibility and decrease the

methods' disadvantages, for example, missed issues through observations notes, very brief answers in the questionnaires, or poor formulation of the focus groups' questions (Alebaikan, 2010). Second, I applied an intervention case study for a whole course of three months (12 weeks of experience, two weeks for the pilot study, and 10 for the main study) for two classes. As a result, the flipped learning programme that was applied was an intensive, rigorous programme and was not surface level. Third, before starting the main study, I created a pilot study to check and update the research design in general and the intervention and methods in particular. The pilot study made me confident in continuing the research process; it gave me a chance to increase research credibility. In this respect, Kim (2011) points out that "conducting a pilot study with clear aims and objectives would promote the rigor and trustworthiness of qualitative research" (p. 203).

Furthermore, another strategy was used to enhance the credibility, which is "respondent validation", or "member checking", and this occurred when I asked three of my participants who provided me with their contact details to review some parts of the gathered data and my analysis, and they confirmed the "validity" (Johnson & Waterfield, 2004, p. 125). I did this through phone correspondence with two participants, and I met one participant during my 2017 summer holiday in Saudi Arabia.

In addition, and in regard to transferability, which means "how one determines the extent to which the findings of a particular inquiry have applicability in other contexts or with other subjects/participants" (Lincoln & Guba, 1985, p. 290), it can be handled by providing a dense description, which may allow other researchers to assess the degree of transferability or fittingness to their setting (Thomas & Magilvy, 2011). As a result, I attempted when I was writing this thesis to provide the reader with a dense description of the research context, design, methods, analysis process, and findings. Thus, any reader of my research can decide its transferability to his or her research setting (Alebaikan, 2010).

Moreover, dependability "occurs when another researcher can follow the decision trail used by the researcher" (Thomas & Magilvy, 2011, p. 153). The methodology chapter outlines the research process in detail, and I also used the peer review strategy to enhance dependability during the analysis process and my supervisor review.

Confirmability “occurs when credibility, transferability, and dependability have been established” (Thomas & Magilvy, 2011, p. 154).

3.13 Chapter Summary

In this chapter, I presented and discussed the research methodology, design, methods, procedures, data analysis process, and ethical considerations. I also provided my position and its impacts on my decisions, I explained and justified my reasons in adopting my methods. I discussed my sample and my processes for gaining access and collecting data until transcription and translation. I presented my data analysis experience step by step. Moreover, I discussed the ethical considerations for this research in detail. In the next chapter, I present the analysis, findings, and discussion. Later in the conclusion I evaluate the methodology and highlight areas where I would have done things differently if it were possible.

CHAPTER 4: FINDINGS, ANALYSIS AND DISCUSSIONS

4.1 Introduction

In the preceding chapter, I explained the research methodology employed in this study. The main aim of this chapter is to present, analyse, and discuss the findings gained by carrying out a flipped-learning intervention, open-ended questionnaire, focus groups interviews, and observations in relation to exploring Saudi female undergraduate students' perceptions towards flipped learning based on their experiences as participants in a flipped course. In the first chapter, I stated the main research questions underpinning this study, and here, I restate them as follows:

Q1. How do Saudi undergraduate students perceive flipped learning?

a. What are the advantages of flipped learning for students?

b. What challenges do students of a flipped learning course encounter?

Q2. How do the participants perceive the future of flipped learning in Saudi Arabia?

a. What are the motivations for the adoption of flipped learning?

b. What might limit the adoption of flipped learning?

c. What practices might improve flipped learning?

Q3. Can flipped learning help students develop habits related to self-regulated learning?

This chapter is organised into three main sections that correspond to the responses to the three research questions. The first research question is about students' perceptions of their flipped-learning experiences and involves two branch questions. The first one is about advantages of their flipped-learning experiences, and the second one is about the challenges students encountered in flipped learning. The second research question is about students' perceptions of the future of flipped learning in Saudi Arabia and involves three branch questions, which are about the motivations for the adoption of flipped learning, factors that might limit the adoption of flipped learning, and practices that might improve flipped learning. The third question attempts through

students' perceptions to explore the possibility of flipped learning helping (or not helping) them develop habits related to self-regulated learning. The answer to this question involves four main themes: the regulation of cognition, the regulation of motivation, the regulation of behaviour, and the regulation of context.

In addition, each theme in this chapter includes excerpts from my data to support the point under consideration, my analyses, and the relevant literature. I would like to remind readers that that the research data were generated from focus groups interviews, an open-ended questionnaire, and classroom observations, as previously mentioned in the methodology chapter. In addition, a large majority of the quotations came from the focus groups, so unless otherwise stated, the participant quotations came from the focus group.

4.2 Responses to Research Question 1

How do Saudi undergraduate students perceive flipped learning?

1. What are the advantages of flipped learning for students?
2. What challenges do students of a flipped learning course encounter?

Students generally expressed positive perceptions of their experiences with flipped learning, which is consistent with the findings of other literature (Bates & Galloway, 2012; Bergmann & Sams, 2014; Khanova *et al.*, 2015; Love *et al.*, 2014; Murray *et al.*, 2015; Mazur, 1997; Roach, 2014; Strayer, 2007).

However, they also encountered challenges. Therefore, this section discusses both the advantages and challenges of flipped learning based on participants' perspectives. The advantages and challenges discussed here stem from what students discussed frequently during the data collection process, which involved conducting focus group interviews, administering an open-ended questionnaire, and performing an observation.

4.2.1 Students' Perceptions of the Advantages of Flipped Learning

The participants' perceptions revealed various experienced advantages. These advantages fall under the following themes:

- Student engagement and active learning

- Peer-assisted learning
- In-classroom activities
- Technology use
- More personal responsibility
- Raising the profile of education in the home

4.2.1.1 Student Engagement and Active Learning

In the current study, most of the data indicated that the participants might have engaged behaviourally during the learning process; they demonstrated a commitment to watching the videos, answered the associated questions at home, attended class, actively participated during class time, and helped other classmates. Prince (2004) states that student activity and engagement are the main components of active learning in the learning practices.

Participants stated that the new experience of flipped learning presented them with a considerable chance to be better engaged in the learning process. This advantage was commonly reported during the focus group, the open-ended questionnaire, and in my research notes that were taken during the observations of the class. This engagement appeared in different levels: behavioural, emotional, cognitive and agentic, and the following comments support this analysis. As an example of perceptions regarding behavioural engagement, Ghosson said, "I think we liked it because most of my group members studied at home, sent homework, and came to most classes". In addition, Sahar said: "I think I did well during the course; I worked at home and in the classroom as well".

In addition, students expressed many positive emotions towards flipped learning. Emotional engagement entails the occurrence of "positive emotions" for the duration of activity participation; for example, "interest" and the lack of "negative emotions" like "anxiety" (Reeve, 2013, p.579). Students mentioned some positive emotions during the focus groups interviews, like "fun", and "enjoy. Also, during class observations, I noticed smiling faces during activities. The following quotes explain that when the students repeated the words "fun", and "enjoy:

> Fai: "…we take advantage and enjoy through discussions".
>
> Rand: "...I feel happy and a sense of achievement when I help my colleagues".

Amal: “I loved the enthusiasm and competition”.

Assel: “I personally enjoyed the experience and I felt that it was moved classes from rigid lecture to flexible”.

Reem: “…the class activities were the fun part of the inverted learning because they broke the boredom and routine”.

Ghosson: “I enjoyed flipped learning”.

Mona: “I was frankly quite enjoying it, especially teamwork in the class. I did not feel it was a class time but it was like a break”.

Shahd: “It is helpful and fun”.

Rawan: “In the beginning I felt that it was difficult and exhausting, but with the experience I found it enjoyable”.

Additionally, cognitive engagement that involves asking higher order questions, for justifications or explanations, and discussion (Jamaludin and Osman, 2014) is likely to be recognized by students’ reactions and was observed in the class sessions. The following are examples of perceptions regarding cognitive engagement among them. Fai: “…my colleagues and I remind each other and collaborate in gathering information, like putting together a puzzle, so we take advantage and enjoy thorough discussions”. Also, Rand: “I feel that my colleague explains things much easier than the teacher’s style, and she gives me good examples to understand, and she tells me how she did her things”. Further, Maha: “Personally I think, when I worked with my group members I learnt many things, one of them is how to formulate sentences, so my language also improves, and I like when they help me to write something”.

Analysing, reasoning, searching, making creative mind maps, and giving opinions through discussions were signs of cognitive engagement in the current study. As a researcher, I observed the teacher encourage cognitive engagement. She stimulated the participants’ minds by encouraging activities that could boost thinking and analysis, such as case studies.

Moreover, students’ perceptions indicated that they might be agentic learners who, to engage themselves during the learning process, attempted to create motivational and

helpful learning environments. Agentic learners need self-regulated skills to engage themselves whether inside or outside of the classroom (Reeve, 2013). Self-regulated learning is a main theme that is discussed in detail later. These skills can manifest as seeking help or feedback, asking questions, or creating an atmosphere that helps them to learn. Agentic engagement may help students to increase their learning and learning motivation (Reeve, 2013). Also, in this study, I think that agentic engagement might help students to make a motivational learning atmosphere for themselves.

Some educators argue that the part of flipped learning that takes place outside the classroom is a kind of passive learning (Ibrahim, Kalman, & Milner-Bolotin, 2013). However, when students offered their perspectives on their experiences while studying at home, they acknowledged being engaged in their studies to some degree. For instance, with every video, there were some attached questions on Blackboard that pushed them to search for answers in the videos or the reading materials. Rand said: "I try to concentrate on the video content to answer questions and participate in the class discussion". Also, Mona said, "Sometimes I draw a flowchart or mind maps when I watch videos, then I bring them with my other notes to the class". Therefore, I found that students seemed to be engaged at home as well as in the classroom within the flipped-learning context. This view is supported by Dixon (2010), who states that there is no considerable difference between learner engagement in passive and active activities; nevertheless, the online materials might be used to engage learners by integrating some learning tasks (e.g. assignments).

According to Jamaludin and Osman (2014), flipped classrooms can support active learning throughout the learning process by boosting student engagement inside and outside of class. Studies that compare active learning classrooms with traditional classrooms have found that learners in active learning classes are very positive, are more able to retain learning materials in the future, have outstanding problem-solving skills, and have great motivation for upcoming learning (McKeachie *et al*., 1990, as cited in Van Dijk and Jochems, 2002). The ability to retain materials, engage in problem-solving, and regulate motivation seemed to appear in students' perspectives and are mentioned later in the analysis sections.

4.2.1.2 Peer-Assisted Learning

According to Topping and Ehly (1998), peer-assisted learning consists of collaborative and cooperative learning and peer tutoring. In this research, participants considered peer-assisted learning as being advantages of flipped learning. In this regard, more than half of the respondents spoke about collaboration and support during class activities, peer tutoring, and competitions through cooperative learning. The most prevalent theme I identified was "peer collaboration". I broke it down into such ideas as "observational learning through peer modelling", "social interactions and the enhancing of social skills". In addition, with "peer tutoring" theme, I considered the following ideas: "instant feedback", "supporting of content deep understanding", "peer understanding", "an increased sense of productivity and responsibility", and finally, "enjoying competitive moments through cooperative learning".

4.2.1.2.1 Peer Collaboration

Regarding peer collaboration, participants valued working together in the classes. Fai was one of the students who valued collaborative learning elements, such as giving reminders to each other, constructing knowledge collaboratively, and having discussions, as she said:

> Sometimes we come to the class and we have watched the video quite some time before; thus, we have forgotten some information. In this case, when we do not have sufficient information, my colleagues and I remind each other and collaborate to gather information, like putting together a puzzle, so we take advantage and enjoy thorough discussions.

Similarly, Suaad mentioned the ability to build knowledge through collaboration: "We can connect our information together to understand a point". Maha also stated: "Personally, I think when I worked with my group members, I learnt many things. One of them was how to formulate sentences, so my language also improves, and I like it when they help me to write something". In addition, Mona said:

> I enjoyed flipped learning. It was a chance to expand my knowledge, especially through class activities when I discussed topics with my friends or my teacher, and they helped me so much when I was trying to understand something in a narrow way or to correct me . . . I feel that class interactions may help in the stability of learning.

Mona enjoyed flipped learning because she thought that practicing discussions with classmates gave her an opportunity to gain more knowledge and a better

understanding. Students' perceptions were in line with those of Love *et al.* (2014) and Murray *et al.* (2015). As mentioned before, peer collaboration themes included some subthemes that will be discussed in the following sections.

4.2.1.2.1.1 Observational Learning through Peer Modelling

Students like Maha felt that they could be motivated through interacting with peers and working in groups. For another example, Sarah said: "when one of my group members implements something, I feel that I can do it, and when I do it, I do not forget it". The students seemed to be motivated when they observed their peers during activities and imitated their good performances, which could lead to improving their own learning and performances. In this situation, learning may occur when the more experienced learners teach or share their knowledge with peers. Participants stated that collaboration was "sharing joy and work," and they motivated each other to achieve. During the class observation, I also observed that some group members looked at other classmates' computer screens to imitate their actions. I found that these participants thought about and regulated their processes to maximise their learning, which reflects the observational learning or modelling that was mentioned in Bandura's (1977) social cognitive theory. Bandura's (1977) view was that the process of learning by observing and applying was a fundamental component that defined motivation and performance. Students are more likely to be motivated to engage and perform when they see that their colleagues can do the modelled action (Grabau *et al.*, 2015). This is in line with Brame's (2013) findings:

> Although students' thinking about their own learning is not an inherent part of the flipped classroom, the higher cognitive functions associated with class activities, accompanied by the ongoing peer/instructor interaction that typically accompanies them, can readily lead to the metacognition associated with deep learning (para. 7).

When Sarah mentioned not forgetting something that had been peer implemented, she gave evidence that observational learning may help with learner memory, which could be understood as a cognitive benefit of this type of learning (Zimmerman, 1990).

4.2.1.2.1.2 Social Interactions and Enhancing of Social Skills

Some participants reported that more social interactions during peer collaboration helped them to build relationships and support their social skills. For example, Amal said: "I think the class part strengthens our relations because we work and interact

together all term". Sarah added: "I was too shy to participate in the beginning, but during class I think I became bold enough to talk and work with classmates because I interacted with them all the time". According to participants' points of view, it seemed that social interactions that happened during peer collaboration helped them build new academic relationships with classmates or strengthened the relationships that already existed. Also, these comments suggest the classroom activities in the flipped learning class might extend beyond the flipped learning and into other lessons. These interactions and relationships may have facilitated students' engagement and learning. This view is supported by Love *et al.* (2014), who found that 78 percent of the students agreed that their collaboration within flipped learning encouraged them to be more social. According to Wentzel and Watkins (2002), social interactions in peer collaboration contexts may assist students' engagement (p. 370). King (1997) added that "during such interaction[s] with another, we clarify ideas, negotiate meaning, develop new skills, and construct new knowledge; thus, learning becomes a by-product of that interaction" (p. 221). These interactions, clarifications, and negotiations may facilitate the process of scaffolding through learning environments.

4.2.1.2.2 Peer Tutoring

4.2.1.2.2.1 Instant Feedback

Some participants valued peer tutoring that happened through class activities because it allowed them to receive feedback faster than they did from the teacher. When Amal was asked to explain the positive and negative sides of flipped learning in the open-ended questionnaire, she appreciated the speed of feedback with peer tutoring:

> Frankly, I am very pleased when the teacher appoints a colleague to explain something to me. I can ask her and she can answer quickly. It's not that the teacher does not answer me; she may just be busy with another colleague.

I need to make it clear that Amal was not a proponent of having "substitute teachers" in the classroom. It is about the benefit of articulating to others how one understands something—and building on this. Seeing Amal explain her experience in this way could lead the reader to believe that she is a passive learner who simply receives information, whereas the point she was trying to make was that her friend gave her the necessary information at the right moment to help her to move forward in the learning process. In other words, quick feedback may speed up the learning process. Thus, she did not mean that she found relying on her classmate to be an easy way of obtaining knowledge. However, I cannot deny that some students complained about

the reliability of some colleagues, which is discussed later in the challenges section of this chapter.

In the interview, Fai added: "Actually, it is nice when you have a peer in the class who can teach and discuss some things with you and answer your questions at the same time". Clearly, the participants valued the instant feedback that came with peer tutoring.

I also observed students' peer tutoring in flipped learning sessions in which the teacher assigned pairs of tutors and tutees. Students seemed satisfied and comfortable and did not hesitate to ask questions for feedback. As stated by Goodlad and Hirst (1990):

> Behaviorist theory holds that learning increase[s] if every response a learner makes receives instant feedback….By giving every learner his or her own teacher, peer tutoring offers all the benefits of individualised instruction, whether or not programmed instructional materials are used (p. 62).

Consequently, to maximise student learning, teachers should offer their students learning environments that can supply them with the required instant feedback.

Hence, according to my participants' perceptions, peer tutoring that happens during flipped learning sessions may provide a learner with the needed instant feedback by a classmate tutor, which can support her learning, fitting Topping's (1996) claim that "opportunities to respond are high, and opportunities to make errors and be corrected similarly high" (p. 325). Participants complained about the lack of instant feedback at home which they considered one of the important aspects of flipped learning, as mentioned later in this chapter.

Some participants considered peers' feedback as an alternative to formative assessments at the beginning of class by the teacher. Despite students' claims that flipped learning had a lack of continuous assessments and their recommendations to fix this shortage in the future, they found that their classmates' feedback could help to compensate for some of the shortcomings and give a sense of reassurance in terms of their performances. For example, Rana expressed: "I think colleague review is very important. Before each class, I like to ask my close classmate to review our answers for the assignment and to review the most important points with me. This process feels convenient to me." Likewise, Hala stated that she liked "to review everything with [her] friends and compare their responses". Rawan added: "Although some colleagues complained about the weakness of the continuous assessment during the

course, I felt that the review with the instructor and my review with colleagues was adequate". These reviews may help learners to strengthen the foundation of knowledge required to continue their learning and then to build the extra knowledge they need to move through their ZPD.

4.2.1.2.2.2 Supporting of Content Deep Understanding

According to the students' perceptions, one of the advantages of peer tutoring was that they seemed to gain deep understanding through peer tutoring. For example, Amal said: "I think when my classmate teaches me something, she helps me very well, and I understand in a good way". In addition, Sarah stated: "I like when my colleague gives me a summary of a lesson so I [can] review my thoughts and make sure I understand everything". Noha wrote in the questionnaire: "Peer teaching helps me to consolidate information". Alaa stated: "Because my classmate[s] talk and explain things in a simple language, [and] not in a very scientific or complicated way, I can understand information greatly when she teaches me". Similarly, Rand said: "I feel that my colleague explains things much easier than the teacher's style. She gives me good examples to understand, and she tells me how she did things". Summaries, simple language, and similarity of thinking and abilities were the main reasons for reaching the required level of understanding according to students' perceptions. In this way, peer tutoring may support students' understanding. This finding is consistent with Mazur's (1997), as he found that peer tutoring led to deeper understanding of new concepts on the part of students. These perceptions lead us to an important point, which is the role of the teacher during group work activities. Teachers should not just assign tasks for groups or assign tutors and tutees. It may be better if they move from group to group to share in discussions, facilitate learning, and provide the needed scaffolding. For example, when a student mentioned using simple language as an advantage of her peer teaching, maybe she meant that videos and books use essential learning components and that her classmate provided simple definitions for these concepts. As a result, this finding suggests that it would benefit learners if teachers moved from group to group during classes to participate, help, and simplify concepts when needed to ensure the students' understanding of concepts, procedures, or learning elements. According to the students' perceptions, their comprehension improved when the teachers took on roles as directors, guides, and facilitators in flipped learning classes (Khanova *et al.*, 2015; Ramnanan and Pound, 2017;

Zainuddin and Attaran, 2016). However, the teacher should not dominate the group discussions (Ramnanan & Pound, 2017).

Peer understanding is another subject that falls under peer tutoring. Students provided perspectives expressing the importance of peer tutoring in terms of tutors' understanding the tutees. For example, Rand stated:

> I feel embarrassed to ask my teacher [questions] sometimes, so I like to ask my colleague because I am not ashamed to ask her…Also, I feel happy and get a sense of achievement when I help my colleagues, but sometimes I feel disappointed and frustrated when the work group or one of its members is not ready and did not watch the video and I have to explain it from scratch.

Rand mentioned the convenience of seeking help from her classmate, as she was too shy to ask her teacher questions. Sarah said that peers could "understand each other". As a result, students tended to appreciate peer tutoring because their peers understood them, which may have led to better learning. According to Moust and Schmidt (1994), "students felt peer tutors were better than staff tutors at understanding their problems, were more interested in their lives and personalities, and were less authoritarian, yet more focused on assessment" (as cited in Topping, 1996, p. 325). It also appeared that the lesson structure in students' minds is "akin." As a result, a peer tutor colleague may be more familiar with and able to distinguish his or her colleague's challenges and level of understanding; thus, "tutees may respond better to their peers than to their teachers" (Goodlad & Hirst, 1989, p. 63).

On the other hand, Rand felt peer tutoring was frustrating when her colleagues were not ready for class during flipped learning. She mentioned that some of them came to class without watching videos, which meant she needed to explain the new information to them. Although this participant felt frustrated, Vygotysky (1978) stated that according to ZPD theory, students can develop their own knowledge when they share their knowledge and build it together. Peer tutoring allowed for group discussions. As mentioned in Chapter 2 of this thesis, social constructivist theory has provided strong evidence that students learn in collaboration with one another. Likewise, the evidence about peer-assisted learning in my project is strong. Students' conversations during the learning process can help to develop a strong relationship between thought and language (Vygotsky, 1978). This means that Rand may actually

have benefited from her explanations to her colleagues. In addition, all the questions that her colleagues asked may have directed her thinking, or given her new ideas, reflecting the importance of dialogic learning, as emphasised by Fosnot (1996).

As mentioned in Chapter 2, Fosnot (1996) claimed that dialogic learning, which appears through peer or teacher questions, negotiations, and conversations within the learning process may improve student learning. Furthermore, Goodlad and Hirst (1990) added that "peer tutoring offers tutors the opportunity to review and restructure the knowledge they possess as they re-present it….Teachers often report that only when they begin teaching do they see how their subject area 'all fits together'" (p. 61). Thus, peer tutoring may give a student who plays a role as a teacher a valuable chance to reorganise her ideas and restructure them, benefiting both the tutor and tutee. According to Goodlad and Hirst (1990):

> Having university students acting as tutors in school classrooms can benefit both tutors, the tutored, and their institutions in a variety of ways. Some of the benefits are of a cognitive kind, concerned directly with academic competence in a particular area; others relate more to affective factors—attitudes toward a subject, self-confidence, educational and vocational aspirations. There is also the possibility that tutoring schemes are catalytic in bringing about closer co-operation between institutions, and between institutions and their constituent communities.

Vygotsky (1978) argues that language is the greatest cultural tool. Thus,

> we would never argue against the study of individual processes of thinking and learning, but we believe that the relationship between social activity and individual thinking is a vital, distinctive characteristic of human cognition, and one which underpins cognitive development (Mercer and Howe, 2012, p. 12).

Speech for others may lead to a dialogue, which is a type of collaborative building of meaning wherein group and individual understanding is improved through continual contributions of individuals who react to others' contributions and are directed to additional responses (Wells, 2000). Hence, learners' engagement in such activities may generate original understanding and ways of thinking, not only for the learners but also for those interacting with them (Mercer & Howe, 2012). "Indeed, one of the distinctive strengths of sociocultural theory is that it explains not only how individuals learn from interaction with others, but also how collective understanding is created from interactions amongst individuals" (Mercer and Howe, 2012, p. 13). Wells (2000) describes this process as follows:

> In contributing to a knowledge building dialogue, then, a speaker is simultaneously adding to the structure of meaning created jointly with others and advancing his or her own understanding through the constructive and creative effort involved in saying and in responding to what was said. And, since a similar constructive effort is required to listen responsively and critically to the contributions of others, that too provides an opportunity to advance understanding . . . that makes dialogue such an effective means for participants to enhance their individual understandings. Certainly, dialogue of this kind involves both the internalization of the meanings created in the inter-mental forum of discussion and the externalization of those intramental meanings that are constructed in response (p. 18).

Lyle (2008) argues that classrooms are brimming with talk; however, few of those discussions are utilized to advance learners' interactions. Supporters of dialogic engagement regret the lack of interchange, of real discussion in classrooms where learners are kept from using their voices and paying high attention to their own goals, means, and limits in learning (Lyle, 2008). Also, implementing such types of interactions requires high exertion and obligation from instructors and offers a significant test to the individuals who wish to build up such procedures in classrooms (Lyle, 2008). One of the boundaries to the application of dialogic teaching is the predominance of the tutor's voice rather than giving students a chance to use their voices. Furthermore, numerous instructors do not have the needed expertise to arrange successful dialogue, and therefore, the educational capability of learning through dialogue is not achieved (Lyle, 2008).

Mercer and Howe (2012) argue that the quality of talk between teachers and students can play a crucial role in improving students' academic achievements, and through various topics, teachers can support their students' understanding, enabling them to move through their learning process, and prepare them to be independent learners when they actively involve learners in deep discussions about their studies. This approach to teaching and learning has been discussed by many researchers, such as Alexander (2006), who called it "dialogic teaching". Dialogic teaching employs talk to encourage and expand learners' thinking and improve their understanding and learning. It helps give power to the student for long-lasting learning and to enable them to be active members active members of the learning environment. In addition, it assists teachers in identifying their learners' demands, structuring their learning activities, and evaluating their improvement (Alexander, 2010). Also, learners support

each other to learn through dialogue and to construct their knowledge while they work together "doing things" (Watkins, 2005, as cited in Lyle, 2008, p. 231). Thus, "dialogue becomes not just a feature of learning but one of its most essential tools" (Alexander, 2006, p. 25).

Alexander (2008, 2010) differentiates between two types of talk in the classroom: discussion or conversation and scaffolded dialogue. He believed that discussion regularly involves a series of freed interactions to share information, explore topics, examine ideas, and solve problems. The teacher or a learner can run a discussion, or the group can lead it cooperatively, while a dialogue clearly requires attention and participation and for exchanges to be made in a significant order, which leads to accumulative inquiry and discussion. Also, Alexander (2010) argues that scaffolded dialogue involves interactions, questions, answers, feedbacks, contributions, exchanges, and classroom organisation (p. 3).

In addition, Alexander (2008) identified essential characteristics of the dialogic classroom as:

> • Collective: teachers and children address learning tasks together, whether as a group or as a class;
> • Reciprocal: teachers and children listen to each other, share ideas and consider alternative viewpoints;
> • Supportive: children articulate their ideas freely, without fear of embarrassment over "wrong" answers; and they help each other to reach common understandings;
> • Cumulative: teachers and children build on their own and each others' ideas and chain them into coherent lines of thinking and enquiry;
> • Purposeful: teachers plan and steer classroom talk with specific educational goals in view. (p. 14)

Although the current study is linked to higher education and Alexander's work is concerned with primary education, I have found close links between his work and the current research results, which caused me to employ this concept in the current work.

4.2.1.2.2.3 Increased Sense of Productivity and Responsibility

Some participants reported that being tutors for classmates made them feel productive. In this regard, Rand said "I feel happy and get a sense of achievement when I help my colleagues." Maha added: "When you are free and fully understand and then you teach someone, you feel that you are an effective and useful person."

According to Rand and Maha's views, it seemed that peer tutoring gave them a chance to feel that they were doing something beneficial.

Furthermore, some of them felt that peer tutoring increased their discipline and commitment. For instance, Sarah said: "Because sometimes the teacher assigned me to teach a colleague, I think that ma[de] me prepare myself very well at home so I [could] explain well and answer the questions of the [tutee]. I mean it is better to be prepared for that". Mona highlighted the role of peer tutoring in promoting her responsibility towards her own learning: "I think I need to understand the content in a good way for myself in case I need to explain". Hence, within peer tutoring, students may "becom[e] more active and responsible for their own learning" (Loke and Chow, 2007, p. 242).

4.2.1.2.2.4 Enjoying Competition Moments Through Cooperative Learning

Participants expressed their enjoyment of competitive moments through their perceptions. I would like to mention that when I say "competition", I do not mean game-based learning but rather the challenge that exists between work groups or a group of members when they were asked to do brainstorming or to find a solution to a problem or to produce mind maps.

In the open-ended questionnaire, Hala reported her enjoyment of competition and highlighted the role of competition in refreshing the class atmosphere when she said: "I think the [moments] of competition were beautiful, and I really enjoyed them...because they ma[de] us alert and g[ave] vitality to the overall atmosphere of the class". Also, in addition, Alaa said, "We enjoyed the competitive moments with the other groups and we helped each other by explaining the difficult points". Suaad gave her view about this aspect during the focus group interview when she said "it is important to compete in the class from time to time because it is exciting and enjoyable at the same time." Similarly, Rawan reported: "I think we enjoy competitions," and Amal stated that she "loved the enthusiasm and competition amongst workgroups". According to the students, they enjoyed the competitive moments and they found them to be enthusiastic and energising elements. Moreover, competition may provide social benefits, such as reducing students' isolation. For instance, Dalal mentioned during competition with other groups, he found himself

"integrated with [her] group to support it, even though [she did] not normally join". Cooperative learning within flipped learning classes in which teachers assign one or more tasks to each team can reduce social isolation in classes by activating competitions between the groups, which some students enjoy. However, according to Johnson and Johnson (1998), "studies indicate that cooperative learning promotes higher individual achievement than do competitive approaches or individualistic ones" (p. 31). I would add here that the competitions that happened during some flipped learning classes to support cooperative learning were not very strong competitions that affected students' learning or relationships. Instead, they were slight competitions that broke the routine and added some enjoyment.

4.2.1.3 Other In-Classroom Activities

"Flipped learning model is flexible and can incorporate a wide variety of learning activities and teaching strategies" (Khanova, 2015, p. 1045). Throughout this project, and especially during the class time, the students experienced multiple activities. They frequently mentioned some of these activities when they expressed their opinions about flipped learning, where they considered that these activities and instructional strategies were the most positive and stimulating for them during the semester. These activities, which included the use of clickers, group brainstorming, case studies, and concept maps, may enhance students' active learning.

4.2.1.3.1 Using Clickers (Audience Response Systems)

A clicker system is an interactive response strategy that permits audiences to deliver their answers in an electronic format from a handle machine (a clicker) to a recipient connected to a computer (Stowell & Nelson, 2007). Recently, many educators have used clicker systems during public lectures, in workshops, and in classrooms.

During four of the class sessions, the course teacher used the clicker system in class. She did not use special devices for it, and we did not purchase actual voting devices. Rather, she turned the students' smartphones or tablets into clickers after it had been confirmed that all of the students in the class had these devices. She used this strategy at the beginning of the classes as a starting activity to make sure that students understood the content. If any misunderstandings were noted based on learners' answers to homework questions, the teacher addressed these during the class. This

was done through multiple-choice questions, true-or-false questions, or quick quizzes. Through my observation, I noticed that students were active and excited when they used the clicker system, and most of the class participated in responding to questions with it. In addition, they had positive perceptions towards expresses during the focus groups interviews, and they reported enjoying this method of response. Ghosson reported that:

> I think that when we used our phones to press the right answer was one of the most interesting moments in the class. I was very excited. I like new ideas that have a fun side. I wish that all classes include new and exciting things.

Similarly, Sahar said, "I felt pleasure and interest when the teacher asked us to press our phones and the answers appeared on the main screen in the classroom". Furthermore, in the questionnaire Saleha stated, "I liked accessing the voting site to choose the correct answers during the class time through our mobile phones . . . . I feel that it is an advanced way".

The teacher used a site that provides an application that allows this strategy: socrative.com (see figure 10,11,12, and 13). It is a solid application with a low subscription fee. Thus, a teacher can create an account through it, which will allow him or her to create a group of questions and store them in a special room. The application provides the teacher with the room number, and then, he or she should give it to the students to allow them to enter the questions through their mobile phones. Next, students need to access socrative.com, enter the room number, and start answering questions. Then, on the class screen, their answers will appear in chart form with the percentages of students who provided those answers. On the other hand, I have found that this application features a defect: it does not show the teacher the students' names, so the teacher cannot assess each individual's understanding of course content, only the collective understanding. This "allows a teacher to address immediately areas of learning where students show deficiencies" (Engel & Green, 2011, p. 41). Nevertheless, students still expressed that using the clicker was fun. Moreover, according to Stowell and Nelson (2007), compared with other response strategies in the class, such as "hand raising", clickers may allow students to answer questions privately and anonymously, which has an influence on their "participation and academic emotions" in a positive way and may encourage those who suffer from

"less negative academic emotions", such as shame or anxiety, to participate (p. 253). In this project, I found positive emotions in the participants' perceptions through some words, such as "interesting moments", "very excited", "fun", "exciting things", and "pleasure and interest".

Fai stated another advantage of using clickers: "This new thing, like when we click together [using clickers], can encourage us to attend the class". Fai perceived that employing an audience response system in class might enhance students' class attendance. This perception receives support from Preszler *et al.*'s (2007) survey study of learners in six biology courses, which found that using student response systems can promote students' class attendance, content understanding, and interest in the course.

When Saleha said, " . . . and the answers appeared on the main screen in the classroom", I asked her for further clarification of this sentence, and she replied as follows: "I mean it is good to see the right answers on the screen after our responses". I think this is evidence that this student may appreciate the instant feedback that she can gain through this strategy for better learning. According to Jain and Farley (2012), learners offer positive feedback regarding the use of clickers in the classroom due to the instant feedback they can receive.

In addition, I noticed that the course teacher attempted through her questions to move the students from their comfort zones to challenged zones to make them work through their ZPD, with her questions working as advanced organizers. "The use of mobile devices adds a new functionality to the ARS [Audience Response Systems] that traditional ARS clickers do not have" (Engel & Green, 2011, p. 41). This new functionality or task can be expressed through the possibility of using the phone as a research tool to help in the construction of information, which is discussed in detail under the theme of the benefits of using technology in flipped learning. In addition, based on my observation, another advantage of using smartphones as answering clickers is that it is economical, as it may be easy to lose an answering machine after class, but it may not be easy to lose a cell phone.

It may be argued that using cell phones as a clicker is a complicated method. However, I can say that although it was challenging to direct some students the first

time to access the website and enter the teacher's room number, they did not need extra directions the following times.

Based on my readings, Mazur is considered one of the first educators to have employed the clicker strategy within the flipped-learning field. It is considered to be an inquiry-based learning method. He developed a flipped-learning approach in which he employed clickers within peer instruction during class time (Mazur, 2009). Class time was organized based on conceptual questions that all of the students had to answer, and these questions were delivered through an audience response system—specifically, the use of clickers, which allows students to respond anonymously. If 30%–65% of the students answer a question incorrectly, students need to re-answer the question but through a group discussion while the lecturer moves from one group to another to boost fruitful discussion. Then, the students should answer the question another time, and the lecturer this time can provide the needed explanation or any related questions. Next, they move to the next conceptual question. With this procedure, each topic consumes about 13–15 minutes (Brame, 2013; Mazur, 2009). Mazur (2009) found the clicker strategy to be beneficial for two reasons. First, it promotes learners' mind engagement, and second, it affords both the learner and the lecturer continual feedback about learners' understanding of the learning topics. The participants' of the current study reported these two reasons as well.

Figure (10): Screenshot of Socrative Quizzes Page

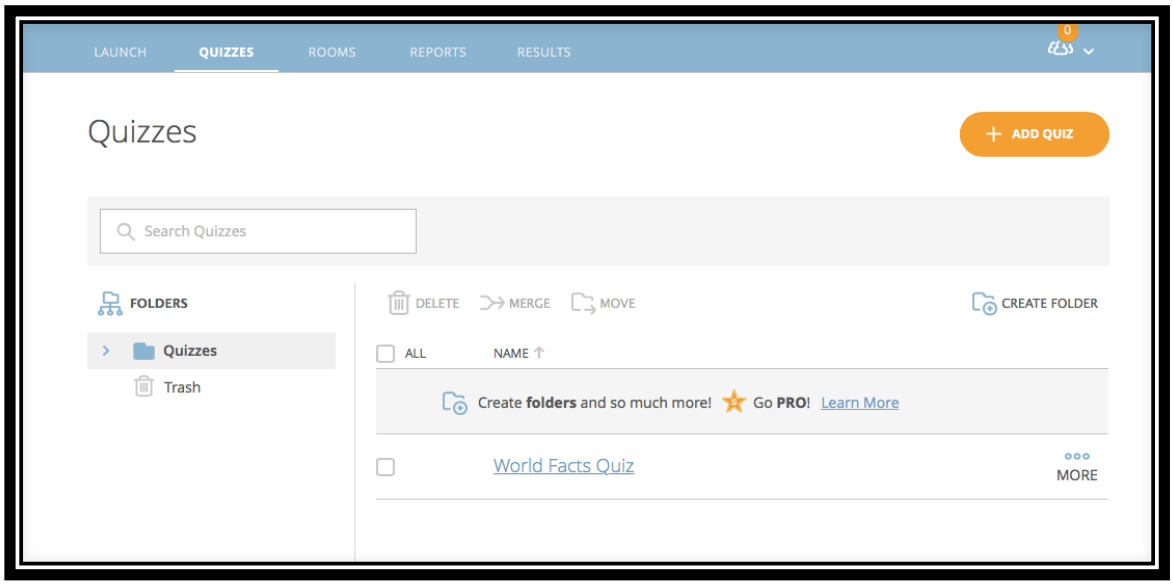


Figure (11): Screenshot of Socrative Functions Page

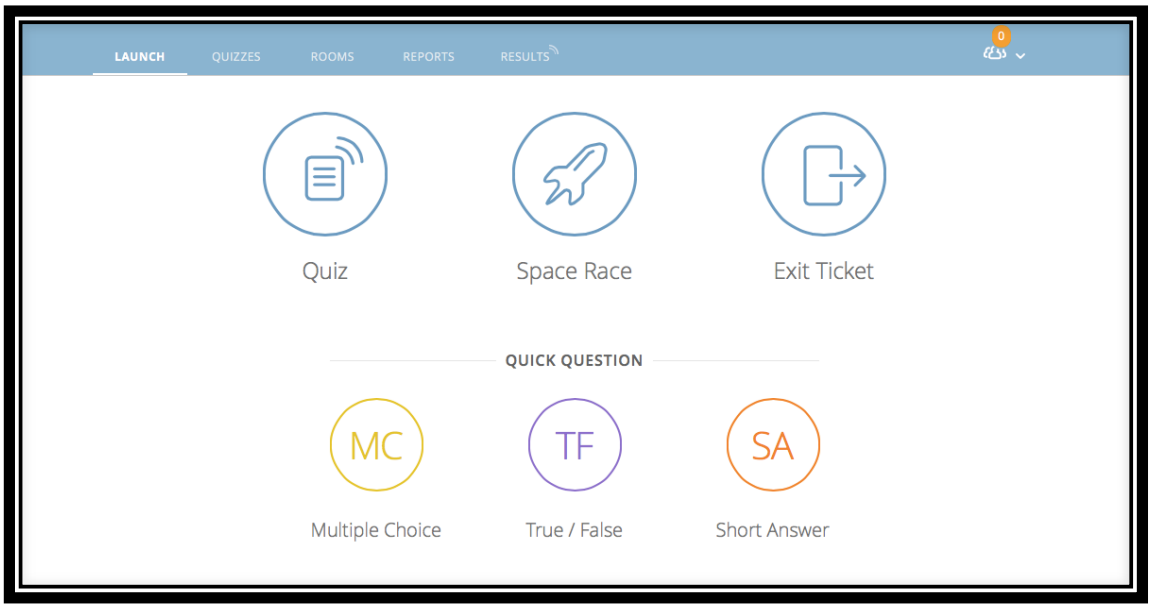


Figure (12): An example of Socrative Quizzes

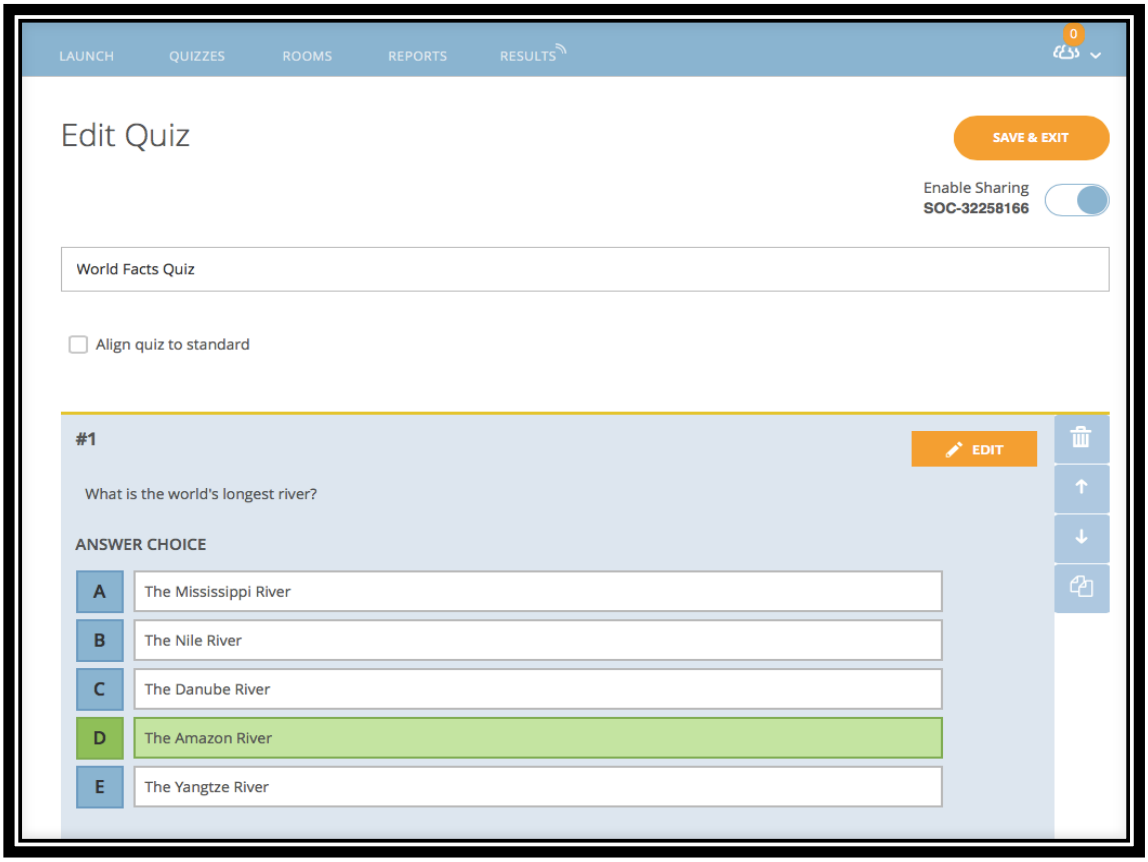
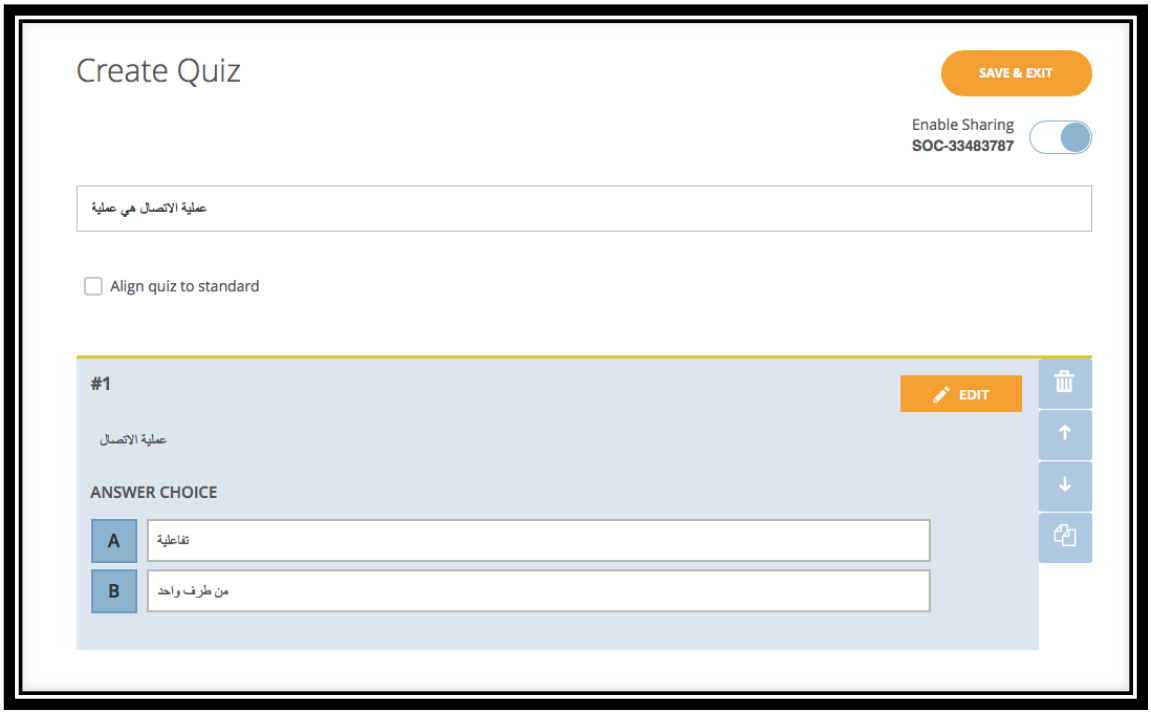


Figure (13): Screenshot of Socrative Quizzes Creation Page



4.2.1.3.2 Brainstorming

Brainstorming was one of the activities employed during class time. In the beginning of some class sessions, the teacher asked each group of 3–4 students to complete brainstorming about the main concepts or steps they already knew about the topic, and the teacher circulated between the groups to promote their discussions. Afterward, each group, swapped its sheet with the other groups, found the missing information, and completed it. This process was followed by the production of a concept map for each group, which included enthusiasm about production based on my observation. The students also reported about this activity positively when they provided their perceptions. The following are examples of the students' perceptions through the focus group interviews. Lana said, "I think the brainstorming was helpful . . . ", and Alaa stated that "writing random information in the class [brainstorming] helped me to remember what I already read or studied at home . . . ". In addition, Rand said, " . . . Brainstorming helped us . . . ".

Brainstorming is the random generating of ideas around a specific topic without considering the organization of the ideas by a group of people (Osborn, 1957). Osborn (1957) introduced this technique and thought that this procedure could enhance

creativity within the group work setting to solve problems. Through my observation, I found that some students adapted this strategy in some situations even if the teacher did not ask them to do this. For example, in one of the case study activities, I saw a group generate many ideas on one sheet. Thus, I think they may have found it to be a comfortable strategy that could help them to solve problems. According to Roehl, Reddy, and Shannon (2013), brainstorming is one of the pedagogical strategies that can be embedded in classrooms to support active learning within the flipped-learning context.

4.2.1.3.3 Case Studies (Problem-Based Learning)

A case study is a "description of an actual situation, commonly involving a decision, a challenge, an opportunity, a problem or an issue faced by a person or persons in an organization" (Leenders *et al.*, 2001, p. 2). Teachers usually employ the case study strategy or method in classes to encourage their students to think critically and to facilitate active learning (Popil, 2011). It was also one of the activities carried out during the classroom sessions, which the students evaluated when they were expressing their perceptions during the focus groups interviews as well as in the questionnaire. For example, in one of the interviews, Suaad said:

> I really appreciate the examples [case studies] that the teacher provides us some times, because these detailed examples [case studies] bring us meanings and make them more realistic. I do not like just giving definitions or problems that are not very close to the lesson, but these detailed examples [case studies] of problems I like very much.

Farida wrote the following in the questionnaire: " . . . It was good when we had problems and discussed them together and found causes or solutions . . . ". In addition, Atheer wrote the following: "There were beautiful activities, for example, when we had a paper with a story of a problem and we were looking for the cause of the problem based on the lesson".

According to Suaad's perception, she found that a case study helped her to understand lessons as it conveyed meanings in a way that was close to reality, as it was not just theory but rather reflected real problems related to the subjects under study. Similarly, Atheer valued the real-life scenarios, or the "story", as she said. In addition, Farida

seemed to appreciate the group discussion about problem causes and solutions that may happen within the case study activity.

Case studies or problem-based learning activities were used within flipped learning throughout many studies, such as Khanova *et al.* (2015), Love *et al.* (2014) Ramnanan and Pound (2017), Roach (2014), and Zainuddin and Attaran (2016). Students had strong positive perceptions towards the problem-based learning activities according to Ramnanan and Pound's (2017) study.

Therefore, connecting to reality and providing real problems, discussions, and thinking in a critical way to look for reasons and solutions were the benefits that students perceived when they talked about case studies in the class sessions. Also, based on my observation, I found that case studies might enhance student-student and student-teacher interactions, and students were active to participate during this strategy. Moreover, case studies seemed to stimulate students' thinking and brainstorming when they tried to analyse the provided scenarios and solve problems.

4.2.1.3.4 Concept and Mind Maps, and Visual Metaphors

As mentioned for the brainstorming theme, students used the result sheet for brainstorming to make concept or mind maps as a class activity. Concept maps allow learners to realize connections between concepts and to consequently comprehend these concepts and the fields to which they are related (Davies, 2011). Meanwhile, mind maps permit learners to think and examine relations among concepts (Davies, 2011). Mind maps differ from concept maps in terms of the form and accuracy of their composition. Concept maps are usually rigorous in construction, are linear, are horizontal, and contain concepts and words that illustrate relationships. Meanwhile, mind maps can be created in a visual way with the inclusion of images and other visual aids (Davies, 2011).

The teacher asked each group of 3–4 students to draw a diagram showing the connections between the information they provided in the brainstorming activity. The central topic was always the lesson's topic or a branch of it. Thus, they tried to explain what was in their minds in a visual picture, which could help them to review

the information they had studied at home, find details, recognize relationships, or remember questions to ask the teacher. In addition, this process could help them to build up their knowledge collaboratively according to Vygotsky's (1978) theory.

Some of the focus group participants appreciated this activity. For example, Mona said, " . . . the mind maps that we did in class were very beneficial, and also, sometimes I draw a flowchart or mind map when I watch videos, and then, I bring them with my other notes to class". Mona thought that concept or mind maps contributed to facilitating her studies both at home and in class. This perception is analysed later in the third question regarding self-regulated learning. Sahar also reported the following:

> I can describe the mind maps that we draw in the classroom with the rescuer . . . It helps a lot in remembering information and sequences or remembering the missing ones . . . It is a review of things that you read at home . . .

Similarly, Noha stated that "I like making concepts maps and colouring them with my favorite colours or even using some images. This helps me a lot in remembering the information". Sahar and Noha valued concept maps and mind maps as instruments that can support their memory. Sahar called it a "rescuer" that served them in remembering and sequencing information, whereas Noha appreciated the ability to insert colours and images within the maps that can support her memory. Based on the previous perceptions, students are more likely to remember concepts and their relationships through concept or mind maps.

Furthermore, one of the students, Rawan, mentioned another role of this activity as a supportive problem-solving strategy when she said the following: " . . . Maps helped when we tried as group to find a solution . . . ". I also observed this when students drew maps or diagrams along with brainstorming when trying to analyse a case study exercise. Rawan's view received support from Hsu (2004), who stated, "Concept mapping is an effective teaching strategy for developing students' critical thinking skills and problem-solving abilities" (p. 510). Thus, these students tended to employ concept and mind maps as problem-solving tools within flipped-learning class contexts. In this regard, White *et al.* (2017) found that concept maps can help learners

in flipped-learning classes to explore the connections among different elements and to analyse and find a solution to some problem scenarios.

In addition, Rawan's saying " . . . we tried as a group . . . " is a sign of engagement within work groups, which may lead to active learning. I also observed that students shared their produced maps with their peers, which played a role in stimulating debate among them. According to Budd (2004), mind maps can be employed as classroom exercises to support active learning.

On the other hand, making visual metaphors for some concepts or any information related to lessons was one of the activities that students conducted during the classes.

> A visual metaphor is a graphic structure that uses the shape and elements of a familiar natural or manmade artefact or of an easily recognizable activity or story to organize content meaningfully and uses the associations with the metaphor to convey additional meaning about the content (Eppler, 2006, p. 203).

Dalal provided her perceptions regarding this when she said, " . . . Drawing some shapes in the classroom and adding information on them helped me organize the new information like when we made Edgar Dale's 'Cone of Experience' . . . ". Dalal mentioned the role of this activity in helping her to organize her information. In addition, Reem appreciated the role of metaphors in facilitating her learning: " . . . Shapes and arrows help one to absorb and learn . . . ". This vein receives support from Lakoff and Johnson, (2008) who argued that metaphors can ease comprehension by activating working relations among metaphor items. Thus, metaphors can offer associations among learning elements, which may support understanding, and this is what I also observed in the classroom. The teacher provided students with a plain metaphor and asked them to write its elements. I listened to a group discussion where one of the students said, " . . . You have to start from the top because the starting point was here . . . ". This meant that the relations clarified by the metaphor might have helped her.

Figure (14): Brainstorming Activity

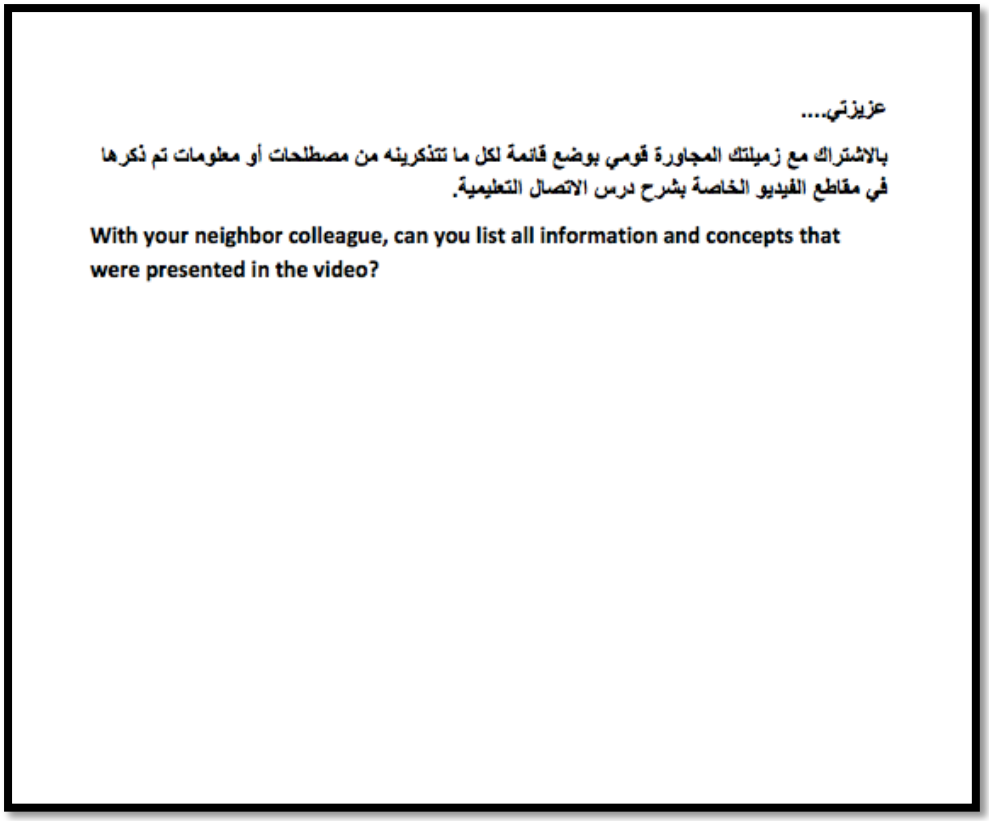


Figure (15): Brainstorming Activity

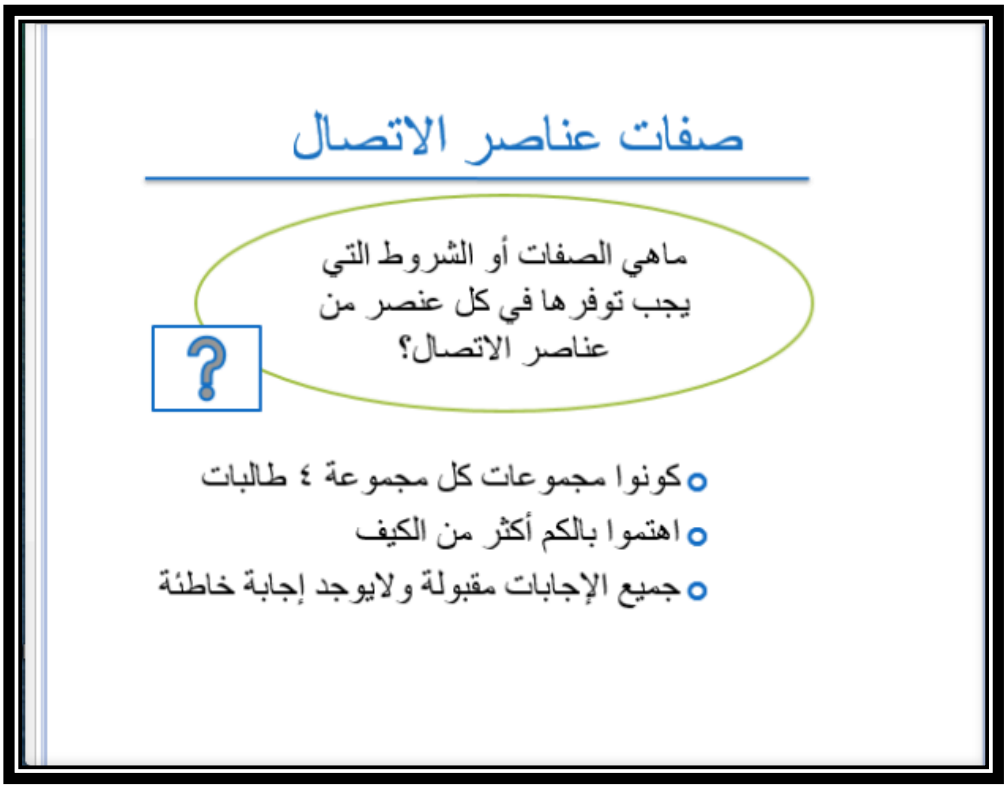


Figure (16): A Concept Map Activity

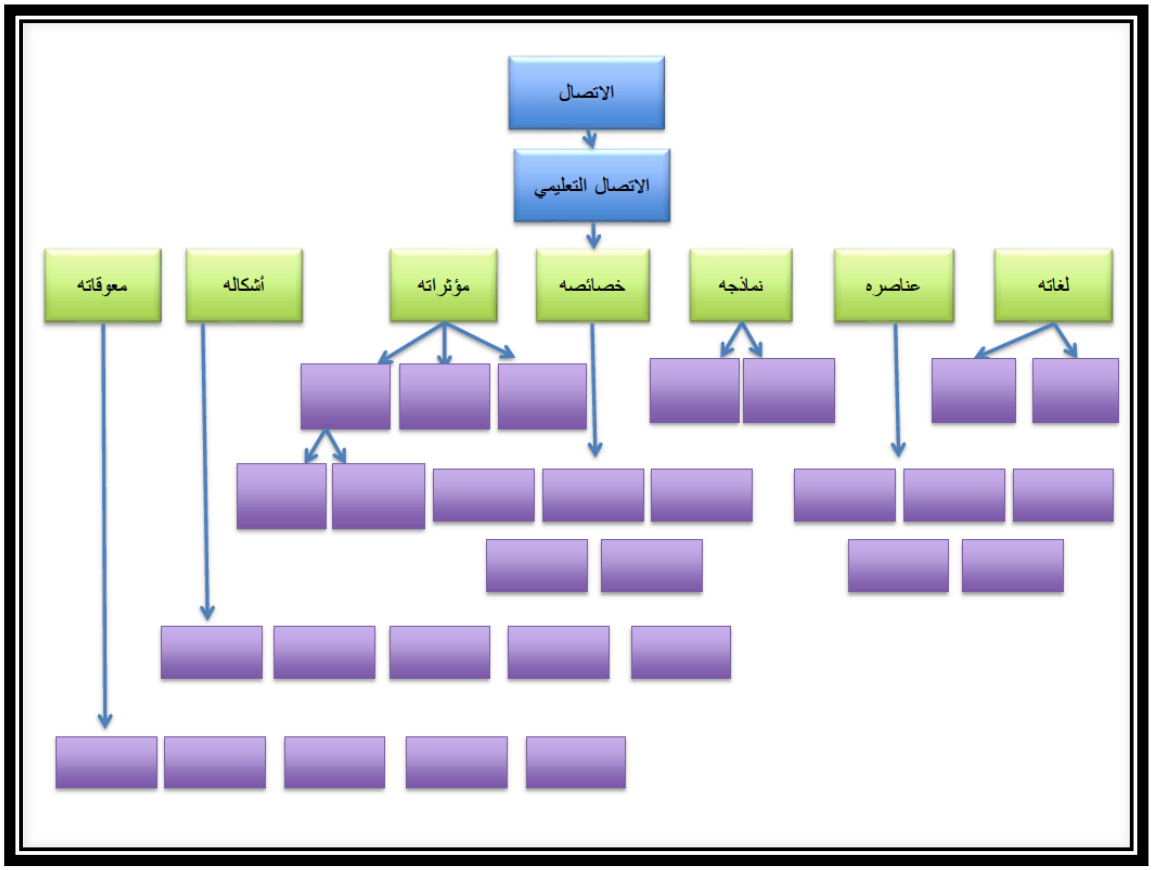


Figure (17): A Mind Map Activity

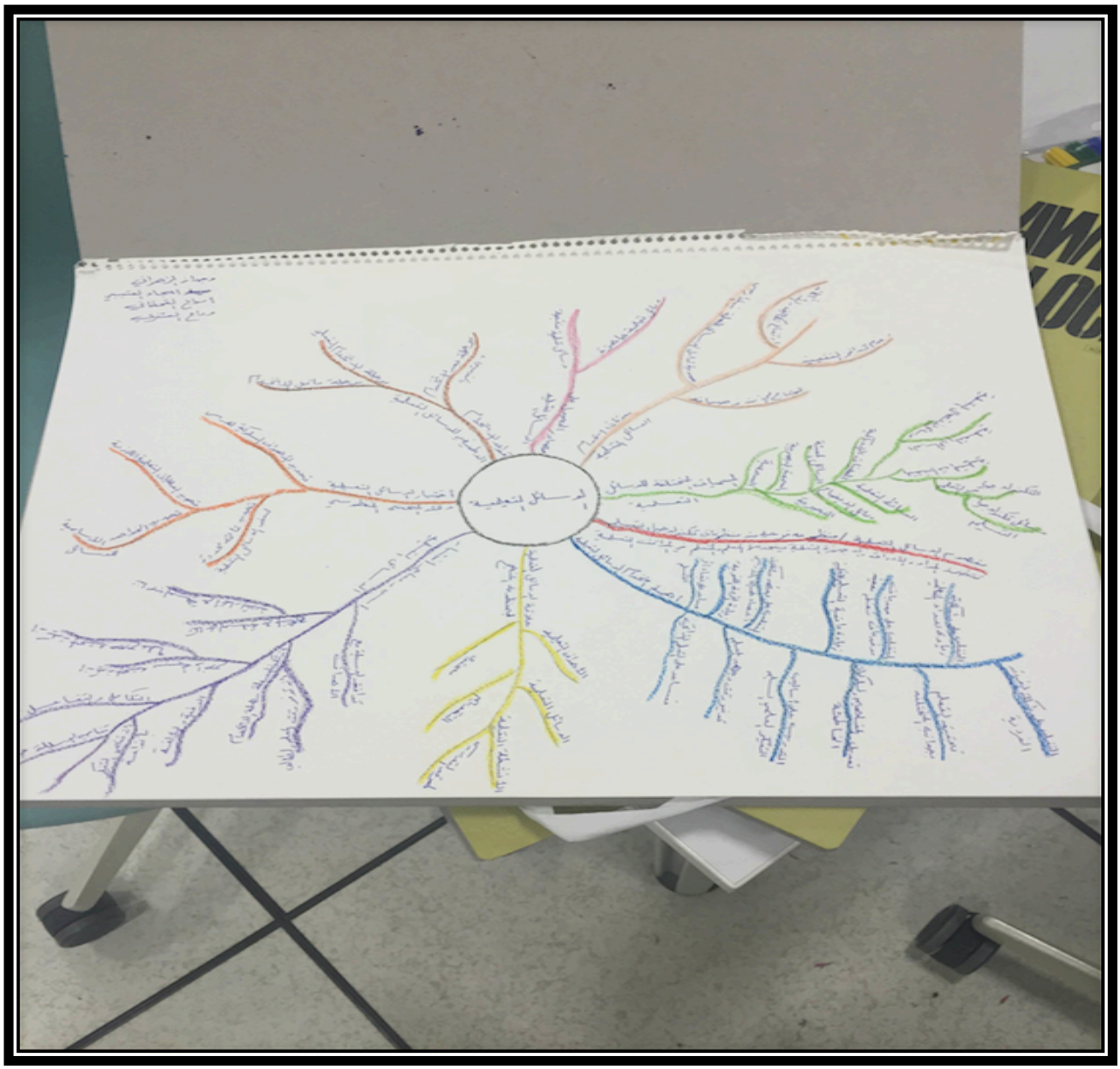
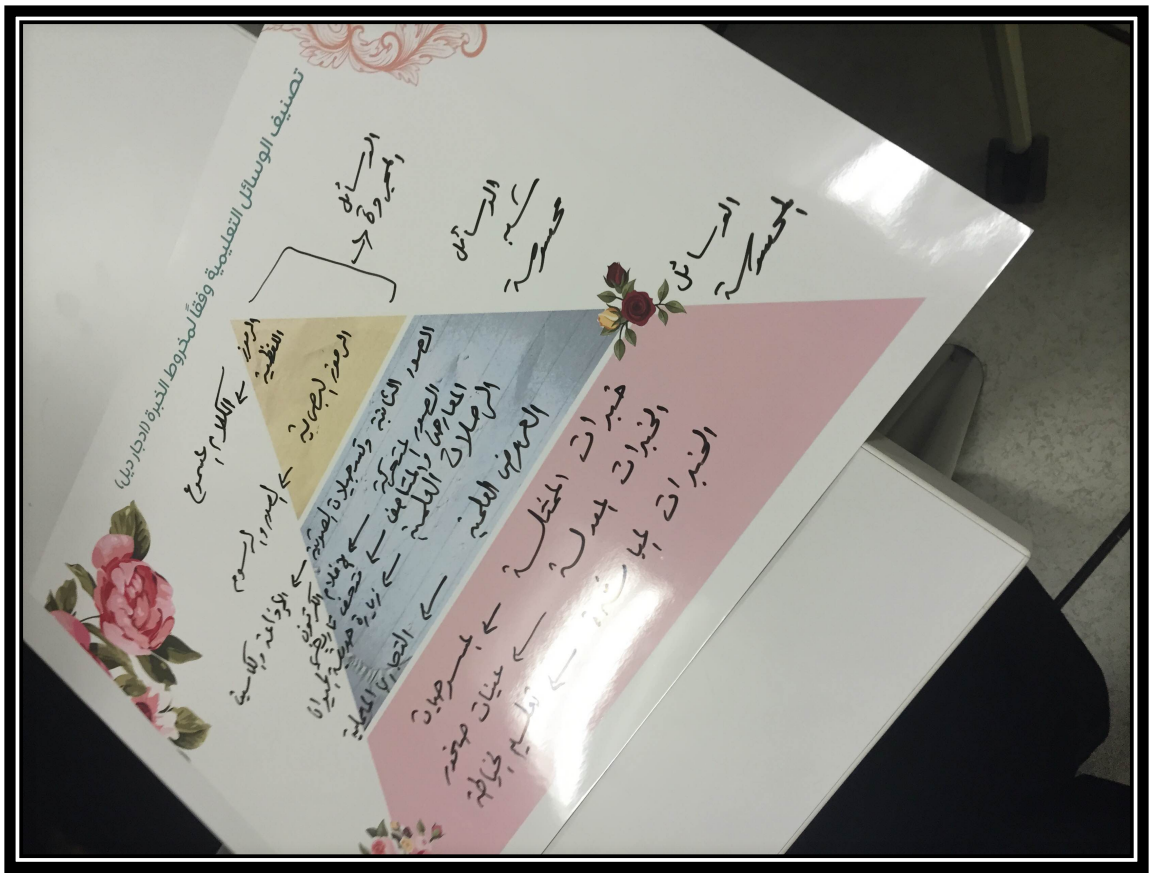


Figure (18): A Visual Metaphor Activity



4.2.1.4 Raising the Profile of Education in the Home

Flipped learning in the current project seems to have raised the profile of the course in the home and increased family involvement in some of the students' studies. In Saudi culture all of the female students live in their family's home if she is single, or with her husband if she is married; a low percentage live in university accommodation if they come from other cities. As a result, they are surrounded by their family members. In the current project, some participants mentioned that their parents, siblings, or partners had become involved and supported them in their commitment to learning. This can be considered as an advantage of flipped learning. For example, Maha stated that: "... my mother and father encouraged me during my working at home..." .In addition, Rand said: " … my husband keeps reminding me to send the assignments, and to watch the videos…". Also, Dalal reported that: "…sometimes my sister, who already had this course before, helps me when I study at home…she explains some points for me…". These examples give evidence that family members tend to be

involved in the learning process within flipped learning. Maha's parents encouraged her. Rand's husband tried to help her to manage her time, and Dalal's sister assisted her by giving some explanations. As mentioned before, Vygotsky (1978) stressed the major role of social interaction in the development of knowledge and supposed that cognitive development differs across cultures.

Family members' involvement, understanding and encouragement is very important for Saudi students who have busy lives between university, home, cultural duties and children if she is a mother.

Thus, flipped learning may help to narrow and bridge gaps between students' learning processes and their social lives, which may facilitate their learning when family members become involved in their learning or provide them with the needed learning conditions and encouragement. According to McCarron and Inkelas

> … Hossler *et al.* (1999) defined parental involvement in terms of parental encouragement (i.e., attitudes towards education). They found that, with regard to educational aspirations development, parental encouragement in the arena of support with schoolwork was more important than family income (p. 537).

Consequently, research has shown that parental involvement plays a crucial role in student life, and it has expanded from mere financial involvement to covering most of the college students' dimensions of experience (Wartman & Savage, 2008).

Also, family members involvement may assist the educational community to improve learning and teaching pedagogies. New pedagogies like flipped learning requires home links with the learning institution to achieve learning goals and support student success. Scant evidence or research seems to exist on the familial impact on higher education students' education. It is possible that the current proliferation of interest in flipped learning in higher education will encourage further research in this area.

4.2.1.5 Technology Use

Flipped learning uses technology to deliver learning materials outside and inside the classroom through learning activities. Most of the participants reported that they found that the technology used within flipped learning was beneficial. In this regard, some themes identify what the technology allows students to do or to what they have

access. These themes are flexibility and availability, mastery learning, multimedia advantages, scaffolding and promoting active learning, and breaking routine.

4.2.1.5.1 Flexibility and Availability

My participants seemed to agree that flipped learning gave them a kind of flexibility and availability, which supported their learning process. The majority of the participants reported that flipped learning provided them with flexibility that allowed them to choose where and when they learn, repeat, and review information; they could essentially control their learning. This view is also supported by students in the literature, such as Khanova *et al.* (2015), Love *et al.* (2014), Murray *et al.* (2015), and Zainuddin and Attaran (2016).

The following quote was taken from the open-ended questionnaire essay of Nora: "Some times I watch the videos in my bed before sleeping". Also, Noha said: "it was an interested experience but to be honest I did not watch videos at home only in the car when I come to the university". Moreover, Mona emphasized this view when she said: "Videos were short and can be viewed at anytime".

As well as Mai said: "I can see lectures any where any time…also, I can send my assignment email any time from any where".

Also, Hala reported that: "I like to watch videos when I have my coffee break".

Students valued that they could access to the videos or submit assignments online from car or bus when they are in they way to or from the university, in the bed time before they slept, in a coffee shop, in the university campus, before the class or during class in some activities when their teacher asked them to enter specific material, charts, procedures or pictures based on my observation notes. According to Oliver (2002) these days students value flexibility and availability of learning when they can take knowledge anytime and anywhere. Based on the earlier data flipped learning in the current project may supports flexibility of learning in a physical meaning which allow students to learn anytime and anywhere. According to Murray *et al.*'s (2015) survey regarding students' perceptions of flipped learning, "The majority, 96.1%, stated that they watched the videos at home. Videos were also frequently watched at university, 47.1%, while usage in other locations, such as public transport was quite

small, 7.8%." (pp. 59-60). This signals the flexibility that flipped learning can provide when educational objects can be viewed anywhere or at any time.

Also, the availability to learning materials both in the educational setting as students allowed to access learning materials in some class activities and in the home as the learning resources were available 7/24 for students may make their learning comfort and easy. Rand clearly supported this point when she said the following:

> …I can return to them [the learning materials] whenever I want, while I can not return to the traditional lectures. Some times when I study I wish if I can record lectures. I think flipped learning facilitates my study and make it easy…

Likewise Maha said:

> I like it from the beginning, it is good, and within flipped learning we have a flexible time to watch lectures, I mean not a limited time, I am a kind of student who forget information very quickly after normal lectures, but within flipped learning I can return to all the information or some parts of them, even before exams I review videos or some parts. Yes, I like my teacher's normal lectures but I can not replay them.

In the open-ended questionnaire, Alaa stated, "I can see the video at home and watch it again and again. If I do not understand something, I can ask my teacher because she is available in class". In addition, Sarah said, "I like when I can have access to videos many times . . . and if I am absent, videos are available . . . ". They appreciated the ability to access the materials several times and to watch them as much as they needed to do so. The materials provided them with the necessary support even inside or outside of the classroom walls. Thus, this is about repetition and the way in which technology can be used to supply the same information again and again so that students can review it when they think deeply on their own.

In addition, the students reported that these videos allowed them to develop their foundational knowledge at their own pace, as they can rewind or stop and replay a video. For instance, in the focus group interview, Shahd explained her positive experience: "I do not like listing information during the usual lectures, and some of this information does not enter into my mind . . . I found the videos more suitable for me; I can stop or replay". In addition, Hala said the following:

> I like the videos, and if I am busy, I can stop it and return to it again, but in the [traditional] lectures, if that happens and my thinking strays, it is impossible to cope with the rest of the information. Also, I can replay some points and focus

on them; I have some control.

These students seemed to be talking about the ability to view materials multiple times to gain the maximum effect. In addition, flexibility occurred when students could learn at their own pace at home, where they could replay videos to review them or pause videos. I think what is interesting here was that students valued opportunities to slow down the learning experience to gain more from it. These results were consistent with Love *et al.* (2014), who reported that students appreciated the ability to repeatedly view materials. Furthermore, Khanova *et al.*'s (2015) studies found that watching materials outside of the class can give students the required time to process the information. Similarly, Zainuddin and Attaran (2016) stated that students appreciated the pause and replay features in videos.

In addition, Rana said, "I felt comfortable when I was absent because I accessed the videos and reading materials, and I downloaded all of them on my laptop. Then, I felt safe".

This student stated that she felt comfortable even when she was absent because she had all of the resources she needed to manage her missed learning opportunity. She could thus catch up on missed classes if she absent by watching lectures online, reading other materials, or downloading and printing them. The same view is supported by Bergmann and Sams (2012), who highlight that the importance of flipped learning appears as assistance for absent students "to keep our students who missed class from missing out on learning" (p.3).

Most of the project participants were single students and some of them were married with no children while others were mothers. Married students and mothers who have extra responsibilities in their lives appreciated flipped learning accessibility, which benefited them to have learning resources in the case of absence. An example of that was Maha who said: " I have responsibilities at home as a married student, but I enjoyed this course, if I am absent I can reach all the lecture content and I really appreciate that". As they mentioned, the flexibility and accessibility feature of flipped learning helped them to overcome this problem and cope with the flipped learning assignments. Wives and mother students have busy lives, Sometimes children may

cause an emergency, like illness may happen, which forces mothers to be absent from some lectures. Available lectures and other materials can help them in this situation. For instance, Mona stated that: "If one of my kids is ill, I have to stay with him at home, but I have all the stuff that can help me… ". Moreover, Maha added that "I think the lecture will not take all our time as wives, it is only ten minutes, we can watch it in our way to the home in the car…". She meant that the accessibility allowed wives to arrange their time and do all the tasks. Mona also enhanced that by saying "yes, that is true, and even if I have an event at home like a dinner invitation I can find time, and the teacher send lecture in early time, so materials remain online for a good duration…". Hala also contributed "…I watch it sometime in the university if we have family event at home, and I need to help my mother at home…".

These features that appeared in this project match the features of flipped learning that were mentioned in the Flipped Learning Network report (2014, Online). According to Davies (2014)

> "we need to move from focus 'on the production and interpretation of meanings within contexts towards a focus on the projection of meaning a cross contexts'. Thus understanding that meaning-making requires attention to flows and processes across spaces, especially given contemporary 'intensified mobility… of people, objects and information' (Kell, 2011, p. 606)" (p. 74).

Nowadays, educators emphasize the importance of the mobility of information, which may lead to the normal placement of learning, which blends university and home or anywhere. Therefore, students can learn anytime and anywhere. Electronic learning and particularly flipped learning may help learners to learn in flexible way, where technologies brings spaces and places together. Harrison and Dourish (1996) claimed:

> It's no accident that these experimental audio-video environments are called Media Spaces, not Media Places. Placeness is created and sustained by patterns of use; it's not something we can design in. On the other hand, placeness is what we want to support; we can design for it. Media spaces were intended to provide the structure from which placeness could arise, just as places arise out of the space around us. They were not designed as places themselves, but for people to make places in them (p. 70).

In this study, participants appreciated the role of flipped learning as a blending environments and offering mobility of the information. They mentioned that they like watching videos while they are sitting in a cafe, lying in the bedroom, or in the car.

For example, Noha said, “it was an interesting experience, but, to be honest, I did not watch videos at home, only in the car when I came to the university”. Also, Hala commented that “I used my bedroom TV screen to show the videos and I liked that”. These comments show a kind of life blending. Thus, “the use of technology overcomes the space and time limitations by supporting self-directed learning and self-pacing” (Tawfik and Lilly, 2015, p. 302).

4.2.1.5.2 Mastery Learning

In the focus-group interview, Sarah said,

> I think flipped learning can help people [students] who take time to understand some point to move to the next one. They can focus at home as long as they want, but in the traditional lectures, they do not have time to understand, which leads to a growing lack of understanding and an inability to follow the lesson.

In this quote, Sarah summarised the concept of mastery learning, which may happen within flipped learning when students learn at their own paces until they master the required skills before advancing to the next unit or lesson. Moneerah also commented, “I appreciate that we do not need to stop the lecture because one or two students cannot understand something”. Similarly, Shahd said, “I like to learn using videos because I am able to study at my own speed, and I can get ahead”. Thus, students can take the time they need to master their learning and achieve their goals, whether at home or in the classroom. According to Bergmann and Sams (2012), “The basic idea of mastery learning is for students to learn a series of objectives at their own pace. Instead of all students working on the same topics at the same time, all of them work toward predetermined objectives” (pp. 51–52).

Consequently, Bergmann and Sams (2012) defined the flipped mastery classroom as any flipped classroom in which students must show their understanding of a concept before advancing to another one. Students can work at their own paces and use technology to support their learning and to meet their individual needs. All these components of flipped classes, which fulfil mastery-learning conditions, seemed to occur in the present study. The students worked at their own paces, and they demonstrated comprehension during class; this may increase the probability that they understand a unit before they move on to the next one. Lastly, the students used technology to meet their needs individually and during group work.

4.2.1.5.3 Multimedia Advantages

The students considered the multimedia tools employed in the videos to be helpful. Specifically, they mentioned the importance of the sounds, pictures, symbols, motion, and flowcharts. For example, Rand said, "I benefited from the pictures of some models and flow charts. . . . I reviewed them before the midterm exam". Maha added, "I think that studying through video is sometimes better than studying through a textbook. I can remember the sequence of the lesson during the video, which helps me to understand and remember well in the classroom". Maha thought that using video was better than using text because she could remember the presented material better. Indeed, pictures, colours, and all the other infographic elements that videos contain can increase students' attention levels, thereby increasing their comprehension and retention of the lesson's information. During my observation, I heard a discussion in which a student asked her classmate about the answer to one of the assignment's questions, saying, 'On which page did you find it'? The other student answered, "I do not know the page, but it is mentioned in the image of the pyramid in the video that the teacher sent". Thus, this student had retained the video's information; when she said, "in the image," she demonstrated the importance of the video's media elements. Most of the participants considered the learning videos to be helpful in acquiring basic knowledge before each class. Therefore, videos in flipped-learning situations can help students learn; this supports Vygotsky's (1978) sociocultural theory, in which he stated that learning can happen through social interaction, the exchange of experiences, and the use of tools. According to Choi and Johnson (2005), "the learners reported that the video-based instruction was more memorable than the traditional text-based instruction" (p. 215). This result is consistent with Triantafyllou and Timcenko (2015), who found that students valued visual objects and animations within online resources of flipped learning.

4.2.1.5.4 Scaffolding and Enabling Active Learning

For some activities, students were allowed to use their mobile phones, tablets and the available computers in the classroom to access the recorded videos, to search for concepts with Google, to follow procedures, or to solve problems. Their phones assisted their learning processes, and they appreciated being able to learn in individual and group settings during class. For example, in the focus-group interview, Hala

commented, “Using my phone or tablet during class activities helps me to find missing steps or review information”. Sarah also said,

> Sometimes, when I read about a concept or acquire information, I feel that I already know something about it, but I need to review it or verify my information to move in and do my task, so thank God we have technology. I can check and receive help, so I think technology was a good helper in the class.

Similarly, Noha reported, “I feel that technology helped us during group activities”. In addition, Alaa wrote in the questionnaire, “There are also many resources in the classroom through which I can receive feedback from either my teacher or my computer”. Participants seemed to appreciate technology as a tool for scaffolding and for providing feedback during class. According to Baek *et al.* (2008), “With the focus on learning, Bransford, Brown, and Cocking (2000) address the role of technology in . . . providing scaffolding that allows learners to participate in complex cognitive tasks, increasing opportunities to receive sophisticated and individualized feedback” (p. 225).

Consequently, technology can provide learners with necessary scaffolding during individual and group work. For example, Dalal stated, “My mobile phone helped me to cope when I worked with my group”. Students’ engagement tends to increase when they review online materials with their phones and when they work in a group. Students bring various ability levels to their groups, and I noticed that some of the lower-level students tried to catch up by quickly scanning through the material on their computers or mobile phones to find what they were missing. The teacher tried to stop them from looking at their phones during activities unless she had asked them to do so, but in the last few lectures, she let them do so during the activities. She most likely found that allowing the students to access their phones and computers could improve their performances through scaffolding. The students appeared to be more active, talkative, and open to discussion when the teacher asked them to access their computers, phones, or tablets.

Anderson *et al.* (2007) showed “how technology-enhanced instruction can support pedagogical choices, and the importance of having clear pedagogical goals when incorporating new technology into the classroom” (p. 69). In a class on algorithms, the students used personal computers after the teacher assigned the students a model

problem. The students needed to solve this problem, send it to the teacher, and check their solutions. Then, the teacher chose certain students to discuss the problem and its solution based on their submissions. The main role of technology "was to integrate activities into the lecture" (Anderson *et al.*, 2007, p. 69). In the end, Anderson *et al.* (2007) concluded that technology can support active learning in the class and that "a key to the success of active learning (whether technology supported or not) is having a deep pedagogical basis" (p. 73). Anderson *et al.* (2007) stressed the importance of adapting clear pedagogies in instruction; I agree with this conclusion because technology may not produce the needed outcomes if it is not employed according to a pedagogical foundation. That is why I employed technology to enhance classroom pedagogies in this project. As mentioned in the Methodology section, during lectures, the teacher used various flipped-learning pedagogies—such as problem-based learning (case studies), inquiry-based learning (e.g., using smartphones as audience-response clickers), and collaborative learning—to promote active learning in the classroom. Students used technology to support these pedagogical activities. In one type of activity in the class, the learners received specific problems to work on and were allowed to search online as a group to learn about any concepts related to the problem and to find a solution. The students seemed to be engaged by participating in the problem-solving process.

During my classroom observations, in some lectures, the students used their phones, tablets, or computers to search for information; this is allowed in flipped learning when students are directing their own studies or solving problems. According to Tawfik and Lilly (2015), technology plays a crucial role in enhancing self-directed learning to solve educational problems. Moreover, it contributes to learner scaffolding, which is an important element in active learning in Vygotysky's (1978) theory and in the constructivist rules. Tawfik and Lilly (2015) argued that "while scaffolding may reference a more knowledge peer or instructor, research has also shown technology to be effective in scaffolding student problem-solving" (p. 301), and "this scaffolding strategy may therefore be one way to bridge the scaffolding and self-directed learning tensions that novices experience with PBL" (p. 303). Thus, in this project, the in-class technologies seemed to help some students direct their learning, gain scaffolding, or solve problems.

4.2.1.5.5 Breaking Routine

Some participants found that using technology in class broke their routines. Rawan expressed this view in the open-ended questionnaire when she stated, “I feel excited when the teacher asks us to use our devices in the class. It is like breaking the routine, and sometimes, we need to return to some information”. For example, Sahar said, “It refreshes us and makes us active”. Reem also said, “For me, the class activities were the fun part of the inverted [flipped] learning because they ended the boredom and routine, as in other lectures…”.

4.2.1.6 More Personal Responsibility

The theme of student responsibility refers to how students seem to feel a sense of obligation to deal with their learning tasks; they considered this to be an advantage. Personal responsibility is a very important concept in flipped learning, and most of the students mentioned it many times through focus group interviews and the open-ended questionnaire. Their concept of responsibility seemed clear when they talked about time management, priorities, and self-awareness of their learning habits. For example, Majda wrote in the questionnaire, “I think that this method of education make us attempt to be more disciplined”. In addition, Rand who described how she managed her time and priorities during the course:

> During this semester the flipped course had a very high priority for me, every Tuesday, which is the deadline of the weekly assignment. I can not go outside home before sending that, also my husband keeps reminding me to send the assignments, and to watch the videos, and as a married student I try my best to organise my time and find a free time to do flipped learning duties.

Also, Hala stated, “I watch videos sometimes in the car, in my bed to save time”, which means that she tried to manage her time by watching videos in various places. These are examples of the benefits of availability and flexibility in flipped learning, which I have previously discussed.

Although students needed to be responsible for their learning, some students tried to resist flipped learning when they felt that they would need to be responsible, and they considered that responsibility to be one of the most important challenges that they faced during the project:

Alaa: "…. but sometimes I did not like to work at home and watch the videos, where I feel I am responsible".

In line with this, Ramnanan and Pound (2017) pointed out that, in four studies about students' perceptions towards flipped learning in medical courses, they found that students appreciated the positive effect flipped learning had on their accountability.

Some students may not feel safe or comfortable during in- or pre-class activities. We might assume they might usually feel safe within the lecturing style, where they sit and act as receivers for new information. As educators, we want to make them responsible for their learning and even feel uncomfortable, which may lead to expansion of their learning. Research shows that it may be better if students participate in some challenging tasks during the learning process. Students may feel annoyed when they work outside of their comfort zones, but according to Vygotsky (1978) they need this kind of frustration. Also, he argues that the comfort zone is the area of learning where the learning tasks are too easy, the frustration zone is the area where the learning tasks are too difficult, and between these two areas is the zone of proximal development where learning should take place. As a result, students should be challenged but not frustrated or bored all the time.

According to Gee (2003, p.6), "Learning is or should be both frustrating and life enhancing"; he later calls it "pleasantly frustrating" (2004, p.19). Gee's research explores video games and learning and how frustration can be beneficial to learning. In his (2003) book, *What Video Games Have to Teach Us About Learning and Literacy*, he explains how frustration can lead to beneficial learning. He argues that anger that is caused by frustrating challenges turns to happiness, which energizes the brain. He refers to this as "pleasantly frustrating". This concept means that although students may feel irritated during some activities, all of these emotions will be converted to a sense of pleasure, relief, and satisfaction when they achieve them. Also, he argues they will see both the result of their efforts and how they reached a solution. The key for teachers is to always find challenging and stimulating tasks for students to expand their learning instead of assigning only simple or easy tasks.
Therefore, flipped learning pre-class preparation and in-class activities may be considered examples of those kinds of task.

Having discussed students' perceptions of the advantages of flipped learning, in the

next section, I discuss students' perceptions of the challenges of flipped learning.

4.2.2 Students' Perceptions of the challenges of Flipped Learning

This study's participants perceived various challenges in the flipped-learning environment; I described these challenges using themes constructed from the data. These challenges fall under the following themes:

- Challenges of using technology
  - Digital divide
  - Problems with learning-management systems
  - Poorly designed videos or class activities
- Students who have little ability to regulate their learning
- Resistance to change
- Lack of instant feedback and skipped information
- Saudi female students' roles as wives and mothers

4.2.2.1 Challenges of Using Technology

Using technology in flipped learning was not an advantage for all participants. It seemed to be a challenge for some of them. In other words, not all students gained understanding from video content. For instance, Moneera stated that:

> I face difficulties understanding from videos. For some lecture, I replayed it six times, then I returned to the text book. I tried to watch from my laptop, and I tried to connect my laptop with my bedroom TV, and tried during my coffee time.

Then she concluded with this comment:

> Flipped learning may be suitable for my colleagues but not for me. Technology is not my thing; I prefer face-to-face lectures, and if I don't understand any point, I ask my teacher to explain it again and she explains in another way.

In addition, Noor commented on Moneera's answer this way: "I see flipped learning as good for me, but some people cannot understand from videos, they like when the teacher stands up in the front of the class and explains everything". In the focus-group interview, Rawan said, "I think the video part of flipped learning does not consider individual differences".

Therefore, it may be better if teachers pay attention to individual differences.

Moneera presented clear evidence of the individual differences when she demonstrated that video learning is not suitable for every student. Students are different, learning videos may not be beneficial for all of them, and this is one of the disadvantages of flipped learning. Although the teacher provided alternative learning materials, like some papers, and the textbook was also available, the videos were the main materials. Moneera also gave some examples of environmental regulation when she tried to regulate herself. She tried to study from her laptop, bedroom TV, and in a café, but in the end she found that flipped learning was not her thing as she told.

Interestingly, Moneera and Rawan showed a level of self-awareness, and they mentioned individual differences, and self-awareness and awareness of individual differences are crucial elements of the self- regulation. I was surprised when they mentioned the term individual differences, Moneera tried to find her suitable learning strategy when she returned to the textbook. According to Zimmerman (2002) "awareness of particular aspects of their functioning could enhance their self-control" (p. 65).

On the other hand, some challenges arose from using technology during class time. The following excerpt from my field observation notes captures an example of a student who was not well engaged in a class activity during the course. "Today, all the students were active, when the teacher asked them to Google the concept "web quest", some groups opened the class PCs, and some used their mobile phone, except Lana. She just kept writing and thinking". The same student Lana stated in the focus group that she did not like using technology for class activities and gave a reason. She said that "I feel that using technology for class activities distracts my focus and cuts my thoughts". In addition, Rand added "yes, as Lana said, it cuts the concentration sometimes, and also the Internet network in the class and in the university in general is too slow. Because of the high load, it may take a long time until all the groups complete the required task". These participants found that using technology affects their learning and ability to focus. In addition, Rand mentioned an important issue, which is the slow Internet connection that is related to network bandwidth.

During one session's class observations, I spotted two students who were checking their WhatsApp chats while the teacher was busy with other students. This issue may cause students to not benefit from class time. Also, maybe they will become

dependent on their devices, which may affect their cognitive skills when they try to directly find an answer or solution online. Moreover, battery capacity and screen size are other issues that may affect students learning process in a negative way. I noticed some students charge their phones and keep looking to the screen to check the battery, since the lectures were held in a computer lab where many electrical outlets exist, which may distract them from class activities. Another challenge was screen size. Mobile phone screens are too small when compared with personal computer screens. This kind of screen may have a negative effect on students' eyes (Crescente and Lee, 2011). One of the students mentioned one of these effects when she said: "I do not like to watch my phone screen like my friends. I prefer to use the computer; mobile screens strain my eyes".

Some educators agree with the point of view that using technology in the classroom has drawbacks for students' learning. Here I focus on mobile devices, as they were the electronic devices that most students used during the flipped learning class sessions; students also used them to watch videos at home as they were told to do. For an example of some educators' views, Mehdipour and Zerehkafi (2013, p. 97) argued that "battery life", "risk of distraction" (Crescente & Lee, 2011), and "screen size" were considered technical challenges for mobile learning. Also, there is evidence to support Moneera's reflection. According to Crescente and Lee (2011)

> Previous mobile devices have generally had postage stamp sized screens, which made reading large blocks of text extremely difficult because only a small section was visible at any given moment. While the devices could accommodate large files, the learner had to scroll back and forth to see the whole document. The effort proved tedious, frustrating, and hard on the learner's eyes. (pp. 117–118).

To sum up, in the current study, individual differences, negative effects on students' cognition, distractions, screen size, and battery life were some of the challenges of using technology.

4.2.2.1.1 Digital Divide

Some participants indicated that a digital divide amongst students was one challenge for flipped learning. For example, some students reported that they were unable to afford Internet service at home.

For instance Alaa said in the interview: “Not all of my friends are able to pay for the Internet”. As a result, students with low income may not do all the required flipped learning jobs at their homes, which may affect their learning.

This point of view was supported by Sarah when she said: “I do not have internet connection all the time through my cell phone, for example, I can not watch videos in the bus, only at home or on campus”.

Therefore, some students did not have an Internet connection all the time in their mobile phones, which limited their ability to gain access to information anywhere and anytime. So they could not watch lectures or send assignments anywhere and anytime.

Similarly Amal said:

> “Some times my Internet data allowance ran out when I watch videos or send an assignment which I consider the most important obstacles, also, my internet connection at home is very slow. For example, I tried to send my assignment email during the night and the teacher received it in the morning”

As a result, not all of the students can access advantages that are offered by using the Internet in the learning context; which has been described as a digital divide (Gunkel, 2003). As stated by Hassani (2006) people’s income has an important effect on the Internet usage; people who have low income seem to have fewer benefits that are offered by the Internet accessibility. Also, their slow connections and ancient equipment may prevent them from visiting development sites like graphics sites. Moreover, during class observations, I noticed that, although each of the students had a smartphone or tablet to use for in-class activities and for watching videos, not all of them had one that was advanced, of high quality, or in good condition. For example, I noticed two students using devices with broken screens.

4.2.2.1.2 Learning Management System (Blackboard) Problems

Some participants mentioned these problems in the focus group interviews. For instance, Noha said, “the videos did not work for me through Blackboard; I needed to copy the video link and paste it in a new page of Internet Explorer”. Maha added, “it

does not open quickly, and it is difficult to play the videos". Noha and Maha both reported the difficulty of playing videos and said that they ran slowly through Blackboard.

During the project, the students faced technical problems with the university's learning management system, Blackboard. For example, the system ran slowly, had slow download times, and occasionally hung, which frustrated students. The course teacher used Blackboard to deliver the course syllabus, videos, assignments, and any content or links. After the first lecture, students complained about having difficulty watching the videos. The students had formed a WhatsApp group, and one of them acted as the group representative who would contact the teacher and other students. The students suggested that the teacher sent the video lectures through WhatsApp. The teacher approved of this, and she used this application as an alternative to Blackboard for the rest of the lectures because students preferred WhatsApp as an announcement and delivery tool (as both the teacher and the students told me).
In addition, Lana stated,

> Our problem with Blackboard is not new; we have used it before, but I think there is a lot of pressure on the system, so sometimes it hangs or stops. We have deadlines, and when time is running out, students are not able to enter the system and turn in the required assignment.

Lana also provided information about the Blackboard situation to the university. She told administrators that the problem they were facing during this course had appeared before, and she gave a possible explanation for the problem: the high pressure on the learning management system. Moreover, Mai commented, "I support what my friends said; these problems have appeared not only in this course but in previous courses".

4.2.2.1.3 Poorly Designed Videos or Class Activities

Videos and in-class activities are the backbone of flipped learning in this project. They should be properly designed to achieve learning goals. Some lessons' poorly designed videos or class activities were a true challenge for the students participating in this experience. Participants informed me that some videos were not designed very well, which made them wonder about the differences between these lectures and the textbook. For instance, Noor said, "I like that the video lectures were more organized

than the textbook and highlighted important information…for some lectures, I felt that they were same as the textbook". In the last part of her statement, Noor meant that there were some poorly designed lectures that did not present the content in the way that videos should. In her opinion, videos needed to be arranged to focus on the key information. Regarding flipped-learning videos, which are usually teacher created, Herreid and Schiller (2013) claimed, "The quality of the teacher-created videos is often marginal, however, and creating them requires a significant amount of time" (p. 63).

It is recommended that a video not look like a textbook or even an electronic book; it should not just list the information. For this course, the duration of each video was only 10 to 15 min. Thus, teachers could include only the most important content so that learners could build a knowledge foundation for the intended topic. The students needed to acquire other details and extend their knowledge during class activities. Thus, videos for flipped learning should be relevant, interactive, organized, and engaging; these requirements necessitate hyperlinks, images, and other fundamental tools (Crescente & Lee, 2011). I discuss video design issues later in this chapter.

Moreover, class time is a key period in flipped learning. Class activities need to be designed to encourage learners to engage and move through their learning zones according to Vygotysky's (1978) ZPD theory. In the current research, flipped learning was applied to a course with a class time of 2 hours. Although the students build their basic knowledge at home, they also have a period of time in the classroom to deal with. This time should be filled with meaningful learning activities that help the students to construct knowledge and to take advantage of the time. Lana was one of the participants who commented on this issue, saying, "I felt bored and not very excited in some classes because the activities did not add anything for me". Similarly, Sahar said, "Some activities were boring". The view that flipped learning videos and class activities should be carefully designed to meet students' needs was supported by students' responses in some studies, such as Khanova *et al.* (2015), Murray *et al*. (2015), Ramnanan and Pound (2017), and Zainuddin and Attaran (2016).

Unfortunately, in my observations, I noticed that there were missed opportunities for student engagement in two of the lectures. In one of my field observations, which I

made during a poorly time-managed and designed lecture, I wrote, “Today, the teacher gave four activities in the class. . . . all the groups did the first activity very quickly. Then, the teacher discussed it very rapidly and moved on to the other activities. . . . Suddenly, they had finished all the activities with half an hour left in the class time”.

My impression in this class was that learning happened very quickly. The idea of flipped learning is that the teachers give the students a substantial amount of time for interaction. Because teachers are normally not used to having so much discussion time, they need might to learn to allocate time differently.

Another related note for the next class was, “It was possible to prolong the debate on the given case study, but they discussed it quickly”. I meant that the teacher and students were discussing a given case study briefly when they could have discussed other dimensions.

This happened mainly because the teacher did not successfully design the activities in terms of the number of activities, the kinds of activities, and time management. One reason for this is the nature of work as a lecturer at a Saudi university.

During a flipped learning course, the teacher not only specialised in teaching but also had a number of other responsibilities: preparing for video lectures, designing class activities and assignments, reviewing students’ answers before class to prepare activities based on their answers, teaching other classes, completing administrative work, and serving as a member on committees for the department and even for the president or the college in general. Also, she was the chairperson of the department’s committee on exams. She was very busy before the exams period, which was when the class sessions mentioned above took place. I believe the teacher’s excessive workload could cause her to rush some in-class activities, thus causing students not to fully benefit from class time because more of that time is free.

4.2.2.2 Students who have Little Ability to Regulate their Learning

As flipped learning may give learners control and flexibility, students need to be self-regulated to benefit from these features. According to Sun (2015), “Giving students

control over their learning process is indispensable and necessary in flipped classroom, and self-regulated learning becomes a crucial aspect for the success in the flipped classroom learning" (p. 10). Also, Sletten (2017) stated, "Study strategies had a moderately strong relationship to viewing frequency. This may mean that students who are able to regulate their study behaviours are more likely to view the assigned lectures" (p. 355). In fact, not all students can regulate themselves, and some may struggle in flipped learning as a result (Sun, 2015). They may face problems in managing their time, mastering the content, or seeking help; they may also have a lack of responsibility. Thus, students may come to class unprepared; this not only would affect their learning but would also impact on their colleagues' learning and on the flipped learning process in general. One participant, Rand, gave an opinion similar to the above explanation when she argued, "flipped learning was very enjoyable for us, and we benefit from it, but I think it is not suitable for students who cannot manage their time or who do not take responsibility for their learning". Rand stated that some students are unable to organize their time or take responsibility for their learning process. In other words, they seem not to have the necessary self-regulation skills. An example of a student who tended not to self-regulate by seeking assistance is Mai, who noted, "sometimes, I did not ask for help, which caused me to have lots of questions before the exam". Students may refrain from seeking assistance due to laziness, pride, or shame, which may reduce their opportunities for learning and their chance of mastering the content, such as when Mai found herself with many unanswered questions before the exam. Help seeking is a crucial part of self-regulated learning skills; a self-regulated learner needs to be a good help seeker (Pintrich, 2000).

Moreover, Suaad commented,

> for some lectures, I did not study very well; I just tried to answer the questions and send them back to the teacher, I was scanning the content to find the answers, and in the class, I tried to work with my friends…but before the midterm exam, I faced an accumulation of lecture notes, and I felt that they were new to me.

Suaad seems to be the kind of student who cares about her grades, her academic success, and her teacher's satisfaction rather than about her own satisfaction or improving her learning methods. She realized the consequences of her behaviour just

before the examination, which means that Suaad may have suffered from a lack of self-regulation skills. According to Zimmerman (2002) self-regulation helps learners and "enhances their self-satisfaction and motivation to continue to improve their methods of learning. Because of their superior motivation and adaptive learning methods, self-regulated students are not only more likely to succeed academically but to view their futures optimistically" (p. 66).

In addition, although must of the students valued the flexibility and accessibility of flipped learning (i.e., the ability to watch videos anywhere and anytime), I found that some of them did not do well with the timing of their lecture viewing, which resulted in weak time management. I noted in my observations that some students watched the videos directly before entering the class. This behaviour is acceptable behaviour for those who are reviewing the lecture, but it is not acceptable for those who are watching it for the first time; these students likely have defects in their self-regulation.

4.2.2.3 Resistance to Change

Resistance to change is expected in all of life's contexts, including school or university life. Some participants raised this challenge during the focus-group interviews. For example, Ghosson said, "I think some of my classmates like to fight the new things". Likewise, Mai said, "Students may not accept new ideas [pedagogies]".

At the beginning of the use of flipped learning in the course—and especially in the induction lecture—a few students were scared of being responsible, and they tried to resist the new pedagogy. The teacher made an effort to reassure them, and then they felt reassured; none of them refused to participate, as I mentioned in research ethics section. Most of the participants were committed and worked hard during the course. Two participants showed resistance in the initial classes when they came unprepared, but they tried to work with their groups. In the next lecture, one of them tried to influence her entire group by openly and loudly stating, "I feel that I am studying when the teacher is explaining in front of me in the classroom." The same student was absent for one lecture during the course. Later that week, she asked the teacher during the class about the learning videos that went with the lecture for which she had been

absent, which means that she appreciated the advantage of the videos for when she was absent from the classroom.

The real problem appeared to be that these students may have affected their colleagues' motivations. For instance, Rand said, "I feel disappointed and frustrated when the work group or one of its members is not ready; if someone did not watch the video, I have to explain it from scratch". According to Herreid and Schiller (2013),

> Students new to the method may be initially resistant because it requires that they do work at home rather than be first exposed to the subject matter in school. Consequently, they may come unprepared to class to participate in the active learning phase of the course. Faculty solve this problem by giving a short quiz either online or in class or by requiring homework that references information that can only be obtained from the outside reading or videos. (p. 63)

This study's participants had used the teacher-centred learning method for years. As a result, some resisted student-centred learning, which needs them to be more responsible. Åkerlind and Trevitt (1999) noted, "Student resistance to the inevitable stress of such change is to be expected" (p. 96). Students may be afraid of taking responsibility for some aspects of the learning process, or they may like having the teacher in charge of the educational process. Weimer (2002) argued that students resist learner-centred pedagogies for various reasons, two of which are that students do not want to be responsible and that they feel the teacher should be responsible for their learning.

4.2.2.4 Lack of Instant Feedback and Skipped Information

Skipped information refers to new information that students do not understand at home and also forget to ask the teacher about during class time. This information may be difficult, or the students may require extra clarification, more examples, or even an extension of the content to enrich the students' knowledge. Although each class was 2 hours long and the students could ask about anything that they wanted—and although the beginning of each class included a summary and review of the main points mentioned in the videos—there was still skipped information. This was caused by the lack of instant feedback outside the classroom. When at home, the students were

sometimes still passive receivers of information, such as when the teacher was delayed in replying to students in their WhatsApp group.

At the same time, providing continuous feedback would be a huge workload for the teacher, and the students are aware of that. In response to my question on the open-ended questionnaire about "what sort of things you disliked about the course", Lana stated,

> one of its [flipped learning's] disadvantages is that, if I needed to ask about something at the same moment when I was watching or get an extended explanation, then I would forget to ask the teacher in the class, which meant that I missed the information.

In addition, one participant wrote about "the inability to direct an inquiry to the teacher in the event of a lack of understanding regarding a certain point of a lesson". Similarly, another participant said, "it does not allow questions about some points at the time of viewing". During the focus group interview, Moneera claimed, "I need direct feedback for the difficult topics during the lectures; I cannot wait until the class time". Correspondingly, Rawan mentioned the importance of direct feedback for her to learn outside the classroom: "I need direct feedback when I watch videos. I tried to write notes, but I forgot to ask my teacher during class time". All these quotes mean that these students had skipped or missed content during the course, which may have affected their learning in this course and may continue to affect it in the future. According to Bergmann and Sams (2012), "One of the drawbacks to the flipped model is that students cannot ask immediate questions that come to their mind, as they could if the topic were being taught live" (p. 13). This finding is in line with Triantafyllou and Timcenko (2015), who found that students sometimes missed the direct feedback when they studied outside of classes, which may affect the quality of their learning.

4.2.2.5 Saudi Female Student Circumstances as a Wife or a Mother

For some learners as mentioned above, flipped learning can be beneficial in raising the profile of education at home. However, for other students, it is not beneficial but a challenge. The student who is a wife and mother may find her roles conflicted. Many Saudi students have busy lives filled with obligations like housework, childcare and frequent family gatherings according to the social life of Saudi society. Flipped learning may well be an overload on them. Few participants reported that wives and

mothers may not have the necessary circumstances in order to study at home. For example, Hala claimed that "… I think it is better for the married students to attend lectures at the university because they already have loads of responsibility at home…". Rand as mentioned before is an example of married student who liked flipped learning and showed a very high commitment through the course, she argued that "…Not all married students have suitable conditions to study at home like me, I still do not have kids and my husband encourages me, but may be other student need to do housework or childcare, may be she does not have the needed help or encouragement …". Moreover, Moneera pointed out "If I am married and I have obligations, frankly I think that I will not have time to watch videos…". Thus, it seems that for some women, keeping the domain of education outside the home is more manageable.

Having answered the first research question, in the next section, I answer the second research question.

4.3 Responses to Research Question 2

In Research Question 2, I asked how the participants perceived the future of flipped learning in Saudi Arabia. Specifically, I asked,

1. What are the motivations for the adoption of flipped learning?
2. What might limit the adoption of flipped learning?
3. What practices might improve flipped learning?

Understanding student perceptions of flipped learning's future in Saudi Arabia could help educators and policy makers. In their discussions with me and their answers in the questionnaire, students seemed focused on whether they wanted to join flipped learning or recommend it to others in the future. Students' perceptions covered three dimensions, which in turn branched into three questions. First, flipped learning should be applied widely because there is some motivation to use it. Second, there might be some limitations in its adoption. Third, teachers can apply flipped learning but with certain conditions or practices that could improve it.

4.3.1 Enthusiasm for Future Application

What are the motivations for the adoption of flipped learning?

Some participants showed a strong enthusiasm for flipped learning. Rand was an example of this enthusiasm and hoped to experience it again in the future when she said: "I wish to have the same experience in the future, I benefited from flipped learning this semester". Also, some participants described flipped learning as developing creativity and modernity in education in its future wide implementation. For instance, Mai wrote in the questionnaire "…we need to develop teaching systems [strategies] in our universities and flipped learning is good for that [development]". Also, Fai wrote, "Future generations of students may not be suited to the usual methods, but they are suited to modern methods such as flipped learning". Similarly, Mona said: "I think it's a way to go along with the fast, modern age, as students feel bored by the length of lectures". While, Hala wrote: "It is creative way that supports students' learning and understanding". Shahd stated in the interview: "It is modern teaching and invests time in class". Moreover, students talked about points that I discuss in the following sections.

4.3.1.1 Fostering Learning Autonomy in the Future Through Flipped Learning

Some participants who supported the adoption of flipped learning claimed that it facilitates learning autonomy because it can enhance students' future independence. Independent students are those who can study on their own, try to solve their learning problems, direct their learning, use resources, and take ownership of some aspects of the learning process. Learning autonomy, or self-directed learning, is learning without teacher supervision or class attendance; the learners thus depend on themselves to gain knowledge and 'design their own learning goals, adopt appropriate strategies for learning, and evaluate their learning results' (Hao, 2016, p. 84). In the focus-group interviews and the open-ended questionnaire, the students frequently referred to learning autonomy as *self-learning* and *self-reliance*. Mona referred to self-learning during her focus-group interview, and she thought that flipped learning could contribute to changing the minds of those who are afraid of self-learning: "I think flipped learning can change the ideas of students who think that they cannot learn by themselves, thus helping them rely on themselves in the future, so it encourages self-learning when they try studying alone at home". Noha said, "[Flipped learning] trained me to be more independent and to not depend on someone else". In addition, Dalal said, "In the future, this kind of learning can change the minds of students who think that they cannot learn independently. They just need self-discipline, desire, and motivation". Similarly, Fai commented about flipped learning's future in the questionnaire when she wrote, "It is a new way to enhance a student's self-reliance in their learning in the future".

According to Weinstein (1987), "If we agree that helping students to accept more responsibility for their own learning is an important goal, then we must help them develop the competencies and attitudes needed for self-directed learning" (p. 590). Therefore, flipped learning can introduce students to learning autonomy by encouraging them to try studying by themselves and depending on themselves. Flipped learning does not provide complete learning autonomy, however, because the teacher provides supervision and instructional resources. It gives students the opportunity to discover their ability to learn by themselves by studying new subjects at home, thus granting them responsibility for their own learning, which may in turn increase their readiness for autonomous learning more generally. In this study, some students seemed very ready to be independent, even in the preparation stage of flipped learning outside the classroom. They studied learning materials very well before

classes and took considerable responsibility for their own learning, and they began showing self-directed learning. Students are expected to direct their learning when completing flipped-learning class activities, such as trying to solve a problem within a case study.

To sum up, flipped learning may encourage autonomous learning and (later, in class) collaborative learning. Therefore, there are two components of flipped learning: individual learning at home and collaborative learning in class, so this method may suit many learners.

4.3.1.2 A solution for Overcrowded Classrooms

Participants also pointed to the possibility of flipped learning in contributing to solving the problem of classrooms packed with students in the universities in the future. The solution can be represented through pre-studying at home, which helps them to share their knowledge and combine it in the classroom, enabling the teacher to communicate with them during the class and answer their questions with the possibility of practice activities - currently not countered in some classes. Some students saw flipped learning as a way of resolving issues associated with large class sizes. As Maha said in her interview:

> We have time in class to do activities and talk with the teacher, but we cannot do that if the class is full of students and the teacher does normal lectures. It cannot be denied that this strategy [flipped learning] can help universities and perhaps also public schools to provide a better education for crowded classrooms.

This view showed that flipped learning can have a role in the future to offer good education in the full classes in universities and also she recommended it in public schools, even in the university or public education system in Saudi Arabia. Also Farida wrote in the questionnaire "students can practice activities even in full classes, so no problem to have full classes and admit more students in some sections". I think this statement is interesting, as some educators say that flipped learning works only with a small number of students because face-to-face flipped-learning sessions are interactive, but big classes cannot be active. Students saw flipped learning, however, as a possible solution for large classes because this approach gives them the time they need to do what they cannot do when the class is overcrowded. For example, they can perform activities or interact with the teacher.

4.3.1.3 Enhancing the Acceptance of More Online Learning in the Future

Participants seemed to appreciate the continuation of flipped learning in the future because of its overlap with e-learning; in turn they saw this as creating a bridge to facilitate more acceptance of online learning. They frequently mentioned this point in the focus group interviews and in the open-ended questionnaire. Amal mentioned this point when she commented: "I feel that it is not too difficult to enrol in online courses in the future". It seems that her experience for the electronic portion of the flipped learning was a positive experience, which made the student ease into online learning (which she might have to do in the future) because she experienced it and tested her performance and capabilities through it. Likewise, Reem said: "It [flipped learning] gives us a good idea and experience about online learning". In addition, Suaad commented, "I think I can study remotely [online learning] in the future if I need to". Flipped learning seemed to increase Suaad's acceptance of online learning in the future. Moreover, Rand stated, "I think that, if teachers apply flipped learning in the future, it could help students who do not accept the idea of relying on themselves through e-learning [online learning], so it may help them to accept e-learning". Rand also shared the same idea as her colleagues, which stressed on the possible role of flipped learning in promoting the acceptance of more online learning in the future.

4.3.1.4 A Cumulative Electronic Resource of Knowledge

The participants reported that flipped learning might provide a cumulative electronic source of knowledge for learning institutions and students. The following quotes reflect this point of view. For instance, Alaa pointed out: "We will have a group of videos for each course and we can return to the needed information any time". Furthermore, Rawan referred to the possibility of reviewing educational materials and returning to them when needed in the future when she said: "We can review anything in the future because we have the videos". Also, Maha suggested the possibility of making the courses library by using videos, which may help university departments when she said: "University departments can use videos to make a good library for the courses, they can use it to benefit students and even teachers".

Therefore, recorded videos for flipped lessons can make a knowledge bank that can be archived and might facilitate students' learning in the future and also may help teachers. Students' perceptions and comments bring to mind shared-resource sites such as Creative Commons, an American noncommercial organization dedicated to increasing the amount of resources ready for others to share and building on them lawfully (Creative Commons, n.d.), and "the [Creative Commons] mechanism was designed for facilitating content sharing in general contexts. However, it may be helpful in the educational context as it may encourage students to create and share their work" (Liu *et al.*, 2014, p. 682). When teachers put resources such as TED videos on the Internet, other teachers, especially those who live in poorer countries, can use and share them.

4.3.2 No Enthusiasm for Future Application

What might limit the adoption of flipped learning?

The group of participants who were not excited about the future application of flipped learning gave a variety of reasons including: students' self-commitment, students' homework load, and excessive pressures on the teacher. Noha said: "In the future, I expect it is not suitable for all types of students. Some of the students have no self-commitment. They may be slack. Some will say "I will watch the video and I will not attend the class". Noha saw that there might be an inconsistent nature in what she saw as non-committed students, and that this may engender laxity in their studies and class absence. In addition, Moneera thought that flipped learning would not be used in the future because the essential preparation at home, which takes a significant amount of student time, as she said: "Flipped learning takes up a considerable part of student's time at home, so I do not think that will expand its use in the future". Then there were participants who emphasized the new possible burdens of the teacher as a result of flipped learning as a reason for hesitating for its future acceptance and application. Sarah stated: "I enjoyed it but it causes work overload on the teachers if applied in the future". Also, Moneera wrote, "I see it is exhausting to the teacher in terms of video preparation and activities". Such difficulties are more extreme for teachers and students who have two or three flipped courses.

4.3.2.1 Flipped Learning Is Not for All Topics

In the focus-group interviews, the participants discussed a very interesting issue: Flipped learning is not suitable for all fields of learning, which makes it difficult to apply to all disciplines and educational departments; when a teacher decides to flip a course, he or she might only be able to flip selected lessons.

The participants supported such mixed teaching methods. For example, Rand stated, "The flipped way is good, but traditional lectures are not bad, either. I think we need both from time to time during the course". In addition, Amal said, "I think teachers need to flip some lessons that are complicated or too long and to also keep the lecture system for others". Moreover, Reem said, "Because flipped learning requires a lot of effort from the teacher and the student, so it should be limited and used only when it is needed". Rawan also wrote (in the questionnaire),

> I think it is important to consider the nature of the lesson. . . . I advise exchange between lecturing and flipped learning according to the nature of the lesson. Some lessons that need activities may fit better with flipped learning than with other methods.

Thus, the students thought that teachers could use flipped learning during one session and also use traditional teaching methods when appropriate, and they gave three reasons for this. First, lecturing is not detrimental and cannot always be excluded, and its use appeals to those who are comfortable with the lecture method. Second, flipped learning requires a great deal of time and effort, so when choosing lessons to flip, limiting its use is a relief for the teacher and for the students. Lastly, selections must be based on the nature of the lessons.

On the other hand, some participants recommended that flipped learning be used for specific subjects. They reported that flipped learning could be beneficial in subjects such as English language courses and the sciences. For instance, Suaad said,

> I think that using this method will be very good in English courses . . . when students are given video lessons in advance and then are able to study and practice the grammar and pronunciation at home, on the condition that classroom activities be more intense and the students reach more advanced levels.

In addition, Amal said, “I would like to point out that flipped learning is perfect for science, but I have some reservations about its application to some social sciences—for example, topics that just talk about dates and history and events”.
Lana also said: “I think that flipped learning is good for prerequisite courses, so we can review it at home before class time, sometimes we need to remember some definitions or procedures we already studied in the past”.

Furthermore, during one of the focus group interviews Ghosson said: “My specialization is Islamic Studies, I think that flipped learning is not appropriate for some topics like Tajweed Quran, I think that the course is difficult to be flipped”.
Fai supported Ghosson, in her argument and expanded on the point:

> It is good to have some supported videos that contain Tajweed Quran rules, but not full flipped learning, because we need to watch the teacher’s face directly when she explains the rules, we need to observe the movement of her tongue, jaw, and lips, seeing the letters’ pronunciation, and you know that she cannot do that in a video. Also, we need her to correct our pronunciation …our teacher sometimes gives some learning videos, but after the lectures, these videos contain pictures for mouth, teeth, and jaw shapes to indicate the pronunciation method as well as to contain some sounds. I use the videos for review.

Sahar said to Fai: “I think she can make these corrections during flipped learning and she has time to correct your pronunciation”.
Fai responded: “I have to see her when she explains lessons, and I need to repeat directly after her, and she should correct me if I make any mistakes”.
Ghosson thought that flipped learning is not suitable for all courses and she gave Tajweed Quran as an example of her point. Tajweed Quran is one of the Islamic Studies Department courses. This department is one of the Education College departments, and all of its students have to study “Technology Integration in the Learning Environment”, which was the flipped course during the project. Some of the research participants were from this department. Tajweed Quran means the correct way to read the Holy Quran and follow the main rules of pronunciation while reading the Quran. Ghosson supposed that it would be difficult to flip this course. In addition, Fai appreciated videos as a learning-assisted tool, which contain images and voices, in addition to the traditional lecture, but shared the same belief with Ghosson that Tajweed Quran should not be flipped. She explained that she needs to observe her

teacher directly when she explains Tajweed rules, to practice with the teacher, and to have the teacher correct her mistakes. She wants to watch her teacher and the only way that she can see her teacher's explanations is face-to-face because, according to Saudi culture, the teacher may not show her face in recorded videos. As a result, she evaluated the learning videos as a secondary method that helped her to review lessons, only. Moreover, when her classmate Sahar suggested that flipped learning may offer the needed time for the practice and correction, Fai repeated her view of the need for a traditional lecture for direct viewing and then application and correction.
Also, Rana wrote in the open-ended questionnaire

> I think that it [flipped learning] is not suitable for religious specialization, but is suitable for disciplines whose subjects contain procedures and steps. As well as the long lessons that take up the lecture time not providing the opportunity for discussion.

Rana thought flipped learning may suit some topics that have processes or practices more than theoretical topics, like religious specializations, and also may suit the long topics that do not give an opportunity for further discussion in class. According to Roehl, Reddy, and Shannon (2013), "the flipped classroom may not be applicable to all subjects" (p. 47), which means that flipped learning may not give positive results all the time when it is applied to different subjects. For example, Strayer's (2007) study that compared a traditional classroom and a flipped classroom for a statistics course and he found that students in a flipped class were less satisfied than the students who participated in traditional classes. Flipped-class students were uncomfortable in the new learning environment that required working in groups. Also, they preferred to do their homework in the traditional way at home and by themselves. Nevertheless, Strayer's (2012) comparison between flipped-class students and traditional-class students in terms of cooperation and innovative experiences found that flipped-learning students are more cooperative and innovative in their learning.

4.3.2.2 Lack of Class Attendance

Class attendance in a flipped classroom may be considered evidence of the students' engagement levels. As mentioned previously, one of the advantages of flipped learning is that students show a high level of engagement in some aspects, including a

commitment to attending classes. However, some participants in this study discussed the issue of deliberate absences from the classroom, which may make the adoption of flipped learning difficult. Some participants mentioned that some of their colleagues might tolerate absences because the lecture content has already been covered. For instance, Shahd said, "I think flipped learning will increase students' abstention rate because they think that they already have mastered the required learning and have no need for more information, and they may think that their attendance is just waste of time". Shahd meant that students may feel no need to attend the classes as long as they have learned about the new lessons through video lectures; they do not want to do more work in the classroom. As mentioned regarding the themes of flexibility and accessibility, when a student must be absent, he or she can feel safe because the needed learning content is available. However, for other students, the availability of content may make them feel safe to avoid attending the lectures.

In addition, Moneera reported, "I feel that I am excited to attend other lectures, but I feel that I am too lazy to attend the flipped one because I have already watched it". Moneera meant that watching lectures before class made her not want to attend the flipped class. I think the elements of surprise and new information play an important role in motivating some students to attend lectures. For example, Moneera seemed to lose her excitement or enjoyment because she already knew the lectures' content. Her curiosity to learn new information may have been low, thus affecting her task value. As a result, she seemed to not be motivated to attend classes because she considered attendance to not be important for her. Task value refers to "beliefs about the importance of, interest in, and value of the task" (Pintrich, 1999, p. 462). According to Pintrich (1999), "The importance component of task value refers to the individuals' perceptions of the task's importance or salience for them." (p. 465). Moneera's task value was low, which led her to have little desire to attend the flipped classes. Pintrich addressed this issue by noting that "Task value beliefs are positively related to self-regulated learning. Students who believe that their course work is interesting, important, and useful are more likely to report the use of self-regulatory strategies" (p. 467). Thus, some participants believe that watching video lectures at home is enough and that they have no need for class activities; dealing with these less self-regulated learners may be considered to be a real future challenge within flipped learning.

4.3.3 Future Developed Application

What practices might improve flipped learning?

There were participants who were enthusiastic about applying the strategy but under certain conditions or actions and gave some suggestions and recommendations to improve flipped learning.

4.3.3.1 Need of Continuous Evaluation

Lana highlighted the need for continuous evaluation or formative testing during flipped learning when she said:

> I think it is good to adapt flipped learning in the future but with some controls like a frequent test procedure [formative test] to ensure that the student has achieved the desired objectives and the students understand everything, and these tests should not be scored, so as not put a load on the student.

Formative testing may not be advisable in applying flipped learning because it can over-burden students. Additionally, we know student knowledge is more than quantifiable information; it is through practice and experience.

In addition, Mona suggested, “I recommend teachers in the future to call some students by name at the beginning of each class and ask them some questions to make them take studying at home seriously and to become more committed and not dependent on their colleagues”. It is noteworthy that this discussion is about accountability and careful monitoring. Thus, learners may feel that their teachers are watching them. This perceived invasion may conflict with self-regulated learning, in which students monitor themselves.

4.3.3.2 Need of instant feedback outside the classroom

Most of the participants stressed the importance of instant feedback from outside the classroom in future applications of flipped learning. Dalal mentioned the importance of immediate feedback when she said: “I recommend flipped learning to be applied in the future, but we need direct feedback. We cannot wait till the class time. If they apply it, they need to solve the direct feedback problem”.

In addition, Alaa stated, "I think it will be very good if we have like a discussion forum to discuss any video issues together [with her classmates] or with the teacher … if we need further explanation." Alaa's suggestion is another sign of the need for feedback while studying outside the classroom. Her suggestion is also compatible with one of the participants' suggestions in Roach's (2014) study.

4.3.3.3 Following the Best Practices of Video Design Within Flipped Learning Context

Through deductive analysis of the data, I found that students discussed many issues related to the video-design principles that they think should be included to make effective videos for flipped learning. These perceptions may help teachers understand and account for students' needs when they design learning videos in a flipped-learning context. In addition, teachers need not include all of the students' suggestions in the blueprint for the design of these videos, but the students' suggestions do present an opportunity to understand their needs and to use that knowledge to guide students when they lack understanding of an educational issue. For example, some students thought that the videos should be very short, easy, or funny. Therefore, educators should be careful and be aware of their duty to tell their learners that, with this technology, age can impact education, for not everything that appears on the screen should be easy or funny.

In this next section, I describe the participants' opinions, which I obtained from the focus-group interviews and the open-ended questionnaire, and I attempt to relate their responses to aspects of the relevant literature. These findings led me to return to Mayer's (2009) work in particular, where he identified a list of principles of multimedia design based on the cognitive theory of multimedia learning. Mayer's work formed a strong connection between my participants' perceptions and some of his principles. I found that my data fit with Mayer's theories and work, so I have used those principles as a framework; this has helped me analyse and discuss my data. I also used Mayer's principles' names to identify my themes. Thus, I analysed and discussed the students' perceptions of the following themes:

- coherence;

- redundancy;
- signalling;
- segmenting;
- pretraining;
- modality;
- multimedia; and
- personalization, voice, and image.

However, some of the participants added some suggestions or needs that Mayer (2009) did not include in his theory, so I also analysed other video-design principles on the following themes:

- creativity,
- video duration, and
- meeting students' diverse needs.

I generated all the above themes from the students' responses. The reader could argue that these principles are axioms in multimedia design, but some educators neglect them. Consequently, the lists can serve as a guide or a reminder for teachers who are designing videos.

Coherence

Participants expressed the need for and importance of short videos containing only the necessary information, and they criticized the inclusion of details in the videos. They mentioned these issues frequently in the open-ended questionnaire and the focus group interviews. The following excerpt from Mai's open-ended questionnaire shows her view of a good video:

> I consider a good video as one that contains the basic information of the lesson without extra details or not related to the topic; for example, in one of the videos in this course where the teacher during the explanation of the video linked to a website to review a definition, whereas she could have mentioned that anyone who wanted to read it could read it by herself. . . . I saw that it wasted time for the video, and the details caused distraction.

Similarly, Alaa said, "the teacher should put only very related pictures or written

speech [text]". Also, Noor said, "I appreciate the teachers' efforts when they make videos and they give great and interesting information, but we need the most important information". Moreover, Mona stated that "it is not correct to show more than one image at a time or a lot of text… a lot of padding in the video causes dispersion and non-focusing". In addition, Noor said:,

> I think videos are suitable when they are made by our teacher, so I feel reassured that she has put in everything we need, while the videos that are taken from the Internet may include details that we do not need.

Mona found that cluttered videos with too much content and text could cause distraction. She pointed to the need for carefully structured videos that focus on one point at a time to support students' understanding, help them acquire knowledge, and increase their content selectivity. Noor considered the videos that her teacher made to be appropriate because those videos included only the necessary knowledge and excluded undesired details.

The aforementioned perceptions are clear evidence that teachers should take these important principles into consideration when they design videos: including basic and relevant information, avoiding excessive details, not showing more than one picture at a time, and considering selectivity when choosing images or text. The students in this study thought that details were interesting and sometimes beneficial but that they could be distracting and could waste time during a video. This opinion reflects Mayer's (2009) coherence principle, which stresses the necessity of including basic knowledge and of avoiding details when designing learning presentations. Students' perceptions are important, but some of their opinions can indicate misunderstandings. The students in this study, however, would only have their teachers omit the less important details; I agree that, when they design videos, teachers should avoid adding secondary details that are not necessary for content comprehension. We have to inform students, however, that details can be necessary and therefore should sometimes be included in the videos.

Furthermore**,** Suaad was the only participant who pointed out the importance of interlacing and sequencing video content, and she considered this to be a good standard to adhere to when possible. She wrote in the questionnaire, "The content of the educational videos for this course was interrelated and sequential, which is good".

Therefore, based on Suaad's view, the learning content that the videos provide should be logically coherent and sequenced.

Redundancy

Participants found that the availability of images, and presenting voice and text at the same time, are major issues with learning videos. One of the principles agreed upon by most students is the need for organization in video design in order to increase understanding of the educational content. The students conceived of organization as a lack of accumulation of text and images and the need to display images with only a voice commentary on them (without text). Hala said:

> One of the most important things to do with video is organization even in the PowerPoint slides. . . . I do not like accumulated text and putting pictures at the same time with the voice of the teacher when she explains. I cannot focus in this case: should I read the text or see the picture or listen to the explanation? . . . Or motion images and voice and text all in the same time.

In addition, Mai wrote in the questionnaire, "I like an organized video, so that it contains only pictures or charts and the audio of the teacher's voice when she explains". Similarly, Fai said:

> I do not like the videos that contain written speech [text], and the audio is reading that speech [text], because it is boring and does not add so much for me, but it is good to have pictures and the teacher commenting on them.

Participants in this study frequently used the word "organization" to describe the need for presenting visual objects on the screen and the need for narration to comment on the visuals. The participants might have chosen the word of "organization" a reflection of their feelings regarding what happened when the messy competition occurred in their cognitive channels and as a reflection of the need for organization in order to recognize objects after looking at the text and the pictures on the screen and listening to the audio in the same moment. According to Mayer's (2009) redundancy principle, students learn better from pictures and narration than from pictures, narration, and onscreen text.

Signalling

My participants expressed the importance of assistance that emerges through hints or cues that may help them through the learning process. For example, in a focus group

interview, Dalal said, “I think it is important to put significant points of the texts in the video clearly, for example in a rectangle or a circle with coloured borders”. Also, Noha mentioned that “Arrows show important points in images and graphics”. In addition, Rana said, “I feel the importance of some of the lesson parts from the pronunciation of the teacher, such as when she emphasizes words or repeats them; then I think it is important”. Lastly, Sarah said, “I like when the teacher says in a video ‘this is important’ or ‘please pay attention to this’ I try to take notes directly”.

Participants appreciated some kinds of cues or signs like using shapes with coloured borders for texts, arrows that included with graphics, different intonation, and reminder words. Including these cues in learning videos is considered an interactive element that may promote learning (Wouters *et al*, 2007). Sarah made me think about whether in the future there would be a new genre for the video that is dedicated to flipped learning so that its language has specialized features. Just as there is a language for dramatic and romantic genres, there may be a language for flipped learning videos.

According to Mayer’s (2009) signalling principle, students may learn better when cues or signs are inserted in the presentation. In this study, the participants considered signalling as important assistance that may facilitate their learning. They mentioned the importance of adding some items such as arrows and shapes, stressing words, and changing intonations in the videos.

Segmenting

Interactivity was an important criterion that students mentioned frequently when sharing their perceptions in the open-ended questionnaire. Based on students’ perceptions, interactivity means the ability to control the sequencing or pacing of a lesson. This meaning of interactivity has been adopted in many studies. It means students can speed (Fast-forward), start, and stop videos, whereas noninteractive videos let students only watch from the beginning to the end without any ability to stop or direct the learning video (Domagk and Schwartz, 2010). Alaa reported, “I like to move from point to another one based on my desire. . . . I need to jump from one topic to another one, or start in the middle”. Similarly, Noha wrote,

> We use learning videos in another course, but I hate it because when I start I need to watch it to the end, and if I need to repeat some point I have to start from the beginning. . . . I prefer to stop and repeat as I want.

Moreover, some participants expressed their preference for hypervideo, or hyperlinked video, which is a kind of video that includes hyperlinks that support content or can be used to navigate through the video (Dakss *et al*, 2003). For example, videos may contain embedded hyperlinks to explain a term or translate it. In one of the focus group interviews, Sarah said, "It is good to have links through the video to review old terms or give a definition or example because the videos are short". Also, Rand said, "I like the 'skip advertisements' feature on YouTube. I would like to skip some information that I do not need in the video, such as those advertisements".

According to Schwan and Riempp (2004), such interactive or hyperlinked videos have the key features of "'new media':

- non-linear structure, and
- interactivity, which gives users the opportunity to decide on the 'what' and the 'how' of the information presentation" (p. 294).

Thus, based on the previous characteristics, we can describe a video as interactive when "the user affects the flow of the video and that influence, in turn, affects the user's future choices" (Stenzler and Eckert, 1996, p. 77).

As a result, teachers should try to produce educational videos that have interactive features to help students through the learning process. Schwan and Riempp (2004) found that viewers of interactive videos improved their understanding of the content shown more than viewers of non-interactive videos (p. 303). Another advantage of pacing was found in Schwan and Riempp's (2004) study in which participants used videos to learn how to tie nautical knots of various complexity (p. 293). The group of participants who were allowed to pace the video presentation required considerably less time to learn the essential skills to tie nautical knots than the participants who watched a non-interactive video.

In the current study, the participants stressed the importance of the ability to control the sequencing of the lesson or the pacing. According to Mayer (2009), students learn better when the multimedia learning content is supplied in student-based segments instead of as a continuous part, and this is what Mayer called a *segment principle*. In

addition, in the flipped learning project, some video lessons came in multiple parts or segments, and students appreciated that the content had been divided into multiple short videos in some lessons rather than together in a continuous, long video.

Pretraining

In one of the focus group interviews, Lana argued that videos do not explain everything when she said, "sometimes I need to stop a video many times to review a term then return to the video. . . . It is good if the video explains everything". When I asked her about the kinds of terms that she reviewed, she answered, "things that I already studied in the past but I forgot them and need to review them".

Lana explained that her problem while watching videos was the need to continuously stop to review content objects. She was not referring to adding new content but meant that she needed to review terms and prior knowledge. Thus, she reported her demand for providing essential prior knowledge in videos because, otherwise, she had to repeatedly stop watching to review the previous knowledge. Lana's frequent discontinuance was the result of her attempt to engage in cognitive processing during the presentation, as her lack of prior knowledge led to her inability to fully engage. Therefore, she claimed that supplying the previous knowledge for review is necessary in the designing of educational videos. This suggestion by Lana is what Mayer (2009) calls the *pretraining principle*, which means that students learn well from a multimedia performance when they understand the features and terms of the basic concepts.

As frequently mentioned, videos in flipped learning should be short and should not cover everything because students need to continue to construct their learning in the classroom. In some situations, I think teachers should provide a short introduction or a review of previous content that relates to the current content in an optional video for each lecture as an introductory resource for anyone who needs it.

Modality

When Mai wrote in the questionnaire "I like the organized videos that contain only pictures or charts and the audio of the teacher's voice when she explains," I understood from the word "only" in her perceptions that she needed nothing more

besides the pictures and the teacher's voice. Thus, she can learn when these two items are available. Moreover, Fai talked frankly about that when she said,

> I do not like the videos that contain written speech [texts] and the audio is reading that speech [text], because it is boring and does not add so much for me, but it is good to have pictures and the teacher commenting on them.

The previous mentioned evidences may support the modality principle. This principle means that a student learns more intensely from images and verbal words than from images and printed texts (Mayer, 2009).

Multimedia

Some students in the present study expressed their demand for and appreciation of presenting pictures and different graphics with the narration when the teacher explains lessons. For example, Fai said, "I do not like the videos that contain written speech [texts], and the audio is reading that speech [text], because it is boring and does not add so much for me, but it is good to have pictures and the teacher commenting on them". Likewise, Mai wrote in the questionnaire, "I like the organized videos that contain only pictures or charts and the audio of the teacher's voice when she explains".

The students may have felt that presenting images with words helped them to build mental models in their verbal and visual channels and then encouraged them to construct connections between them. This kind of engagement may lead them to be engaged in the generative processing. Thus, students considered the availability of words and pictures together to be better than words only, and this is the essence of the multimedia principle.

Personalization, Voice, and Image

At the beginning of the course, the teacher was not confident enough to use her voice in videos. I helped her by putting my voice in some of the videos. She also used another person's voice in other videos. After that, though, she started to use her own voice. Most of the participants talked about videos that had been created by their teacher. They expressed that they appreciated their teachers' effort, and they considered the existence of their own teacher's voice to be a significant element in the learning videos. They also commented about teacher language and the importance of

selectivity when their teacher used alternative video sources. One of the participants, Amal, gave her opinion about that:

> I like when the teacher puts her own voice in the videos; because we do not have a normal [traditional] lecture, when I hear her voice, I feel that this is a true alternative lecture. I also like to hear her comments; for instance, when she stresses a certain point, I feel that it is important.

Also, Fai commented, "I prefer the videos made by our teacher because I feel comfortable; it's better than using the ready-made recordings [videos]". It seemed that participants had an expectation of flipped learning videos that was different to their expectation of other types of videos. They really appreciated that they could hear their teacher's voice at home, and they seemed to feel safe and happy when they listened to her at home. They might have needed the continuity of the class atmosphere at home, the continuity between what happens in the classroom and what happens at home, thus, they wanted that connection.

Rana said, "I could remember her voice and the graphics when I was answering questions on the exam". Therefore, the participants stressed the importance of having videos that were developed by their teacher and that used her voice. Also, the participants raised the issue of using ready-made lectures rather than their teacher's video lectures. Some participants stated that they preferred when the teacher made videos rather than using ready-made videos. Participants thought that their teacher understood the course and she is part of the course.

Also, Noor said:,

> I think videos are suitable when they are made by our teacher, so I feel reassured that she has put in everything we need, while the videos that are taken from the Internet may include details that we do not need . . . unless there are good videos in the subject matter and elements of the lesson.

Similarly, she said, "Our teacher will state the important points for us". Noor thought the teacher's videos were more likely to contain what the students needed and exclude undesirable details and information.

Moreover, students valued the existence of the teacher's voice despite the absence of her face. Shahd highlighted this point when she wrote in the questionnaire, "I did not face any problem with the videos because I felt my teacher with me and I could hear her voice like in the class". She stated that she did not face problems because she

heard the teacher's voice as she did in the classroom. This means that the teacher's voice meant a lot to her. Amal also said, "We do not see her face like when she is lecturing in the class, but having her voice in the video is good". In addition, Fai gave an important reason for the preference of the teacher-created videos when she said,

> I do not like the videos made by others that are available online. . . . Her [the teacher's] style of speech is closer to us and her talking is directed to us. . . . It is not as if someone in the video does not know us.

Thus, Fai mentioned the importance of the acceptance of the teacher's way of speaking and a sense of familiarity.

However, Moneerah said, "In traditional lectures there is a sound and a picture of the teacher so I can focus, but in the video I listen to her voice only so the traditional lecture is sometimes better than the video". Moneerah was comparing a traditional lecture to a video lecture, and she linked her ability to focus and gain information to the existence of the voice and image of the teacher together. Therefore, so she found that a traditional lecture was better for her because of the availability of both elements.

Students also considered that using simple and informal language is an important principle of video design. For instance, Rand said, "I think the teacher should use easy language when she speaks through videos, like when she talks with us in the class".

On the other hand, Noor mentioned the importance of selectivity in the case of using alternative sources. She indicated the need to choose carefully and take into account that these sources should help in achieving the objectives of the lesson and include all its elements. Long, Logan, and Waugh's (2016) study reported some findings from a survey about how students value pre-class experiences within flipped classrooms. They found that instructor-developed video (IDV) was the learners' favourite, followed by alternative source video (ASV) (p. 250). The researchers stated that IDV ranked highest because they gave students the experience of hearing their teacher's voice while watching videos.

In this research, the participants commented on the importance of using simple and conversational language through videos, which reflects Mayer's (2009) personalization principle. This principle emphasizes the importance of using informal language through multimedia presentation because learners think that the creator is

speaking with them and they are more likely to consider him or her as a conversational party and, accordingly, will try to understand the other party who is talking in the learning presentation.

Also, they stressed the importance of the teacher's voice when they appreciated videos that were made by their teacher. They reported that teacher's voice was familiar to them and that she spoke to them directly. Amal said, "Her [the teacher's] style of speech is closer to us and her talking is directed to us". The importance that students give to their teacher's voice and their demand to hear it in the video reflects Meyer's (2009) voice principle that "people learn better when the narration in multimedia lessons is spoken in a friendly human voice rather than a machine voice" (p. 268). Moreover, Mayer's (2009) image principle is that learners do not really learn better from a multimedia performance when the orator emerges on the screen through the means of inserting his or her image.

The theoretical explanation for this is that the presence of the speaker's image on the screen in the absence of an urgent need may lead to the distraction of the student, and the student may waste a part of her or his image processing ability when the image of the speaker appears at the same moment as another image in the displayed content. In this study, Moneerah was a student who needed a voice and the face of the teacher to be able to absorb lessons whereas the majority of students found that the availability of the voice of the teacher was enough for them.

Creativity

According to students' perceptions in previous sections, teachers should not be worried about not being professional video makers, because what the students want may be basic needs according to Mayer's (2009) theory, which states that multimedia design principles have been developed in line with how the human brain works. However, students gave some perceptions could be considered high expectations of teachers. I discuss them here because they are part of the students' perceptions and may suggest further studies in the future; they may also inform teachers about some students' expectations that need to be guided, as it is very easy for students to list things they think teachers should do. One of these high expectations is creativity.

Students reported directly and indirectly their perceptions that there is an urgent need for what they called "creativity", which they considered an important element of designing videos. There is much research about creativity in education and what it means. However, I interpret this term in the manner that the students defined for me. Thus, in reporting students' comments about creativity, I try to reflect the perceptions of what this means for them. Students thought, for example, that teachers should use original ideas from time to time while producing learning videos. This led me to conclude that students could make videos in the future.

They defined creativity as avoiding repetition and routine in design, not presenting videos in a normal way, attractiveness, and originality of the ideas to grab their attention and increase engagement. Mona wrote in the questionnaire, "Learning videos need to be designed in un-normal way to attract us". Also, Amal mentioned that "Videos were normal, but they should be more attractive and creative." Noha said, "I loved the videos that were made in an innovative way". Amal's comment was a sign from her that there is a need for creativity. In the focus group discussions, Moneerah said, "We like videos that contain new ideas and creative design". Moreover, Maha gave an example of new ideas that could be applied when the teacher designed videos, which I considered a kind of need for creativity. She said, "It is good to make, like, a break in a video and show, like, a wise message or very short story". Hence, students thought that teachers should use original ideas from time to time while producing learning videos.

According to the National Advisory Committee on Creative and Cultural Education (1999) creativity means "imaginative activity fashioned so as to produce outcomes that are both original and of value" (Loveless, 2002, p. 3). This definition focused on the use of imagination to give products of value and originality. Similarly, "Creativity has been defined as a product or process that shows a balance of originality and value. It is a skill, an ability to make unforeseen connections and to generate new and appropriate ideas" (Ferrari *et al*, 2009, p. III).

In this age, modern and sophisticated technologies have become able to support creativity, but we must know how to employ them to serve that in an appropriate way. "Learners and teachers can use ICT [information and communications technologies] to support imaginative expression, autonomy and collaboration . . . being original and

judging value." (Loveless, 2002, p. 2). Loveless (2002) suggested that there are some learning and teaching methods that can support creativity through using technology. Examples include developing ideas, which means supporting original assumptions and carrying out examination and demonstration of ideas, and making connections, which means developing, supporting encounters, and supporting ideas by creating connections with resources, people, information, and projects. Another example is transformation of media and manipulation (p. 4). Moreover, students can collaborate with others in instant and active ways to construct knowledge together. Also, they can make connections between videos and events, students, and information. Finally, they can collaborate with other teachers to produce videos. Moreover, they need to be open to their students' critiques and comments to improve the quality of learning videos.

Lastly, creativity has become an urgent requirement according students' perceptions, and it may help them to engage in and learn from educational sources. The adoption of creativity in the design of educational videos may inspire students, increase their awareness of the importance of creativity, and provide them with new ideas. According to Berk (2009), one of the values that learning videos foster for students is creativity. This leads me to think whether we get students to make videos in the future.

Finally, I would like to add here that through the students' discussions with me, I often recognized media discourse within their comments. For example, it seems that the term *creativity* and the idea of uncluttered screens has become part of common parlance. I often wondered whether the students' views were simply reflecting media interests as opposed to their own, but there is no way of knowing the full effect of these media influences.

Video Duration

Participants often talked and gave perceptions about the duration of videos. Some saw the need to shorten the duration of the presentation whereas others felt the need to lengthen it. For example, in the focus group interview, Rana said "Video duration is very important for me. I do not like long videos to just be long and contain marginal information or to be so short that I cannot understand the lesson through it; it must be balanced". Also, in Reem's interview, she highlighted the importance of short videos when she said, "I like the system of short videos. I can concentrate and not be bored,

not like in long videos". Moreover, in one context, Amal referred to the importance of this criterion when she said, "video length is very important".

However, some participants reported that videos were too short or that all videos for individual lessons need to be in one long video. For instance, Dalal said, "I think videos need to be longer," and Lana recommended the following in the open-ended questionnaire:

> Maybe video duration needs change. I do not like the idea of cutting videos into two or three parts. I feel that distracts me. Sometimes I am joyful and focused on watching and then the video ends. I would like them [videos] to be together the next time.

In the current study, the length of each video was 10–15 minutes, and each lecture has two to three short videos because the videos' function was only to establish and outline the lessons and not to review the details that will be built later in the classroom. Many studies in flipped learning adapted a 10–15-minute length for the videos (Bergmann and Sams, 2012; Gilboy *et al.*, 2015; Kachka, 2012; Kiat and Kwong, 2014; Slomanson, 2014).

Also, this choice came as a result of the studies in which researchers argue that students cannot focus on watching a video more than 10–15 minutes. It is therefore necessary to divide the content into a number of short videos or segments to cover the content adequately. According to Gilboy *et al.* (2015),

> with online lectures, students become bored or distracted if the recorded lecture is over 15 minutes. Therefore, even if content requires more time, recorded lectures should be purposively segmented (e.g., 10–15 minutes maximum) to help minimize boredom and distractions (p. 13).

According to Kachka (2012), flipped learning will not achieve the needed goals if "the home lectures are too long" (p. 1). Video lectures are more beneficial when they are made in small parts and are as short as possible. Thus, it is a good idea to create the videos "at or less than 10 minutes". However, in Long, Logan and Waugh's (2016) study that reports some results from an open-ended questionnaire about students' preferences and attitudes about preclass experiences within flipped classrooms, students had to watch videos before classes. Most videos were 20–30 minutes in length, but other videos varied from 10 minutes to 1 hour in length. The

students proposed that the videos have to be shorter, and they thought that 20–30 minutes was the perfect duration.

Therefore, the current study adopted 10–15 minutes' duration for videos based on the appropriate duration according to literature review. However, after analysing students' perceptions, the most important thing was to educate students that in the technology age, not everything that appears on the screen should be easy, short, or fun. Traditional lectures are also long, and universities have used traditional lecturing for years. A reader here may ask, if I support long lectures, why conduct this project? I must say that new inventions do not cancel everything that preceded them but rather reinforce them or provide a solution to some circumstances.

The Meeting of Students' Diversity Needs

Learners are not equal in their abilities and needs. Thus, in this research, the teacher made videos for a standard level in order to be compatible with the majority of the students' capabilities, but some participants saw the videos as very easy. Lana stated, "Some videos provided easy information; they should be higher [more advanced]." Likewise, Noor said, "Some videos were simple". Based on Lana's and Noor's perceptions, some videos did not challenge advanced students who can learn at home and build more complex knowledge in the classroom. Consequently, as classrooms have students with different needs, there should be videos for students with advanced capabilities. As a result, flipped course teachers may need to make extra videos for the advanced students to meet their needs.

However, one of the participants mentioned a very important issue when she highlighted students with special needs, such as hard-of-hearing or deaf learners. In the focus group interview, Rawan said, "Maybe teachers put text and speech at the same time if there is a student who cannot hear very well so that she can read". According to Huereca (2015), captions should be implemented in videos for hard-of-hearing or deaf students to satisfy their needs.

Having answered the second research question, in the next section, I answer the third research question.

4.4 Responses to Research Question 3

Can flipped learning help students develop habits related to self-regulated learning?

The answer to this question has been drawn from data analysis of focus group discussions and the open-ended questionnaires, as well as through my observations, to understand participants' perceptions. Through the data analysis process, I noticed that many students inadvertently revealed experiences and perceptions regarding self-regulated learning. I found that my participants frequently revealed evidence of their cognition, motivation, behaviours, and context regulation within flipped learning. They talked about their goals, stimulus, and strategies when they learn. But it also seemed to me, that some students might be able to regulate their learning because of the flipped course. It seemed that through the experience of being involved in the project, students were also learning how to self-regulate their own learning.

I am aware that "to study self-regulated learning in context requires complexity in both theory and methods" (Meyer and Turner, 2002, p. 17). However, I could not ignore all the evidence I found through my analysis, which seemed to indicate the state of participants' self-regulated learning within the flipped learning context. According to Sletten (2017) "it was found that students' perceptions of the flipped model positively predict[ed] students' use of several types of SRL [Self-Regulated Learning] strategies" (p. 347). This led me to develop my third question in this research. As I mentioned in the Methodology chapter, I started to think about this question at the observation stage, but I was not sure of the question until I started the analysis, when the question finally took shape.

After searching for a long time and looking at the data, I found nothing better than the theory of self-regulated learning as an umbrella or framework for the issues I had identified. Self-regulated learning theory has many frameworks; I was looking for a framework that dealt with all the issues students talked about, especially because most frameworks do not discuss motivation. Then I found Pintrich's (2000) model, which is described in detail in Chapter 2. I did a systematic discovery of the self-regulated learning theory based on Pintrich's (2000) framework from the data. Then I adopted the framework and found that my data fit in it easily and smoothly. According to Glaser and Strauss (1967), "We suggest as the best approach an initial, systematic discovery of the theory from the data of social research. Then one can be relatively

sure that the theory will fit and work" (p. 3). In addition, within this theme, I described students in class in some situations and described their reports about their behaviours at home. I had concerns that this data may not fit with some people's understanding of *perceptions*. However, I felt it was important to include students' engagement in this theme because it strongly reflected their perceptions.

As discussed in the literature review, self-regulated learners are learners who have a high level of engagement in, and awareness of, their knowledge and learning strategies that support their learning, and this awareness can be called a metacognition. In other words, they know their knowledge limits, can ask for the help they need, or can design solutions or learning strategies to achieve learning goals (Zimmerman, 2002).

4.4.1 Regulation of Cognition

4.4.1.1 Cognitive Planning and Activation

During the analysis, I found the three elements of cognitive planning and activation according to Pintrich's (2000) framework. These elements are goal setting, activation of prior knowledge, and activation of metacognitive knowledge. The following sections discuss these elements.

4.4.1.1.1 Goal Setting

During the analysis of the data, it seemed to me that students tended to set their goals before studying or completing tasks, and they reported this. An example of students' perceptions regarding goal setting can be seen in Sarah's statement: "I like to read the lecture goals at the beginning of each video, and I feel comfortable when I understand all the content related to these goals." Sarah tended to set her goals by reading the goal list for each lesson, and she felt it was convenient to reach goals when she had grasped the knowledge concerning these goals. In addition, Maha reported: "It is not very difficult to organize ourselves during flipped learning. . . . I try to organise myself to do something every day between the teacher's task submission day until the night before class, so I do [reach] all of my goals". This means that Maha tried to set and identify her goals and break them down into more manageable goals for herself. Also, through my observations, I saw that some group leaders set some goals for the group members before they started tasks, especially long tasks. Setting goals and

breaking them down are very crucial tasks during self-regulated learning (Zimmerman, 1990), and "students who set specific and proximal goals for themselves displayed superior achievement and perceptions of personal efficacy". (Zimmerman, 2000, p. 65). According to Pintrich (2000),

> Of course, goal setting is most often assumed to occur before starting a task, but goal setting actually can occur at any point during performance. Learners may begin a task by setting specific goals for learning, goals for time use, and goals for eventual performance, but all of these can be adjusted and changed at any time during task performance as a function of monitoring, control, and reflection processes (p. 457).

This also means that the setting of goals is a continuous process and is not limited to a specific time such as the beginning of the task; the learner can set goals at any stage of learning, such as at the beginning, during, or even at the end to become the beginning of another task, and this was observed during this study. Goal setting and other planning aspects appear to assist students "to activate or prime relevant aspects of prior knowledge, making the organization and comprehension of the materials much easier." (Schunk & Zimmerman, 1998, p. 68). This may indicate that students can regulate their cognition during flipped learning when they plan their goals.

4.4.1.1.2 Activation of Prior Knowledge

Some of my participants mentioned their activation of prior knowledge in the focus group interviews. For example, Rand said: "I like to read the questions before watching videos because that helps me to know things that I already know and things that I do not know". This is a clear indication that the student tended to activate her prior knowledge before doing the assignments when she asked herself about subjects and issues she knew and did not know. Thus, "self-questioning activities" such as students asking themselves about their knowledge related to a particular field, problem, or topic is a form of prior knowledge activation (Pintrich, 2000, p. 457).

Moreover, prior knowledge activation appeared clearly in flipped classes when students began to activate the foundation knowledge they had already built at home to continue their building of knowledge together in the class. Some participants gave their perceptions regarding this issue in the focus group discussions. For instance, Hala said: "Brainstorming helped us in the beginning of each class to trigger our minds and it was a good start to continue our work… Then I did that by myself even

if the teacher did not ask us to do that". Brainstorming was one of the strategies used by the teacher during the inverted classes, in which she asked each working group to make a list of the most important information, definitions, and procedures that were addressed in the educational videos. Hala valued this strategy and thought it assisted her in activating her prior knowledge, and she incorporated this as a learning routine in her group without the teacher having to ask her. In addition, Amal highlighted the role of the summary in each class when she said: "the short summary in the classes can remind me of the needed knowledge". Also, their quick reviews of the videos and their notes before entering class was a form of prior knowledge activation. In addition, peer tutoring may activate prior knowledge of tutor students when they start to explain a concept or a task to their tutees or when the tutees try to solve or answer any task. Both of them may give their perceptions towards the task value. Tutees can seek needed help from their tutors.

4.4.1.1.3 Activation of Metacognitive Knowledge

> When school environment and task conditions make self-regulation demands (and the evidence indicates they commonly do), a student who has an appropriate repertoire of effective cognitive strategies (and the associated motivation to apply them) may still fail to do so in many school learning situations, as a result of poor metacognitive control. (Corno, 1986, p. 334)

Metacognition plays an important role in student learning, especially in self-regulated learning (Corno, 1986). It is not enough for students to have a range of learning strategies or good motivation if the self-regulation component of their metacognition is weak. Therefore, students may not be able to control their cognitive or motivational behaviours.

In the current study, participants discussed metacognitive knowledge activation, which refers to activation of the knowledge related to cognitive strategies and cognitive task features (Pintrich, 2000). Students talked about cognitive strategies that allowed them to think, remember, solve problems, review, or study. This led me to think that students might be able to activate metacognitive knowledge related to cognitive strategies. The evidence for this is discussed later in the adoption of cognitive strategies for learning under the Cognitive Control and Regulation section.

Students discussed some strategies such us rehearsing, note taking, screen capturing,

etc. Furthermore, Suaad provided a perception about metacognitive knowledge that related to task features, which made me think that she might be able to activate metacognitive knowledge regarding tasks. For example, when Suaad appreciated case studies, she said:

> Because these detailed examples [case studies] bring us meanings and make them more realistic, I do not like just giving definitions or problems that are not very close to the lesson, but these detailed examples [case studies] of problems I like very much.

The word *detailed* attracted my attention and reminded me of Pintrich's (2000) description:

> Metacognitive task knowledge includes knowledge about how task variations can influence cognition. For example, if there is more information provided in a question or a test, then it generally will be more easily solved than when there is little information provided. Most students come to understand this general idea and it becomes part of their metacognitive knowledge about task features. (p. 458).

Hence, through Suaad's perception, I realized that she could benefit from detailed tasks or activities because this would make her understand meanings.

4.4.1.2 Cognitive Monitoring (Metacognitive Awareness and Monitoring of Cognition)

As mentioned before, the students seemed to have metacognitive awareness. They also tended to give judgments regarding their cognition among their perceptions. An example of this can be seen in Amal's statement: "I feel that when I explain something to my friend who did not watch the video, my information will be better established, and I can remember it forever". I think this student had a high awareness about her metacognitive ability, which is the ability to establish new information when conveying it to another colleague by way of explanation. Also, she could monitor her cognition before and after her explanations for her friend and offer a judgement about that.

Also, the participant Mona explained her learning habits and highlighted the role of flipped learning in supporting these habits:

> It is an excellent strategy. I like it, and maybe it is not new for me because before university I used to prepare for the next lesson. I am the kind of student who likes to review the new lessons before classes. I see it as a good studying habit to maintain information and remember the new

concepts.

Mona showed high self-awareness of her learning routine, She thought that preparing and reviewing lessons at home within flipped learning could help her retain information. In addition, Rand said, "It is easy to review lessons; I can return to them [the learning materials] whenever I want, but I cannot return to the traditional lectures. Sometimes, when I study I wish I could record lectures. I think flipped learning facilitates my study and make it easy…". She mentioned that she is the kind of student who likes to review new information from time to time, and she found that flipped learning made it easy to review her learning, because information is available at any time.

Moreover, in Pintrich's (2000) framework, he mentions the "feeling of knowing" (Nelson & Narens, 1990; Koriat, 1993, cited in Pintrich, 2000, p. 459). This term refers to when a learner is trying to recall knowledge that the learner already knows or has read before. Koriat (1993) pointed out that there is evidence that FOK judgments are better than chance predictors of future recall performance, albeit not a perfect correlation (p. 459). I can see this kind of judgment clearly through Lana's speech: "sometimes I need to stop a video many times to review a term then return to the video . . . . It is good if the video explains everything". When I asked her for more clarification, she said, "things that I already studied in the past but I forgot them and need to review them". Hence, this student was able to judge her cognition when she was trying to recall the knowledge.

Moreover, peer tutoring may also improve metacognition awareness. According to Schunk (1987), peer tutoring gave:

> [G]reater meta-cognitive awareness and better application of knowledge and skills to new situations have been claimed. Motivational and attitudinal gains can include greater commitment, self-esteem, self-confidence and empathy with others. Much of this links with work on self-efficacy and motivated learning. (as cited in Topping, 1996, p. 325)

This leads to the "self-regulation of learning and performance" (Schunk & Zimmermann 1994, as cited in Topping, 1996, p. 325).

4.4.1.3 Cognitive Control and Regulation (Selection and Adaptation of Cognitive Strategies for Learning, Thinking)

Another component of Pintrich's (2000) framework is control of cognition, which

involves the “selection and adaption of cognitive strategies of learning and thinking” (p. 454). These learning strategies concern habits or learning methods that students use to learn more effectively (Strohmyer, 2017, p. 155). My participants mentioned some of the learning strategies they used before and in flipped learning classes which may improve their learning. These learning strategies resulted from the self-awareness of the habits or activities they practiced during learning that helped them regulate their learning.

Through students’ perceptions, they reported that they adopted strategies that facilitated their learning to better conduct learning tasks and achieve goals. For example, Maha reported, “It [flipped learning] has benefits like, umm . . . I captured some screenshots to review before class to help me get involved with my group”. She took advantage of the availability of videos before class time to capture screens and use them to review the information before sessions to engage with her colleagues during activities. Taking notes and drawing flowcharts or mind maps were also mentioned as one of the learning strategies the students use to enhance their performance. Also, some students brought learning materials to the class, and they highlighted some parts or lines. In addition, they summarized the main points in small paragraphs or by taking notes with elaboration. The participants also talked about other elaboration strategies such as asking and answering questions for themselves during studying. In addition, they came to classes with a network of sketches, flowcharts, or mind maps. Evidence of this can be seen in Ghadah’s statement: “I think there is a study habit that I benefited from when I study during this course, which is that I took notes while watching videos to help me solve the attached questions”. Also, Mona gave an example of an organizational strategy when she said, “ . . . the mind maps that we did in the class were very beneficial. Sometimes I draw a flowchart or mind map when I watch videos, and then I bring them with my other notes to the class”. These cognitive regulation strategies, which are rehearsal, elaboration, and organizational strategies, may help students gain a greater understanding of the learning materials (Schunk & Zimmerman, 1998). Furthermore, when Amal said, “I feel that when I explain something to my friend who did not watch the video, my information will be better established, and I can remember it forever”, I think she indirectly mentioned rehearsal strategy, which is another form of cognitive regulation. Rehearsal strategy is “repeating things over and over again until

committed to memory" (Sletten, Smart, Bradley, Guy, & Stupnisky, 2015, p. 20).

4.4.1.4 Cognitive Reaction and Reflection

Another phase of Pintrich's (2000) framework is "cognitive reaction and reflection" (p. 460). This involves the final performance judgment, which is when a learner finishes doing a cognitive task, and the reflection or attribution of this execution. I found this phase described in Fai's open-ended questionnaire when she said: "it is good when the teacher reviews the task answers at the beginning of each class, so I can know if I did well or not". According to Fai's perception, she found the class task review to be a chance to evaluate and judge her performance. Also, Rawan said, "answering questions attached to the videos [assignments] is important for me to test my understanding sometimes". This student used the questions attached with the video lecture to gauge her understanding. During class activities, I noticed that, at the end of each cognitive task, most of the students tried to compare her sheet with the true answers, which the teacher showed on the board. As Zimmerman (1998b, as cited in Pintrich, 2000) mentioned, "good self-regulators do evaluate their performance in comparison to learners who avoid self- evaluations or are not aware of the importance of self-evaluation in terms of the goals set for the task" (p. 460–461). Furthermore, students spoke out loud about the reasons that they answered a certain way in an attempt to explain something to the neighbouring colleague; this is called attribution. Also, in the focus group interview, Ghosson said, "I think recording the important points in the video using a paper and pen and focusing helped me solve the attached questions quickly". This student attributed her quick cognitive performance to the strategies that she adopted during studying, which is registering the significant information using concentration.

4.4.2 Regulation of Motivation

4.4.2.1 Motivational Planning and Activation

During the analysis, I found four elements of motivational planning and activation according to Pintrich's (2000) framework. These elements are goal orientations, self-efficacy perceptions, task values, and personal interest activation. The following sections discuss these elements.

4.4.2.1.1 Goal Orientations

Goal orientation is a motivation variable that defines why and how learners attempt to achieve different objectives (Anderman & Maehr, 1994). Based on self-regulation learning, goal orientation plays a crucial role in learners' motivational regulation. As part of the participants' discussions, they talked about their goal orientations that may lead them to work through flipped learning. Some students mentioned that they had an intrinsic orientation in their goals, such as Mona, who said, "I think that we must always think of success to overcome anything difficult or new to us . . . .I always think about my success during flipped learning, so I have to work very hard". Hence, Mona thought about success, that is, her academic achievement and mastery. In addition, Maha said, "I enjoyed the experience of flipped learning because I enjoy challenging myself, and I always like to be one of the top students", which means that she was oriented by her interest in being challenged. This can be considered a mastery goal, and her desire to be a top student can be considered a performance goal. Also, Reem said: "I have to work and study at home because I want to work with my group in the class". Reem's goal seemed to be guided by her social sense, and she did not want to feel isolated while working with the group in the class. Moreover, Noor mentioned the influence of her family when she said, "personally, I think the surrounding people have an impact on me . . . . I cannot deny that during my studying in general and in this course, my family has stress on my academic achievement". Noor's goals may be oriented by pressure from her family, and she may work to please her parents. Thus, according to the students' perceptions, they seemed to regulate their learning when they tried to orient their goals to different constructs such as "mastery," "performance," "social responsibility," "social approval," or some other construct (Dowson & McInerney, 2004, p. 295–296). The mastery construct means a desire to achieve to show understanding, academic ability, or a better performance, while performance means "[w]anting to achieve to outperform other students, attain certain grades/marks, or obtain tangible rewards associated with academic performance". In addition, social responsibility means "[w]anting to achieve to maintain interpersonal commitments, meet social role obligations, or follow social and moral rules". Finally, social approval means the desire to gain the approval of friends, parents, or teachers (Dowson & McInerney, 2004, p. 295–296). As a result, some students seemed to have intrinsic goal orientations that arise from their inner selves, while others have an extrinsic orientation, such as family satisfaction or the desire to avoid parents' punishment, "where the focus is on getting good grades or

seeking approval or avoiding punishment from teachers or other adults" (Pintrich, 2000, p. 476).

4.4.2.1.2 Self-Efficacy Perceptions

Zimmerman argued (1995) that self-regulation "involves more than metacognitive knowledge and skill, it involves an underlying sense of self-efficacy and personal agency and the motivational and behavioral processes to put these self beliefs into effect" (p. 217). According to Bandura (1986), "what people think, believe, and feel affects how they behave" (p. 25). Some participants perceived that flipped learning may help them to accomplish class tasks and may reduce their stress. Also, they mentioned that they feel panic sometimes if they are unable to understand during a traditional lecture or cannot follow new, related information. This was clearly supported by the participant Rand who commented that:

> I think it is a developed learning way. I like to see lectures at home; it reduces stress if the lecture is difficult and makes me relax in the class because I already have a good background, so I can enjoy activities and ask about unclear parts. That is why I said it reduces stress and the shock of new information. I hate that moment during lectures when you're a little shocked, and information is interrelated and sequential, and if I did not understand from the beginning, it impedes my understanding of the remaining part of the lecture, whereas in flipped learning, I have time at home to read about difficult points or watch extra material on YouTube, so I will be able to work and follow task steps in class.

Similarly, Ghosson said, "It is comfortable and can relieve the pressure and stress on us". Good preparation before class time, which is allowed in flipped learning, may increase participants' predictions and confidence in achieving learning tasks, as well as reduce stress. According to McLaughlin et al. (2013), "high-quality videos often led to student perceptions of efficient learning and reduced stress" (p. 6). In other words, flipped learning may increase participants' self-efficacy. Self-efficacy is a strength that refers to the belief in one's ability to complete a task or learn how to deal with a learning problem. Regarding the point of view of my participant, she seems to agree with Bandura's (1986) argument, which explains that people are affected by how they understand their previous experiences instead of their accomplishments. In this regard, Sun and Xie (2015) also claim that pre-class self-efficacy perceptions in flipped learning are a constantly effective tool for upcoming performances in class, whereas previous experiences affect the following actions, mainly through their

influence on self-efficacy confidence. I think that through flipped learning, students may tend to be on a pathway toward becoming self-efficient learners in the future. In addition, the participants exhibited noticeable confidence in the observation sessions when they discussed issues, worked in groups, and even when they worked individually. This confidence may be a result of the self-efficacy the students felt. Students who have a high self-efficacy are more motivated to achieve learning objectives and tend to deal with learning problems better than students with low self-efficacy (Sun & Xie, 2015). The findings of the current study support other education studies that reflect positive results in terms of students' self-efficacy. For example, female students showed an increase in self-efficacy while employing the flipped classroom (Kenna *et al.*, 2014).

4.4.2.1.3 Task Value

Some participants' perceptions tended to value the flipped learning tasks they were asked to do during the course. Task value has an important role in students' motivational regulation process (Pintrich, 1999). In addition, task value has three important components, which are learners' perceptions of the significance of the task, perception of the usefulness value of the task in the future, and the individual interest in the task (Eccles, 1983, as cited in Pintrich, 1999). Thus, this theme highlighted some perceptions of a kind of task value during the course. An example of perceptions that highlighted the importance of some tasks can be seen in Shahd's statement: "I feel that we do some important and modern jobs during flipped learning like working together [collaboration learning] and use technology". In addition Rawan said: "answering questions attached to the videos [assignments] is important for me to test my understanding sometimes". Rawan's perception suggests she valued the assignment tasks because they were tools to test her understanding.

Moreover, some students valued the utility of the task for their future goals. For instance, Maha said: "Personally I think, when I worked with my group members I learnt many things. One of them is how to formulate sentences, so my language also improved, and I like when they help me to write something". Maha's perception tended to reflect the utility of the task (as working in a group) in the future improvement of her language. Also, Amal said: "Studying through videos is very useful because I can save it and watch it many times". Amal may appreciate the

watching videos task through flipped learning due to the usefulness of the videos in the future. Thus, she can use videos again and again.

Furthermore, some participants' perceptions expressed their personal interest in some tasks through the focus group interviews. For example, Noha stated that "I must admit something about flipped learning: When I study at home and face something interesting, I have time to research it, and I am interested in researching to expand my knowledge or to solve the assignment". Noha talked about her interest in searching for information even for herself or to solve assignments. Interest means curiosity or attention to something, which can be considered an intrinsic motivation for individuals. As a result, Noha seemed to value searching tasks through flipped learning because it gave her an opportunity to satisfy her curiosity.

Task value, which the students discussed, may play a role in their motivational regulation, which can lead to an enhancement of the students' self-regulated learning. This can be considered an advantage of flipped learning from the perspective of undergraduate students. Students who see some task as valuable for them "are more likely to be engaged in the task as well as choose to engage in the task in the future" (Wigfield, 1994; Wigfield & Eeeles, 1992; Pintrich, 2000, p. 462).

4.4.2.1.4 Personal Interest Activation

Some of the participants expressed their personal interest in flipped learning tasks in the focus group discussions or in the open-ended questionnaire. Suaad and Noha reported their interest in some activities during the project. For example, Suaad said: "I am interested in class discussions," while Noha said, "I am interested in watching some videos." This can also be seen in Reem's comment on the questionnaire: "I enjoyed this new experience, especially when I chatted with the teacher in the class or with my friends or my sister at home regarding some of the information". Although individual interest is a constant characteristic, interest can be activated in particular tasks, situations, or context features (Pintrich, 2000, p. 463). Although these students seemed to be interested in watching videos and chatting with peers or teachers in their normal life, the flipped learning context involves tasks that allow for class discussions and for watching videos, which may activate their interests.

4.4.2.2 Motivational Monitoring (Awareness and Monitoring of Motivation)

Through the previous elements that related to students' motivations, the students showed high awareness regarding their own motivation, and they monitored it during the learning process to fulfil tasks' demands. They seemed aware and offered judgements about their self-efficacy levels, personal interests, and tasks' value.

4.4.2.3 Motivational Control and Regulation (Selection and Adaptation of Strategies for Managing Motivation)

Motivational control and regulation may appear in students' positive self-talk and in the extrinsic or intrinsic motivation that they experienced during the goal orientation. When learners gave their perception regarding their self-efficacy, they might have been aware of their efficacy levels and then might have tried to change them (Pintrich, 2000, p. 464). This awareness and attempt to change is a form of motivation monitoring and control, which leads to regulation. They may change their efficacy using self-talk or "by promising themselves extrinsic rewards or making certain positive activities" (Pintrich, 2000, p. 464). An example of self-talk can be found in Mona's statements when she tried to motivate herself: "Sometimes I feel lazy, but I say to myself I need to succeed". Also, Sarah said: "always when I start new assignments for new lessons, I tell myself that it is easy, and I will enjoy and do things more difficult than this, and this is because I am a very concerned student".

On the other hand, an example of an extrinsic reward can be seen in Rand's statement: "when I finish all the flipped learning tasks, I watch a series". Also, Sahar reported that " . . . students should find a suitable way to study . . . . I try to watch the video when I am in a good mood and not busy . . . . I avoid doing that when I am tired . . . . and when I get tired, I stop for a break and then come back, because I always give myself breaks so that I do not get bored". I considered these types of breaks to be an extrinsic reward that can improve her motivation to continue her studies.

4.4.2.4 Motivational Reaction and Reflection

After the completion of any task, a student may feel success or failure as a final emotion, and that student attribute that to a reason (Weiner, 1986, as cited in Pintrich, 2000). This leads in turn to impacting the student's self-regulation in the future, when the student tries to control the attributions to reach success (Pintrich, 2000). An

example of this is Sahar, who said, " . . . because I always give myself breaks, I do not get bored". Sahar seemed to be happy with her high morale, and she did not feel bored during studying. She said that she gave herself some breaks while studying, and she is likely to keep this causative action when she regulates herself in the future.

4.4.3 Regulation of Behavior

4.4.3.1 Behavioral Planning and Activation

Participants reported intentional planning when making schedules of their activities. Also, planning is a self-observation of behaviour. These two elements shape behavioural planning and activation according to Pintrich (2000). These two issues are discussed in the following sections.

4.4.3.1.1 Time and Effort Planning

Time and effort planning is one of the basic elements of regulating behaviour according to Pintrich (2000). Participants in this study tended to plan their time and effort. This element can be seen clearly in Sarah's comment: "Flipped learning improves my time management. I have many things to do during this term, so I try to manage my time during the week and before the class to do the needed task". In addition, Maha reported, "It is not very difficult to organize ourselves during flipped learning . . . I try to organise myself so I do something every day between the day the teacher assigns the task until the night before the class, so I [reach] all of my goals". Sarah stated that "I did my best to arrange my time at home". Students' attempts to set up a schedule for their work is a kind of time and effort planning. Also, the course teacher gave a deadline for students to submit the weekly tasks, and most of the participants committed to doing this on time every week. According to Zimmerman (2002), time management is a self-regulated learning strategy, which means it involves approximating and using time intelligently.

4.4.3.1.2 Planning for Self-Observations of Behavior

To regulate behaviour, learners need to plan for self-observation of their behaviours. After that, they can use the results of the observation for the future self-control or self-regulation of their behaviour. I found this kind of planning in Maha's perception in the previous theme. Maha was a good self-observer because she noticed that she

could finish her flipped course duties if she organized the tasks for the days "between the day the teacher assigns the task until the night before the class". Based on her observation, she might organize her work and regulate herself in the future. In addition, Hala said in the interview, " . . . I think it [flipped learning] is okay for me . . . . I watch videos and answer the questions in less than one hour if there are no other extra materials to read". I think Hala might also plan a self-observation report of this time.

4.4.3.2 Behavioral Monitoring and Awareness (Awareness and Monitoring of Effort, Time Use)

In this stage, "students can monitor their time management and effort levels" and try to change their effort to suit the job (Pintrich, 2000, p. 467). A student may set two hours aside to finish studying, but that student may notice that the materials are complicated and need more time. The student can then adjust the time and effort needed to fit that task. In the previous theme, when Hala said, " . . . I watch videos and answer the questions in less than one hour if there are no other extra materials to read", I understand that she was aware that the time she set aside can change if there is extra work to do. In addition, I observed that the students began to intervene to determine the time required for some classroom activities in the middle of the course, which meant that they were monitoring the required time to complete the tasks in the preceding classes. For example, in the fifth class and when the teacher distributed the case study paper and identified 20 minutes of activity, Majda intervened by saying, "Is it possible to please add five minutes to the final discussion? Because 20 minutes is not enough for this activity". I think Majda realized the time needed and requested an adjustment from a previous monitoring and observation of her time and effort.

4.4.3.3 Behavioral Control and Regulation

4.4.3.3.1 Increase, Decrease Effort, or Persist

Increasing effort or persisting can be observed among participants' perceptions. For example, consider the participants who appreciated the possibility of replaying the video to understand the content as a kind of increase in effort, because when a student repeats the watching experience, she increases her effort. In addition, Sahar said, " . . . I have seen one of the videos more than once . . . . I must make an effort to

achieve success". She thought that success can be achieved by doubling her effort when needed.

4.4.3.3.2 Help Seeking Behavior

Behaviour control or regulation can happen through seeking help as a behavioural strategy. Pintrich (2000) considered it to be a form of contextual control, as the learner receives help from the teacher or from colleagues in the environment. The data indicate that participants tended to seek help during social interactions with their peers or the teacher. They often reported that they could seek help within flipped learning, such as when carrying out activities through group work. However, they provided clear perceptions regarding their help-seeking behaviour. For example, Fai said, "The good thing is that our teacher is available to help us in the class . . . . I wrote some questions for my teacher to answer in class". This participant found that flipped learning gave her a chance to seek the help she needed from her teacher during class because she could review new topics at home and make a list of questions regarding unclear points. Moreover, she said, "I feel like it is okay in flipped learning to ask my teacher questions during class because all of us ask her questions". Thus, she thought that she was able to ask for help without being shy of the teacher because her classmates also asked for help. Help-seeking is an important academic behaviour that can assist learning, and "If students need help but don't seek it, their performance will suffer because they miss an opportunity for an important social interaction with their teacher and peers to support their learning and achievement" (Järvelä, 2011, p. 298).

Furthermore, students also use technology in the class to seek help, which is a theme in this research.

4.4.3.4 Behavioral Reaction and Reflection

In this stage, the students gave a final judgment regarding their time management for and the effort that was spent on a specific behaviour, and based on this judgment, they may adopt or make some changes to that behaviour for the future (Pintrich, 2000). Suaad, one of the students who gave me an opinion about one of her behaviours – which I mentioned in the challenges section – may suffer less self-regulation, which I considered when she said:

> For some lectures, I did not study very well; I just tried to answer the questions and send them back to the teacher. I was scanning the content to find the answers, and in the class, I tried to work with my friends . . . but before the midterm exam, I faced an accumulation of lecture notes, and I felt that they were new to me.

It seemed that she was interested in her grades and the teacher's satisfaction during the semester, but that she faced a real problem before the exam. This shows a weakness in the self-regulation process, but on the other hand, I considered her reflection of her behaviour to be an opportunity for future behaviour regulation.

4.4.4 Regulation of Context

4.4.4.1 Contextual Planning and Activation

Contextual planning and activation can appear in students' perceptions of tasks and contexts in a flipped-learning environment (Pintrich, 2000). It can be argued that perception is a cognitive aspect, but according to Pintrich (2000), "the focus of the perceptions is outward, away from the individual's own cognition or motivation, and toward the tasks and contexts" (p. 469). Therefore, these perceptions were focused on tasks and contexts, such as task accomplishment and classroom standards. In a flipped-learning context, these standards can be applicable at home or in a classroom. The following sections discuss this issue.

These perceptions involve the style utilised to do a task, the steps followed to implement a task, and/or all the standards involved to accomplish a task in a learning context. In the current study, participants reported several aspects regarding the task's accomplishment both inside and outside classroom. For example, Dalal said, "We must be committed, we have a deadline to send the assignment . . .". The home task had a deadline, which she thought she had to commit to. Also, students enforced classroom rules for their class activities. For example, cheating (looking at others' work) is not allowed, and working in a group is not allowed for some tasks. Students talked about their observations on the contexts of collaborative learning and peer tutoring in a peer-assisted learning setting. For example, they reported that a student can act as a tutor or tutee. They also thought that in order to play their roles within the group, they needed to study well at home.

4.4.4.2 Contextual Monitoring (Monitoring Changing Task and Context

Conditions)

Contextual monitoring means a continued awareness and monitoring of learning contexts and task requirements. Learners at this stage monitored and were aware of the context in terms of the grading system, the classroom's rules, and the teacher's behaviour (Pintrich, 2000, p. 470). In this study, the participants reported frequently about the classroom, their feedback, the evaluation system, and their teacher's behaviours, which indicate that they seemed to monitor the tasks and contexts during the class. This observation and awareness are important for learners to do well at home or in the classroom.

4.4.4.3 Contextual Control and Regulation

Contextual or environmental regulation was clear in some observations. Some students reported that they tried to control their environment to make it more suitable for studying. For example, Hala commented, "I used my bedroom TV screen to show videos I liked". Also, Lana said, "I think a student should make a suitable study area for herself at home . . .". When I observed the students, I noticed that they tried to regulate the classroom environment by adjusting lighting, adhering to the seating layout, or removing distractions. I also noticed that they negotiated task requirements.

4.4.4.4 Contextual Reaction and Reflection

Finally, in this stage, learners gave their judgements and reflections on the tasks and contexts that may improve future regulation. I consider their observations in this research to be a general evaluation about flipped-learning tasks and contexts. They had many opportunities to reflect on their experiences through the pilot study, open-ended questionnaires, and focus group interviews. In the first and second research question, they gave their critical opinions on the videos' design and on a flipped-learning future, which may help facilitate their learning and performance in the future.

To sum up, Pintrich's (2000) work thoroughly explained many aspects that were hidden in my data. I found his work very useful, and I consider this finding very important in my study. The findings confirmed that students' positive perceptions and reception of flipped learning could positively predict their use of self-regulated learning strategies and their development of habits related to flipped learning (Sletten, 2017).

According to these findings, flipped learning could not just help students enjoy classes more and help them to do well in class; it could also promote their self-regulated learning, which could help them learn how to study for the future, so it has lifelong benefits consistent with Ramnanan and Pound's (2017) study.

Students seemed to develop self-regulated learning habits. By *habits*, I do not mean only the strategies that they used to control their learning but also all the practices that appeared in the self-regulated learning phases, such as prior knowledge activation. Elements such as prior knowledge activation, positive self-efficacy, and the use of help-seeking strategies could positively impact student achievement within flipped learning, which is consistent with Sun's (2015) study.

4.4.5 Self-Regulated Learning From Vygotsky's Perspective

According to Vygotsky's inner speech theory, learner's inner speech is a knowledge source and a form of self-control (Zimmerman, 2001, p. 24). He considered that learners can be motivated through inner speech, and this may happen through inner statements, which can stimulate self-control. Although inner speech is a cognitive phenomenon, I can identify it in some students' speech, such as Mona's, when she said: "Sometimes I feel lazy, but I say to myself, I need to succeed". She used her inner speech to motivate herself to work through flipped learning. Also, as cited earlier Sarah said: "always when I start new assignments for new lessons, I tell myself that it is easy, and I will enjoy it and do things more difficult than this, and this is because I am a very concerned student". Sarah's inner speech represents a high level of consciousness that may reflect her self-awareness: "[I]nner speech parallels the state of self-awareness and is more frequently used for introspection purpose among highly self-conscious persons" (Morin & Everett, 1990, p. 342). Zimmerman (2001) stated that "Vygotsky viewed awareness as a subarea of consciousness" (p. 25), while Fox and Riconscente (1990) indicated that "metacognition appears in Vygotsky's work primarily in the sense of consciousness. … For Vygotsky, metacognition and self-regulation are completely intertwined" (p. 383). Through my observation, I could identify students' consciousness that could lead to deliberate control, especially when participants worked together in social interactions. They paid attention to each other in tasks and imitated each other's actions, which conveys consciousness, inner dialogue, and control of thought and action. "The types of tasks which students

perform in school, the systems of socially constructed stimuli to which they are introduced, and the introduction to scientific concepts are all critical for deliberate control of behavior and actions" (Fox and Riconscente, 1990, p. 385). In sum, Vygotsky believed that inner speech could lead to self-direction or self-regulation (Zimmerman, 2001, p. 26). Thus, according to this theory, inner speech plays a crucial role in individual learning, allowing learners to plan, implement, and control their learning aspects. Moreover, students' questions and their seeking of help from their colleagues or the teacher may help them to move through their ZPD (Vygotsky, 1978), because the answers and feedback they receive can be considered the necessary scaffolding that assists and regulates their movement. Moreover, metacognition is an important tool for constructivist learning:

> Getting students to actively explore what they already know about given topics, how they came to know, and in what context are important elements to constructivism. This then brings the focus on to the idea of getting students to not only own their own learning, but also to think about their own learning and how they go about constructing knowledge. This is the concept of metacognition. (Peters, 2000, p. 168)

Therefore, learners need to think about their own learning environments and how to acquire knowledge in any context.

Furthermore, as reported by King (1997):

> In any form of peer tutoring, responsibility for learning is shifted from the teacher to the tutoring pair. This provides an opportunity for students to assume more control for their learning. According to a Vygotskian view, this transfer of control and responsibility should promote self-regulated learning. Ability to self-regulate one's own learning is likely to enhance one's sense of personal control or empowerment in a learning context. (p. 226)

Consequently, the responsibility for learning within peer tutoring contexts through flipped learning classes may mean more self-regulation of learning.

I would also like to point out that during the flipped learning classes as discussed earlier in the first research question, students were allowed to play the role of tutor or tutee so that everyone could acquire the supposed skills of being a tutor or tutee. Peer tutoring assisted learners in developing skills, such as clarifying, inquiring, and providing detailed information, which led them to improve their self-regulated learning. Peer tutoring "not only scaffolds tutoring partners' knowledge construction, it also scaffolds their development of questioning skills" (King, 1997, p. 227). As a

result, tutors and tutees "should eventually be able to scaffold his or her own learning without the aid of the tutoring partner" (King, 1997, p. 227).

4.5 Summary

The chapter's main purpose was to present the findings, analysis, and discussion of the study's data. I provided and discussed the participants' responses from the focus group interviews, open-ended questionnaire, and my field observations regarding the relevant research questions. In addition, I tried to connect these discussions to the relevant literature. In the following, I conclude this chapter by discussing three key points.

First, I discussed students' perceptions of the advantages and challenges of flipped learning, which is the focus of the first research question. The responses to this research question were discussed under two main themes: students' perceptions of advantages of flipped learning and their perceptions of challenges of flipped learning.

Second, I discussed the participants' perceptions about the future of the flipped learning in Saudi Arabia, which is the focus of the second research question. The discussion of students' responses fell under three main themes: enthusiasm for future application, no enthusiasm for future application, and future developed application.

Third, I used Pintrich's (2000) framework to discuss students' perceptions of self-regulated learning and to determine whether they developed any habits related to self-regulated learning. These perceptions were the focus of the third research question. The responses to this research question were discussed under four main themes: regulation of cognition, regulation of motivation, regulation of behaviour, and regulation of context.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The aim of this study was to understand how Saudi female undergraduate students experienced and perceived flipped learning and its future through their experience as participants in a flipped learning course in a Saudi university. I carried out an intervention case study of a flipped learning program. Focus group interviews and open-ended questionnaires were used to collect and analyse the views of my participants. Also, I observed all the classes' sessions that were implemented throughout the intervention. The majority of the students in this study expressed positive perceptions towards their flipped learning experience. The main purpose of this chapter is to provide a summary of the significant conclusions drawn from my study. In addition, it discusses the contribution and educational implications produced from the findings of the study, as well as the recommendations for future research. This chapter also outlines the strengths, challenges, and limitations of the research. Finally, it discusses my reflexivity and reflectivity.

5.2 Summary of the Study

This section provides the reader brief conclusions for all the chapters of this dissertation and recaps the key findings of this work in relation to the research questions. I would like to mention that being a qualitative researcher means that I was the key tool in this research. My knowledge and professional background and my ontological and epistemological assumptions were the fundamental factors that might have played a significant part in defining my positions as a researcher in education. Therefore, my conclusion about my findings and the interpretation of these findings are related to my knowledge, experience, and my understanding of the literature review in the research topic field.

This study started with an introductory chapter that presented the research aim and questions, the significance of the study, and the study's context.

The second chapter involved the literature review. This section started with a discussion of the term *perceptions* and the concept of flipped learning. Then I presented my study's theoretical framework and its justifications, followed by a

discussion of social constructivist theory as this study's main learning theory. Then I discussed student engagement and active learning, as well as the adopted pedagogical practices and technology use within flipped learning, which involves videos, social networks, and mobile devices. The video section involved video design and the principles of multimedia design based on the cognitive theory of multimedia learning, which is a supportive theory in the theoretical framework. At the end of the chapter, I discussed self-regulated learning theory (another supportive theory in the theoretical framework), its phases, its strategies, and Pintrich's (2000) framework.

The third chapter included the research methodology. It discussed my philosophical assumptions. In addition, it covered the research design as a case study and the intervention program in detail, as well as the data collection procedures. Chapter 3 also discussed the research setting, the participants, and the data analysis process, and last, it explained the ethical considerations and the related issues.

The fourth chapter involved the findings, analysis, and discussion. I arranged this chapter in accordance with my participants' answers to the three research questions; under each question, I reported a group of themes, and in each theme, I presented the responses that I obtained from the focus group's interviews or from the open-ended questionnaire, followed by my field notes, if any. Then, I discussed the participants' responses based on my interpretations and understanding, followed by discussions from the relevant literature.

Furthermore, as I mentioned above, this section provides a brief summary of the main findings of this study in relation to the research questions. Thus, I would like to present the research questions with their branch questions again.

Q1. How do Saudi undergraduate students perceive flipped learning?

a. What are the advantages of flipped learning for students?

b. What challenges do students of a flipped learning course encounter?

Q2. How do the participants perceive the future of flipped learning in Saudi Arabia?

a. What are the motivations for the adoption of flipped learning?

b. What might limit the adoption of flipped learning?

c. What practices might improve flipped learning?

Q3. Can flipped learning help students develop habits related to self-regulated learning?

Regarding the first research question, the participants provided various perceptions of flipped learning, and their perceptions came in two major topics: the advantages of flipped learning that they experienced and the challenges that they encountered through their experience as participants in a flipped learning course. They seemed to welcome and support the experience, and the key advantages that they perceived were supporting students' engagement and providing an active learning environment, promoting peer-assisted learning and classroom activities, and enhancing personal responsibility. Furthermore, students expressed their appreciation for the benefits of using technology within flipped learning. These benefits are having flexibility and availability, engaging in mastery learning, taking advantages of multimedia, supporting scaffolding and enabling active learning, and breaking routine. Finally, students' perceived that FL had raised the profile of education in their homes.

On the other hand, and regarding my participants' perceptions about the challenges that they faced within the flipped learning experience, some of them faced challenges that related to the use of technology, such as a digital divide, and learning management system (Blackboard) problems. Furthermore, some participants indicated that the poorly designed videos or class activities were challenges. They also reported the change resistance and the lack of ability of self-regulated learning among some learners. Participants also stated that the skipped information was one of the challenges that they countered within their flipped learning experience. Skipped information refers to new information that learners might not understand at home and that they forgot to ask the teacher about during class time and is caused by the lack of instant feedback outside the classroom. Last, despite participants appreciating the role of flipped learning in providing a flexible learning environment and raising the profile of education in the home, some participants found that flipped leaning might conflicted with some Saudi female student roles as a wife or a mother.

The second research question was addressed to explore the students' perceptions about the future of flipped learning in Saudi Arabia. Participants' perceptions came in three major themes, which generated the three branch questions. Some participants

were enthusiastic about future applications, and they saw that flipped learning should be adopted in Saudi universities for certain reasons. These reasons can be summarized in the ability of flipped learning to foster learning autonomy in the future, support interactions in overcrowded classrooms, may enhance the acceptance of more online learning in the future, and in that it can make a cumulative electronic resource for knowledge. However, some participants were not enthusiastic about future applications, and they provided some reasons that might limit the adoption of flipped learning. These reasons were that flipped learning does not suit all disciplines and that a lack of responsibility in some students may lead to the failure of the learning process. On the other hand, other participants perceived that flipped learning could be adopted in the future, but only after being developed through some practices. These practices were finding a procedure for gaining instant feedback outside the classroom, finding a way to evaluate students, and making sure that they understand the content through continuous evaluation or formative testing, as well as providing learning videos with the appropriate design. "Appropriate design", "well design", and "convenient design" were the expressions used by the participants when they gave their views, especially when they talked about learning videos, which prompted me look again at my data using deductive analysis to see what these videos are in participants' opinions or what the principles are that should be adopted when designing videos from participants' perceptions. After the deductive analysis, I found some convergence between student video design standards and 10 of the 12 principles of multimedia design by Mayer (2009). These principles were coherence, redundancy, signalling, segmenting, pretraining, modality, multimedia, personalization, voice, and image. In addition, I inductively found other principles, which are using creativity, choosing the appropriate video duration, meeting students' diversity needs, and supplying well-structured content.

The third research question's main concern was determining whether flipped learning could help students develop habits related to self-regulated learning through participants' perceptions. The process of developing this question began after the focus group interviews that were conducted in the pilot study. It was remarkable that the students gave perceptions on some issues, such as self-control or time management. I also began to observe some aspects of self-regulated learning through my classroom observations. However, I did not make sure that the question would be

related to the self-regulated learning, and this took long time for me to decide. I made sure of this question after analysing my data deductively and when I tried Pintrich's (2000) framework and found it fit the data quite well. Participants' perceptions covered some issues related to the four aspects of self-regulated learning, which are cognition regulation, emotion regulation, behaviour regulation, and context regulation. They gave positive perceptions regarding these aspects, which in general made me think that they might be able to regulate their cognition, emotion, behaviour, and context within a flipped learning experience, and this might be supported by my classroom observations. In addition, they reported some strategies and habits that they used within flipped learning that made me think that flipped learning might help them develop habits related to self-regulated learning.

Students' perceptions informed about some aspects within the four levels of the regulation process, which are planning, monitoring, control and regulation, and reaction and reflection. These levels were founded through regulation of cognition, motivation, behaviour, and context.

I organized the following key findings according the theoretical framework. First and in terms of the regulation of cognition, participants commented positively on goal setting, prior content knowledge activation, and metacognitive knowledge activation. Second and with regards to the regulation of motivation, they gave positive perceptions about goal orientation, self-efficacy, task difficulty, task value activation, interest activation, and the adaption of strategies for managing motivation. Third, they reported some positive perceptions about their behaviour regulation. They expressed their ability to manage their time, put forth effort, conduct self-observation, and seek help. Fourth and in reference to context regulation, they gave positive perceptions about their ability to thrive in their learning environment by regulating task and context, and they judged the learning context in general. The findings confirmed that students' positive perceptions and reception of flipped learning positively predict their use of self-regulated learning strategies and the development of habits related to flipped learning (Sletten, 2017). Based on these findings, flipped learning has the potential not just to help students enjoy classes more and help them to do well in class but also to promote their self-regulated learning, which can help them learn how to study for the future. Therefore, flipped learning has lifelong benefits, consistent with Ramnanan and Pound's (2017) study. Finally, I provided a discussion about self-

regulated learning from Vygotsky's perspective.

I think the key findings of this study present some factors that affected the participants' views of the flipped learning environment to enhance the educational process (Alebaikan, 2010). These factors were identified through exploring the experience of the students and their opinions of the advantages of flipped learning and the challenges they encountered, as well as their views regarding their self-regulated learning aspects and the future of flipped learning. Identifying the issues that shape the experience of learning in a flipped environment will provide the educators who intend to adopt flipped learning insight into how students should be supported in this new learning environment.

As an overall conclusion of these factors, this research on students' perceptions about flipped learning indicates that flipped learning can provide learners an active learning environment in which they can regulate their learning. In addition, this pedagogy can employ technology inside and outside the classroom, which can support their learning and provide them the needed flexibility and availability, as well as enhance active learning in the class. However, students can face some challenges, the most prominent of which are challenges related to using technology, such as a digital divide, a lack of instant feedback outside the classroom, the poor design of learning videos, and incompatibility with some social and domestic conditions for some students. On the other hand and with regards to the future of flipped learning, some students welcome the future adoption because they see it as a solution to overcrowded classrooms, and the learning resources that are made through this pedagogy can create a cumulative source of knowledge. Also, they consider that flipped learning may accelerate the acceptance of online learning and autonomy learning. Others, however, see the lack of responsibility and discipline of some students, and the lack of suitability for all subjects may limit the adoption of flipped learning in the future. In addition, some students see that it can be adopted, but that some of its aspects still need to be developed, and they provided some suggestions.

5.3 The Contribution of the Study

This section presents the main contributions that I hope my research offers in relation to the flipped learning pedagogy in the context under investigation. The study theoretically and practically contributes to the knowledge of flipped learning. This is

the first time (to my knowledge as a researcher) that Saudi female undergraduate students were asked about their perceptions regarding flipped learning, their views about the future of flipped learning, and the critical elements that impacted their views.

5.3.1 Theory

This study was based on a theoretical framework that connected three theories to understand students' perceptions toward flipped learning (see section 2.4). These theories were: social constructivism; self-regulated learning, and the principles of multimedia design based on the cognitive theory of multimedia learning. These three theories converged in the context of the flipped learning, and this has allowed me to put forward an original framework that researchers or teachers could later use.

With regard to social constructivism, the study presented extended discussions of flipped learning based on this theory, and this may enrich the literature on flipped learning. Discussions were facilitated regarding the constructivist pedagogical practices adopted within flipped learning, which involve active learning; peer-assisted learning; collaborative learning; cooperative learning; peer tutoring; problem-based learning; inquiry-based learning; and using technology within flipped learning.

In addition, I consider the answer to the third research question to be a significant contribution to the flipped learning literature, because it connects flipped learning with self-regulated theory, and presents detailed results, analyses, and discussions based on Pintrich's (2000) framework, thus enriching a small field of research connecting flipped learning with self- regulated learning. In addition, it shows that flipped learning is not just beneficial within a specific course, as the literature has indicated; but it can also help with creating lifelong learners who can gradually become independent of their teachers. This quality can enrich educators' knowledge and understanding of self-regulated learning in the context of flipped learning, which may enable them to support their students' life-long learning abilities. This may impact teaching and learning quality.

5.3.2 Designing Flipped Learning

This study provided a model for the flipped learning design that could then be used among researchers, teachers, or workshop providers. This model is presented in a table (see Table 4 in Chapter 3), which shows a teacher's, student's, and researcher's tasks in applying flipped learning. In addition, all of these tasks are summarized in a specific timeframe. Thus, I can call this model a practical work plan.

5.3.3 Designing Videos

In this study, students' perceptions involved some descriptions of what they called "good video," which led me to discuss their perceptions of the principles of multimedia design based on the cognitive theory of multimedia learning, as I found a lot of matching between their perceptions and the principles themselves. I adopted these principles in the study's theoretical framework as mentioned above. As a result, the study provided key principles that can help in designing flipped learning videos.

5.3.4 Challenges and Other Issues for Teachers and Policy Makers to Consider

As previously mentioned, the participants of this study supported flipped learning. However, they reported some of the challenges they had encountered. Therefore, the study presented some challenges and other issues for teachers and policy makers to consider, and it offered some recommendations for addressing these challenges, which I consider to be practical contributions. These recommendations are addressed to several levels of decision-makers, policy makers, university administrators, lecturers, and students.

Despite the fact that this study indicated that flipped learning provides a better learning context for some females in Saudi Arabia because it offers a flexible and easily accessible environment, the teaching and learning experiences were challenging from a cultural standpoint for some students. For instance, some students are mothers or wives or have many social duties, or are a combination of the three. Consequently, teachers should be aware of students' circumstances and needs in general. Thus, these students may need more support and encouragement from lecturers, or lecturers may need to direct them in how to effectively manage their time.

Moreover, "A new learning environment has to be managed and supported sufficiently to succeed and achieve desirable outcomes" (Alebaikan, 2010, p. 263).

One of the challenges was the digital divide, as an Internet connection was not available at all times for some students, which means that teachers may have needed to provide other solutions for the students, such as CDs or memory sticks, that included the digital content that the students needed so that they would not require an Internet connection outside of the classroom. In addition, with regard to the low screen resolution of the tablets or smartphones that some students own compared with the high resolution of videos, my recommendation is that videos should not be designed with high resolution because not all learners may have the advanced devices needed to accommodate them.

Furthermore, one of the challenges that these students faced is the lack of instant feedback outside of the classroom. Thus, I found that some students confused flipped learning with other educational pedagogies. I would like to emphasize the need for educators and students to understand that it is not the role of the lecturer within the flipped learning context to provide students with complex feedback outside of the classroom, as class time should be completely free for this kind of feedback. Providing support or answering urgent questions outside of the classroom is fine, but detailed feedback should be given in the classroom.

Furthermore, I suggest that universities provide lecturers with the necessary support for producing learning videos, such as offering them the required training, or employing someone who can help the teachers to make videos and thus minimizing their teaching loads.

Unfortunately, in the case of Saudi higher education, there is a shortage of video sources that can be used as an alternative to teacher-produced videos in case the teacher is unable to produce such videos. Because Arabic is the language adopted in Saudi higher education, many valuable sources in other languages that are available on the Internet cannot be used to serve the objectives of Saudi higher education courses. I think this lack of video resources demonstrates the need for concerted efforts by educators to enrich Arabic content in general and educational videos in particular, as well as to encourage Saudi academics to participate in the collaborative production and publication of learning videos.

Furthermore, I found that the collection of students' perceptions could be counted as a kind of assessment at the level of the learners and the level of the teaching and

learning process in general. Through the study, I learned about their perceptions and the critical factors influencing those perceptions, which were the advantages and challenges of flipped learning; their perceptions regarding the future of flipped learning; and their ability to give their perceptions regarding the educational context in the form of "context regulation" (Pintrich, 2000), which is one of the elements of self-regulated learning. Based on this, I advise educators to obtain learners' perceptions at the end of each term and to provide other types of formative evaluations, such as giving quizzes or collecting students' self-reports, such as diaries or reflective essays.

Finally, this thesis will be accessible by the audience; thus, educators in general, and decision-makers for higher education in Saudi Arabia can view the findings of this study. Curriculum designers may also appreciate the findings. Furthermore, I plan to publicize the findings through the publication of some parts of my work in journal articles and conference papers.

5.3.5 Methodology

The exploratory methodology used in this study is unique, and according to my review of higher education studies in Saudi Arabia, I found that most of them relied on the scientific paradigm. Qualitative research is not often used in Arabic contexts, and most Arabic educational research adopts the "scientific paradigm" (Alebaikan, 2010, p. 265). Thus, it took considerable time for me to read, learn, and train myself to design the study, as well as to collect and analyze my data, which I consider to be a contribution to the Arab educational research community.

In addition, the study employed a mixture of instruments that are rarely used together in Saudi educational research, and this added a kind of uniqueness to the study. These instruments were focus group interviews, questionnaires, and observations. Furthermore, the researcher was very careful to accurately explain how to use these tools and stages of the use, and provided many details regarding the application, which might raise the reflectivity.

5.4 Limitations of the Study

The main purpose of this section is to present and discuss the limitations of this research. The two following areas caused limitations in the study.

The first limitation was the sample that I applied to the study, which was the sample of the students from the two classes on which I applied the intervention, I observed, and I used to collect my data. The sample was representative because the students were Saudi female undergraduate students in classes that can be found in any Saudi university, but this may have still limited the findings with regard to the perceptions of this group of students, whom their teacher volunteered to implement the intervention as I mentioned in the methodology section (see Chapter 3).

The second limitation was the limited timeline for fieldwork, which restricted the time spent on the intervention application. Consequently, it limited the observation period, so a longer period than three-and-a-half months may be needed in future studies for the data collection process.

Considering all of the above limitations, the results of this study can provide valuable insight into how students experience and perceive flipped learning and its future in Saudi universities.

5.5 Directions for Future Research

5.5.1 Flipped Learning in the Context of Saudi Culture and Norms, and Female Students' Responsibilities

As stated earlier, there is a lack of research in the field of flipped learning in the Arabic literature, specifically in Saudi Arabia, so there are a number of areas in which further research would be valuable. Thus, in this part, I discuss some suggestions for future research.

It is important to note the need to test flipped learning on multiple disciplines in the context of Saudi higher education, as one of the results of this study suggested that this type of learning may not suit all disciplines. However, this cannot be confirmed without carrying out the needed studies. Thus, this is a call to researchers from different disciplines to test this theory.

Despite the fact that this study was carried out with female participants, many of the assumptions, implications, and recommendations could also be of considerable value for conducting flipped learning for male students in gender-segregated Saudi universities.

This study presented areas that might seem interesting to social researchers. For instance, some video production standard themes in this study require further investigation, such as encouraging creativity, meeting students' diversity needs, and choosing appropriate video durations. I stress the importance of the last standard and the need to study it and to develop students' ideas about it. According to literature reviews and to my observations, students usually prefer short videos that range from 10 to 15 minutes.

In addition, as Saudi society has a special cultural nature that influenced the design of educational videos in this study, such as the lack of the appearance of the face of the teacher during the explanation in the video, this can lead us to further research the standards of video design according to Saudi culture and norms.

Moreover, the themes that answered the third question regarding self-regulated learning might be considered for future research. Students' willingness to regulate their learning and how this influences flipped learning seem to be interesting area for future research. Also, Saudi female students' responsibilities and the requirements for studying under flipped learning are fertile ground for future studies.

5.5.2 Access to Technology

Access to technology and the other issues surrounding it, such as the difficulty of connecting to the Internet, the lack of modern equipment, etc., which may lead to a digital divide under flipped learning, are hot issues that require further research and in-depth study.

5.5.3 The Use of Technology in Education, and the Need to Study the Accompanying Behaviour by Teachers and Learners for Guidance

I noticed that the perceptions of the learners stressed the need to shorten videos and thus reduce the boredom that comes from viewing videos that exceed the abovementioned timeframe. Some students believe that technology is only for fun and entertainment. However, in the technology age, which may impact most aspects of learning, teachers play a crucial role in educating learners in this regard because not everything on the screen should be easy, short, or amusing. Traditional university lectures are also lengthy in nature, and if we make learners choose, they would likely prefer the option of shorter traditional lectures. According to Woolfitt (2015),

“Lecturers also need to make decisions about the role of technology as well as managing student expectations by explaining to students the specific role of technology in the educational context” (p. 8). Therefore, it is the responsibility of educators to increase students’ awareness of this and to inform them that they need to be to be more responsible and disciplined regarding their learning. Teachers should also explain that students need to know that flipped learning or using technology in education is a different way of learning and is not always easy. As a result, I find that the use of technology within education may require a study on the accompanying behaviors of teachers and learners for guidance.

In addition, I think we still need more studies and case studies in particular through which technology is used to support the teaching and learning process, coupled with appropriate pedagogies and not just random technology use, to keep up with the modern age.

5.5.4 Flipped Learning Models to Include Feedback and Help Outside of Classrooms

Students had seen that there was an urgent need for good communication with the teacher outside of the classroom and before the start of each class to provide some feedback and to answer some pressing questions, which made me think that flipped learning may require further studies in this regard and that production has possibly improved models of it.

In addition to the above, one of the students’ suggestions for the future of flipped learning is to provide continuous formative evaluations to ensure that everything is okay, and they thought that teacher’s observations and class activities are not enough to evaluate their performance. This is a good topic for future research.

5.5.5 Family Influence on Learning

As I mentioned before, scant evidence or research seems to exist on the familial impact on higher education students’ education. It is possible that the current proliferation of interest in flipped learning in higher education will encourage further research in this area.

5.6 Developing Reflexivity

In the methodology chapter of this dissertation, I explained my journey of the research focus, my experiences, and knowledge background. I also mentioned that I considered myself to be the main tool of this research. As a result, I have accepted that I had an effect on this study. This effect required me to be transparent, critical, and reflective during all the research stages. Thus, being reflective and critical among the research phases meant being reflexive. Wellington (2015) explained this term:

> Being 'reflexive' is part of a more general approach to research – being 'reflective'. The former is a subset of the latter. Being reflective involves thinking critically about the research process; how it was done and why, and how it could have been improved. Reflection is an important part at every stage, i.e. in formulating questions, deciding on methods, thinking about sampling, deciding on presentation, etc. (p. 101).

Therefore, from beginning to the end of my research, I tried to be reflective. I attempted to explain in detail all the research processes, including collecting data, conducting my analysis, and making my interpretations. I also tried to give reasons for my decisions, tried to describe how I implemented everything, and tried to be a critical thinker.

At the end of the first year of my PhD and when I was doing the first Viva, one of the examiners asked me, "What will your research would represent in the future?" I said optimistically, "It will be a rock in the wall of the research in Saudi Arabia." He replied, "I wish for my research to be just sand and not a rock." I felt that I had said something inappropriate but did not know exactly what. During the three years following the test, I realized how that sentence was never successful and arrogant unintentionally, and even at this moment, I feel embarrassed when I think about it. Indeed, I later realized that research is a sea with no coast and that my research just represents a drop in this sea; I comprehended that knowledge is cumulative. Thus, it is not possible to master everything in my field in three or four years, but I can say that this experience has made me try to be a good reader. It opened my mind to questioning everything, even things in my life. Before this research, I accepted anything written in any scientific paper or book as fact. This may have been due to the educational system in Eastern countries, which gives more weight to indoctrination than to the development of critical thinking among students. I am not saying that I have become 100% critical, but I have found a great way to think critically, and I am

still training myself and am very happy. I learned this way of thinking through meeting with my supervisor, who has always motivated me to think of something from all angles: what, how, and why. This has added a kind of pleasure and meaning to reading.

Furthermore, I gained another lesson through my PhD journey. During this journey, I had to deal with qualitative research for the first time because this type of research is rarely used in the research medium that I was most familiar with compared to quantitative research. Thus, I did not have the audacity to carry it out, despite my mental tendencies towards this kind of research. Once again, thanks to my supervisor and her guidance, I overcame this barrier and worked through the qualitative paradigm. I learned how to code data and then put them into themes and interpret them through this experience.

In regards to research ethics issues, I have learned a rich lesson: Research should be done without exposing participants to any kind of abuse or damage, whether it be physically, psychologically, or socially, and to be honest with myself and the reader.

Last, I "realised that there is no perfect research but there is always room for improvement for both the research and the researcher" (Mutlu, 2016, p. 274). Yes, there is always chance to read, search, think, and write, and the PhD journey can be but a step in a researcher's life that motivates that researcher to move on.

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Appendices

Appendix 1: Research Ethics Approval Letter

The University Of Sheffield.

Downloaded: 14/12/2015
Approved: 07/12/2015

Maha Alharbi
Registration number: 140105243
School of Education
Programme: PhD

Dear Maha

PROJECT TITLE: Students Perceptions of Flipped Learning In Saudi Universities: An Exploratory Investigation
APPLICATION: Reference Number 003935

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 07/12/2015 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 003935 (dated 18/11/2015).
- Participant information sheet 1012739 version 1 (21/10/2015).
- Participant information sheet 1012738 version 1 (21/10/2015).
- Participant consent form 1013558 version 1 (18/11/2015).
- Participant consent form 1012740 version 3 (21/10/2015).

If during the course of the project you need to deviate significantly from the above-approved documentation please inform me since written approval will be required.

Yours sincerely

Professor Daniel Goodley
Ethics Administrator
School of Education

Appendix 2: Participant Consent Form

Participants Consent Form

Students' Perceptions of Flipped Learning In Saudi Universities: An Exploratory Investigation

Researcher: Maha Alharbi

Please read the statement below and complete the required information.

Statement of consent

I have been fully informed about the aims and purposes of the project, and I have had the opportunity to ask questions about the project. I understand that:

My participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline. I understand that my responses will be kept strictly confidential. Also, I give permission for members of the research team to have access to my anonymised responses. Furthermore, my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research. Finally, I agree for the data collected from me to be used in future research, and I agree to take part in the above research project.

…… (Signature of participant) ……(Date)

……..(Printed name of participant)

* I agree to review the final results with the researcher Yes No

- If yes please provide your contact details ……

- Also you have a choice to mention your name if you wish (in the research materials, in the report or reports that result from the research):

* I agree to mention my name Yes No

One copy of this form will be kept by the participant; a second copy will be kept by the researcher.

If you have any concerns about the project that you would like to discuss, please contact the researcher:

Maha Alharbi, email: mmalharbi1@sheffield.ac.uk

Appendix 3: Teacher's Information Sheet

Participant Information Sheet (Teacher)

Students' Perceptions of Flipped Learning in Saudi Universities: An Exploratory Investigation

You are being invited to take part in a doctoral research project. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and decide whether or not you wish participate. Thank you for reading this.

Purpose of the project

The primary goal of this study is to explore the perceptions of Saudi students toward flipped learning in undergraduate classes. Flipped learning is a pedagogical approach in which students watch short learning videos about new topics outside of the classroom, and class time is freed up for active learning. The teacher usually creates the learning videos. Then, the teacher uploads these videos on the learning management system (Blackboard) for students to access anywhere and anytime.

Why you have been chosen

You have been chosen because you are already engaged in a Saudi university as a teacher of undergraduate students, and I need your cooperation to conduct my study.

Participation

It is up to you to decide whether or not to participate. If you do decide to take part, you will be asked to give your consent by signing a consent form, and you can still withdraw from the research at any point without giving any reasons.

What I would like you to do

Before every lecture, you will consult with the researcher about the teaching aims and then prepare a video and some questions regarding the content. In addition, you will upload the video along with any related online materials and the questions for the lesson to Blackboard. Students need to watch this video before class, answer the lesson questions, and send their answers to the course email. You need to check their responses in order to get an initial idea of students' understanding and to learn what points require extra emphasis in class. Also, you need to prepare in-class activities. During the class, you will start by having a discussion about the questions; then you

should lead students in activities (for example, group discussions, problem solving or peer tutoring). Through these activities, students reflect on, discuss and practice what they have learned. I will observe students' emails with you and observe you and the students during the class activities.

The possible disadvantages and risks of participating

As the course teacher, you need to devise your own materials and design class activities. This might be a hard task for you, as the usual teaching method in Saudi Arabia is lecturing. However, I will help you by providing you with the necessary training to produce learning videos and by working with you during class as a participant observer.

The possible benefits of participating

I hope you will benefit from the flipped learning experience. You may enjoy having more interactions with your students in class, and you will have enough time to answer their questions. Also, you will benefit from the training I will provide for you, and you will learn a new practice in the education process.

If something goes wrong

If any problems occur, please contact me (mmalharbi1@sheffield .ac.uk). In addition, if you have any concerns or complaints, please contact my supervisor (Julia Davies, j.a.davies@sheffield.ac.uk).

Confidentiality

Once the study's observation data have been gathered, their confidentiality will be maintained by ensuring that only my supervisor and I have access to the data. You will not be identifiable in the study. Your data will be kept secure and will be destroyed/deleted when the study is complete.

The results of the research project

The research results will be used in the thesis to explain students' perceptions of flipped learning in Saudi universities. I may write papers for academic journals using these data or present the data at academic conferences. All previously agreed anonymisation will be adhered to.

Organiser and fund provider for the research

This study is supported by the Education Ministry - Higher Education of the Kingdom of Saudi Arabia as I pursue a doctoral degree.

Ethical approval reviewer

This project has received ethical approval via the school of education ethics review procedure. The University of Sheffield Research Ethics Committee monitors the application and delivery of the university's ethics review procedure throughout the university.

Contact for further information

Maha Alharbi, The University of Sheffield, The School of Education, 388, Glossop Road, Sheffield S10 2JA

Email: mmalharbi1@sheffield .ac.uk

Thank you for your cooperation!

Appendix 4: Students' Information Sheet

Participant Information Sheet (Students)

Students' Perceptions of Flipped Learning In Saudi Universities: An Exploratory Investigation

You are being invited to take part in a doctoral research project. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and decide whether or not you wish to take part. Thank you for reading this.

Purpose of the project

The primary goal of this research is to explore the perceptions of Saudi students regarding flipped learning in undergraduate classes. Flipped learning is a pedagogical approach in which students watch short learning videos about new topics outside the classroom, freeing up class time for active learning. The teacher usually creates the learning videos and uploads them to the learning management system (Blackboard) for students to access anywhere and anytime.

Why you have been chosen

You have been chosen because you are already enrolled as an undergraduate in a Saudi university.

Participation

It is up to you to decide whether or not to take part in the study. If you do decide to take part, you will be asked to give your consent by signing a consent form. You can still withdraw from the research at any point without giving any reason, but this course will be flipped and your consent is a permission to be observed, interviewed through the focus group and to answer the questionnaire.

What I would like you to do

Before every lecture, your teacher will upload a learning video and some questions to Blackboard. This video contains the learning content of a lecture. You need to watch this video and answer the questions before class; send your answers to the course email. The class time will start with a discussion of the questions; then, you will engage in activities (for example, group discussions, problem solving or peer tutoring); through these activities, you will reflect on, discuss and practise what you

have learned. I will examine your emails with your teacher and observe you during the class activities. In addition, at the end of this course, I will contact you to arrange an interview. I will invite you and some of your colleagues to join me in a focus group in which we will discuss your experience with flipped learning. The interview is likely to take 75 to 90 minutes. I will then analyse the interview transcripts. All the interview data will be anonymised. Moreover, I will provide you with a questionnaire that will give you a chance to answer open-ended questions about your experience with flipped learning.

The possible disadvantages and risks of taking part

As this research involves focus group interviews, you may feel slightly inconvenienced due to possible time conflicts with other members in the focus group. However, I will do my best to arrange a convenient time for the interview.

The possible benefits of taking part

I hope that you may benefit from the flipped learning experience. You may enjoy taking a class that involves more interactions with your colleagues and that gives your teacher enough time to answer your questions. You can use your tablets during class for learning alternatives. You will also benefit from involvement in the project by providing your feedback on my research findings.

If something goes wrong

If any problems occur, I hope that you will contact me (mmalharbi1@sheffield .ac.uk). If you have any concerns or complaints, please contact my supervisor (Julia Davies, j.a.davies@sheffield.ac.uk).

Confidentiality

Once the observations, focus group interviews and questionnaire data have been gathered, confidentiality will be maintained by ensuring that only my supervisor and I will have access to the data. You will not be able to be identified from the information in the study. Your data will be kept strictly confidential and will be destroyed when the study is complete.

The results of the research project

The project's results will be used in a thesis about student's perceptions of flipped learning in Saudi universities. I may also write papers for academic journals using this data or present the data at academic conferences. All previously agreed-upon anonymisation will be followed.

Organisation and funding of the research

This study is supported by the Education Ministry–Higher Education of the Kingdom of Saudi Arabia as part of my pursuit of a doctoral degree.

Ethical approval reviewer

This project's ethics have been approved via the School of Education's ethics review procedure. The University of Sheffield's Research Ethics Committee monitors the application and delivery of the Ethics Review Procedure across the University.

Contact for further information

Maha Alharbi, The University of Sheffield, The School of Education, 388 Glossop Road, Sheffield S10 2JA

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Thank you for your cooperation!

Appendix 5: Access Letter

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
رمزها ٠٣٤
أقسام العلوم الإنسانية

بسم الله الرحمن الرحيم

الرقم: ٣/١٣/٤٣٩٩٧٨
التاريخ: ٦/ ١١/ ١٤٣٦هـ
المرفقات:
الموضوع: ١٤٣٦٠٠٨٠٥١٠
١١/٤٩٠٥/و

سعادة الدكتورة/ وكيلة كلية التربية

حفظها الله

السلام عليكم ورحمة الله وبركاته... وبعد

مرفق لسعادتكم خطاب الأستاذة/ مها بنت محمد الحربي محاضرة بقسم تقنيات التعليم بجامعة الملك سعود وطالبة دكتوراه بجامعة شفيلد بالمملكة المتحدة والتي تقوم حالياً بدراسة بعنوان آراء الطالبات عن التعلم المقلوب في الجامعات السعودية

"Students' Perceptions of Flipped Learning in Saudi Universities: An Exploratory Investigation"

وترغب الباحثة في تطبيق دراستها على أحد شعب مقرر ٢٤٢ وسل التي يقدمها القسم، ونفيد سعادتكم موافقة القسم من تطبيق البحث في الفصل الدراسي الثاني من العام ١٤٣٦/١٤٣٧هـ

آمل من سعادتكم التكرم للاطلاع والتوجيه .

شاكرين ومقدرين لكم اهتمامكم

وكيلة قسم تقنيات التعليم

د. مريم بنت محمد السيف

لإبلاغ
وكيلة الكلية
د. سارة بنت عبد الكريم
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Appendix 6: An Example of One of Classroom Observation Agenda

Example of An Classroom Observation Draft

Lecture Topic:

- Students' Attendance	
- Interactions- Discussions	
- Students' Engagement in General	
- Feedbacks (student to student + teacher to students)	
- Others	

Date:

Appendix 7: Focus Group Questions

Focus Group Questions

- Describe what you experienced and how you felt about it?
- Do you consider your mode of learning to be flipped?
- How did you find:
    - Learning videos?
    - Assignments?
    - Classroom activities?
- What are the advantages of flipped learning, from your point-of-view?
- Did you face any obstacles?
- Did you get the needed feedback from your teacher during class time?
- Did you get the needed helpfulness during the class time from your teacher?
- Did you get the needed helpfulness during the class time from your colleagues?
- How do you compare flipped classes with traditional classes?
- How well do you think flipped learning fits into Saudi culture and society, especially for females?
- How do you see the future of flipped learning in Saudi Arabia?
- Do you have any suggestions or comments?

Appendix 8: Open-Ended Questionnaire

Questionnaire

"Students' Perceptions of Flipped Learning In Saudi Universities: An Exploratory Investigation"

Questionnaire

Dear students, the aim of this questionnaire is to know your ideas and views about flipped learning. Please read each question carefully and ask me for any unclear point. It should only take a few minutes of your time and your answers will be treated in confidence. I would be grateful if you could finish this questionnaire and return it back to me.

1. **How did you find the programme of flipped learning?**

   ---

2. **What sort of activities you liked and enjoyed most?**

   ---

3. **What sort of things you disliked in the course?**

   ---

5. Do you feel that flipped learning is appropriate to the Saudi Higher Education system? Why?

Yes, because----------

No, because----------

---

6. How do you feel about your learning progress in this course? Why?

---

7. Can you provide any other suggestions, comments, etc.

Thank you all for cooperation
Maha Alharbi

Appendix 9: Short Video Production Report

In this section, I present a personal account of my experience with co-creating instructional videos with the study's tutor-participant. I hope that this experience can offer a narrative that is valuable to both researchers and practitioners regarding the development of flipped learning resources.

As I mentioned in the methodology chapter (section 3.7.1.), the flipped learning program in this course involved the production of short videos to cover 12 lectures during the course. Each lecture had one or two videos depending on the length of the lesson. Because the length of the video is 10-15 minutes, if the lesson is very long, it should be placed in two short videos.

The production process of these videos passed a series of phases that started by contacting the teacher before the fieldwork began, and that ended when the teacher was confident about producing the videos by herself and using her own voice (see the flowchart in the next few pages).

First of all, in December 2016, I contacted the course teacher by e-mail, and she provided me with her contact number. We talked about the research, and I answered all of her initial questions about the study and the video production issues, such as the training she received, the application used to produce videos, and the induction day for students. Then, she provided me with the curriculum content and the initial syllabus, which clarified the distribution of lessons during semester weeks.

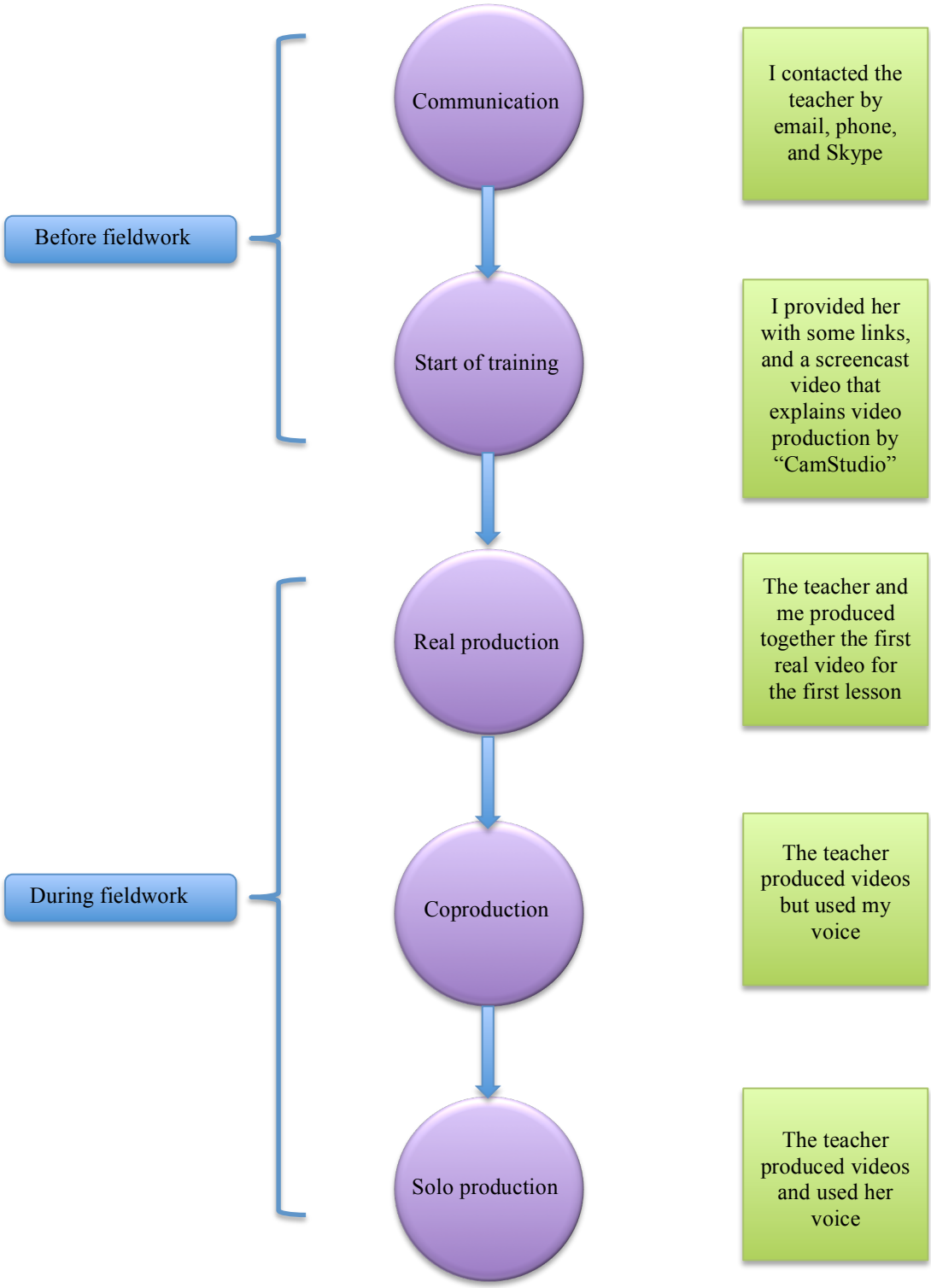
Second, and with regard to training, I provided her with some links about flipped learning in general, screen casting, and the application used to produce videos, which is "CamStudio." In addition, I met her twice on Skype to talk about the production, and I sent a screencast video by me about making videos. I made a semi entire video for the first lecture as an example.

Third, when I arrived in Saudi Arabia two weeks before the fieldwork, I met her face-to-face, and we sat together and began to prepare for orientation day. Together, we produced the first real video for the first lesson by using her laptop. After that, the teacher and I developed the videos as the semester progressed; we tried to prepare the videos two weeks in advance of the lectures to accommodate any potential

emergency, especially because the teacher has a small child and thus could have been forced to delay the lessons in any week. In addition, we created the questions and class activities beforehand.

Fourth, the teacher was capable of making videos but was not confident enough to put her voice on the videos; in fact, she used my voice until the fifth lecture. She said, “I am ashamed to hear my voice after recording, and I do not like to hear my voice between the corridors of the university when one of the students listened to the lecture.”

Finally, in the solo production phase, she was able to produce videos by herself and put her voice on them with no help. I think she was motivated to do this after observing the students’ responses to the videos, hearing the voice of the researcher, and getting used to the process, realizing that nothing bad would happen (I encouraged her as well, but, of course, she did not have any pressure to do record her voice). I truly appreciate what the teacher did during the course; she was excited and loved exploring innovations in education.


Before fieldwork
During fieldwork
Communication
Start of training
Real production
Coproduction
Solo production
I contacted the teacher by email, phone, and Skype
I provided her with some links, and a screencast video that explains video production by "CamStudio"
The teacher and me produced together the first real video for the first lesson
The teacher produced videos but used my voice
The teacher produced videos and used her voice

Appendix 10: Data Analysis Process

The following is a sample of the analysis stage for the theme of challenges to flipped learning. Chapter 3 (Section 3.10) contains the detailed analysis process. Here, I provide a sample that shows a part of each phase. Translation from Arabic to English occurred in the last phase (see the last table in this appendix), during which I gave all similar initial codes one name, as a subtheme under the main theme, which was the challenges of flipped learning based on participants' perceptions.

Table (1): Phase 1: Initial Codes Regarding Flipped Learning Challenges From the Transcribed Focus Group Interviews

Initial codes	Evidence	Participant
Technology problems in general	لقد واجهت بعض الصعوبات للفهم من الفيديو، بعض المحاضرات أعدتها ست مرات، ومن ثم عدت إلى كتاب الدراسة. كذلك حاولت المشاهدة من حاسوبي المحمول، كذلك حاولت ربط الحاسوب بتلفاز غرفة النوم، كما حاولت خلال وقت القهوة.	Moneera
	التعلم المقلوب قد يناسب زملائي لكن لا يناسبني. التكنولوجيا ليست لي. أنا أفضل المحاضرات وجها لوجه، وإذا لم أفهم شيئا ما ، أسأل المعلمة لتشرحه لي مره أخرى، وستشرحه بطريقة أخرى	Moneera
	أنا أرى ان التعلم المقلوب جيد لي ، ولكن بعض الطلاب لا يستطيعون الفهم من خلال الفيديو، فهم يعجبهم حينما تقف المعلمة في مقدمة الصف وتشرح كل شيء.	Noor
	أشعر بأن استخدام التقنية في الفصل تشتت تركيزي وتقطع أفكاري	Lana
	نعم كما قالت لانا انه يشتت التفكير بعض الأحيان، كما أن شبكة الانترنيت في الفصل وفي الجامعة عموما بطيئة جدا نظرا للضغط الكبير، مما يجعل عمل المجموعات بطيئا من أجل اكمال المهمات الصفية.	Rand
	لا يعجبني مشاهدة الهاتف كزميلاتيأنا أفضل استخدام شاشة الحاسوب حيث أن الهاتف يرهق عيناي.	Ghada
Technology access	ليس جميع الصديقات قادرات لدفع قيمة انترنيت	Alaa
	ليس لدي اشتراك لخدمة الانترنيت كل الوقت في هاتفي النقال ، على سبيل المثال لايمكنني مشاهدة الفيديو في الباص فقط في المنزل أو الحرم الجامعي	Sarah
	في بعض الأوقات رصيد البيانات في هاتفي ينتهي عندما أكون أشاهد الفيديو أو أقوم بإرسال أحد الواجبات والذي أعتبره من أهم العقبات. كما أن اتصال الانترنيت لدي في المنزل بطئ جدا، على سبيل المثال لقد حاولت ارسال أحد الواجبات طوال الليل والاستاذه استلمته في الصباح	Amal
Blackboard challenge	الفديوهات لم تكن تعمل خلال البلاكبورد، لذلك كنت احتاج إلى أن انسخ الرابط وألصقه في صفحة جديدة في متصفح الانترنيت.	Noha

	لم يكن يفتح بسرعة، ومن الصعوبة تشغيل الفيديو من خلاله.	Maha
	مشكلتنا مع البلاكبورد ليست بجديدة ، لقد سبق لنا استخدامه، ولكن أظن أن هناك الكثير من الضغط على النظام، لذلك هو بعض الاحيان يتوقف أو يتجمد. للأسف لدينا مواعيد للتسليم وعندما يمضي الموعد الطالب غير قادر على التسليم .	Lana
	أنا أؤيد ماقالته الزميلات ، هذه المشكلات تظهر ليس فقط في هذا المقرر وإنما ايضا في مقررات سابقة.	Mai
Materials design	تعجبني دروس الفيديو المنظمة أكثر من الكتب النصية لأنها تلقي الضوء على المعلومات المهمة...ولكن بعض الدروس شعرت بأن الفديوهات تبدو مماثلة للكتب.	Noor
	أشعر بالملل وعدم الحماس في بعض الفصول لأن الأنشطة لا تضيف إلي أي شيء.	Lana
	بعض الأنشطة مملة.	Sahar
Time management	التعلم المقلوب كان ممتعا بالنسبة لنا ولقد افادنا ، ولكن أعتقد بأنه غير مناسب للطلاب الذين لا يستطيعون إدارة وقتهم ولا يستطيعون تحمل المسؤلية حيال تعلمهم.	Rand
	في بعض المحاضرات لم استذكر جيدا ، فقط حاولت الاجابة على أسئلة الواجب وإرسال الحلول إلى المعلمة. كنت فقط اتصفح المحتوى لايجاد الاجابات، وفي الصف حاولت العمل مع صديقاتي، ولكن قبل الاختبار الفصلي واجهت مذكرات متراكمة وأحسست بحداثة المحتوى بالنسبة لي	Suaad
Weak acceptance of new ideas	الطالبات قد لا يتقبلن الأفكار التدريسية الجديدة	Mai
	أشعر بالخيبة وا لاحباط عندما أعمل في فريق و أحد الأعضاء غير مستعد، ولم يشاهد الفيديو، مما يتوجب علي الشرح لها من البداية"	Rand
Need for feedback	لا يسمح بالسؤال عن نقطة معينة في وقت المشاهدة.	Rand
	أحتاج تغذية راجعة للموضوعات الصعبة خلال المحاضرة لا أستطيع الانتظار حتى وقت المحاضرة.	Moneera
	أحتاج تغذية راجعة عندما أشاهد الفيديو، لقد حاولت كتابة الملاحظات ولكن أنسى سؤال الاستاذة في الصف	Rawa
Saudi female circumstances	أعتقد أنه من الأفضل للطالبات المتزوجات حضور المحاضرات في الجامعة لأن لديهن بالأصل الكثير من المسؤليات في المنزل.	Hala
	ليس كل الطالبات المتزوجات لديهن ظروف دراسة مناسبة في المنزل، مازال ليس لدى أطفال وزوجي يدعمني دراسيا ولكن الطالبات الاخريات قديكون لديهن أعمال منزلية ورعاية أطفال ، فقد لا يكون لديها المساعدة والدعم اللازم	Rand

Table (2): Phase 2: Initial Codes Regarding Flipped Learning Challenges From the Field Notes (Observations)

Initial codes	Evidence
Technology problems in general	بعض الطالبات كن يستخدمن تطبيق الواتس اب خلال الصف عندما تكون الأستاذه مشغولة مع طالبات أخريات. سعة البطارية + حجم الشاشة + شحن الطالبات للهواتف
Technology access	ليس الجميع لديهم أجهزة متقدمة ذات جوده عالية أو بظروف جيدة. على سبيل المثال لقد رأيت خلال ملاحظاتي الصفية طالبتين يستخدمن أجهزه محمولة بشاشات مكسورة
Activity design	اليوم، قامت المعلمة بإعطاء أربعة أنشطة في الصف...كل المجموعات أنجست النشاط الأول بسرعة. ومن ثم قامت المعلمة بمناقشته سريعا وانتقلت للنشاط الآخر.وبذلك وفجأة انتهت جميع الأنشطة وتبقى نصف ساعة بدون أي نشاط. لقد كان من الممكن إطالة الحديث بخصوص دراسة الحالة المعطاة، ولكنها نوقشت بسرعة.
Weak acceptance of new ideas	الطالبة تقول "أشعر بأنني أدرس بشكل جاد عندما تقوم المعلمة بالشرح أمامي بالفصل".

Table (3): Phase 3: Initial Codes Regarding Flipped Learning Challenges From the Open-Ended Questionnaire

Initial codes	Evidence	Participant
Lack of seeking help	بعض الأحيان لم أتمكن من السؤال مما أدى إلى تراكم الأسئلة قبل موعد الاختبار.	Mai
Skipped information	أحد مساؤي التعلم المقلوب، هو أنني لو احتجت أن أسأل عن شيء ما في ذات لحظة المشاهدة أو الحصول على شرح مطول ولكن أنسى أن أسأل في الفصل مما يعني أنني أفتقد لبعض المعلومات. عدم القدرة إلى توجيه سؤال مباشر للمعلمة خارج الفصل مما يسبب نقص في الفهم بما يتعلق بأحد النقاط.	Lana Rand

Table (4): Phase 4: Compiling Similar Codes From All Sources Under Subthemes Under the Main Theme, With the Source and Participants' Names

Main theme	Subtheme	Evidence	Participant	Source
Flipped learning challenges	Challenges of using technology	لقد واجهت بعض الصعوبات للفهم من الفيديو، بعض المحاضرات أعدتها ست مرات، ومن ثم عدت إلى كتاب الدراسة. كذلك حاولت المشاهدة من حاسوبي المحمول، كذلك حاولت ربط الحاسوب بتلفاز غرفة النوم، كما حاولت خلال وقت القهوة.	Moneera	Focus group
		قد يناسب زملائي لكن لا يناسبني. التكنولوجيا ليست لي. أنا أفضل المحاضرات وجها لوجه، وإذا لم أفهم شيئا ما ، أسأل المعلمة لتشرحه لي مره أخرى، وستشرحه بطريقة أخرى	Moneera	Focus group
		أنا أرى ان التعلم المقلوب جيد لي ، ولكن بعض الطلاب لا يستطيعون الفهم من خلال الفيديو، فهم يعجبهم حينما تقف المعلمة في مقدمة الصف وتشرح كل شيء.	Noor	Focus group
		اليوم كل الطلاب كانوا متفاعلين، عندما طلبت منهم المعلمه للبحث في قوقل عن مفهوم "الرحلة المعرفية" ، بعض المجموعات استخدموا الحواسيب الموجوده في الصف والبعض الآخر استخدم الهواتف النقالة، ماعدا لانا ، فقد كانت تفكر وتكتب.	Me	Field notes
		أشعر بأن استخدام التقنية في الفصل تشتت تركيزي وتقطع أفكاري.	Lana	Focus group
		-		
		نعم كما قالت لانا انه		

		يشتت التفكير بعض الأحيان، كما أن شبكة الانترنيت في الفصل وفي الجامعة عموما بطيئة جدا نظرا للضغط الكبير، مما يجعل عمل المجموعات بطيئا من أجل اكمال المهمات الصفية.	Rand	Focus group
		بعض الطالبات كن يستخدمن تطبيق الواتس اب خلال الصف عندما تكون الأستاذه مشغولة مع طالبات أخريات.	Me	Field notes
		سعة البطارية + حجم الشاشة + شحن الطالبات للهواتف .	Me	Field notes
		لا يعجبني مشاهدة الهاتف كزميلاتيأنا أفضل استخدام شاشة الحاسوب حيث أن الهاتف يرهق عيناي.	Ghada	Focus group
	Digital divide	ليس جميع الصديقات قادرات لدفع قيمة انترنيت	Alaa	Focus group
		ليس لدي اشتراك لخدمة الانترنيت كل الوقت في هاتفي النقال ، على سبيل المثال لايمكنني مشاهدة الفيديو في الباص فقط في المنزل أو الحرم الجامعي	Sarah	Focus group
		في بعض الأوقات رصيد البيانات في هاتفي ينتهى عندما أكون أشاهد الفيديو أو أقوم بإرسال أحد الواجبات والذي أعتبره من أهم العقبات. كما أن اتصال الانترنيت لدي في المنزل بطئ جدا، على سبيل المثال لقد حاولت ارسال أحد الواجبات طوال الليل والاستاذه استلمته في الصباح	Amal	Focus group
		ليس الجميع لديهم أجهزة متقدمة ذات جوده عالية أو بظروف جيدة. على سبيل المثال لقد رأيت خلال ملاحظاتي الصفية طالبتين يستخدمن أجهزه محمولة بشاشات مكسورة.	Me	Field notes
			Me	Field notes
	Problems with learning-management systems	الفديوهات لم تكن تعمل خلال البلاكبورد، لذلك كنت احتاج إلى أن انسخ	Noha	Focus group

		الرابط وألصقه في صفحة جديدة في متصفح الانترنيت.		
		لم يكن يفتح بسرعة، ومن الصعوبة تشغيل الفيديو من خلاله.	Maha	Focus group
		مشكلتنا مع البلاكبورد ليست بجديدة ، لقد سبق لنا استخدامه، ولكن أظن أن هناك الكثير من الضغط على النظام، لذلك هو بعض الاحيان يتوقف أو يتجمد. للأسف لدينا مواعيد للتسليم وعندما يمضي الموعد الطالب غير قادر على التسليم .	Lana	Focus group
		أنا أؤيد ماقالته الزميلات ، هذه المشكلات تظهر ليس فقط في هذا المقرر وإنما ايضا في مقررات سابقة.	Mai	Focus group
	Poorly designed videos or class activities	تعجبني دروس الفيديو المنظمة أكثر من الكتب النصية لأنها تلقي الضوء على المعلومات المهمة...ولكن بعض الدروس شعرت بأن الفديوهات تبدو مماثلة للكتب.	Noor	Focus group
		أشعر بالملل وعدم الحماس في بعض الفصول لأن الأنشطة لا تضيف إلي أي شيء.	Lana	Focus group
		بعض الأنشطة مملة.	Sahar	Focus group
		اليوم، قامت المعلمة بإعطاء أربعة أنشطة في الصف...كل المجموعات أنجست النشاط الأول بسرعة. ومن ثم قامت المعلمة بمناقشته سريعا وانتقلت للنشاط الآخر.وبذلك وفجأة انتهت جميع الأنشطة وتبقى نصف ساعة بدون أي نشاط.	Me	Field notes
		لقد كان من الممكن إطالة الحديث بخصوص دراسة الحالة المعطاة، ولكنها نوقشت بسرعة.	Me	Field notes
	Students who have	التعلم المقلوب كان ممتعا	Rand	Focus group

	little ability to regulate their learning	بالنسبة لنا ولقد افادنا ، ولكن أعتقد بأنه غير مناسب للطلاب الذين لا يستطيعون إدارة وقتهم ولا يستطيعون تحمل المسؤلية حيال تعلمهم. بعض الأحيان لم أتمكن من السؤال مما أدى إلى تراكم الأسئلة قبل موعد الاختبار. في بعض المحاضرات لم استذكر جيدا ، فقط حاولت الاجابة على أسئلة الواجب وإرسال الحلول إلى المعلمة. كنت فقط اتصفح المحتوى لايجاد الاجابات، وفي الصف حاولت العمل مع صديقاتي، ولكن قبل الاختبار الفصلي واجهت مذكرات متراكمة وأحسست بحداثة المحتوى بالنسبة لي.	 Mai Suaad	 Open-ended questionnaire Focus group
	Resistance to change	الطالبات قد لا يتقبلن الأفكار التدريسية الجديدة الطالبة تقول "أشعر بأنني أدرس بشكل جاد عندما تقوم المعلمة بالشرح أمامي بالفصل". أشعر بالخيبة وا لاحباط عندما أعمل في فريق و أحد الأعضاء غير مستعد، ولم يشاهد الفيديو، مما يتوجب علي الشرح لها من البداية"	Mai Me Rand	Focus group Field notes Focus group
	Lack of instant feedback and skipped information	أحد مساؤي التعلم المقلوب، هو أنني لو احتجت أن أسأل عن شيء ما في ذات لحظة المشاهدة أو الحصول على شرح مطول ولكن أنسى أن أسأل في الفصل مما يعني أنني أفتقد لبعض المعلومات. عدم القدرة إلى توجيه سؤال مباشر للمعلمة خارج الفصل مما يسبب نقص في الفهم بما يتعلق بأحد النقاط. لا يسمح بالسؤال عن	Lana Rand Moneera	Open-ended questionnaire Open-ended questionnaire Focus group

		نقطة معينة في وقت المشاهدة. أحتاج تغذية راجعة للموضوعات الصعبة خلال المحاضرة لا أستطيع الانتظار حتى وقت المحاضرة. أحتاج تغذية راجعة عندما أشاهد الفيديو، لقد حاولت كتابة الملاحظات ولكن أنسى سؤال الاستاذة في الصف	Rawa	Focus group Focus group
	Saudi female students' roles as wives and mothers	أعتقد أنه من الأفضل للطالبات المتزوجات حضور المحاضرات في الجامعة لأن لديهن بالأصل الكثير من المسؤليات في المنزل. ليس كل الطالبات المتزوجات لديهن ظروف دراسة مناسبة في المنزل، مازال ليس لدى أطفال وزوجي يدعمني دراسيا ولكن الطالبات الاخريات قديكون لديهن أعمال منزلية ورعاية أطفال ، فقد لا يكون لديها المساعدة والدعم اللازم.	Hala Rand	Focus group Focus group

Table (5): Final Phase: Translation From Arabic to English

Main theme	Sub-theme	Evidence	Participant	Source
Flipped learning challenges	Challenges of using technology	- I face difficulties understanding from videos. For some lecture, I replayed it six times, then I returned to the text book. I tried to watch from my laptop, and I tried to connect my laptop with my bedroom TV, and tried during my coffee time.	Moneera	Focus group
		- Flipped learning may be suitable for my colleagues but not for me. Technology is not my thing; I prefer face-to-face lectures, and if I don't understand any point, I ask my teacher to explain it again and she explains in another way.	Moneera	Focus group
		- "I see flipped learning as good for me, but some people cannot understand from videos, they like when the teacher stands up in the front of the class and explains everything"	Noor	Focus group
		- "Today, all the students were active, when the teacher asked them to Google the concept "web quest", some groups opened the class PCs, and some used their mobile phone, except Lana. She just kept writing and thinking"	Me	Field notes
		-"I feel that using technology for class activities distracts my focus and cuts my thoughts"	Lana	Focus group

		- “yes, as Lana said, it cuts the concentration sometimes, and also the Internet network in the class and in the university in general is too slow. Because of the high load, it may take a long time until all the groups complete the required task”	Rand	Focus group
		- students who were checking their WhatsApp chats while the teacher was busy with other students.	Me	Field notes
		- Battery capacity and screen size + students charge their phones.	Me	Field notes
		- “I do not like to watch my phone screen like my friends. I prefer to use the computer; mobile screens strain my eyes”.	Ghada	Focus group
	Digital divide	- “Not all of my friends are able to pay for the Internet”	Alaa	Focus group
		- “I do not have internet connection all the time through my cell phone, for example, I can not watch videos in the bus, only at home or on campus”.	Sarah	Focus group
		-“Some times my Internet data allowance ran out when I watch videos or send an assignment which I consider the most important obstacles, also, my internet connection at home is very slow. For example, I tried to send my assignment email during the night and	Amal	Focus group

		the teacher received it in the morning" - not all of them had one that was advanced, of high quality, or in good condition. For example, I noticed two students using devices with broken screens.	 Me	 Field notes
	Problems with learning-management systems	- "the videos did not work for me through Blackboard; I needed to copy the video link and paste it in a new page of Internet Explorer" - "it does not open quickly, and it is difficult to play the videos" - Our problem with Blackboard is not new; we have used it before, but I think there is a lot of pressure on the system, so sometimes it hangs or stops. We have deadlines, and when time is running out, students are not able to enter the system and turn in the required assignment - "I support what my friends said; these problems have appeared not only in this course but in previous courses".	Noha Maha Lana Mai	Focus group Focus group Focus group Focus group
	Poorly designed videos or class activities	- "I like that the video lectures were more organized than the textbook and highlighted important information…for some lectures, I felt that they were same as the textbook" - "I felt bored and not	Noor Lana	Focus group Focus group

		very excited in some classes because the activities did not add anything for me"		
		- "Some activities were boring".	Sahar	Focus group
		- "Today, the teacher gave four activities in the class. . . . all the groups did the first activity very quickly. Then, the teacher discussed it very rapidly and moved on to the other activities. . . . Suddenly, they had finished all the activities with half an hour left in the class time"	Me	Field notes
		- "It was possible to prolong the debate on the given case study, but they discussed it quickly".	Me	Field notes
	Students who have little ability to regulate their learning	- "flipped learning was very enjoyable for us, and we benefit from it, but I think it is not suitable for students who cannot manage their time or who do not take responsibility for their learning"	Rand	Focus group
		- "sometimes, I did not ask for help, which caused me to have lots of questions before the exam".	Mai	Open-ended questionnaire
		- for some lectures, I did not study very well; I just tried to answer the questions and send them back to the teacher, I was scanning the content to find the answers, and in the class, I tried to work with my friends…but before the midterm exam, I faced an accumulation of	Suaad	Focus group

		lecture notes, and I felt that they were new to me.		
	Resistance to change	- "Students may not accept new ideas [pedagogies]". - A student said "I feel that I am studying when the teacher is explaining in front of me in the classroom." - "I feel disappointed and frustrated when the work group or one of its members is not ready; if someone did not watch the video, I have to explain it from scratch"	Mai Me Rand	Focus group Field notes Focus group
	Lack of instant feedback and skipped information	- one of its [flipped learning's] disadvantages is that, if I needed to ask about something at the same moment when I was watching or get an extended explanation, then I would forget to ask the teacher in the class, which meant that I missed the information. - "the inability to direct an inquiry to the teacher in the event of a lack of understanding regarding a certain point of a lesson". - "it does not allow questions about some points at the time of viewing." - "I need direct feedback for the difficult topics during the lectures; I cannot wait until the class time".	Lana Rand Moneera Rawan	Open-ended questionnaire Open-ended questionnaire Focus group Focus group

		- "I need direct feedback when I watch videos. I tried to write notes, but I forgot to ask my teacher during class time."		Focus group
	Saudi female students' roles as wives and mothers	- "… I think it is better for the married students to attend lectures at the university because they already have loads of responsibility at home…".	Hala	Focus group
		- "…Not all married students have suitable conditions to study at home like me, I still do not have kids and my husband encourages me, but may be other student need to do housework or childcare, may be she does not have the needed help or encouragement …".	Rand	Focus group