

Effects of Collaborative Learning on the  
Achievement of Students with Different  
Learning Styles at Qatar University (QU)

*A Thesis submitted for the degree of Doctor of  
Philosophy*

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## **Abstract**

In this research, collaborative learning techniques were designed to examine their influence on the achievement of students with different learning styles at Qatar University (QU). One important issue was whether collaborative learning in a blended learning environment had a major impact on students' achievements and skills irrespective of their learning styles. Furthermore, this research investigated other learning styles to show the importance of collaborative learning on students' achievements and skills.

Qatar University has chosen as a case study; research was conducted on 81 students, aged between 19 and 22. The students, who were on a research methods course, were divided into three different branches where each branch contained the same number of students: the control group (C), the first experimental group (E1) and the second experimental group (E2). In the control group, each student worked separately. The first experimental group was divided into small groups of students who each had a different learning style. The second experimental group was also divided into four groups with the students in each group having the same learning style. The two experimental groups followed the course through collaborative learning, as well as traditional learning. The students were asked to fill in a pre-questionnaire three times in order to distinguish their learning styles, and some of them were eliminated from the analysis process due to instability in their learning style across the three responses. The final sample comprised of 45 students in the control group (C), 44 in experimental group (E1) and 46 in experimental group (E2). Finally, equal numbers represented by the first 27 scores from each group were analysed in order to get more accurate results through comparing symmetric groups in terms of the numbers of students in each group. Subsequently, interviews were carried out with seventy-one (71) students from all three groups; 20 students (28.2%) from the control group (C), 25 students (35.2%) from the first experimental group (E1), and 26 students (36.6%) from the second experimental group (E2), to support the study results.

Data were analysed using SPSS. The study analysis involved first establishing whether the data followed a normal distribution. One-way Analysis of Variance (ANOVA) was used to compare students' achievements due to learning style and

Independent Sample T-tests were utilised to discover if statistical evidence was significantly different.

The findings revealed that collaborative learning had no beneficial effect on the students' exercises and poster skills or in their scores for the midterm exam. However, collaborative learning had a significant effect on the students' proposal writing scores. Other than that, collaborative learning had no effect on exam results including pre-test, post-test, midterm or final exam.

Furthermore, the findings confirmed that there were significant differences in the post-test, midterm and final exam scores of students who undertook collaborative learning with the same learning style in a blended learning environment due to their learning style, with the converging learning style being associated with significantly higher scores. Thus, there was an effect on the post-test, midterm and final exam scores of students engaged in collaborative learning with the same learning style in a blended learning environment which was due to their learning style. On the other hand, differences in learning style had no significant effect on the achievements of collaborative learners in the exercises, proposal writing and poster task, or in the pre-exam. Also, results confirmed that in the control group, there was a significant difference in the students' pre-test, midterm and final exam scores in a blended learning environment due to learning style where collaborative learning did not occur. This difference was due to the learning style, with the assimilating learning style showing the best results. However, there was no significant difference in the students' scores for their exercises, proposal and poster skills or for their post-test in a blended learning environment due to learning style where collaborative learning did not occur. Regarding the first experimental group (E1), learning style had no significant effect on the students' skills and achievements (scores for the exercises, proposal and poster task, and for the pre-test, post-test, midterm and final exam) in a blended learning environment where collaborative learning occurred. The researcher recommends that e-learning centres be established in Qatar universities, distributed in specific centres in colleges, and that educationists who are specialised and qualified in collaborative learning styles be provided so that instruction on this type of learning is based on correct educational roots using precise scientific techniques.

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# Chapter 1: Preface to the Study

## 1.1 Introduction

In the last few years, e-learning has become an area of considerable research interest, and has been applied in several fields; introducing the Internet has had a significant impact in endorsing innovation. Nowadays, Information and Communication Technology (ICT) is widely utilised in schools to allow teachers to develop the core curriculum and to enhance student learning and education outcomes. Moreover, ICT allows significant changes in instruction, helping schools to become more student-centred and enable more individualised learning (Muir-Herzig 2004).

Research into e-learning is still in the early stages and is thrilling, although the multifaceted nature of e-learning makes it complex, as its development is based on creative research in many areas of learning and technology. Recently, it has become increasingly evident that the Internet has become a resource for learning and has gained increasing popularity among education systems, especially in higher education. Generally, the wide implementation of the Internet in education has promoted and facilitated increasing innovation in the learning process (Pange and Pange 2011). Additionally, the benefits gained from using such technology can be continuously maximised through learning and applying it in effective ways through the use of collaborative environments (Stahl et al. 2006, p.415). Simply, e-learning is a tool to deliver learning where many learning resources are available for users and are conducted using a computer, with others conducted using television or other electronic communication techniques (Johnson 2005). Effective e-learning relies on students undertaking tasks that provide an experience likely to lead them to a new desired understanding.

E-learning has become hugely prevalent throughout the global community of students; therefore, interest in building suitable e-learning environments has significantly increased. The matter of e-learning environments should be brought to public attention. At the same time, education processes and pedagogical concepts must take their place in the ICT revolution, and should be a priority in terms of designing and setting up

sustainable strategies and long-term plans for the advancement of society and the education system. All well-developed educational institutions are currently seeking to adopt technological approaches, processes and techniques in order to build a strong research base and to expand their students' knowledge and educational level. Where the knowledge and educational level depends on the students' early educational experiences that mean the students who have enriching early educational experiences will be more likely to stay in education and then successfully transfer to the labour market. The approaches that should be adopted must depend on appropriate technology and communication software and systems. In addition, the level of adoption of technologies is on the rise in academic teaching. A web-based learning environment is an educational approach that allows students to access learning as soon as possible. Learning events that are conducted in traditional classrooms are also available through the internet: it is not just another environment that takes more time to develop than other classrooms, but it provides a wide variety of ways of acquiring information, opens new choices for learning, and constructs a smart and flexible learning environment that gives fresh approaches to education. Individualisation is considered an essential aspect of e-learning and in any learning environment via ICT, not least because the student does not necessarily attend face-to-face classes or instruction. There need not, for example, be specific times or space limitations, or transportation barriers involved. In other words, the student can interact with the material from home or from any other location. The level of interactivity, the sophistication of communication and expense differs in each of these types of learning. Furthermore, e-learning creates a great impact on teaching types that are used with development and practice. Also, an e-learning environment may provide the student with privacy, as learners who participate in the learning process have the ability to organise, control and change the learning environment (Soyemi 2012).

E-learning relates to employing electronic processes and applications to aid in learning. Several elements share in applying e-learning and in its processes, like virtual classrooms, web-based training, and digital collaboration. Content is presented via the extranet, CD-ROMs with multimedia capabilities, the Internet, and satellite TV. E-learning is defined as individualised instruction introduced through a network in two primary ways: publicly via the Internet, and privately through an intranet. Originally, e-

learning was known as ‘internet-based training’ or ‘online training’. Now these concepts are still being used in parallel with differences in e-learning (Manochehr 2006, p. 10). Basically, e-learning has two recognised types described as self-paced (known as synchronous) and instructor-led (known as asynchronous). Based on that, both teacher and student need to attend either classroom or online at the right time to perform tasks that are required. The level of interaction and the cost and sophistication of communication are different in each of these types. Furthermore, e-learning has an influence on the three areas of teaching, training and development. After all, there is variety between learning approaches and these variations and disparities become more significant in the area of education systems (Manochehr 2006).

According to Garrison (2011), e-learning is defined as a method that uses electronic devices such as a computer, communication techniques and mobiles to help students with different learning styles get the information they require. The Internet is flexible and easy to deal with, and is widely known and used by many people. Because of this, it may also be considered a style of flexible learning, as the learning process can take place at any time. In this way, e-learning can support different learning styles and allow for greater diversification of students and greater access to education (Moore, Dickson-Deane and Galyen 2011). However, the main problem that faces students through learning via the internet is not dealing competently with the new technology. To create a convenient and developed environment, many things should be taken into consideration such as the learner’s desire, willingness, requirements and needs. In addition, successful environments should focus on the academic differences between learners so that they fit all the different styles of learning (Manochehr 2006). In this respect, it is worth mentioning that learning via computer enables asynchronous communication in individual learning styles, which may correspond with the needs of students who avoid voicing their opinions and who are reluctant to speak up or discuss topics in front of other people. Therefore, in asynchronous communication, they may be more relaxed and willing to participate in the relative anonymity of the electronic medium (Tu and McIsaac 2002), and can receive individual comments in a private mode. Thus, asynchronous communication allows users to interact with content without being connected directly with the tutor or with other students. This form of communication also allows participants

to place messages on a networked server, which other students can visit and read. Moreover, each student has the opportunity to post a reply or comment in response to the first message. Subsequently, readers can comment upon the original post or on earlier comments (Pena-Shaff and Nicholls 2004): for example, students can receive an activity from the tutor and respond to it later. Some students prefer to think carefully, search and organise their answers rather than responding immediately. In some e-learning environments, students are able to contribute as much or as little as they want, when they want to. If they prefer to “lurk”, i.e. read but not comment, they may do so. Sometimes students are allowed to choose a discussion from the list, or set up their own topic to be discussed with each other. Small groups can coalesce spontaneously around a topic of mutual interest (Warger and Dobbin 2009).

Blending refers to “mixing objects and learning signifies an integration of new information” (Tshabalala, Ndeya-Ndereya and Merwe 2014, p. 102). Staker and Horn (2012, p.3) stated that blended learning is an official learning system that combines parts of traditional classroom learning with internet learning as learners are allowed to develop their thoughts, generate ideas and participate in instruction online. Moreover, blended learning programmes could include different types of learning instruments, which include self-paced, Web-based, real-time, virtual, or collaboration software, knowledge management systems, and courses.

This study will talk about co-teaching. Co-teaching mixes the expertise of two professionals that are a general teacher and a specialist teacher, where the main goal in combination is to deal with the various students’ needs within a general teaching setting (Anderson 2008). Moreover, Lindeman and Magiera (2014) defined co-teaching as a particular kind of collaboration, such as dedicated teaching for students with special needs. This category enables the students to get a better education within traditional teaching schoolrooms. It is also an instructional delivery model for particular and general teaching, providing an educator formulation, which is supportive of students with disabilities obtaining instruction in comprehensive environments. Co-teaching outcomes in amended programmes improve strength and persistence by decreasing the student-teacher ratio and enhancing student engagement (Frey and Kaff 2014).

In contrast to these levels of individualisation, there is also a considerable body of research that has argued for collaborative learning as having powerful effects on student learning, including student characteristics, group composition, and task characteristics, particularly for low-achieving students (Lai 2011). Thus, it becomes imperative to understand the impact of learning styles on an online learning environment to accurately define different types of learners. Collaborative learning shifts some of the duty to teach onto students, since the intention is that they become researchers and self-directed learners, as well as taking responsibility for their own learning (Dooly 2008, 22). Ideally, the teacher should understand the principles of collaborative learning and the preferred learning styles of their students, and thus improve the cooperative education programme. Also, collaborative learning has many characteristics such as co-operative behaviour, the acquisition of knowledge, delegating decisions, etc. to develop student trust and retention, which add value to both student and classroom (Stahl, Koschmann and Suthers 2006, 414). Hence, the teacher can determine how to introduce collaborative learning and also where to begin.

Higher education has a significant impact on changing the curriculum related to e-learning so this allows it to reach a wide variety of learning resources. E-systems have become one of the principal aspects of effective education systems in higher education organisations because they are seen to provide easy access to learning resources with available techniques and tools that can be accessed at anytime, anywhere (Ghaleb, Daoud, Hasna, ALJa'am, El-Seoud and El-Sofany 2006). In addition, applying e-learning in the education system ensures that goals are attained with little time and effort. An e-learning system also offers the means to support several forms of student-instructor and student-student interactions that permit students to relate through synchronous and asynchronous means of communication, thereby supporting the social construction of knowledge (Hasan and Fook 2012). For example, within Qatar University, the many benefits of using e-learning/technology have already been realised. However, we still need to see how students with different learning styles are able to work collaboratively or not within such an environment, to ensure all e-learning benefits are realised to the full potential. Therefore, the current study aims to examine the impact of collaborative

learning on the achievements of students corresponding to diverse learning styles at Qatar University (QU).

## **1.2 Importance of the Study**

So, as already noted, technology nowadays plays a significant role in facilitating many factors across wide areas of life. Since education plays a fundamental role in development in different fields, new applications have been adopted to enhance levels of education. In general, education tools and items can be allocated for each student and adapted depending on their field of study as well as their intellectual interests (Marshall 2002). The recent development of distance education programmes has been reinforced through the growth of technology and the Internet. It seems that education via the Internet can change the educational landscape. Also, it is essential to involve technological innovations to enhance distance learning; however, it is not enough to guarantee that distance learning will be effective. There are several learning styles that are preferred by different students: some of them prefer learning using listening and watching, while others prefer learning based on reading, or on doing and moving in a hands-on environment. Hence, based on previous research, it is essential to study students' learning styles in parallel with developing distance-learning courses. As Zapalska and Brozik (2006) indicated, online education is considered to be a vital approach to learning for students. In order to teach more effectively on online courses, teachers are required to know more about differences in learning and how to deal with the different sorts of learning styles that are found amongst their students. Teachers who know about differences in learning styles are more capable of changing their teaching techniques and strategies in online education.

Moreover, e-learning and online teaching comprises a massive new research area that has attracted researchers concerned with the education process and education systems. There is need for improvement, which reflects on educational process and tools to contribute to the learning environments as they continue to evolve. In addition, these fields examine positive and negative aspects, which are considered to be effective and sensitive issues, in order to find out the weaknesses and strengths in the system. These factors are also important in addressing the contents of the entire system, such as teaching

presence, distance education, collaborative pedagogy and critical thinking. On the other hand, one must highlight the role of upgrading based on the development of the quality of education; for example, enhancing the role of interaction as a crucial technique for the education process (Course 2002). Thus, teachers and officials can also collaborate with each other to develop the delivery of education by making it more interactive. According to Dooly (2008) there are many factors that affect collaborative learning such as skills, knowledge, trust and communication of students. This means that students should understand and know how to interact with one another in the group in a successful way, and this can only be achieved by everyone contributing positively. Considering that one's engagement is necessary for the success of the whole group can be a strong motivational factor.

Furthermore, higher education plays an important role in a wide range of different bodies and aspects, including the national economy and the industrial sector. Currently, from this vision, it has become necessary to generate new advanced approaches and modern methods in education. According to Lindsay (2010), e-learning is defined as a method of delivering data which helps students to understand learning approaches in education. It achieves this by being based on computers and communications technology in regard to systems and teaching procedures. Moreover, it is widely used and may also be considered a style of flexible learning, as the learning process can take place at any time. Individualisation of learning is management of the education process to suit its needs and abilities which aims to adapt the learning styles, as adaptation allows the learner the freedom to choose an activity that fits him/her in terms of prior background knowledge and learned pattern of behaviour to achieve the desired objectives with a degree of perfection.

There are positive and negative aspects to both traditional learning and e-learning methods. For instance, in a face to face environment, interaction between the students in the classroom is limited, because the teacher talks more than them. On the other hand, with online e-learning, interaction between the students becomes more effective and it is clear that the interaction and the level of activities are higher (Johnson 2005). Group, individual and team work seem weak in the classroom, whereas in the e-learning environment they are obviously better (Oakley et al., 2004). On the other hand, an e-

learning environment may provide some students with privacy. Thus, students have an additional role in keeping a learning environment free from defects and under control. Privacy matters for students in a virtual learning environment are more significant than those in normal campus learning environments, because there is flexibility for students in the e-learning environment and more resilience in dealing with their needs. This might include access to sources, as well as saving time, which allows them to expand their perceptions and prospects (Jerman-Blazic and Klobucar 2005). These issues have a greater impact in many psychological and social aspects. In the case of e-learning, the degree of motivation is high for several reasons. For example, the utilisation of technology and entertainment within the education process is a motivating factor, in contrast to classroom or traditional learning where these motivators do not exist. The most important thing is how to make the student self-sufficient in the online environment, for instance, the teacher should not have a major role, unlike in the traditional environment, and their role is limited to giving learning material without any participation from students (Lu 2007). Although there is a lot to do in order to improve and develop such situations, the characteristics of e-learning are still more flexible and elastic. In addition to this, the structure of lessons and courses totally change, making e-learning seem more dynamic, because this structure is affected by the groups and teams of students.

In general, the use of technology and modern methods has a positive impact on the environment of education with respect to different types of students. E-learning has benefits and advantages over classical methods; it enhances communication between learners, opens doors for serious discussion, saves time, and is available twenty-four hours a day. Therefore, e-learning in an integrated manner is considered to be more efficient and functional than a face to face environment. The era of technology and e-learning environments require greater reliability in order to be applicable to education institutions and to the pedagogical process (Muir-Herzig 2004). As an arbitrator in this comparison, the e-learning method provides three major advantages in the field of education, namely time, flexibility, and interactions. In other words, there is a greater range with respect to communication with other bodies in order to develop and improve educational skills and competencies through the use of effective tools, such as the

personal profile in e-learning systems. Furthermore, the flexibility of an electronic educational system model is regarded as an elastic system compared to the traditional and classical education system represented by classrooms. This makes it easier to access databases and obtain information for study, research or other purposes. Time-saving is also a defining feature, making available a lot of opportunities and using time more efficiently than the classical model (Mandic 2012).

Learner and learning approach are poles of the learning environment so the interactions between these two elements are the primary function of education to analyse classroom activities on the one hand and the methods of learning for learners on the other hand. Thus, focused attention on building an integrated environment is necessary in which the learners play an essential role, and the role of the learning methods is to support and direct them (So and Brush 2008, pp. 330).

Focusing on Qatar, the leap of using of e-learning methods requires many measures and necessities to be put into place, such as the use of modern information technology and sophisticated ICT. Institutions also need to set up networks within the overall system of education (Jerman-Blažič and Klobučar 2005). Other important elements include utilising digital tools and methods for assessment purposes and strengthening professional development, interaction and collaboration between the different bodies of information technology and the collaborative environment, which is related directly to higher education and the education system in general (Ruentam 2012). Considering the truth of the education sector is crucial in achieving sustainable development, which is an essential requirement of any reform process related to upgrading the community and its components and it has become necessary for technology, information and communications to take their place in the procession of changes to keep up with modern educational and pedagogical systems. In addition, since education is seen as a hugely significant mainstay in any country that aspires to be a contemporary and flourishing nation, there is a need to address the issue of the learning process. One must be more familiar with the continuous requirements associated with the learning development process, all of which need to be integrated with long-term plans and objectives (Al-Sulaiti, 2011). Education has manifold and complicated relationships with various fields, such as the economic and social systems, and is also concerned with

the creation of youth generations with a high degree of awareness and maturity to ensure their capability and competence in dealing with new obstacles. It is true that there are many possibilities on the horizon, but at the same time, there are also numerous challenges. In general, e-learning has been used recently as a basic source of education in Qatar. However, previous studies in the field of collaborative learning, especially in the Arab Gulf states, are few and do not achieve the desired and expected needs and interest in the context of the concept of learning styles and their relationships with e-learning. This type of research is needed to:

- Develop the educational process.
- Adopt modern teaching methods.
- Cater for the steadily increasing numbers of students seeking to obtain a university education.
- Adopt the principles of lifelong learning and self-learning and to diffuse the literature on the benefits offered by modern information technologies and the ability to disseminate knowledge among the educated in many ways.

It is imperative then, to undertake research and development to establish a solid strategy. This strategy must be transferred into reality to arrive at a stage of stability in this field by using fixed steps in the context of the educational and pedagogical process (Taatila and Raji 2012). In higher education, e-learning resources are commonly used. At this point, this research has probably passed the first stage of e-learning implementation – experimentation. The importance of this investigation lies in the need to study the impact of making learning collaborative through examining the teaching of the Online Research Methods Course at Qatar University, to investigate the impact of the e-learning environment on the progression of learners’ knowledge and practical skills with respect to their different learning styles. The achievements of students at two university-level Online Research Methods classes – which differ only in the degree of collaboration embedded – will be analysed by using the students’ learning style as a variable. In this research, collaborative learning techniques were designed to examine their influence on the achievement of students with different learning styles, in addition to investigating whether collaborative learning in a blended learning environment had a major impact on

students' achievements and skills irrespective of their learning styles, in light of the role played by learning style as an effective factor. It will also look at the impacts and repercussions of learning styles on education in general. The research will focus on an examination of the impacts of collaborative work on knowledge or applications of skills in light of various learning modes. In brief, the significance of this research is that it addresses the pivotal issue of how it could be possible to improve the education process in an integrated manner and with a comprehensive outlook, and begin to look for modern learning methods. So, this research will examine the effect of group and individual work in the e-learning environment on student accomplishment and practical skills. Previous studies have claimed that if learners work collaboratively, they will do better than individuals working alone, because in the first case they will aid and facilitate each other's efforts and share and exchange their experiences and knowledge, with students who lack accomplishment and progression benefiting the most from such collaboration.

### **1.3 The Need for Theory**

E-learning has numerous targets in order to build high quality knowledge and skills to improve learning processes and techniques. There are many deficiencies and insufficiencies related to teaching methods and approaches to education, whether in respect to content delivery, time and time management, interface design or weakness in pedagogical background, etc. (Mayes and Freitas 2004). There are also many problems in the traditional face-to-face teaching processes within classrooms for theoretical subjects including, for example, long study periods of more than one hour's duration, which reduce students' concentration in the classroom. Using collaborative learning techniques within both traditional and online learning environments may develop and improve teaching as this leads to more effective and efficient learning by students (Ruengtam 2012). Thus, collaborative learning became a critical concept to study its effect on the e-learning achievement of students. Providing empirically-based considerations of the variables is also imperative to know the effect of the learning process, as well as provide clarification of its influence as it comes about (Mayes and Freitas 2004). According to Pange and Pange (2011), successful learning should offer a deep understanding rather than surface knowledge and imitation. It is thus necessary to take into account that e-learning research emphasises several pivotal concerns, such as quality and efficiency.

Often, though, the essence of e-learning cannot be shown to offer additional improvements and enrichments to the education and pedagogical process.

Since e-learning trends revolve around the development of education and its components through the use of technology to support and improve learning practices, theories associated with e-learning need to be examined. There are numerous theories that are concerned with e-learning issues and matters of learning via the exploitation of the ICT sector, although a case can be made that previous e-learning studies have not paid sufficient attention to students' thinking and behaviour for reasons related to the characteristics of e-learning environments (Sun, Tsai, Finger, Chen and Yeh 2008). The theories abroad include constructivist theories of learning, which are broadly described as the active construction of modern and contemporary knowledge rooted in the learners' previous experience. In practice, constructivism generally aims to implant learning in realistic and relevant frameworks, bringing together a set of aspects in order to deal with the learning process as a whole. The learning process consists of the system of education, such as: main design factors, learning assessment design factors and collaborative design factors, all of which create a learner-centred model to use in the general e-learning environment (Koochang, Riley, Smith and Schreurs 2009). Despite though, the application of constructivist theory to e-learning environments in recent years, there is still no detailed approach to enhance such environments in a comprehensive manner. It is true that there is continuous research in this field and learning theories are improving. In this respect, the most important theories-based learning approaches are now being combined with technology in learning to create a new and expanding field of specific learning theories (Koochang et al. 2009). For instance, a mixture of e-learning practices that have been developed, as well as the most recent theories and approaches, support the effectiveness and success of the teaching-learning process and ideologies (Anderson 2008). As part of the preparation of a knowledge-based economy and organisational learning, theories such as community, adaptive, and scaffold learning can be incorporated into combined e-learning practices. These might include multimedia training CDs, extra learning content and online conversation (including debate and live broadcasting) which aim to expand and develop learning methods in light of the educational and pedagogical process as an entire integrated system (Tsai 2011). According to active learning theory,

learning is any educational and pedagogical plan that connects students to the learning and teaching process (Alzaghoul 2011; Moore et al. 2011; Pange and Pange 2011).

#### **1.4 e-Learning and Collaborative Learning in Qatar**

In 2007, the Institute of Administration Development (IAD), the Supreme Council of Information and Communication Technology (SCICT), and The Ministry of Information and Communications Technology (ICT) founded the e-learning Portal. It became easy to solve management and business problems and aimed to help university students and government employees undertaking office trade management and archiving electronically in addition to providing a website to book and customise electronic resources with the ease of a new online strategy (ESCWA 2007). In addition to this, ictQATAR (2014) found that more than 2,000 people had completed courses using the e-learning Portal Strategy. This included 15% of non-IT business employees and 30% of state employees. It was concluded that ictQATAR's future efforts would be focused on these strategies:

- 1- Encouraging broader usage of the 3,000 e-learning courses available on the portal.
- 2- Empowering organisations, especially small and medium-sized enterprises, with enterprise learning management systems.
- 3- Supporting private sector and government organisations in their e-learning efforts.
- 4- Increasing awareness of the benefits of e-learning.
- 5- Supplying training and technical support for organisations to control and supervise the portal.

This qualitative leap towards the use of the e-learning approach in Qatar requires many measures and necessities, such as the use of modern and sophisticated ICT and the need for a network within the overall system of education. Other important components include digital tools and methods for assessing and strengthening professional development, interaction and collaboration between the different ICT and collaborative environment bodies. To sum up, the aim and target from 2008 to 2010 in the e-learning for 'Life Strategic Management Plan' was to implement technology in combination with the formation of 21st century learning environments, whereas old-style evaluation expectations were overestimated (Lindsay 2010).

E-learning, then, has emerged as one of the most important changes to hit the education system not only in Qatar but in other Gulf nations. That said, the general aims of applying e-learning systems in Qatar include training effective teachers, improving academic achievement, creating self-directed learners, and providing Rich Learning Experiences (RLE) (Weber 2010). In the last few years, Gulf Cooperation Council (GCC) countries, but mainly Qatar, have realised significant assets in e-learning projects. For example, a major operational framework for e-learning projects in Qatar is the new Sidra Hospital, which opened in 2012 with a \$7.9 billion (USD) permanent fund. This hospital provides digital medical records to access medical histories of patients by using an Electronic Medical Records (EMR) system (Weber 2010). Technology has developed from being only an instructional means utilised by educators or a simple addition to the teaching process. Now, technology is an integral component of the e-learning procedure through the integrated Microsoft education gateway framework. Initiatives such as ictQATAR have undertaken a total education revolution, a huge step into a reform that will drive society to a new world of improvements and opportunities (ictQATAR 2007, p.2). Qatar has set a good example and prompted other countries to start their own e-learning process. As within other Gulf countries, there has been widespread support and enhancement of e-government structures. E-learning in Qatar is frequently closely connected to bigger general ICT strategies in order to incorporate technology into all areas of the Qatari economy. In this sense, e-learning provides an ideal chance to study cultural variances in classroom behaviour, instructional approaches, learning styles and the cross-cultural influence of learning objects. E-learning can represent self-directed learning and collaborative learning, like the Flat Classroom Project at Qatar Academy where learners are divided into several sets to plan and carry out multimedia developments concerning current global issues (ictQATAR 2007, p.2).

Qatar University, launched in 2003, has taken a series of decisions and comprehensive reforms relating to the development of academic procedures and integrating information networks at the university, all of which have contributed to dramatically improve the quality of education provided by the university (Al-Saai et al. 2011). E-learning, therefore, was considered as one of the important outputs of innovations and developed technologies within the country, and was adopted by QU with

the aim of improving its academic reform planning goals. The creation of an e-learning environment, and the building of its infrastructure, has been based on e-learning concepts and practices at the University: thus, the administrators have prepared classrooms with all the necessary technological requirements, and instructors and employees have also been trained to adapt to a modern e-learning environment. Also, delivery systems have several models and tools for hosting e-learning courses, such as Blackboard, Harvard, learning Space, E3, Model, Web Course Tools (Web CT), Top Class and Cyber Psychology. The administrators in Qatar University (QU) adopted the Blackboard system three years before the academic reform planning began in the university (Al-Saai et al. 2011). Blackboard became a university-wide system for supervising and implementing academic courses, thereby satisfying the increasing need for Information and Communication Technology (ICT) in education purposes especially in implementing e-learning methods and technology in an e-learning environment. For instance, the university has used the Blackboard system to host its courses online since 2006, and encourages faculties to integrate technology in its courses (Hassan, Fong and Idrus 2011). There have, therefore, been numerous training programmes at QU on the systems that apply e-learning applications like the Blackboard system, which contributes to increased interaction between learners and e-learning methods in an e-learning environment. The past development and the present e-learning conditions in the University are seen to have contributed to improving the education, political, social, and financial fields. At university level, the Blackboard system was designed to make efficiencies in teaching and learning, with recent improvements in the capabilities of the system, with characteristics such as the discussion board, the Virtual Classroom and the contents page. These provide excellent opportunities for learners to interact online with all educational operation factors such as teachers, instructional materials and peers, which lead to increased awareness. It also enables individual group members to become experts and teach others in the process (Al-Saai et al. 2011; Hasan and Fook 2012).

In order to encourage Qatar University's faculty to apply the Blackboard system effectively, annual awards were started in 2008 for members who successfully used aspects of the Blackboard system to provide their courses. In addition, the Blackboard system is applied to provide course content and progress and track students' activities.

The Blackboard system also serves as a means of communication between the instructor and students. Students can use the visual class, discussion board forums and email to discuss assignment tasks or questions with their teachers and peers. Different teachers can provide several course modules across Blackboard using the same course syllabus, exam questions, content, and assignments. On the other hand, substantial challenges have originated through the application of such e-learning technologies. These include the limited number of Arabic language learning topics, general computer literacy, reliability and bandwidth of the Internet, and the issues of interoperability, as well as cross-platform problems that affect the learning objects flooding onto the market. Blackboard itself was not always well received by students, who were disturbed by the lack of consistency in how resources were planned on different Blackboard sites. Added to that, Blackboard can be time-consuming and expensive, for example, as documents need to be copied and pasted into Word for cost-effective printing. Many e-environments involve the uploading of digitised content materials to e-learning management systems. At present, the main activity of students is in downloading content materials from his/her lecturer only. This means that the e-environment loses any competitive advantage over other approaches to teaching and learning. Further, in the event, Blackboard did not integrate well with other QU administration systems, and this meant that Blackboard users needed to re-enter passwords and log in and out from one system to another (Hasan and Fook 2012).

At the same time, in 2008, Qatar University adopted a collaborative learning strategy: this is the main strategy that is to be used in e-learning education in classroom settings in Qatar, not least because it is seen as a tool for more effective learning and an active learning environment for online learning. Collaborative learning has been seen as a method to be used in classrooms to enable groups of students in their learning tasks. Where students of various levels work together towards the same aim, they become accountable for their own learning and that of others in their group (Maesin, Mansor, Shafie and Nayan 2009). Collaborative learning is not only sitting students in groups, but encourages working and interacting together to achieve collaborative work goals. It can be done so the lessons build such an environment that students are already working cooperatively with each other which requires an understanding of the elements that make collaborative work be successful. In brief, in order to be successful, collaborative work

should match basic elements such as positive interdependence, individual responsibility; direct interaction and treatment of the group's work (Laal and Ghodsi 2012. pp. 488).

Collaborative learning and e-learning are not incompatible approaches, and there are many kinds of collaborative learning strategies which may be used in an e-learning environment. These include students' team achievement divisions (STAD), self-directed learning, learning together, small group projects, debates, simulations, role playing, case studies, forums, talk pairs and inside-outside circles, and three-step-interviews (Hasan 2003). Maesin et al. (2009) have indicated that collaborative learning needs elements of individual accountability, face-to-face contact, encouraging interaction, positive interdependency, and appropriate utilisation of collaborative skills and group processing. It encourages communication, positive interdependency and team handling. Students are given chances to teach through research under the guidance of an instructor, and simultaneously to develop leadership skills, interpersonal skills and communicative skills. Students will also increase the probability of reacting with peers and acquaintances about different beliefs, question others' conceptual frameworks, defend ideas, and actively participate in collaborative learning preparation. For 'cooperation-based societies', curriculum development via the collaborative e-learning, like instant chat and bulletin boards, is very useful. This model is beneficial for both e-learning and peer teaching in the classroom, as it significantly increases the learning of both teacher and student. It might also decrease the pressure on instructors as the only source of knowledge (Weber 2010). As Golub (1988, p.74) points out,

Collaborative learning has as its main feature a structure that allows for student talk: students are supposed to talk with each other and it is in this talking that much of the learning occurs, collaborative learning produces intellectual synergy of many minds coming to bear on a problem, and the social stimulation of mutual engagement in a common endeavour. This mutual exploration, meaning-making, and feedback often lead to better understanding on the part of students, and to the creation of new understandings for all teachers and students.

Based on these perspectives, collaborative learning aims to create a suitable learning environment to encourage learners to strengthen and increase their own

knowledge and each other's culture. In addition, during the independent learning activities in a research course, students are offered chances to learn through their self-expertise under the guidance of an instructor, and will simultaneously develop leadership skills, interpersonal skills and communicative skills. Students will also have more chances to interact with peers, achieve divergent thinking, conceptual frameworks, defend ideas and effectively participate in cooperative teaching. Furthermore, collaborative learning connects students to the knowledge-sharing process by enabling them to motivate each other, depend upon each other and engage in active social communication in a group context. Thus, collaborative learning is mainly based on the ability to use a social interface rather than being a mechanical process without interaction or dynamic behaviour or thinking. So, collaborative learning theory is regarded as an individual attitude rather than just a classroom method and procedure. Since collaborative learning is based on the ability of using a social interface, as well as e-learning offering a different kind of social platform and interface, connecting both concepts becomes critical to studying their effect on the students' effectiveness. To sum up, the collaborative theory approach is without a doubt essential for successful e-learning and education processes, and plays a critical role in distance learning methods (Brindley, Blaschke and Walti 2009).

## **1.5 The Research Problem**

Generally, then, this research intends to adopt a collaborative theory of education, and specifically e-learning (Anderson 2008). A collaborative theory aims to provide a rational relationship between theoretical viewpoints of e-learning and application of its tools to think about technology and learning contexts as a mixture of two related and supportive components for e-learning environmental criteria. From the point of view of both educational and pedagogical theories, this research also aims to emphasise the necessity of a design which is motivated by characteristics of learning. The design aims to segregate learners into small groups to allow them to communicate and act as a team, as well as to join forces to accomplish mutual and shared objectives and achieve aspirations. In this context, the learning environment can be defined as all of the student's internal or external surroundings that serve to support learning. Educational environment must be commensurate with the needs and abilities of the student so that he can interact

with other students and the environment alike that increases the quality of collaborative learning (Sanjaya and Wijaya 2007). Moreover, in order to extend and develop a long-term strategy to enable learners in the education process to improve their practical skills and achievement (as well as their level of knowledge and self-learning potential, as derived from the collaborative learning theory), this aforementioned design should take place in the learning system. For example, what is needed is the provision of environmental criteria and conditions that enable the creation of effective learning groups to carry out a certain mission. This might include writing a report, fulfilling a project, accomplishing assignments or creating a white paper, with groups being required to achieve their tasks in the learning environment criteria in a single session or over several weeks (Lu 2007).

Thus, this study is concerned with the effect of collaborative learning on the achievement of students with different learning styles within a blended learning environment. This research aims to examine the effect of including collaborative learning in an online Research Methods course at Qatar University (QU) on the achievement of students with different learning styles. Accordingly, the empirical design sets out to achieve the following objectives:

1. To examine the effect of collaborative/group work in a blended learning environment on students' Research Methods application skills and achievement, irrespective of their learning styles
2. To examine the effect of learning styles, regardless of whether or not collaborative learning is used, on students' skills and achievement related to the Research Methods Course in a blended learning environment.
3. To examine the effect of collaborative learning on application of skills and achievement related to the Research Methods Course in a blended learning environment for students with different learning styles.

The study research questions are as follows:

*What is the effect of collaborative learning on the achievement of students with different learning styles within a research methods course?*

The research sub-questions are:

1. Does the use of collaborative learning affect the *knowledge, skills* and *achievements* of students in a blended learning environment?
2. Do students' learning styles affect their practical skills, in particular in a Research Methods Course in a blended learning environment, due to collaborative learning?
3. Conversely, does the use of collaborative learning affect students' learning style and knowledge of the Research Methods Course in a blended learning environment, due to collaborative learning?

As the researcher, my intention is to use two main groups of variables to examine the effect of collaborative learning in this online research methods course. The dependent variables are learning method (collaborative vs. non-collaborative learning in blended learning environments) and collaborative learning style groups. The independent variables are the knowledge of skills application and achievements of students in the research methods course. Hence, this research will examine the following main null-hypotheses:

- Collaborative learning in a blended learning environment has no effect on students' achievement
- Collaborative learning in a blended learning environment has no effect on students' skills.

From these main hypotheses, the following sub-null-hypotheses are raised:

- Learning style, regardless of collaboration, has no effect on students' skills in a research methods course in a blended learning environment
- Learning style, regardless of collaboration, has no effect on students' achievement in a research methods course in a blended learning environment
- Learning style, regardless of non-collaboration, has no effect on students' achievement in a research methods course in a blended learning environment
- Learning style, regardless of non-collaboration, has no effect on students' skills in a research methods course in a blended learning environment.

## **1.6 Overview of the Chapters and Appendices**

This first chapter has presented the purpose, importance the research questions of the study. The second chapter will focus on describing the Qatari context, the education system and the need to explore collaborative learning within this context; the third consists of a literature review that gives a background on the study variables plus education in Qatar, higher education, education crisis in Qatar, and then a review of related literature.

Chapter Four offers a detailed description of the methodology, materials, and procedures used for collecting the data in this study. It includes information about the schools, participants, and the research instruments employed for data collection. The next two chapters, Five and Six, look at the analysis and discussion of the study results and the recommendations dependent on these results. Chapter Seven gives a summary of the study results and provides conclusions based on these results, as well as recommendations and suggestions for further research based on the obtained findings.

## **Chapter 2: Education in Qatar**

The Qatar National Vision is founded on policies initiated by the country's leadership, based on four areas: social development, environmental development, economic development and human resource development. Arguably, the most essential of these areas is human resource development, which includes education, health, manpower development, and training (Al-Sulaiti 2011).

In this chapter, several aspects of the Qatari education system are introduced and discussed. These subjects start with the beginning and development of education in Qatar, then the objectives of education and a description of the educational system in Qatar generally (including the nation's higher education). This is followed by an overview of the education system in Qatar which recognises the education crisis and the problems that are faced by the current education system. Finally, Qatar Specialist Educators' views on education reform in this context are debated.

### **2.1 The Emergence of Education and its Development in Qatar**

There is no doubt that an educated population plays a primary role in a comprehensive and sustainable development process, which means that it could be considered as the real wealth of a country. Accordingly, countries are eager to give their education systems particular attention, and seek to enhance it with additional capacities and capabilities for the benefit of their citizens, which is a central human right and requirement of all societies. Therefore, many countries are interested in providing education in standardised environments and achieving high quality learning outcomes and also in setting future plans to accomplish this end (Manochehr 2006).

Since His Highness Sheikh Hamad bin Khalifa Al Thani, Emir of the State of Qatar came to power, attention has been directed on improving human resources (Al-Sulaiti 2011, p.1). This has led to improvements to the education system in Qatar by taking into account that high quality education supports the creation and implementation of effective educational strategies and tools as described and adopted in the vision of Qatar 2013 (Al-Sulaiti 2011).

At the beginning of the 1950s, a formal education system was adopted in Qatar, and in the same year, Qatar's Ministry of Education was established. Since 1962, it has provided free education to citizens of both genders, and also provided a monthly stipend for Qatari students. The government provides free education to the children of expatriates whom it employs (Stasz, Eide and Martorell 2008). Education in Qatar is separated into three stages: six years at primary level, three years at middle level and three years at secondary level. Qatar's Ministry of Education is funded by the Qatari government (Yamani 2006).

In the early 1960s, after the Gulf Cooperation Council (GCC) countries asserted their independence, state universities were established in Qatar. The poor results in terms of training in the public universities led to the establishment of private universities during the 1990s; however, the accomplishments of the latter were limited (Romani 2009).

According to Stasz, Eide and Martorell (2008) huge investment in education since the 1990s has contributed to the rates of ability to read and write rising over the years, achieving a level of 98.2% amongst 15–19 year olds in 2004 (Stasz et al. 2008). Qatar University is the most significant higher education institution in Qatar, and is currently making efforts to achieve the government's aims of developing and promoting efficiency of education process to face any difficulties in the current education era (Yamani 2006).

In May 2001, Sheikh Hamad bin Khalifa al-Thani headed the Education for a New Era (ENE) initiative. The ENE is a ground-breaking education reform initiative to convert Qatari schooling into a system of world-class education, and it is regarded as a crucial step in continuing the success of the wider economic, political and social reform efforts in Qatar. This shift involves transforming the rigid and centralised education system from a low-performing system into a decentralised (self-managed), modern and effective one. The two fundamental components of this reform involved establishing annual student evaluations and reviews to assist in monitoring student performance and learning, and constructing new government-funded Independent Schools (Yamani 2006).

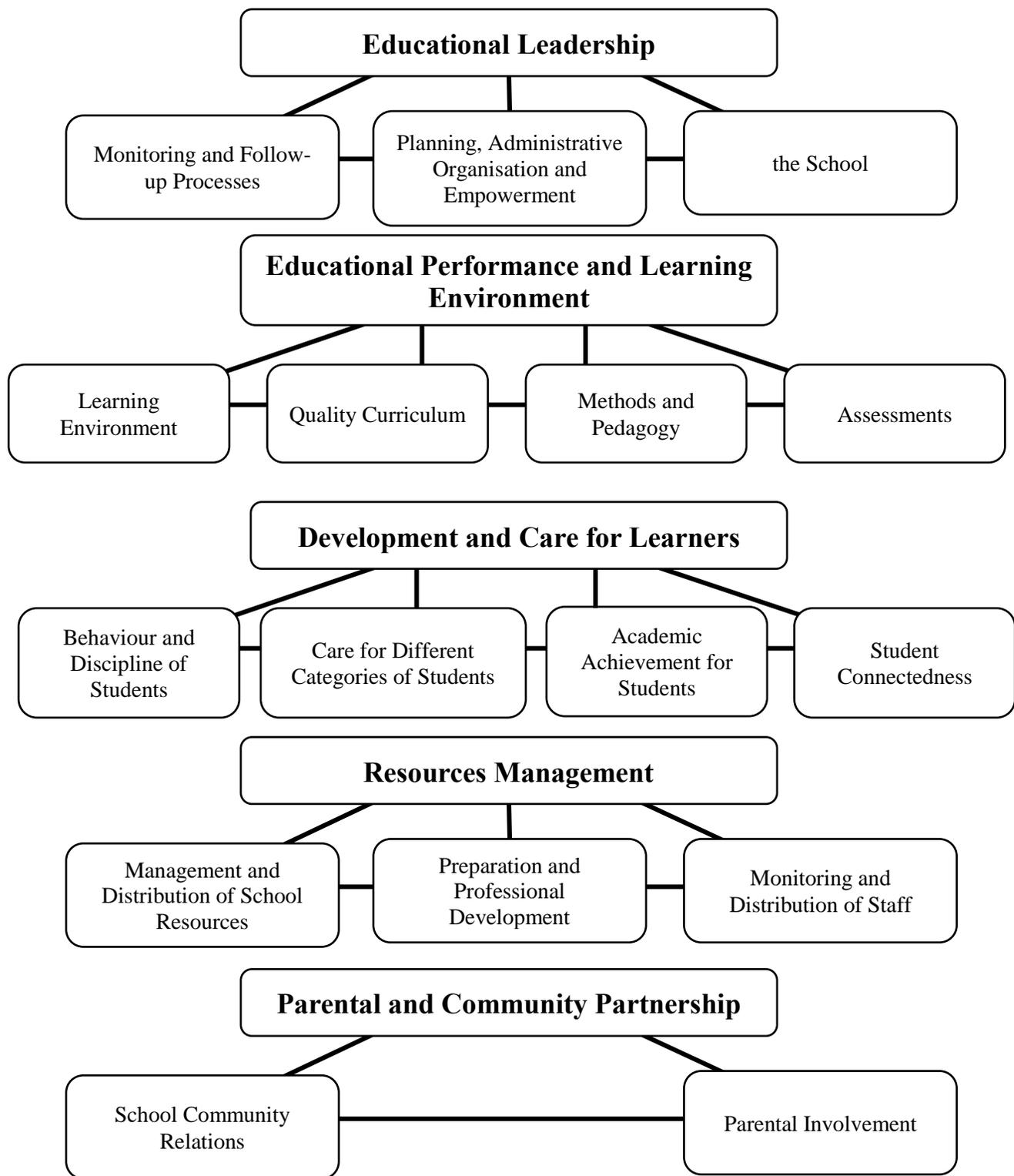
## **2.2 Goals of the Education System in the State of Qatar**

The main aim of the Education for a New Era initiative in Qatar is to establish an advanced, world-class public school system that will provide Qatar's younger generations

with a higher level of education. The long-term aim is to prepare the forthcoming generations for productivity in society and the world in general (Yamani 2006, p.3), to monitor private schools' education regularly and to ensure that they achieve the desired performance level. Moreover, the Qatar National Accreditation Unit for Private Schools works constantly to develop the education stages from kindergarten to twelfth grade. They make sure that parents and students can access and utilise necessary information, which informs students how to achieve their certificates with the high quality academic standards (Szyjko 2012).

According to Figure 2.1 below, the state of Qatar seeks to achieve many goals related to the education system; these goals are represented within five dimensions:

- Educational leadership: this aim includes achieving goals efficiently and effectively, raising the morale of students and facing the risks of the future.
- Educational performance and learning environment: this aim's interest is in learning environment, quality assessment, and a learning evaluation schedule.
- Development and care for learners: this includes firstly, behaviour and discipline of students, secondly, care for different categories of students, thirdly, academic achievement for students and fourthly, student connectedness.
- Resource management: this aim is represented by the management and distribution of school resources, training and professional development, and monitoring and distribution of staff.
- Parental and community partnership: this indicates school community relations and parental involvement.



*Figure 2. 1: The main goals of the Educational System in the State of Qatar (Szyjko 2012, P.127).*

### **2.3 Description of the Educational System in the State of Qatar**

Generally, in the state of Qatar children are taught in single sex schools. The government of Qatar provides free education in government schools to Qatari students, and private schools provide fee-paying education for children of Qatari citizens who can afford it and to children of resident expatriates. There are two types of these single-sex schools: private Arabic schools adopting the Ministry's curriculum and private schools adopting curricula from other countries. For example, Doha College adopts the British curriculum, and the elite Qatar Academy provides an International Baccalaureate (IB) programme. Leaders in Qatar became worried that the education system was not producing high quality results, and that the education system was not just old but difficult to repair. Thus, in 2001, Qatar started major reform efforts to improve and adjust the system in line with the country's developing social, economic and political desires. (Stasz et al. 2008). The aim of this reform was to make Qatari students better prepared for the world of work in the modern era.

Fundamentally, the Education for a New Era reform reflects four vital principles (Yamani 2006) which are:

1. **Autonomy-** by allowing schools and teachers to recruit their staff, select approaches, teaching methods, and the way they choose to address the students' and parents' demands.
2. **Accountability-** by distributing responsibility to all school leaders, teachers, and parents for the success of the students.
3. **Variety-** by encouraging schools to participate in several different kinds of instructional programmes.
4. **Choice -**by enabling parents to choose what they think is best for their children.

Qatar is carrying out a partly decentralized system by opening various new private schools that are financed through the government but controlled by non-governmental parties. Standardised national exams adjusted to 'internationally-benchmarked curriculum standards' are utilised as a component of the school evaluation system (Szyjko 2012).

## **2.4 Higher Education**

Higher education institutions are among the organisations that are moving forward and managing the issues associated with globalisation. Hence, there is a need to produce citizens who can display high performance in any situation. Individual performance has become a significant issue to public and private institutions of higher learning (Solís-Gadea 2010).

According to Baum and Payea (2004), higher education is a key building block for any society that has an ambition for democracy. The best academic environments for teaching and learning enhance self-confidence, strong social awareness, and project a real sense of responsibility towards the students (Kleitman and Gibson 2011). Based on this guidance, developing countries started improving their universities and other institutions of higher education to offer what was needed for younger generations to succeed (Vicente-Molina, Fernández-Sáinz and Izagirre-Olaizola 2013). Furthermore, McMahon (2010) concluded that higher education is of paramount importance if economic and social development is to occur. In terms of economics, institutions of higher learning are mainly responsible for providing individuals with the advanced information and capacities needed to enter positions in government, business, and other important professions (Vicente-Molina et al. 2013).

Higher education has a significant role for the national economy and the industrial sector. Over the last five years, programmes that utilise ICTs to develop the way in which Qatar provides education, healthcare, and public services to its people have taken place. In general, when implementing any new education tool many issues must be considered such as the student degree, and student's intellectual interests. Therefore, educational institutions in Qatar seek to develop a broad-based integrated strategy and plan, which will make digital content available for educational purposes and pedagogical matters (Watt 2013).

Nowadays, there is a need to implement a comprehensive plan so there has been a lot of speculation from several bodies, such as scientific research centres, universities, and government agencies, regarding e-education initiatives. Improving information technology criteria is also important, as well as providing frameworks, visions, and

standards that can be applied in schools and education institutes in Qatar when introducing new technology. Many look to create a national e-Library that includes digital and electronic books and other learning resources. ICT training and professional upgrades should be offered to educators and the country should look to enhance and support the role of information and experience exchange between different sectors of society (Qatar's National ICT Plan 2013).

Added to that, as a development to education in Qatar, the Qatar Foundation (QF) was set up in 1995. This is a national multibillion-dollar initiative to finance the operating costs of the world's most famous and respected universities. It hosts branch campuses of five American universities (Virginia Commonwealth University School of the Arts in Qatar, Weill Cornell Medical College in Qatar, Texas A&M University at Qatar, Carnegie Mellon University in Qatar, and Georgetown University School of Foreign Service in Qatar). This approval of the establishment of branches of campuses in the Education City complex in the Qatari capital, Doha, provides Qatari people with advanced educational and research opportunities (Karkouti 2016, p.183).

Khodr (2011) claims that educational institutions in Qatar affect the dynamics of international institutions and such global dynamics need extensive procedures, measures and decisions regarding the progress of educational system development. The higher education system is one of the most important areas for development as a key factor in social progress. In fact, many Arab regions are reforming their education sectors (especially higher education) because this is regarded as the best way for preparing a strong generation to solve national challenges in the future. Qatar's National Vision 2030, published in 2008, represents the government's policy agenda. It aims to transform Qatar into a sophisticated country, and its vision includes education. It argues for the modernisation of the higher education infrastructure and raising the sector's competitive position within the region, through equipping all schools with the required tools for learning as well as involving them in curricula development and teacher training sessions. This may then also have an impact on globalisation, the internationalisation of education, and transnational higher education. Therefore, it is clear that the reforms regarding the structure of the education system in Qatar, particularly in higher education, are heading in the right direction.

In addition, with the recent developments in the e-learning field, the concept of Blackboard appeared to enable students, teachers, staff, and leadership across an institution by opening up wide-ranging data in student information and learning management systems. Blackboard is a widespread suite of packaged analytics applications, enabling users to deal with limited resources and high responsibility environment, by self-service access to trustworthy data, key metrics, and dashboards to progress decision-making and progress performance. Moreover, the concept of Blackboard is as a live collaboration platform which is designed for education that goes beyond web conferencing and traditional direct messaging to facilitate highly effective, connecting online education, and to help in administering meetings. It involves the basic capabilities of web conferencing, enterprise instant messaging, mobile collaboration, and voice authoring. This helps institutions to minimise costs by removing travel and introducing operational efficiencies, raise income by expanding classroom reach, and progress outcomes by enabling engagement between the students, global collaborations, and effective access to help (BbWORLD 2013, p.14).

#### **2.4.1 Qatar University**

Qatar University, the nation's only state-sponsored, academically directed institution, was founded in 1977.

Qatar University is a pivotal tertiary education national institution, which is the driving force in creating a future national workforce for a multitude of cutting-edge careers. Its main target is to sit at the peak of the nation's teaching institutions, as well as to achieve a good reputation as a modern, technology-driven institution that is committed to international standards of environment sustainability (Greenberg 2012, p. 2).

Qatar University's College of Education provided undergraduate Education degrees before 2000, and most Qatari public school educators studied and/or trained there. A degree in Education is no longer provided, though students are able to gain a Bachelor of Arts (B.A.) degree in Arts or Physical Education, or a diploma in special or early-childhood education. Qatar University initiated efforts to implement a new vision in 2003 and to introduce strategies to achieve this goal (Stasz et al. 2008).

In the past, education in Qatar was associated with studying the Quran and Islamic law. The early establishment of Qatar University was as a primarily secular institution in 1970 and then it was converted into a university with six colleges, where, in the autumn of 2008 more than 7,000 students enrolled. The university runs bachelors and master's degree programmes. A doctorate degree is still relatively uncommon amongst postgraduate opportunities. It also awards various postgraduate diplomas and certificates to students who finish two to five semesters of study in specific subjects.

Due to the customs and traditions prevailing in the Arab countries, Qatar, like other countries in the region that take into account the cultural and societal norms, sees teaching based on gender segregation. Thus, at Qatar University all classes and extracurricular activities are gender- separated. The teaching staff teaches both sexes. This separation of men and women undergraduate students has not been changed by educational developments and is still in place today (Moini et al. 2011).

In 2005, the e-learning system for basic computer and programming courses was set up by a group of academics in the Department of Engineering and Computer Sciences in Qatar University (Weber 2010). In addition, Qatar University offers many disciplines that fit both the desires of students and the needs of the market. Nowadays, Qatar University is wide ranging in its disciplines, from Humanities and Social Studies, Economics and Technology, to Shari'a and Islamic Studies, Education, Law, and Business and Engineering. The University is keen to insert new scientific sections and units, introduce its instructional plans, and evaluate the compatibility of the curriculum and programmes offered within its faculties and address the concerns and demands of the community. It also aims to better support Qatari Ph.D. holders and faculty members (Watt 2013).

#### **2.4.2 Supreme Education Council in Qatar**

The Supreme Education Council (SEC) is an organisation that plays a significant role in supervising Qatar's education reform initiative. This organisation was introduced by Emiri decree no. 37 in November 2002 (six months after the inaugural reform plan) and was formally created in January 2002 and has played an effective role in

implementing the reforms. The members of the Supreme Education Council were selected from the best in business, trade, and academia in Qatar (Yamani 2006).

It was led by the Crown Prince and Heir Apparent, His Highness Jassim Bin Hamad Al Thani, and Her Highness Sheikha Mozah Bint Nasser Al Missned as vice-chair. Also, there are many people in the council that have had a significant role in upgrading higher education in Qatar (Brewer et al. 2007). As a new education authority, the Supreme Education Council was responsible for making a number of significant decisions. For instance, some of these decisions reflected the importance of building a relationship between the Ministry of Education, relevant institutions, and the public. The members of this council must believe in and support education reform and must be acceptable to the Ministry, to promote teamwork amongst education leaders and improve their participation in the developing changes. The Council consists of at least seven members who operate and meet monthly for three-year renewable terms.

In addition to overseeing the reform efforts, the Supreme Education Council leads the work on three vital sub-bodies: the Higher Education Institute, the Education Institute (which focuses on curriculum standards and instructor training), and the Evaluation Institute. The Supreme Education Council also addresses the Ministry of Education's aim of ensuring the establishment and inclusion of new independent schools throughout the entire Qatari school system. In addition, an agreement was signed between Qatar and a New Zealand-based education service supplier to assist in mentoring Qatari schools via a process of decentralisation and modernisation (Yamani 2006).

### **2.4.3 Western Higher Education in the Middle East and Qatar**

In spite of the educational opportunities and learning results differing from state to state, the Middle East area devotes 20% of governmental expenses to education, which means access to schools and increased reading and writing ability has dramatically improved. Moreover, the crowning achievement for the Middle East region has been the eradicating of the education difference between men and women and equality in basic education is almost complete. Despite this achievement primary and secondary education in the Middle East need a big improvement if students are to graduate at university and college level. While there are many countries in the area that are producing competitive

schools and students, especially those states in the Gulf area and Jordan and Lebanon, too many schools throughout the Middle East are staffed by under qualified teachers using dated materials for instruction. Rather than develop critical thinking and problem-solving skills, students in many countries continue to memorise materials and are only expected to repeat that information in examinations without using new learning styles such as cooperative and collaborative learning (Rupp 2009).

The public and private universities in the Middle East states have made efforts to increase collaboration between Arab and US Colleges and universities, but they remain few in number relative to the needs of people and are not adequately preparing their students for the local or worldwide job market. In the last few years, Arab governments and educational elites have taken many steps to highlight the importance of indigenous higher education colleges and have begun an organised chain of projects that are cooperating to make a real change. The states belonging to the Gulf Cooperation Council (GCC) including Kuwait, Saudi Arabia, Bahrain, Qatar, the United Arab Emirates, and Oman, have poured billions of dollars in to the development and expansion of new private higher education institutions in the last decade (Rupp 2009).

## **2.5 Education Crisis in Qatar**

The Arab world witnessed revolution and development with multiple dimensions, and a new wave of higher education as part of the growing internationalisation and privatisation of universities worldwide. For example, The Middle East and North Africa region (MENA) has made significant progress in numbers of universities from 10 in 1940 to 260 by 2007, approximately two-thirds of which were established after the 1980s. The Gulf Cooperation Council countries participated in this new wave of education. In 2003, only eight universities were working in Qatar, but since then more than 100 universities and colleges have been established. In addition, the yearly budget for higher education in Qatar has increased. Qatar has also instituted foreign branches in forty western universities during the same period. Community colleges, teacher-training institutes, and other institutions have also increased to about 1,139. Private sector institutions account for approximately 36% of the total, and their contribution is even larger in some countries. Private sector institutions make up over 80% of all universities in Qatar,

Palestine, Bahrain, the United Arab Emirates, and Lebanon, while they constitute less than 20% in Iraq, Morocco, Algeria, and Libya (Masri and Wilkens 2011).

Funding for higher education in Qatar is provided mainly by the Qatar Foundation. The Qatari capital has gained at least eight foreign universities since 2003, including six from America and two from Australia. Qatari funding tends to include the majority of building costs; however, foreign universities are still wholly private institutions (Romani 2009).

This section explains the critical problems for education in Qatar. After reviewing the major problems and negative parts of education in Qatar in the region, this section will briefly explain Qatar Specialist Educators' Views on Education Reform.

### **2.5.1 Main Problems and Negative Aspects of Education in Qatar**

Several reports and studies have shown that a large percentage of graduates from Qatari schools and universities prefer to work in the arts field rather than fields like science, engineering, medicine, etc. This is so because of an incompatibility between the vocational and technical education (Weber 2010). As Gonzalez (2008, p. 50) stated, the graduate students from Oman, Qatar, UAE, and Lebanon are still not yet ready to enter the labour market with enough and proper practices or to enter innovative university disciplines. Stasz et al. (2008, p. xv) also concluded that in educational institutions males work in careers which are out of demand and contradict their major.

However, there are some recognised weaknesses in the current education system in Qatar. In many governmental and private schools, the curriculum is outmoded, being based on rote memorisation. There is also no suitable and general vision of education quality and the structures required to support it. The system often misses its own performance indicators, and there is no drive to connect the performance of students with school performance. This results in many bored students and offers little chance for student-teacher interaction. Insubstantial performance information is supplied to administrators and teachers, coupled with the fact that few have the authority to make changes in schools. Finally, although Qatar is a rich nation, investment in the area of national education is still modest. Teachers get little professional development and are poorly paid, and classrooms are crowded because most school buildings are badly

designed (Headquarters 2007; Brewer et al. 2007). Therefore, it is clear that the reforms regarding the education system in Qatar are going in the right direction, and given the weaknesses within the Qatari education system, timely initiatives are necessary.

### **2.5.2 Qatar Specialist Educators' Views on Education Reform**

Qatari leaders were elected to establish an ideal strategy and plan for education reform, based on the observations conducted at the time of Rand's<sup>1</sup> initial evaluation. Such evaluation assists decision makers and policymakers by providing the best available information at the time.

Qatar's educational system used the nationalistic and cultural traditions of schools until the late 1990s. After that and in order to start building a new educational system the Qatari leadership approached the Rand Corporation to examine and analyse the existing educational system and recommend options. After conducting a number of analyses and a study of the education system prevalent in Qatar the Rand Corporation suggested that the education system in Qatar was rigid and did not conform to international standards in education. Therefore, to reform the educational system it must follow a system of Independent Schools setting a new curriculum standard, and to find the most effective systems for Qatari students to succeed along international and particularly Western benchmarks, the teaching profession should be developed. Added to that, the reforms refer to key principles of autonomy, accountability, variety and choice. New reforms have stressed initiatives improving professional development for teachers through giving licensing and increased professional development programmes (Nasser 2017).

In 2004, Al-Ammari conducted an exploratory study with the aim of investigating the views of Qatari female elementary teachers regarding the particular advantages and limitations of applying computers as educational methods, and to examine their views and opinions toward training them to use computers and IT labs. The study found that teachers had freedom but lacked support, and suffered from high workloads. There was support for facilitating a change, but the teachers' views were different from those of the school administrators.

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<sup>1</sup> The Rand Corporation is a nonprofit institution that helps improve policy and decision making through research and analysis.

According to Brewer et al. (2007, p. 57), in order to aim for an ideal model in a world-class system, however, they realised that building and fulfilling this system would need important financial investment. Social realities and politics depend on carrying out any educational reform plan. Thus, the leadership in Qatar agreed on a basic educational reform plan. During August 2002, the Rand Corporation elected to refine the Charter School Model and tailor it to the Qatari context. However, the Qatari leadership rejected the first educational reform plan, because this plan was like the educational reform attempts in the past, which had made particular advances and improvements but resulted in most of the education system not being improved (Brewer et al. 2007).

Moreover, in 2010 Al-Obaidli conducted a descriptive study to investigate the vision and opinions of female English teachers on the reforms in Qatar and investigate their experiences of using a new approach for teaching English as a second language (ESL) and identifying professional development needs. The study found that teachers had freedom but lacked support, and suffered from high workloads. Facilitating the change was supported, but the teachers' views were different from those of the school administrators. In addition, it was found that the process of reform in Qatar was widely conceptualised from the top down, and there is a need to pay close attention to the role of female ESL teachers in the implementation process. This was particularly because reform depends on continued professional training development for ESL teachers.

According to Nasser (2017), Rand introduced a new organisational structure to supervise the school system. The new system suggested the development of a structure to enhance the Ministry of Education, known as the Supreme Education Council (SEC), and which was operationally and structurally different from the Ministry of Education. The Supreme Education Council consists of three main organisations; the Education Institute and the Evaluation Institute were the first to be established, followed by the Higher Education Institute. The new organisational structure worked in parallel with the Ministry of Education with straight administrative connections to the newly formed Independent Schools. In 2016, there was restructuring of the Supreme Education Council and the establishment of the Ministry of Education and Higher Education, and that moved to establish a unified structure of the educational system and reorganized the Supreme Education into a ministry.

The governance of the schools that became independent Schools consists of a principal, an academic vice principal as well as an administrative and financial vice principal. Each school had subject coordinators, teachers, and teaching assistants. Moreover, the most important change that occurred in the schools was the development of curriculum standards in four subject areas: Arabic, English, Mathematics, and Science. In addition, the schools were given the chance to develop their own curriculum that aligned to new standards which gave teachers the ability to use new curriculum and for students to be assessed by national exams, which were developed by the newly formed Evaluation Institute of the Supreme Education Council (Nasser 2017).

In conclusion, after investigating the critical problems for education in Qatar and after reviewing the major problems and negative parts of education in Qatar in the region, these problems can be summarised as: the curriculum is outmoded, and based on rote memorisation; there is also no suitable and general vision of education quality and the structures required to support it; the system often misses its own performance indicators, and there is no drive to connect the performance of students with school performance. Also, it can be concluded that (after investigating Qatar Specialist Educators' Views on Education Reform) the process of reform in Qatar was widely conceptualised from the top down, and there is a need to pay close attention to the role of teachers in the implementation process. This is particularly because reform depends on continued professional development for teachers.

## **Chapter 3: Review of Related Literature**

This chapter will present a study of the related literature on the concepts of e-learning, blended learning and collaborative learning, as well as co-teaching and teaching styles. It will also discuss other studies which highlight the difference between collaborative and cooperative learning, and the different learning styles. Finally, it will describe learning styles in detail.

### **3.1 E-learning**

E-learning is considered as a huge and distinct field of inquiry, which attracted widespread attention from different areas, such as computer science (CS), communications, information science (IS), management and educational psychology. There are numerous terms used to refer to e-learning, including online-delivered instruction, computer-assisted instruction, computer-based instruction, online learning, technology-based instruction, distance education and computer-based simulation (Bell and Federman 2013).

#### **3.1.1 Concept**

According to Sun et al. (2008, p. 2) e-learning is mainly electronic technologies that deliver data to student by using a computer in an orderly manner which helps to become a good learner. Ruiz, Mintzer and Leipzig (2006) stated that the standardised, delivered and managed e-learning material may be produced by content, where this content contains all educational material whose difficulty varies between divided components and larger instructional units. On the other hand, Ruiz et al. (2006, p. 208) realised digital learning components as a set of digital resources organised via a significant technique and connected to an educational objective.

The learning components characterise self-controlled elements of instructional resources which are gathered, separated or combined in order to form educational resources that are as large as possible: for instance, complete courses, classes or modules, or to cope with the demands of a determined curriculum, such as game-based learning modules, hypermedia, simulations, case-based learning and tutorials. Content authors

employ pedagogical principles and instructional design in order to make instructional materials and learning objects (Ruiz et al. 2006).

### **3.1.2 Advantages**

E-learning technologies help teachers to explore their content easily and speedily and allow students to check the content simply, learning faster and in sequence, which enables learners to achieve personal learning goals and create effective learning environments. Online techniques provide an opportunity for extensive delivery of digital content to various users at the same time and in any place or time. Another value of e-learning includes interchangeable course content and distribution, whereas the automated tracking and describing of learners' actions reduces the faculty administrative load. Online technology provides a number of techniques and software that have developed in the field of computers and information to assist a teacher in learning and teaching since they are used as means and tools for participants to enable them to take advantage of the service (Ruiz et al. 2006).

In light of the increasingly widespread use of e-learning in postsecondary education, Bell and Federman (2013) conducted a meta-analysis to investigate three key issues through an extensive research review of about 232 studies between 1985 and 2002, which contrasted e-learning with old-style or classroom-based teaching and measures of accomplishment, student attitudes, and course completion. They focused on two categories of e-learning: asynchronous and synchronous. The first category involved activities that occurred between learners at different times, such as correspondence and online courses, whereas the second category involved activities occurring between learners at the same time, such as teleconferencing and satellite-based delivery, including K-12, graduates, military students, and undergraduates. The study showed that the growth of e-learning has been accompanied by a continuing debate about its effectiveness and by the recognition that a number of barriers impede its widespread adoption in higher education.

Also, the results showed that there was a tiny significant difference in favour of classroom instruction in comparison to asynchronous e-learning. There was a difference between e-learning and old-style teaching in terms of accomplishment, although there are

many problems faced by synchronous e-learning including the issue of decreasing the dropout rates, which have negatively impacted on the effectiveness of e-learning. Some differences between e-learning and old-style teaching will be discussed in the sections below. (Bell and Federman, 2013).

Since the current study sheds light on investigating the effects of collaborative learning on the achievement of students with different learning styles, it is necessary to identify any significant difference in students' preference, whether they favour classroom instruction or online classes.

As well as, since a blended learning environment is investigated in the current study it is important to determine how e-learning contrasted with old-style or classroom-based teaching and measures of achievement, student attitudes, and course completion, especially where the results support the aims of the current study, for example if there was a difference between e-learning and old-style teaching in terms of accomplishment.

#### ***3.1.2.1 Synchronous Delivery***

Synchronous delivery includes instructor-led e-learning in real-time, in which all students are given the information at the same time and communicate instantly with other students, through instant messaging, teleconferencing (audio, video, or both) and Internet chat forums (Ruiz et al. 2006).

#### ***3.1.2.2 Asynchronous Delivery***

In asynchronous delivery the data and information is sent at the same time but the students are responsible for the pace of their own self-education and learning. The teachers and students communicate by e-mail or feedback technologies, but not in real time. Various different approaches can be used for asynchronous delivery, such as e-mail, Weblogs, list serves, newsgroups and online bulletin boards (Ruiz et al. 2006).

#### ***3.1.2.3 Linear Learning***

The benefits of linear learning are derived from theoretical assurances of structured output prediction. This learning approach applies techniques from combinatorial optimisation to address the complexity of the underlying illation needed in this type of model. This approach also involves global structural features and restraints over the output components in an effective training and prediction environment. The role

of this learning approach concentrates on making spatial meaning representations from text to discover a virtual world (Kordjamshidi and Moens 2013).

#### ***3.1.2.4 Collaborative Learning***

Collaborative learning can be made available through certain technologies, such as e-mail, weblogs, message boards, chats, and teleconferencing (Ruiz et al. 2006). There are several advantages of collaborative learning: for example, collaborative learning allows the fostering of a spirit of cooperation among the students, enhances the potential of the students, and increases their ability to debate. In addition, the mission of the collaborative learning design is to provide opportunities for students to communicate effectively to encourage mutual support in order to master the purpose of the lesson. Bower and Richards (2006) stated that there were some skills benefits, which have had a large impact on collaborative learning pressure, like the evolution of overall connection influences, sympathy, and cooperation. This pressure depends on the teacher not as the major supplier of information or control, but as a facilitator.

#### **3.1.3 History**

Generally, school teachers have increased their usage of ‘Internet-based content’ and ‘resources’ in the classroom. This growth has usually occurred through a minor number of tech-savvy educators and technology organisers trying other tools in order to offer feeding content and spread learning outside the institute’s bounds and the classroom walls. These attempts are commonly unofficial stand-alone systems, but frequently constructed on computer-based pedagogical courses, which precede extensive acceptance of the Internet.

In recent years, Internet use has significantly raised the level of ‘digital classroom sources’, and has also encouraged the introduction of district-level systems, in which instruction involves a blend between face-to-face and online learning. Nevertheless, several programmes have integrated online content from suppliers like the Monterey Institute for Technology and Education and Apex Learning (Watson 2008).

The use of blending learning is thus a well-established means of learning, and not only a way of teaching. The expression ‘blended learning’ was first used in 2000 and it was frequently linked with supplementing old-style classroom learning with self-study e-

learning activities. Lately, the pedagogical importance of supplying blended learning opportunities has attracted substantial consideration, and the expression has developed to cover a more extensive group of learning environments and approaches. Nowadays, blended learning is able to relate to any combination of dissimilar ways of learning, different learning styles and various learning environments. In brief, the operative application of blended learning is primarily about creating chances for learning opportunities and instruments to achieve the optimal learning environment (Marsh 2012).

#### **3.1.4 Role of the Teacher**

As mentioned above collaborative learning has a variety of common skills benefits such as sympathy and cooperation. This depends on the teacher not as the major supplier of information or control, but as a facilitator, thus it is important to investigate the teacher role in educational operation. There are several roles for teachers in e-learning, as follows (Bañados 2013):

- 1- Developing students' confidence as they become used to working independently online.
- 2- Posting messages to each student individually and to the group as a whole, in order to meet their need for support.
- 3- Posting explanations to guide students in more complex tasks.
- 4- Encouraging students to communicate, employing all the platform tools they have at their disposal to facilitate their work and do their individual assignments.
- 5- Tracking continuously student improvements and giving a boost when motivation starts to decrease.
- 6- Checking and marking the online assignments, filling in students' progress reports and writing feedback on their operation in their online portfolios.
- 7- Encouraging students to accomplish their collaborative work tasks. This type of learning is usually difficult as the students have different schedules and are not used to working collaboratively to attain learning tasks.

In addition, Bjekic, Krneta and Milosevic (2010) determined the roles of e-teachers in e-learning as follows:

- 1- Content facilitator, who acts like a field professional, translator and leader throughout the ideas of education.
- 2- Metacognition organiser, who focuses on education actions, results and improvements to learning abilities.
- 3- Process organiser, who supports students' knowledge strategies and time management.
- 4- Consultant, who supplies pastoral support and a route to institutional/local support systems.
- 5- Assessor sometimes called examiner, who provides feedback on task accomplishment, performance and assignment growth.
- 6- Technology guide, who supports learning with tools and technologies.
- 7- Resource supplier, who describes and positions, formulates and develops resources in order to offer learning provision in requirement time.
- 8- Manager and administrator, who support the direction of the course, maintain records and controls enrolment.
- 9- Designer, who intervenes, assists and plans the course path and the lesson itself – educates and completes the tasks.
- 10- Co-learner: frequently, the e-teacher's function is not as a 'sage on the stage' or even 'guide on the side', but really 'friend to the end' of the course, walking with the student-participants and learning alongside them,
- 11- Researcher, who is able to reflect on his/her experience, and who works on the basis of this e-teaching experience.

From the researcher perspective, the major role of the teacher is to verify the occurrence of targeted educational operations and encourage the intended behaviours of students to interact with each other. Moreover, the teacher acts as an educational facilitator, who provides guidance and allows learners to discover learning materials on their own, without interfering in their learning path.

### **3.1.5 Role of Students**

The aim is for learners to be involved with the e-learning contents to gain knowledge. This will make them ready to practice and undertake new activities (Alonso et al. 2005). All activities in online learning depend on the Internet and computer-based learning, which means that it is limited to learning through the use of computers (Maguire and Zhang 2007).

Regarding the student experience of e-learning in higher education, there are differences in the students' view of collaborative work, where some students believe that it is positive and effective, whereas other students believe that it is boring, frustrating and doesn't help progress in the academic process (Mason and Weller 2000, p. 197)

The distinguishing element in e-learning is that it does not put pressure and responsibility on the learners, whereby the learners feel more comfortable which increases the educational achievements. Wagner et al. (2008, p. 30) determined the role of e- students in e-learning through the following:

- (1) Awareness: recognising the importance of e-learning, performing tasks more efficiently and improving skills.
- (2) Orientation: the student must be prepared to deal with the different stages of the study on the Internet.
- (3) Disciplined: assignments and projects should be completed.
- (4) Organised: study obligations should be followed to a time schedule.
- (5) Self-directed: the ability and potential to motivate.
- (6) Internal or externally motivated: prompt the students to act.

### **3.2 Cooperative Learning**

Cooperative learning is a practise proposed to help in the accomplishment of a specific final target through persons working mutually in teams. In cooperative learning, teachers can keep control of what happens in the classroom and whether the learners are operating in groups (Dooly 2008b). This section provides a brief description of the cooperative concept and some related issues.

### 3.2.1 Concept

Cooperative learning is a model of teaching where students work together with others in order to reduce the negative outcomes and increase the contentment that comes through the operation at a high level of the group's execution. Cooperative learning is an effective learning model in higher education. This type of learning provides many advantages for students: for example, cooperatively instructed learners want to demonstrate higher academic accomplishment, improved high-level reasoning and critical thinking skills, and encourage more positive behaviour in the direction of topic fields and advanced self-esteem, deeper understanding of learned subjects, additional positive and supportive interactions with colleagues, increased time spent on tasks and reduced problem behaviour in the classroom, improved inherent motivation toward teaching and greater power to consider situations from others' perspectives and reduced levels of anxiety and stress (Felder and Brent 2007).

Cooperative learning is a component of a team of education/learning methods, whereas learners co-operate with each other in order to gain objectives and to address mutual learning objectives. Cooperative learning is significantly more than placing learners together in sets and hoping for the best. It is an extensive official means of arranging actions in a learning environment that contains particular factors aimed to provide the potential for effective and pure study for the learners. The essential advantage of cooperative learning is its ability to deal with different circumstances in an orderly manner and that makes it easier for learners to move from one phase to another. In addition, Cooperative Learning models comprise the following basic rules (Macpherson 2008):

- Designing the group tasks in order to be convenient for group work.
- Building positive interdependence and cooperation, which are vital for students to succeed.
- Giving class time and attention to the development of interpersonal/cooperative skills.
- Encouraging students to learn from each other in small groups (2-5 members).
- Asking questions individually for learning and participation.

- Changing the mission of teachers so as to act as an educational facilitator, this provides guidance to students to interact with each other.

However, Tsay and Brady (2012) argued that the effectiveness of peer evaluation can be limited if the learners feel a sense of competition toward one another, as this can adversely affect the reliability of feedback. Moreover, students may still worry about the way they and their colleagues are ranked. In order to address such concerns, moving learners away from their team once teams' examinations have been completed will probably lead to more reliable reactions. An additional factor that might increase competition and motivation for cooperation is to apply a principle referenced ranking system to assess teamwork instead of rating on a curve.

### **3.2.2 Instructional Design and Cooperative Learning**

Cooperative learning, an instructional strategy, includes students working together to achieve a mutual target in circumstances, which contains the following factors (Felder and Brent 2007):

- Positive interdependence, as all members of the team are compelled to trust each other in order to accomplish the team's targets. Therefore, if one of them fails to accomplish the assigned work, the others members will suffer the consequences.
- Face-to-face promotive interaction: team work as a process to work collaboratively to promote interaction instead of that achieved separately, but only through team work, by distributing the sub-tasks between team members, supporting each other, getting feedback, motivating, and possibly most significantly, instructing and inspiring one another.
- Appropriate use of collaborative skills, as learners are urged and assisted to improve and apply decision-making, trust-building, communication, conflict management skills and leadership,
- Group processing, evaluate the members of a groups regularly in order to determine whether or not each member is working on the group goals, how he is working on the overall objectives and how he can improve the group's work in future. The table below views the differences between collaborative and cooperative learning.

Although there is convergence in the sense that there are common areas and overlaps in concepts between the collaborative and the cooperative approach, there are a lot of differences in the finer detail, as well as a set of disparities, especially when the matter is examined at multiple levels. The table below (Table 3.1) illustrates these issues in brief according to Markulis and Strang (2002) and Ruengtam (2012).

**Table 3. 1: The differences between collaborative and cooperative learning (Markulis and Strang 2002; Ruengtam 2012).**

Aspect or Area	Collaborative	Cooperative
Prescriptiveness of Activities	High-level	Low-level
Computer-supported	Online and classroom learning environments and can take place synchronously or asynchronously.	Favourable interconnection, singular responsibility, face-to-face promotive collaboration, suitable use of collaborative services, group processing
How to group student	Homogeneous	Heterogeneous
Assessment	There are a number of challenges in using group-based tasks to assess collaboration. The assessment of collaborative learning has shown a good level of validity, but educators need to rethink the individualistic foundations of assessment in higher education.	The assessment of cooperative learning has shown that it helps students to improve their performances on both formative and summative assessment tasks. Several forms of valuation would be applied to small group activities, involving the assessment of performances,

		tasks, and projects.
Skills components	Mostly previously existing	Training provided within small groups to create it
Some Examples	Forums, chat rooms, blogs, and wikis as well as Skype. In addition, Folksonomy sites such as del.icio.us and Flickr.	Micro-worlds, online drills, simulations or games.
Configuration	Well-organised, official	Self-derived
Interaction	Interactive learning: the students construct information by inquiry-based collaborative interaction, between students, teachers and content (Sessoms, 2008).	Active learning: the students construct information by inquiry-based treatment of digital artefacts.
The Role of the Teacher	Supervision, particular, control	Facilitative, training, guiding
The Role of the Student	Conventional	Determined by student
Type of Knowledge	Conventional, legal	Constructivist, tends to adoption
Goals	Have common goal	Each one has his own problem
Management in	Less managed	More managed

Concept		
Long-term Environment	Open-ended	Results-oriented

In other words, during cooperative learning, students come together as partners or groups in order to cooperate in all practices, uncovering or discovering the details together. Also, the students come together as partners or groups to share information or details they have gathered, so they also collaborate.

### 3.3 Collaborative Learning

Nowadays, blended learning is able to relate any combination of dissimilar ways of learning, different learning styles and various learning environments. In brief, the operative application of blended learning is primarily about creating chances for learning opportunities and instruments to achieve the optimal learning environment (Marsh 2012).

#### 3.3.1 Collaborative Concept

The idea of collaborative learning dates back to between 1950 and 1960 to that used by doctors to deal and communicate with medical students, where it was noted that the students who were working in groups had medical assessment and results better than those who were working alone which reflected the great success of this idea. The best way to understand the method of collaborative learning is with the definition of these concepts as viewed by Swan et al. (2006, p. 46):

- Collaborative learning is a teaching strategy that includes a small group of learners working together in order to develop the educational experience to the maximum extent possible.
- Collaborative learning is defined as the work of individuals as members of groups, and each student of the group is linked to mental, emotional, and behavioural functions to achieve the objectives of the community and systems whose clear objectives help learners in the decision-making process and increase the sense of community.

- Collaborative learning stands on the idea that learning is a naturally social act in which learners talk amongst them, and among the talk the learning occurs.
- Collaborative learning is “a case, where such a case includes the following main aspects: first, two or more students learn or try to learn something together; second, ‘two or more’ may be explained as a pair, a small group (3-5 subjects) or a class (20-30 subjects); third, ‘learn something’ may be explained as follow a course or perform learning activities such as problem solving. Finally, ‘together’ may be explained as many forms of interaction which may be face-to-face or computer mediated”.

Arguably collaborative learning aims to support the most effective teaching possible for the greatest number of students. Laal and Laal (2012, p. 492-493) pointed out that there are five basic elements in a collaborative learning environment:

- Collaborative learning obviously perceives positive correlation; members in the work group are committed to depend on one another to gain the goal. And if any member fails to perform their task or responsibility, all members in the group suffers the consequences. This means the teacher must plant in the hearts of the learners the importance of collaborative teaching to build a collaborative learning environment.
- Great communication and interaction: developing effective communication skills to interact with others contributes to an exchange of information and ideas through various channels to achieve the goals. Furthermore, successful communication depends on several factors such as the interaction between the teacher and the learner and the means of delivery in addition to the effects of the surrounding environment.
- Individual accountability and personal responsibility; each student in the team is responsible for performing their task and reaching a high level of mastery.
- Social skills: understanding behaviour of each student is imperative to succeed. There are a set of social skills learners should have such as confidence, calm, decision making, empathy, smiles, and communication.
- Group self-evaluating: in order to improve the teaching and learning process and development, this should focus on the importance of a teacher competency

standard in educational process and student assessment such as philosophy of education goals, defining curriculum content and textbooks under consideration, identifying objectives and analysing their content, and knowledge of their learning styles.

On the other hand, many previous studies and literature confirms the significance of effective participation and collaboration by students in supporting the effectiveness of the learning process. The evaluation of collaboration needs a radical rethinking of approaches and methodologies. In this context Swan et al. (2006, p. 46-47) pointed to three main issues which are involved in the assessment process:

- The variety and kinds of goals for collaborative learning: these include distinguishing between the teacher who built the learning goals for his students on a collaborative basis, and between the teacher who built it on a competitive basis, or individually. In addition, collaborative learning should distinguish between students who work in the form of learning groups, or conventionally, and among the students who work in the form of cooperative learning groups. Furthermore, collaborative learning should distinguish between each element of the basic elements of cooperative learning that have been implemented in the successful image.

Arguably, even with these different groups, the same kind of evaluation will not be suitable, because learning goals differ from implementation to implementation, for instance, as Swan et al. (2006, p. 46-47) stated:

...distinguish between structured and emergent collaboration schemes. In the latter sorts of collaboration activities, assessment must also emerge. What is consistent across the varieties of online collaboration is that collaborative learning will be more successful when it is valued, and that any such assessment should begin with a very specific understanding of desired learning. And in some collaboration activities, learning to collaborate is seen as an important part of what is to be learned; in others, it is merely a means to an end. In some collaborative activities, collaboration is focused on producing a group project, in others it is designed to improve the quality of individual work.

In conclusion, particular requirements for collaboration, containing detailed evaluation concentrated on crucial collaborative processes, will assist students achieve the desired aims.

- Other issues refer to the complication of evaluating individual and group behaviours, where collaborative learning represents a complicated activity and to support collaboration, individual and group aspects must be evaluated. This means the main building block of successful collaborative learning is integrated between the objectives of collaborative learning on the one hand and the goals of the learners on the other hand. However, to ensure the continued success of a collaborative learning strategy, it should succeed on an individual level.

An example of this type of evaluation according to Swan et al. (2006, p. 47) is: using summative testing is to give each student a grade based on some combination of their test score and the average score for their group. Another frequently used scheme is to give a common assessment for a group project and have group members rate their peers' contributions which are then averaged for individual grades. Unfortunately, these kinds of grading protocols are not often seen in online courses where the common approach is to assess either individual effort e.g., (online discussion participation) or group products (collaborative projects).

- Collaboration on assessment itself: assessment for learning achieves and its effect becomes necessary when the practice is rooted in spirit and the heart of the teaching and learning process. Thus, the teacher uses a package of tools aimed at providing assistance through the presentation of aspects and activities of the collaborative learning plans to find the desired interest such as rebound, questions design and comment trapped correction.

Actually, collaborative learning can be a defined teaching technique, which is invested in the learning process, and can enable more than one learner (a group of three to five people, a class of twenty to thirty students, a community of hundreds or thousands of people, or even millions of people) to learn something related to studying course

material, following a course, problem solving (or other learning activities) or even learning from lifetime work practice together (including several classes of communication, synchronous or non-synchronous, traditional (face to face), common in time or not, computer mediated, common effort or separately (Dillenbourg, 1999).

Moreover, collaborative learning requires working together towards a joint aim. This type of learning is also known as collective learning, cooperative learning, peer learning, learning communities, team learning, collaborative learning, or peer teaching. However, collaboration is more than cooperation. Collaboration means the whole process of learning, which consists of students teaching the teacher, students teaching one another and the teacher teaching the students. More significantly, it also means that students have a responsibility towards another learner in addition to themselves, such that achieving collaborative learning method goals involves students assisting each other to learn and understand (Dooly 2008a).

Interaction is the key portion of the educational process and is a principal focus on education through online methods in order to facilitate continued educational communication. Garrison and Cleveland-Innes stated that the goal of the educational process, regardless of the method of education (online, traditional, or a blended version), is to make the educational process effective, accomplishing specific learning results. However, interaction must be more systematic and structured (Garrison and Cleveland-Innes 2005).

Furthermore, in the collaborative classroom, it is primarily through the interactions and relationships between learners that knowledge is created. Thus, in order to be successful, this learning process needs to pay attention to developing a sense of community among the learners. Online learning includes activities planned to make a social environment that represents support for collaborative learning. Throughout the execution stage, the teachers nurture and encourage a sense of community among learners.

Garrison and Cleveland-Innes (2005) classified the interaction into the following types: learner–learner, learner–teacher and learner–content. On other hand, Sessions (2008) classified the learning process based on technologies into three types: expository

instruction (digital equipment transfer knowledge), active learning (which involves the effective teaching practices that encourage interaction between the learner and the teacher) and interactive learning (technology that enables interaction between the learner and the material presented by the teacher containing images and sound in order to make learning more interactive).

In other words, Marsh (2012) indicated that there are several types of interaction in the education process. These include students interacting with real-life native speakers, students actively participating online in personalised pair and group-work activities in the classroom, interaction with media, student-to-student interaction in the classroom, student-to-student interaction online using a variety of Web 2.0 tools (such as forums, chat rooms, blogs, and wikis), and real-time audio and video conferencing applications such as Skype.

### **3.3.2 Theory Frame**

Collaborative learning depends on constructivist theory, which posits that knowledge is built and translated through students. The learning process must be realised as something learned through activation of the existing cognitive structures or by building new cognitive structures that adapt to new input. Instead of passively acquiring knowledge, learning take place between all the students and teachers in the process. Furthermore, collaborative learning is described from different angles: social presence, motivational forces, cognitive presence and community of inquiry (Lowyck and Pöysä 2001). Thus, the students at Qatar University need tools that enable them to take charge of the learning process itself rather than following the traditional methods used in schools and colleges. In addition, the students need projects and workshops that aim to encourage and develop their skills through courses in different fields, which support collaborative learning. For instance, the mixture of e-learning practices that have been developed, as well as the most recent theories and approaches, support the effectiveness and success of the teaching-learning process and ideologies (Anderson 2008). In a blended learning situation, there will be a combination of face-to-face instruction with computer-mediated teaching to offer a comprehensible learning solution. As part of the preparation of a knowledge-based economy and organisational learning, theories such as community, adaptive, and scaffolding learning might include multimedia training CDs, extra learning

content and online conversation (including debate and live broadcasting) in order to expand and develop teaching and learning in light of the educational and pedagogical process as an entire integrated system (Tsai 2011). According to active learning theory, learning is any educational and pedagogical plan that connects students to the learning and teaching process (Alzaghoul 2011; Moore et al. 2011; Pange and Pange 2011).

### **3.4 Blended Learning**

This study will first briefly discuss the concept of blended learning, the importance of design of blended learning, the role of students and teachers in this type of learning and finally, the challenges and difficulties relevant to blended learning.

#### **3.4.1 The Concept**

Blending refers to “mixing objects and learning signifies an integration of new information” (Tshabalala, Ndeya-Ndereya and Merwe 2014, p. 102). Staker and Horn (2012, p.3) stated that blended learning is an integrated system designed to help the learner through each stage of learning, and is based on a combination of traditional education and e-learning within the classroom. Moreover, blended learning programmes could include different types of learning instruments, which include self-paced, real-time, virtual software, knowledge management systems, and courses. Blended or hybrid learning has been defined by Glick (2008, p.36), as “a combination of face-to-face instruction learning with computer-mediated teaching to offer a comprehensible learning solution”, while Taradi, Taradi, Radić and Pokrajac (2005, p.1) defined it as a course that mixes traditional face-to-face, World Wide Web and (Web)-based learning (WBL) approaches in a pedagogical environment that is non-specific in terms of time and place. Moreover, blended learning encourages positive interaction between the teacher and students which fosters the human aspects of communication between students as well as flexibility in the application of different learning styles that fit the individual needs and requirements (El-Mowafy et al. 2013, p. 133). In addition, it involves “Blended faculty members of the community to combine face-to face workshops, where personal relationships can be established with a sustainable online community for critical reflection and discussion of practice” (Stacey and Gerbic 2008, p. 965).

Recently, blended learning has increased as part of the education process at lower levels of education institutions (Eiter and Woll 2011). In addition, improvements in technology provide new chances for educators to plan and provide their courses in a way that supports and promotes the learners' separate reasoning involvements, the role of teachers and the social environment. Blended learning technologies may offer ways to: (Bath and Bourke 2010):

- 1- Expand the areas and opportunities for learning.
- 2- Provision the educational management process in terms of its interaction, evaluation delivery, determination and feedback quality.
- 3- Provision the supply of data and tools to learners.
- 4- Connect and motivate learners within collaboration and interactivity.

Bonk and Graham (2004, p. 3) identified blended learning systems as systems formed from a blend between two different learning techniques, such as old-style face-to-face learning techniques and distributed learning technique. Graven, Hansen and MacKinnon (2009) stated that blended learning is a style of learning in which e-learning characteristics integrate with traditional face-to-face education factors and characteristics within the traditional classroom or virtual classroom. Furthermore, Torrissi-Steele (2011) indicated that blended learning is characterised by teaching methods, integration and variation in learning styles and delivery methods. Blended learning also focuses on improving the learning process instead of utilising technology for its own sake. Blended learning efforts must inevitably force educators to reconsider how students learn best, how they teach and how best to apply face-to-face interaction with technology to provide diverse experiences. Therefore, blended learning must draw attention to learner experience, strategy and tools. Torrissi-Steele (2011) proposed that blended learning educators formulate and carry out a problem-solving exercise that aims to discover how best to facilitate the achievement of desirable results for different groups of learners. The accessibility of technology as a tool, overlaps with face-to-face (student with each other) methods and creates a possible learning process design that is more congruous with the educational needs of modern society. It is important here to confirm that constructivist

theory states that humans build their own external and internal information, which is influenced by the surrounding environment, society and language.

In addition, the constructivist theory is based on several principles such as that knowledge in the individual mind is incomplete, and the society in which an individual lives has a large impact on the construction of knowledge (Taber, 2011, p.40-42).

### **3.4.2 Advantages and Disadvantages**

Blending offers several benefits over the use of any single learning delivery medium alone. It is able to optimise the cost and time of development, offers learners the ability to be more efficient and more effective in learning, and extends the reach of learning and knowledge (Singh 2003). Moreover, blended learning is concerned with the interior of the learner cognitive processes through synchronous instruments such as social networking sites, discussion boards, blogs and group chats on Skype. Moreover, blended learning is known as a helpful technique for enhancing educational practices (Tshabalala et al. 2014).

In addition, Bath and Bourke (2010) stated that blended learning is concerned with effectively incorporating information and communication technology services into a course plan to improve the teaching and learning skills for learners and educators. It does this by allowing them to engage in means that would not generally become useable or efficient in their common environment (whether face-to-face or at a distance).

Bath and Bourke (2010) found that blending techniques accomplish enhanced learner skills and results, and further effective and effectual education and course management performance, through mixing learning styles, delivery modes and teaching approaches.

Bonk and Graham (2004) stated that there are six reasons to plan or employ a blended learning technique: personal agency, access to knowledge, cost effectiveness, social interaction and ease of revision. Blended learning is marked by increased online learning experiences, as well as different specific contextual requirements and urgent situations, involving the fundamental principles and dynamic reorganisation of education and learning, discipline, and the level of growth of resources. Garrison and Kanuka

(2004) mentioned blended learning as an efficient integration of two categories: face-to-face and Internet technology.

On the other hand, offering a high-quality classroom experience is not enough anymore, as universities are looking for learning that is transferable to the workplace, with concepts and frameworks that can be put into practice and add valuable solutions. Since there has been recent proliferation and broad use of new communication and social media technologies, universities reconsider blended learning as an effectual learning technique at the executive level, as a result of economic pressures, solution-focused learning, and the embracing and combination of new technologies (Eiter and Woll 2011).

Taradi et al. (2005) defined blended learning environments as a pedagogical means to encourage huge challenges and compensation for educators and learners. This environment offers a chance to reconsider education and accomplish education aims that might once have been out of reach. Thus, it may bring about positive change and add value, according to the techniques by which online actions are planned and supplied.

- 1) The design and use of blended learning face many challenges (Glick 2008), such as providing expert improvement for teachers learning online and face-to-face.
- 2) Modifying resources for local learners in order to make them culturally and educationally applicable.
- 3) Offering students the technological abilities to achieve in computer-mediated environments in addition to face-to-face.

Kenney and Newcombe (2011) investigated the difficulties faced and the strategies used when testing a 'blended instructional method' by pilot analysis, through conducting an action research study. The study sample was a large class within the College of Education at a medium-sized university. The need to develop student contributions, planning, and consideration, as well as to encourage a dynamic instead of a passive approach to teaching (which is exceptionally complicated in huge undergraduate courses) pushed the researchers to use a hybrid method. In order to document the adoption process and to estimate the effect of the hybrid approach, the researchers employed an action research study, the results of which showed that the implementation of new learning strategies led to the appearance of issues and barriers. Thus, once

finance, training and provision had been addressed, this study provided the faculty's members with pioneering ideas that helped and inspired them. Since the current study investigates the effect of collaborative learning on student achievements with different learning style, it is significant to determine that any expected challenges and barriers from the implementation of new learning strategies, be addressed in an ideal way.

Adas and Bakir (2013) conducted an experimental study to describe the situation of teaching and learning and the modality of combined writing behaviours. The study involved a total of sixty second- and third-year undergraduates from a traditional university in Palestine. Another group of students were used as the control group. The study classified the sample into two groups: the experimental group, which used blended learning, and the control group, which used traditional face-to-face lectures. The researchers asked the students in both groups to write as much as they could relate to a heading chosen previously at the beginning of the semester. The researchers rated the papers and pointed out strengths, weaknesses and points of improvement for each student when they returned them, and then discussed the answers with the students in class and online. The collected data were analysed using the SPSS programme. The results showed that differences were found in students' achievement scores, since the experimental group had interaction with the instructions and internal and external activities more than the control group. As the current study sheds light on the impact of collaborative learning on student achievements in a blended learning environment, it can be noted that blended learning helped students to perform better; in other words, it enhanced the achievements of students.

On the other hand, Tshabalala et al. (2014) explored the opinions of academic staff regarding blended learning, in addition to identifying the issues and obstacles faced by academic members which influenced the implementation of blended learning in the Faculty of Education at a developing university in South Africa. The sample for the study consisted of sixteen lecturers, eight heads of departments, and the dean of the university (giving a total of 25 academic members); the data were collected through a survey and a series of interviews for lecturers, and separate interviews for heads of departments and the dean. The tools used for the study were the Technology Acceptance Model (TAM)

and the Innovation Diffusion Theory (IDT) in a qualitative exploratory research design. The study concluded that opinions affecting e-learning or a blended learning policy, faculty provision by management, the existing computer abilities of learners and teachers, and insufficient access to computers on the part of the students impede the implementation of blended learning in South Africa. Hence on these results many factors should be taken into considerations to guarantee an effective blended learning environment.

### **3.4.3 Blended Learning vs. Traditional Learning**

Traditional education is comprised of face-to-face classroom education to study theoretical principles or practical exercises that improve technical skills, as each of them helps to develop educational process by using e-learning technologies (El-Mowafy et al. 2013). Blended learning utilises both traditional and modern instructional design.

The term ‘blended learning’ is now regularly adopted as a result of growing interest from academia and business, mainly in higher education institutions (Bonk and Graham 2004). Moreover, higher education institutions are applying blended learning to increase access to learning environments, improve pedagogy, improve cost-effectiveness, and increase the flexibility of learning environments. In addition, the main reasons that drive faculty acceptance of blended learning are that it develops student learning, involves students more in the learning process, and increases student engagement (Kenney and Newcombe 2011).

The role of higher education institutions is to offer efficient learning experiences to fulfil the requirements of learners who are oriented to digital issues. Blended learning has appeared as a means to provide for these requirements and is trusted by several higher education institutions. Nevertheless, the hosting of blended learning by institutions does not mean that all faculty members will follow it, despite the fact that this learning approach provides several advantages for teachers (Tshabalala et al. 2014).

### **3.4.4 The Challenges that Lead to the Development of Blended Learning**

Most of the educators stated that they are faced with many challenges (by the DfES and funding councils), for instance: they are obliged to change blended learning

software, tools and programmes when they are using learning technologies. Some of these challenges according to Gulc (2006, p.2) represent with the following:

- Most of the learning strategies require sequences of procedures such as: replacing some traditional methods by using e-learning to enable a new relationship with learners to develop their skills and take them outside the boundaries of the traditional classroom, expanding collaboration and allowing teachers to apply new resources into their teaching, where such resources derived from a world of digital libraries. In other words, blended learning needs to implement several mixes of online and face-to-face methods to establish more flexible learning and accreditation opportunities.
- “The early concentration on infrastructure has given way to a focus on pedagogy, and on connecting electronic communications with other processes, in a new blend of approaches to learning and teaching, where distance learning is now seen as one end of a continuum where e-learning offers opportunities across all programmes and all education sectors”. Thus, for most teachers the main reason for using blended learning is that its procedures allow them to support learning and be focused on the best learning style for each student.

So, the reasons blended learning is preferred by teachers can be summarised according to Gulc (2006, p. 2-3) as below:

- Blended learning increases the effectiveness of education through improved education outcomes by providing a better link between the needs of the learner and the education programme and increases the accessibility of information, and achieves the best results in the field of work.
- Blended learning provides the diversity of the means of knowledge through an appropriate way to capabilities and skills, which helps students to gain more knowledge and raises the quality of the educational process.
- Blended learning provides learning through activity that focuses on the role of active learner interaction through a combination of individual and collaborative activities and projects instead of the negative role of the learner of receiving information.

- Blended learning enables interaction during education through dealing with teacher and colleagues face to face, by means of electronic and traditional interaction, which helps to strengthen the human and social relationships and trends of learners while teaching.

In conclusion, blended learning empowers teachers and students and improves the quality of the learning experience, while expanding the scope of the teacher. Gulc (2006, p.3) views these achievable benefits as:

- Blended learning provides sufficient educational flexibility through the built-education system to meet individual needs and learning styles of learners depending on levels and ages.
- Master practical skills: particularly the practical skills associated with the medicine, engineering and technology education and other practical disciplines.
- The provision of training and practice in the learning environment: This achieves the possibility of training in the school environment, and provides hands-on training and practise of skills and provides appropriate reinforcement of performance to achieve educational goals.
- Achieving satisfaction with education through communication with the Internet programmes to strengthen and increase information collection, follow-up physical training and increase the effectiveness of the education process and learner satisfaction toward learning.
- The credibility of the assessment adds value to educational process through live and direct follow-up of the learners during the evaluation.

### **3.4.5 Role of Teachers and Students**

Bonk and Graham (2004) determined six important topics which are applicable to scheming blended learning techniques. The topics are dealing with the digital divide, the function of online contact, the function of student selection and self-regulation, cultural adaptation, obtaining equilibrium between invention and construction, and finding models for support and training to improve the use of an e-learning environment.

On the other hand, in order to improve the use of a blended learning environment for learning introductory programming in universities, Boyle et al. (2003) conducted a descriptive study with a sample of around 600 students from London Metropolitan University. The data were collected via three questionnaires distributed at three different time intervals throughout the semester. The study's results showed that the character of the modifications was affected by two aspects: analysing the problem and the educational ideas that generate enhanced students' learning practices. The result of the study revealed that there were obviously developments in the rates of success in institutions. So, in the current study to improve the blended learning environment, it must be noted that the character of the modifications was affected by two aspects: analysing the problem and the educational ideas that generate enhanced students' learning practices.

Stacey and Gerbic (2008) divided the success factors for blended learning into three main categories, each of which contained sub-factors which are a specific approach to meet the needs of the educational process. Institutional, teacher and student factors are the main categories of success factors for blended learning. The first category, '*institutional factors*', contained ten sub-factors, namely organisational preparation, adequate technical resources, encouragement from the education institution, communication and feedback between education institution and students, ability to provide traditional learning (face-to-face) as well as active learning, having an obligation to the blended learning technique, reconstructing the courses to include the new technology, and disseminating the results of using blended learning in the educational process by conducting a systematic assessment. '*Teacher factors*' consist of four sub-factors, namely professional development for instructors with adequate intervals for development, continuous pedagogical and technical support, getting rid of teachers' concerns about their inability to control, and teachers' workloads. The last category, '*Student factors*', consists of three sub-factors, namely mixing and preparing for blended learning with students' requests for independent learning, developing learning and time management skills, and understanding the blended learning process. So, in this study the researcher seeks to adopt the principles of lifelong learning and self-learning to understand the blended learning process.

On the other hand, Singh (2003) determined eight factors that contribute to the success of blended learning: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical. Each factor addresses a range of issues:

- (1) The *Institutional factor* addresses organisational, managerial, academic affairs.
- (2) The *Pedagogical factor* addresses the mixture of issues related to delivery (content analysis), student requirements (audience analysis), knowledge objectives (aim examination) and the design and strategy of e-learning.
- (3) The *Technological factor* addresses the learning content management system (LCMS) that catalogues the real content (online content modules) for the learning programme, as well as determining the best learning management system (LMS) requirements that would manage multiple delivery types.
- (4) The *Interface Design factor* addresses blended learning programme components.
- (5) The *Evaluation factor* addresses the ease of use of a blended learning programme. In other words, a programme must be able to assess learning efficiently in addition to assessing the learners' rendering.
- (6) The *Management factor* addresses the blended learning programme management, including infrastructure and logistics, in order to accomplish several delivery types, registration and notification, and arrangement of the diverse components of the blended topics.
- (7) The *Resource Support factor*: a resource provision may be a therapist/teacher who is continuously available, whether personally or via e-mail, or on a chat system, contracts with diverse types of resources (whether offline or online or both) existing for students and managing them appropriately.
- (8) The *Ethical factor*: identifies the ethical issues which are essential to be taken into consideration during the blended learning programme enhancement, for instance equal opportunities, cultural diversity, and nationality.

These classifications of factors show the main influences that contribute to the success of blended learning and should be taken into consideration to enable a successful learning environment.

### **3.4.6 Motivation**

Any skilled teacher recognises that without good motivation for students to involve themselves in learning, even the most effectively designed learning process will be unsuccessful. In other words, learners who are motivated to study will have greater success than those who are not. Moreover, students who study well will be more motivated to do so in the future (Hodges 2004). Thus, motivation is the main factor in any learning environment. Motivation can also be identified as the main source of student success in the learning process. Motivational beliefs consist of various different constructs that have been generated by different theoretical models, such as goal theory, intrinsic motivation theory, and attribution theory (Yukselturk and Bulut 2007). Motivation is an ability to motivate and interest an identified population of learners (Leacock and Nesbit 2007, p. 45).

Greener (2008) classified motivations into four types as follows:

1. Competence motivation, which is concerned with successful learning practices.
2. Extrinsic motivation, which is related to competence or high marks. Extrinsic motivation is involved when an action is completed for the purpose of achieving some independent outcome. Extrinsic motivation differs from intrinsic motivation, which relates to participating in an activity just for the enjoyment of the activity itself, instead of looking at its instrumental value.
3. Intrinsic motivation is concerned with knowledge and understanding of subjects. Intrinsic motivation is a vital instrument for open-ended cognitive expansion, as it is “the driver of spontaneous exploration and curiosity” (Oudeyer and Kaplan 2008, p. 1).
4. Achievement motivation is concerned with improved self-esteem through achievements. Achievement motivation theorists “try to express choices of people in achieving tasks, persistence on those tasks, force in carrying them out, and performing on them” (Wigfield and Eccles 2000, p. 68).

Motivation is necessary for both teachers and learners and it is necessary to determine how to motivate students in any learning environment (Ocak and Akçayır 2013). Key factors that allow conceptual change to happen include clear aims for both teachers and students, collaboration with peers, teaching with dialogue that promotes activities to encourage deeper understanding, freedom for the student to engage meaningfully in the task, and motivation that is intrinsic to the student (Marcus et al. 2004).

In addition, Sugie (2012) conducted a descriptive study to identify the motivation of Japanese learners regarding collaborative blended learning of Chinese language learning at “Chinese as a Foreign Language” classes at a high school in Japan. The class used the systematic language learning model, which utilises Information and Communication Technology. The participants in this study were novice learners in blended learning. The course used face-to-face grammatical practice, web-based training, and a bulletin board system that allowed students to interact with Chinese native speakers. Qualitative analysis was used to assess the students. The study found that Japanese students showed enhanced feelings of fulfilment and efficiency as a result of the involvement of actual on-line Chinese voiced interaction with local speakers.

Liao (2006) indicated that there are two major categories of theories within the cooperative learning model: firstly, motivational theories, and secondly, social cognitive theories. With regard to the former category, education must be oriented to help students see their ability to develop their skills and increase their capacity for control throughout the teaching mission. Students must attain competence through being made to see that their power is making a difference, and must be enabled to make improvements relative to their own past performance instead of their classmates.

Furthermore, Liao (2006) demonstrated the social cognitive theories and claimed that social upbringing is the foundation of cognitive growth, and that the procedure of cooperation with colleagues promotes students in respect to their knowledge, as it enables them to work together in the area of development. In addition, cooperative learning was found to have a significant positive effect on motivation and strategy use.

Moreover, Quinn (2006) conducted a survey to determine the influences of cooperative learning on students' motivation, attendance and achievement. The study's sample consisted of twenty-nine students randomly selected from a school-age GED programme's science lessons. The researcher asked the students to fill in a pre-test, which was administered to the students before they were classified into groups, and a post-test that was applied to assess and compare their progress and achievements. In order to evaluate the influences of cooperative learning on motivation, the researcher analysed students' attendance before and during cooperative learning. The study concluded that the students were positively motivated and achieved high levels of accomplishment after participating in cooperative learning. However, the researcher was not able to discern the influence of cooperative learning on the students' attendance.

### **3.5 Teaching Styles**

This section will start by giving some further details on the concept of teaching styles and their effects, and will then discuss the most widely known teaching styles and their classifications. Finally, it will explore the relationship between learning styles and teaching styles under two approaches, namely teacher-centred and student-centred.

#### **3.5.1 Concepts**

Teaching styles refer to the learning style of the person and the thinking process of the individual. Learning style is defined as the means by which human beings start to focus on engaging with, processing and remembering new and difficult data (Attard 2010).

Faruji (2012) indicated that teaching style is regarded as the demands, impressions, and behaviours that educators show in the classroom. Teaching style is multi-dimensional and affects how educators demonstrate data, supervise coursework, manage classroom tasks, mentor students, mix students in the field, and interact with students. This means that education or teaching style relates to an educator's universal characteristics, which remain constant even if situational factors alter. It is a mark related to several available and recognisable sets of reliable classroom behaviours seen in a teacher, irrespective of the content that is being taught. Another definition is the formula for the total of one's beliefs, values, philosophy and behaviours (Faruji 2012).

### **3.5.2 Teaching Styles: Classifications**

Kassaian and Ayatollahi (2010) created a framework to describe five liberal teaching styles, each entailing different levels of direction: formal authority, personal model, delegator, expert and facilitator. It was asserted that these styles are not separate characters that affect only a few educators. Instead, they are prevailing fields of faculty present in their classrooms, and they act with students' learning styles in certain ways. They also supply researchers with the means to realise the nature of teacher-student interactions.

#### ***3.5.2.1 Formal Authority***

The first category is formal authority. Teachers with this style are attached to their reputation as well-educated people, founding learning objectives: they supply positive and negative feedback, expectations and guiding principles for students and underline the correct, standard and acceptable means of doing things. They also supply students with the structures they require to learn (Kassaian and Ayatollahi 2010).

#### ***3.5.2.2 Personal Model***

The second category in this model is the personal model. Teachers with this style teach through personal example and establish a model of how to think and how to behave. They supervise, direct, and guide through demonstrating how to do things, and promote the learner to detect and compete with their approach (Kassaian and Ayatollahi 2010).

#### ***3.5.2.3 Delegator***

The third category in this model is delegator. Teachers with this style are concerned with developing the students' capability to operate autonomously. Students work separately on tasks or as part of self-directed teams. The teacher is available as a resource at students' request (Kassaian and Ayatollahi 2010).

#### ***3.5.2.4 Expert***

The fourth category in this framework is expert. An expert teacher is one who shows the knowledge and expertise that students demand and strives to retain his or her position as an expert through demonstrating detailed knowledge and through challenging students to increase their competence. Such a teacher is concerned with carrying data.

This approach includes anecdotic speaking, such as the Confucian view of education that is prevalent in some East Asian countries (Kassaian and Ayatollahi 2010).

#### ***3.5.2.5 Facilitator***

The fifth category in this model is facilitator. With this style, the personal nature of teacher-student relations is emphasised. Teachers with this style lead and direct students through suggesting alternatives, asking questions, exploring options and encouraging them to formulate criteria to make informed options. Their general objective is to formulate in students the capability for initiative, independent action and responsibility. Such teachers work with students on task in a consultative style and attempt to supply as much affirmation and encouragement as possible (Kassaian and Ayatollahi 2010).

#### **3.5.3 Learning Style and Teaching Style**

Teaching styles can be categorised as follows: (1) Direct learning from teachers; (2) Telephone assistance for personalised learner support; (3) Live events, such as virtual classes by means of a computer-based video conference, in which the teacher explains detailed learning subjects to the group and students ask further questions. This might also include teacher-led learning actions in which all students participate; (4) Interaction between students and the teacher, and between the students themselves, to stimulate group learning. Tools might include e-mail messages, threaded discussions and online chat; (5) Learning experiences at each student's own speed and in his own time, which the learners finish individually, like interactive, Internet-based or CD-ROM training, (6) Support and query lines for topics in learning management (enrolment LMS platform problems etc.); (7) On-the-job orientation materials that improve learning retention and transmission, containing PDA downloads and PDFs; (8) Measurement of students' knowledge through examinations. Pre-assessments arise before live or self-paced events, to define previous knowledge, and post-assessments may take place after scheduled or online learning actions, to assess learning transfer; (9) The presentation of a certificate or diploma that confirms having taken or passed the course (Alonso et al. 2005; Thomas and Reinders 2010).

### **3.5.4 Teacher-Centred Learning**

Teacher-centred teaching styles focus on controlling behaviour. Teachers should attempt to control their teaching styles so that they fit with their students' learning styles. Nevertheless, incompatibility might sometimes be crucial, particularly with low-level students, as they feel disappointed at the early stages of teaching, but this should be handled with care (Awla 2014).

### **3.5.5 Student-Centred Learning**

The student-centred learning (SCL) approach is diametrically opposed to the philosophy that is fundamental to the traditional method of learning. In addition, student-centred learning permits students to form their own teaching methods and places upon them the responsibility to actively enter into constructing their own meaningful educational procedure. Student-centred teaching styles can also be regarded as supporting autonomy. Each learner may need different means of learning, exploring and examining the data available. Some students may need more support when embarking on a programme of studies that applies a student-centred learning approach, particularly when it comes to getting options based on their learning styles and examining the implications of any such options. Others may already be accustomed to such an approach and demand less help in this respect (Attard 2010).

Qatar has adopted the latest methods in teaching, as the country is committed to further enhancing the role of teachers and has embraced key global developments in the field of teaching, such as e-teaching and the modern tools in state schools. The minister of education in Qatar said, "Improving the financial and professional conditions of teachers remains a priority for the government". He stated that the ministry would continue with this development and excellence in all aspects of the educational process by following the strategic education plan 2017-2022 (Watt 2013).

## **3.6 Learning Styles**

This section will describe learning styles. It will then review the experiential learning theory, individual differences and instructional preference. Learning style and motivation, social culture and discipline (specialism), as well as the students' learning

styles and their background will also be discussed. Finally, it will identify the community of inquiry.

### **3.6.1 Concept**

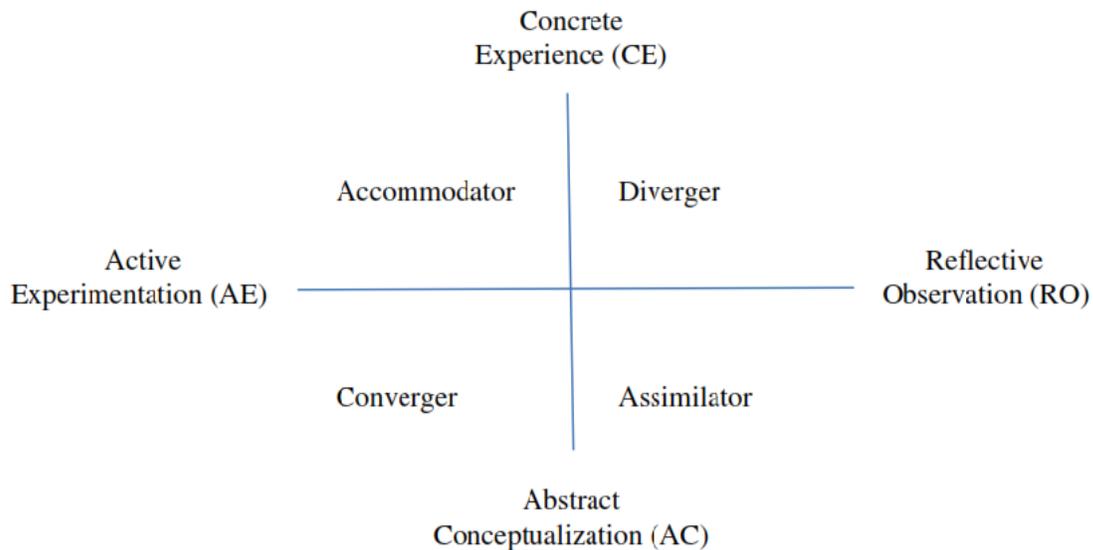
Sadler-Smith (2001) described three types of learning style: (1) Dependent learners: these students tend to choose teacher-directed and extremely integrated programmes with explicit appointments adjusted and evaluated by the teacher, such as computer-assisted learning and open learning, distance or flexible learning; (2) Collaborative learners: these students are concerned with discussion and prefer group projects, as well as collaborative appointments and social interaction, such as role-play, discussion groups and business games; (3) Independent learners: these students prefer the content and structure of learning databases within which the teacher or educator is a resource, such as lectures or tutorials.

Since the learning style is considered as a vital and critical aspect in the success of the education process, it will be imperative to take into account the students' perceptions towards their own ways of learning in order to increase the efficiency of education system outputs (Ghoneim and Budi 2012). According to Sen and Yilmaz (2012), it is notable that the identification and determining of learning styles can enhance self-efficacy beliefs, which are considered important in increasing learners' motivation, and furthermore, helps to develop their problem-solving skills and overall performance by creating a better education environment. From this standpoint, it is clear that considering the learning style within teaching techniques will result in an improved quality of education.

According to Kazu (2009), the significance of learning style stems from its ability and potential in providing procedures to optimise individuals' learning. On the other hand, the need to incorporate the learning style approach stems from the importance of responding to more varied bodies of learners and increasing the level of communication and interaction within the environment of the education process, and ensuring that the outputs of education match the future disciplines' requirements and expectations (Montgomery and Groat 1998; Al-Shehri 2009).

According to Zhang, Sternberg and Rayner (2012), learning styles are considered important, as they can organise and explain important aspects of individual learning by establishing features, qualities and traits that each style possesses. Specifically, it is important to recognise that all styles share a key feature in that they are different from abilities, and that there are differences between learning styles, thinking styles, cognitive styles, mind style, modes of thinking, or teaching styles. However, it is now agreed that "style" constructs are included in the term intellectual styles.

Furthermore, according to Manolis et al. (2013), learning styles exist within a set of environments. These styles can be divided as indicated into four types: the affective learning environment, the symbolic learning environment, the perceptual learning environment and the behavioural learning environment, as shown in the figure below (Figure 3.1). All of these are different learning environments but are considered the most appropriate for accommodating the diverse learning styles.



**Figure 3. 1: Learning style environments: Kolb's Experiential Learning Model (Manolis et al. 2013)**

### **3.6.2 Experiential Learning Theory**

There are numerous classifications, models, and theories associated with the area of learning styles. Kolb has adopted specific aspects to create his own version, but there are other approaches. These include Bloom's taxonomy, whose key principle is represented in assumptions about the mechanisms by which students store and retrieve data and knowledge obtained from the education process. Such tendency adopts the line of preferences for thinking, dealing with ideas and approaching work on discovering how students learn within the education system. The findings of this taxonomy are in the form of a set of domains of learning styles, which are cognitive, associated with the level of realisation and the progress of intellectual behaviours and skills, affective and psychomotor, which is concerned with motor and dynamic skills. One of the most common learning style evaluations is the Myers Briggs Type Indicator (MBIT) (Jizani 2007). This is based on Bloom's Taxonomy, and states that many teaching methodologies are tailored to specific learners. Furthermore, Robert Gagne highlighted in his theory of learning style that rational skills and eclectic behaviourism were the major starting points in creating his own model. Kolb's method suggests that the learning process is similar to a computer's information processing, where learning revolves around certain key issues, namely attention, encoding and recovery of information and facts. In addition, the Gregorc Style Delineator, which is considered as an important classification, incorporates a belief in self-analysis and recognises the moderating channels used to deliver and express information, but it should be kept in mind that this style delineator was developed purposely for adults and as yet no typology has been proposed for children (Harris et al. 2007).

Another organisation of learning styles is the Felder-Silverman Learning Style. In this scheme, Felder has harnessed a number of dimensions and elements to create his own criteria of learning style, such as the aspect of organisation, which ranges between inductive approaches like facts and attitude remarks, and deductive approaches like general principles and attitudes (Montgomery and Groat 1998). Moreover, according to Cassidy (2004), there are numerous models regarding learning styles, such as Honey and Munford's famous Learning Style Questionnaire Design (LSQ), which is similar to Kolb's experimental approach in that it is based on four categories. It is also worth

mentioning the Kaufmann Assimilator-Explorer Model, the core idea of which is based on a cognitive-centred approach and cognitive personality style. Such a model will be more attractive for individuals who need to deal with challenges and problems during the learning process.

According to Richmond and Cummings (2005), in Kolb's perspective, a classification constitutes four categories of learning styles: accommodative, assimilative, divergent and convergent. If any one of the above styles is combined with another, this combination will result in one of the following learning modes: concrete experiences, reflective observation, abstract conceptualisation and active experimentation. In other words, the matter revolves around four styles of learner: the theorist, the pragmatist, the activist and the reflector (Abu Zaid 2011).

### **3.6.3 Individual Differences**

Accommodating learners are characterised by their open-minded attitudes, and are not sceptical. This tends to make them excited about any new experience. They work and then look for the consequences later; and they have a tendency to thrive on challenges relating to new opportunities but are bored with accomplishment and longer-term consolidation. Diverging learners think carefully before making any decision or conclusion, adopt a cautious philosophy towards anything, prefer to stand back and wonder about experiences, and study any issue from several diverse standpoints. On the other hand, assimilating learners like logic, analysis, etc. In other words, they incorporate dissimilar facts into rational solid theories, prefer to achieve solutions with conviction and assurance and feel uncomfortable with subjective findings and lateral philosophy. Converging learners are characterised by efforts to try anything that they have learned immediately, and are impatient with pondering and open-ended discussions. They treat new problems as a challenge and deal with new challenges in a practical manner (Koob and Funk 2002).

In addition, according to Kolb and Kolb (2005), there is a set of advantages related to the adoption of a learning style classification in general and Kolb's learning style specifically in education systems. Such matters increase individuals' comprehension and the level of the learning process from their own experience and increase their

awareness of how they learn and progress, which increases their capability towards meta-cognitive control of learning procedures which enables them to monitor and select tactics that attain maximum achievement in diverse situations. Moreover, this approach encourages the provision of a language of learning style in terms of education measures that help to facilitate educators' attention and familiarisation with the most effective and functional learning environment.

#### **3.6.4 Instructional Preference**

The instructional learning model (also known as instructional systems design) provides teachers with the capacity to provide personalised e-learning processes that focus on certain pedagogical objectives and on the features and demands of learners. This instructional view depends on the learner's perspective (meaning the way in which the teaching should happen for learners to optimally gain the knowledge). In order to achieve an effective instructional design model, teachers must use best practice and innovative teaching methods, such as blended learning. Thus, specialist sequences in the subject urge a blended learning process.

#### **3.6.5 Learning Style and Motivation**

In addition, the amount of effort a learner makes is affected by the motivational quality of a learning object and the capacity to invest in working with and learning of the object. The Expectancy-Value theory is one of the important theories to explain human motivation. The essence of expectancy theory suggests that the desire or the inclination to act in a certain way depends on the strength of the expectation that it will be followed by work or a certain outcome. It also depends on the willingness of the individual in those results (Leacock and Nesbit 2007).

Various theories have been founded according to the various forms of motivation, including attribution theory, expectancy-value theory, and goal theory. *Attribution theory* is social theory, which tries to explain the causes of human behaviour through perception of self and others. Those causes could be fixed and/or manageable (Hodges 2004, p. 2). The *expectancy - value theory* is when learners expect specific results from their behaviour. The more valued the results, the more probable it is that someone will act in the necessary way. An example is when a student wants or expects to achieve a good

grade in an exam, and accordingly studies for it extensively. *Goal theory* presumes that the setting up of goals motivates behaviour. This theory holds that the ultimate objective is determined by the strategy that should be followed. To achieve that, several objectives are taken into account at the time of achieving objectives such as performance or learning goals. (Hodges 2004).

### **3.6.6 Community of Inquiry**

In general, e- learning and online teaching comprise a new and extensive research area that has attracted researchers concerned with the education process and education systems. Furthermore, there is a need for improvement as well as the development of educational methods and techniques where such environments continue to evolve. On the other hand, it is important to analyse the terms that are related to such techniques and to realise and accommodate the core notion of the community of inquiry (COI): for example, community of inquiry and cognitive presence with respect to conceptual and empirical aspects. In addition, these fields examine positive and negative aspects, which are considered effective and sensitive issues, in order to identify the strengths and weaknesses in the system, and to become involved with the contents of the entire system, such as teaching presence, distance education, collaborative pedagogy and critical thinking. On the other hand, one must highlight the role of upgrading based on the development of the quality of education; for example, enhancing the role of interaction as a crucial technique for the education process.

#### **3.6.6.1 Concept**

The community of inquiry as a community structure represents a procedure for producing a pure and constructivist learning experience that is comprehensive and integrated. This could be achieved through the growth of three connected elements – social, cognitive, and teaching presence. After that, the best definition of this community of inquiry is a group of individuals who are involved in a collaborative approach through consequential conversation to construct personal meaning and ensure mutual understanding (Garrison and Arbaugh 2007).

According to Garrison and Arbaugh (2007), the community of inquiry in general consists of a set of terms that form its framework. These include social presence,

cognitive presence and teaching presence, and take into account supporting discourse, climate setting and the selection of content, as shown in Figure 3.2 below.



*Figure 3. 2: Communication of Inquiry Framework (Garrison and Arbaugh 2007, p. 158)*

Moreover, from the viewpoint of Garrison et al. (2000), the community of inquiry is a process model or a certain method of online learning. This theory assumes the increasing interest in development of communities which helps dramatically to improve high order learning in any educational environment. Such improvement is not a trivial challenge in the online environment. In addition, the framework of such an educational system, which is a dynamic model based on core basics (cognitive presence, social presence, and teaching presence), requires the activation of all components of each element for the purpose of developing the community and achieving the optimum level of inquiry in any educational or pedagogical environment.

### **3.6.6.2 Cognitive Presence**

Effective learning with high efficiency performance must take into account both the internal cognitive process and the external contextual items that accelerate and affect the behaviour of thinking. Moreover, cognitive presence is concerned with the process

and procedures of both reflection and discourse, construction of the structure, and confirmation of significant learning outputs.

Generally, cognitive presence is considered as the major tool that makes the education process in the community of inquiry and the learning environment successful. Whereas the benefits and the significance of cognitive presence is strongly related to critical thinking, as cognitive presence is an important element in the creation of a solid environment and conditions to enable a high level of thinking and learning. Cognitive presence also plays a significant part in the activation of the community of inquiry with respect to education boundaries. In addition, its process and procedures take into consideration the experience of perception, which develops the level of awareness in general and the experience of conception in particular. It enhances the core ideas, principles and basics, all of which play a vital role in light of cognitive methods of thinking and help the community of inquiry, which ultimately serves to upgrade the education system. Furthermore, cognitive presence makes it easy to use the community of inquiry in practical ways, whether on the level of the private world or the shared world or in respect to discourse or reflection (see Fig. 3.3). All of these aspects are considered as indications regarding the ability and quantity of education-related skills that are concerned with integration in the learning system and with the resolution processes and related details: thus, cognitive presence has numerous strengths and advantages (Shea and Bidjerano 2009).

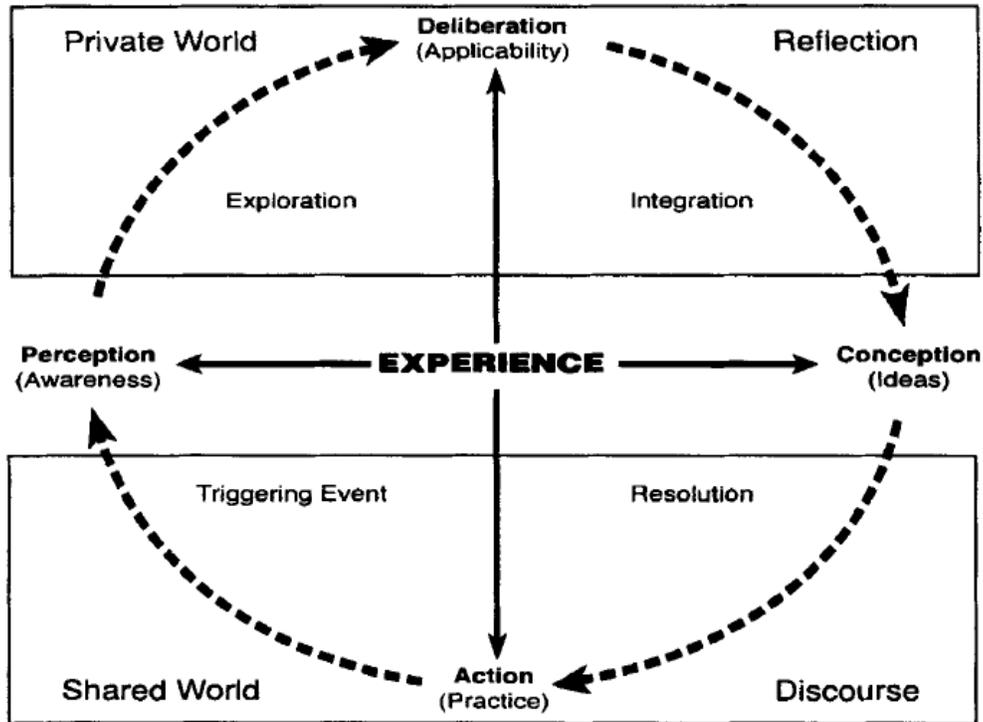


Figure 3.3: Practical Model for Cognitive Presence (Akyol and Garrison 2011, p. 235)

Cognitive presence is probably the most challenging aspect for the improvement of e-learning and the education environment in general, where investigation related to the development of inquiry regarding the learning environment plays a positive role in promoting the concept of the COI framework, as well as supporting the idea of advanced methods for improving the quality of the education process. However, all such issues are critical approaches because of the sensitive situation and complex conditions with respect to pedagogical measurements. Thus, cognitive presence has the ability to evaluate the level of quality for critical inquiry as a function of providing a means for evaluation regarding the systematic evolution of thinking over time. In addition, one apparent advantage in the process of critical thinking, as reflected by the perspective of a community of inquiry, is the potential to develop students' cognitive and communicative skills. This activates the positive role of such systems and fortifies the modern ways of thinking and dealing with the various procedures relating to the educational process to ensure a high-quality teaching and learning environment with positive and solid outcomes at the end (Garrison et al. 2013).

However, the concept of cognitive presence has various deficiencies and limitations; these are not necessarily flaws, but they could be considered as negative aspects. In addition, from the vision of integrated development, it is significant to undertake further investigation of such a system in order to provide a suitable and comfortable education environment. Specifically, cognitive presence could be affected by other components, such as the community of inquiry in general. For example, teaching presence and social presence are integrated with the community of inquiry; this precise and sensitive situation is enough to create a state of complexity within which numerous factors should be taken into consideration and must be addressed in order to ensure a state of stability during the education process when applying this pedagogical approach. Moreover, the environmental conditions of debate, controversy and sparring could be cut short due to time limitations, and such educational stress might have an effect on the core concept of cognitive presence and on the community of inquiry as a whole. Therefore, numerous negative aspects start to appear when the education process is affected with respect to several elements of cognitive presence. For instance, it is beneficial to convert the education system from one that focuses on mathematical knowledge and direct instruction to one where the teacher poses challenges and provides questions in order to create thinking and develop communication skills to build solid knowledge and make it applicable in ways that encourage innovation and creative thinking, but these behaviours and methodologies could be difficult to use with sensitive systems, such as cognitive and teaching presence (Colt 2008).

One of the properties of the community of inquiry in general and cognitive presence in particular is that individuals question each other, and pursue the reasons for their beliefs and principles to build their own knowledge. In other words, learners always try to benefit from others' beliefs and experiences to gain the desired level of learning. However, the problem lies in ensuring that the long-term vision is concerned with providing an appropriate environment for education requirements based on cognitive presence, where it becomes not just a need but an essential requirement, and the complexity associated with the situation of cognitive presence affects the overall issue of the community of inquiry (Shea and Bidjerano 2009).

### ***3.6.6.3 Teaching Presence***

Teaching presence is defined as the presence of adequate knowledge, personality and social relationships to achieve the goals of education and bring about the desired change in the educational process. This element contains many categories, including design and organisation (e.g. setting the curriculum and methods), facilitating discourse (e.g. sharing personal meaning) and direct instruction (e.g. focusing discussion) (McKerlich et al. 2011).

### ***3.6.6.4 Social Presence***

Social presence is defined as the degree of interaction and communication that teachers promote in an educational environment such as encouraging learners to show their emotions, provide positive messages that are clear and effective and feel a personal connection to others and encourage collaboration (McKerlich et al. 2011).

### ***3.6.6.5 Advantages***

According to Swanson and Hornsby (2000), there are several advantages and benefits of the community of inquiry style. For instance, the community of inquiry learning style encourages the learning of thinking skills, as it emphasises thinking skills rather than learning skills themselves, so that the education research skills developed are more flexible and more useful in terms of real-life application. Moreover, it focuses on the concept of educational and pedagogical processes, unlike other methods, which adopt the approach of information gain only, and thus makes it possible to open the doors towards activation as well as to promote the role of the various thinking types, namely critical, creative, and complex thinking.

According to Garrison et al. (2000), the community of inquiry provides many useful prospects and advantages, such as encouraging the spirit of collaborative work and information exchange, allowing a solid vision to be built in education methods and processes. It is worth mentioning that the community of inquiry also plays an important part in developing the core idea of making learners create their own knowledge and experience as well as building self-motivation towards their intentions and interests. Moreover, the community of inquiry system allows student to improve the skill of self-correction. In other words, the community of inquiry develops the capacity of thinking

regarding different levels and several orientations. In addition, students who learn in the community of inquiry get involved in each other's contributions, leading to knowledge exchange, and learn how to be open-minded towards various fields of education, leading to capacity building. They also learn how they should pay attention to the serious situations of education and research, as well as how to be confident in the pedagogical system.

#### ***3.6.6.6 Disadvantages***

The time issue is considered as an obstacle in the field of the community of inquiry, because there are rigid time constraints, as the strict time schedule which is generated from such a system impedes progress, and could be a limitation in the education process, whether with respect to the learner or to those who control the matters of a successful education system. Thus, the issue of time is sometimes a disadvantage in this field. Other disadvantages include the line of oral mediation, in which three verbal mediation challenges appear: speaker delays, irrelevance of matter, and slow-thinker insularity, as well as dynamic issues, as such an environment carries with it specific dynamics that challenge self-confidence and therefore make the gaining of self-assurance unsafe and risky (Swan et al. 2009).

Moreover, dealing with the community of inquiry in the education process sometimes creates limitations in one way or another. For instance, instead of the teacher answering students' questions directly, it should be left for other students to take the opportunity to answer and interact with each other. Therefore, it is clear that there are a set of limitations and negative aspects in the community of inquiry, but it is possible to rely on enhancing and promoting its strengths and work on activating the positive role of the community of inquiry in order to overcome many of these obstacles. The critical analysis of the community of inquiry could help in developing and improving the education process and encourage related terms such as cognitive presence and teaching presence. One can expand the area of the community of inquiry to involve various aspects of the education process and pedagogical procedures, such as developing the skills of communication and interaction (Pardales and Girod 2006).

### **3.6.7 Learning Style and Social Culture**

Learning style within the sociology of education is based on the assumption that students will be affected by the trends of others, their cultures and their behaviours. This means that they can learn by observing and imitating responses and this is what gives the character of education because learning is not done in a vacuum but in a social environment. Learning theory indicates there are two types of learning style. First, observational learning: a new behaviour will be noted, which affects the performance of others who listen, watch and recognise. Second, stop and editing: avoid the performance impeding behaviour of the individual when the situation is deserving of punishment because of preoccupation with this behaviour (Joy and Kolb, 2009).

### **3.6.8 Students' Learning Style and their Background**

La Lopa (2013) indicated that teachers must identify their students' learning style and then match their way of teaching to each style in order to increase students' performance. Several differences have been found between students, including their background knowledge of what is being taught and their concern in being taught it. La Lopa (2013) pointed out that learning theories differ in their views, with each of them having strength and weaknesses with respect to knowledge and learning styles, where some of these theories meet their objectives and are considered as accepted, unlike other theories that do not correspond to the cultures of all students.

### **3.6.9 Learning Style and Discipline (Specialism)**

The experiential theory of learning views it as the introduction of knowledge by a shift in experience and suggests that various learning styles are associated with different kinds of knowledge. Academic disciplines vary their principles for academic quality and productivity, knowledge structure, research approaches, ways of recording and depicting knowledge technologies and products and teaching methods. Academic environments include many students that differ in their abilities, their personalities and their values, and teaching staff are, in addition, obliged to deal with different learning styles which suit the students' skills, and these differences, if the focus, will lead to raising the level of achievement in universities. The process for students' growth is a creation of the collaboration within their individual options and acculturation experiences in academic disciplines. That means that the individual student's tendencies result in a choice of

educational experiences which accord with those moods. The result of experiences added support to similar choice dispositions for subsequent experiences (Kolb and Kolb 2005).

In general, there is a notable lack of studies and research in the Arab world on learning styles, their related issues and concepts, and their impact on the achievement of students at all levels, especially in Qatar. Hence the importance of this study to shed light on learning style concept and issues, and to investigate the effect of collaborative learning in an e-learning environment at Qatar University (QU) on the achievement of students with different learning styles.

### 3.6.10 Models of Learning Style

There are many models of learning styles, which include Kolb’s learning style, Honey and Mumford’s learning style, Gregorc’s learning style, Dunn and Dunn’s model, Kogan’s classification of learning styles, Riding and Rayner’s model, the Myers-Briggs Type Indicator (MBTI), Jackson’s Learning Styles Profiler (LSP), Herrmann’s model, Allinson and Hayes’ Cognitive Style and Vermunt’s learning styles. Two of these models will be summarised in the following tables (Tables 3.2, 3.3).

#### 3.6.10.1 Kolb’s Learning Style

**Table 3. 2: Kolb’s learning style**

Kolb’s learning style	Strengths	Weaknesses
<b>Design of the model</b>	According to Kolb’s classification of learning styles, there is a four-step cycle that includes four adaptive types of learning: Active experimentations (AE), concrete experience (CE), reflection observation (RO) and Abstract conceptualisations (AC), depending on experiential learning theory, which includes growth and development. This learning style is stable and flexible.	Process, level and style components must be inserted into the learning cycle.
<b>Reliability</b>	The authors (Koob and Funk 2002; Kolb, 2005; Coffield et al. 2004) found that when the instrument was changed, the	There is a long history of public dispute over the reliability of the LSI, and the third version is still undergoing testing.

	consistency of the learning style inventory (LSI) increased.	
<b>Validity</b>		There is a serious challenge to the learning style inventory (LSI) in terms of construct validity. Its predictive validity is low, but it was formulated for another function as a self-assessment practice.
<b>Implications for pedagogy</b>	<ul style="list-style-type: none"> <li>- Kolb stated that the theory of experiential learning offers a practicable framework for the management and design of all learning experiences</li> <li>- Both teachers and students could be induced to study and improve their learning models</li> <li>- All students would become effective in all four learning styles (concrete, reflective, active and abstract) in order to create balance and integration among learners.</li> <li>- Teachers would attempt to discover the range of learning styles within students and would consequently change their education.</li> <li>- Teachers would develop additional empathy with their students through dialogue, as well as more capable to assist them to improve their skills and knowledge.</li> </ul>	The idea of a learning cycle could be severely flawed, as the implications for teaching have been described reasonably from the theory instead of research outcomes.
<b>Assessment</b>	This model is considered as one of the first learning styles built on an explicit theory. But there are some problems with its reliability, validity and the learning cycle.	
<b>Key sources</b>	Coffield et al. 2004; Kolb 2005	

### 3.6.10.2 Honey and Mumford's Learning Style

**Table 3. 3: Honey and Mumford's learning style**

Honey and Mumford's learning style	Strengths	Weaknesses
<b>Design of the model</b>	Kolb's model characterises with new terms for style preferences (activists, reflectors, theorists and pragmatists), which are adjusted to the four phases of the learning cycle.	The questionnaire seems to be a consistent and internally reliable measure both of behavioural and attitudinal dimensions; however, it is not obvious that it supplies a suitable substitute to Kolb's inventory as a way of evaluating learning styles. For example, 8% of the variance is explained by personality and learning style.
<b>Reliability</b>		Moderate internal consistency has been detected.
<b>Validity</b>	Face validity is confirmed through the study (Freedman and Stumpf 1978; Kolb 2005 and Coffield et al. 2004).	Validity has not been evaluated by the authors. More evidence is required before the LSQ is acceptable.
<b>Implications for pedagogy</b>	<ul style="list-style-type: none"> <li>- Helping managers and employees to prepare personal development plans.</li> <li>- Managers are shown how to help their staff to learn.</li> <li>- It is a starting- point for discussion and advancing with a knowledgeable instructor.</li> </ul>	All the propositions are deduced logically from practice by applying the Learning Styles Questionnaire, but they have not been strictly examined to ensure that they work.
<b>Assessment</b>	Has been extensively applied in business, but needs to be restyled to remove or overcome the weaknesses discovered by researchers.	
<b>Key sources</b>	Honey and Mumford 2000; Coffield et al. 2004	

### 3.6.10.3 Allinson and Hayes' Cognitive Style

**Table 3. 4: Allinson and Hayes' Cognitive Style**

Allinson and Hayes' Cognitive Style	Strengths	Weaknesses
<b>Design of the model</b>	This model was designed on a single bipolar dimension from intuition-analysis, and Allinson and Hayes stated that this bipolar dimension addresses and supports other facets of learning style.	This dimension is very wide and consists of various related characteristics.
<b>Reliability</b>	According to both interior and exterior evaluations, the test–retest reliability and interior uniformity are high.	
<b>Validity</b>	Cognitive Style Index correlates with scales from other devices, like the four types from the Myers-Briggs Indicator. Analysis is linked with greater job satisfaction at junior levels than intuition, while intuition is related with success in entrepreneurship and with seniority in business.	<ul style="list-style-type: none"> <li>- There is clear evidence that intuition and analysis are not opposites.</li> <li>- The authors acknowledge that further study is required to realise the relations between intellectual ability, education achievement and cognitive style.</li> </ul>
<b>Implications for pedagogy</b>	<ul style="list-style-type: none"> <li>- In general, intuitive managers are better liked, regardless of the style of their subordinates.</li> <li>- Matched styles are frequently efficient in instructing relations.</li> <li>- If it were to be demonstrated that identifying a greater assessment on intuitive performance through students of university resulted in better business results and a more successful career, changes in human resource pedagogy</li> </ul>	<ul style="list-style-type: none"> <li>- It is clear how far outcomes are context-dependent.</li> <li>- Implications, at best, are interesting propositions which must be examined empirically.</li> </ul>

	and evaluation would be indicated.
<b>Assessment</b>	Generally, the Cognitive Style Index has the greatest proof of reliability and validity of the thirteen models examined. Although the pedagogical implications of the model have not been fully researched, the constructs of analysis and intuition are related to work performance and decision-making in several settings. The Cognitive Style Index is a desirable instrument for exploring and reflecting on instructing and learning, particularly if covered as a measure of two aspects rather than one.
<b>Key sources</b>	Hodgkinson and Sadler-Smith 2003; Coffield et al. 2004; Allinson and Hayes 2012

#### 3.6.10.4 Vermunt's Learning Styles

**Table 3. 5: Vermunt's learning styles**

Vermunt's learning styles	Strengths	Weaknesses
<b>Design of the model</b>	<ul style="list-style-type: none"> <li>- Based on interviews with students.</li> <li>- It attempts to incorporate cognitive, conative affective and metacognitive procedures.</li> <li>- Learning strategies, need for learning and preferences for organising data are contained.</li> </ul>	<ul style="list-style-type: none"> <li>- It ignores preferences for representing data.</li> <li>- Not complete: no points on the control of motivation, feelings or care.</li> <li>- The interpersonal context of learning is under-emphasised. It is not relevant to every part of stages and types of learning styles. Feelings of constructive and destructive friction are not examined</li> </ul>

<p><b>Reliability</b></p> <p><b>Validity</b></p>	<p>It is utilised to evaluate methods of learning reliably and validly.</p>
<p><b>Implication for pedagogy</b></p>	<ul style="list-style-type: none"> <li>- It is based on context: for example, the interaction between personal and contextual effects is a learning style.</li> <li>- It supplies a shared language to allow learners and teachers to talk about and encourage variations in learning and education.</li> <li>- Its stress is not on individual variances, but on the whole teaching–learning environment.</li> </ul>
<p><b>Assessment</b></p>	<p>A fertile model, suitable for application in human resources contexts, with potential for more worldwide employment in post-16 education where text-based learning is significant, to formulate more effective approaches to learning. Reflective use of the Inventory of Learning Styles in learners and teachers to encourage more creative approaches to learning.</p>
<p><b>Key sources</b></p>	<p>Coffield et al. 2004; Vermunt 1998</p>

### 3.6.11 List of Learning-Styles Instruments and Theories

**Table 3. 6: List of learning-styles instruments and theories**

Author(s)	Measure	Key Terms/Descriptors	Data Introduced
<b>Allinson and Hayes</b>	Cognitive style index (CSI)	Intuitive Analytic	1996
<b>Dunn and Dunn</b>	Learning Style Questionnaire (LSQ)	Environmental	1979
	Learning Styles Inventory (LSI)	Emotional	1975
	Productivity Environmental Preference Survey (PEPS)	Sociological	1979
	Building Excellence Survey (BES)	Physiological Processing	2003
<b>Gregorc</b>	Gregorc Mind Styles Delineator (MSD)	Concrete sequential Abstract Random Abstract Sequential concrete Random	1977
<b>Herrmann</b>	Brain Dominance Instrument (HBDI)	Theorist Humanitarian Organiser Innovator	1995
<b>Honey and Mumford</b>	Learning Styles Questionnaire (LSQ)	Activist Reflector Theorist Pragmatist	1982
<b>Jackson</b>	Learning Styles Profiler (LSP)	Initiator Analyst Reasoned Implementer	2002
<b>Kogan</b>	Sorting Styles into Types	Three types of Style 1- Maximal performance (ability) measures 2- Value directionality (advantageous) 3- Value-Differentiated Measures	1973

<b>Kolb</b>	Learning Style Inventory (LSI)	Accommodating Diverging	1976
	Revised Learning Style	Converging	1985
	Inventory (R-LSI)	Assimilating	1999
	LSI Version 3		
<b>Myers-Briggs</b>	Myers-Briggs Indicator (MBTI)	Perceiving Judging	1962
		Sensing Intuition	
		Thinking Feeling	
		Extraversion Introversion	
<b>Riding and Rayner</b>	Cognitive Styles Analysis (CSA)	Holist analytic	1991
		Verbaliser imager	
<b>Vermunt</b>	Inventory of learning Styles (ILS)	Meaning Directed	1996
		Application Directed	
		Reproduction Directed	
		Undirected	

### **3.6.12 Learning Style and Cognitive Style**

Cognitive style is described as a predisposition to process data in a particular way that includes awareness, perception, reasoning and judgment, which is related to an individual's preferred and habitual method of coordinating and constituting data. Cognitive style is defined as the method that identifies the way in which individuals perceive, remember information and think, or their preferred methods of employing such information to figure out a problem and solve it. There are several dimensions of cognitive style, including Holist–Serialist, Wholist-Analytical, Verbaliser-Imager and Field-Dependence/ Field-Independence (Mampadi, 2011). Learning style is described as a typical preference for approaching learning generally, which is related to how a student interacts with the environment and acquires data in his or her own way (Bakar and Ali 2013). There are several different theories and models of learning styles with changing dimensions and features, which mean that different theories concentrate on different areas, including cognitive processes, sensory modalities, cognitive preferences, talents, thinking styles, personality descriptions and learning processes (Boström and Hallin 2013).

The terms 'learning style' and 'cognitive style' are intimately linked and are frequently applied interchangeably. Both work outside the individual's cognisance and are presumed to be less amenable to change and conscious control (Howles 2007). Thus, the relations between cognitive style, learning style and knowledge of students' learning strategies are the most important issues in the learning process, which attempts to make desired behavioural changes in a student's cyclic process (Bakar and Ali 2013).

Graf and Lin (2008) have studied the cognitive traits and their impact on learning styles in the Felder-Silverman learning style model, as they found that there is a clear relationship between cognitive traits and learning methods as described in working memory capacity. Also, they suggested that there are two types of learners: the first type, with high working memory capacity, tend to adopt a sequential, reflective, and intuitive learning style, while the other type, with low working memory capacity, tend to adopt a visual, active, global, and sensing learning style. All these relationships can be applied to enhance the student model. This relationship can also shed light on the process of incorporating the added information about a learning style into the procedure of

identifying cognitive traits and vice versa. This contributes to a more authentic student model.

### **3.6.13 Learning Style and Thinking Style**

Thinking style is defined as a student's preferred manner of employing personal abilities when handling life problems. Here, it is necessary to distinguish between style and ability - style is a pattern where the functions should be performed optimally, while the ability means that it possesses characteristics and capabilities to perform the task (Sun et al. 2013).

Vengopal and Mridula (2007) examined the differences between learning styles and hemispheric preferences and thinking for information processing in children. A total of 250 students, both boys and girls, from Year 7 in five English schools were chosen. The tool used was Styles of Learning and Thinking. The authors found significant differences between the learning styles and thinking and concept preferences among children of both genders. These were demonstrated in the right and left (brain) hemisphere preference for information procedure between children, with girls being more left hemispheric oriented and boys more right hemispheric oriented in information procedure.

Furthermore, Sharma (2011) investigated the relationship between academic achievement and the learning-thinking style in secondary school students. A total of 140 Year 10 secondary school students participated: 70 boys and 70 girls from schools in different areas. Mean and Pearson's Product Moment Correlation ('r') was the tool used in this case. A positive relationship was found between learning-thinking style and academic achievement. Students with high academic achievement were also found to be better for teaching. Sharma (2011) concluded that academic achievement is an aspect which influences the learning-thinking style of secondary school students. The study found that the students were different in respect to their learning-thinking style. No significant difference was found between boys and girls in respect to their academic achievement.

### **3.7 Summary**

This chapter provided an explanation of the concept of e-learning, blended learning, cooperative learning and collaborative learning, as well as teaching styles. In addition, it discussed other studies, which highlighted the difference between collaborative and cooperative learning, and the different learning styles. Finally, it described learning style in much detail.

Firstly, it observed that e-learning technologies help teachers to explore their content easily and speedily. E-learning technologies help students check the content easily, learning faster and in sequence, which enables them to orient their experience to cope with personal learning targets. Internet technologies provide the opportunity for extensive delivery of digital content to various users at the same time and at any place or time. Then it discussed cooperative learning as a component of a team of education/learning methods, where learners co-operate with each other in order to achieve tasks and to address mutual learning objectives, and it argued that cooperative learning is significantly more than placing learners together in sets and hoping for the best. It is an extensive official means of arranging actions in a learning environment that contains particular factors aimed at enhancing the potential for rich and pure learning for the participants. After that, the chapter moved to define collaborative learning as a method employed in the teaching process wherein more than one person learns or tries to learn something together.

Moreover, the current study aims to explore the effect of collaborative learning on student achievement in a blended learning environment, so this chapter talked briefly about blended learning, and defined it as an official learning system that lets learners participate by delivering content and instruction online with some element of student control over time, place, path, and/or pace to distinguish blended learning from technology-rich instruction at a managed brick-and-mortar place away from home.

# **Chapter 4: Research Methodology**

## **4.1 Introduction**

In this chapter, the research methodology is described in detail including the research aims and objectives. It will outline and justify the approaches and methods chosen for the study, to achieve the research aims and objectives. There are different approaches to collecting data for various types of research and the current study used mixed methods research, and a case study. As the research is looking at the impacts of collaborative learning on the achievement of students, its research method must depend on constructivist theory.

Moreover, this chapter will highlight the practical part of this study. In addition, it will explain in detail how to measure the variables that are included in the study model. This chapter will begin with the research method and approach, which will give the reader an idea of the direction of the study and general strategy. Then there will be a description of the method, hypothesis of the study, study population, and data collecting methods and tools, dependent and independent variables in the research study and implementation of the method. Following this, the details of the considerations of the reliability and validity measures will be discussed, followed by a description of the ethical issues regarding the research, the models for the study and statistical methods and summary.

## **4.2 Research Method**

This research was considered to be experimental in nature. According to Cresswell (2008), experimental research is defined as a ‘controlled condition that is placed for the phenomenon (the subject of the study), which aims to determine deliberate challenge and hypothesis under these conditions to detect fact and results’. There are four basic components to a clear experiment: manipulation, control, random assignment, and random selection, of which the most significant elements are manipulation and control. The main definition of manipulation is that the researcher purposefully changes something in the environment. Control is mostly utilised to prevent external aspects from influencing the research outcome. It increases the researchers’

confidence that the manipulation “caused” the outcome when the situation is manipulated and controlled and then the outcome occurs. Also, experiments enable researchers to minimise error and bias through close control and systematic actions, which increases the researchers’ confidence that the manipulation “caused” the outcome (Creswell 2008).

Furthermore, experimental research in general is employed as the most suitable method for shaping causal conclusions about instructional interventions; for example, which instructional method is most effective for which type of student under which conditions. Also, experimental research is ideal for establishing whether one or more factors cause change in an outcome because of its strong ability to enable fair comparisons (Creswell 2008).

In this research, a mixed method approach, as one of the most common methods and strategies in scientific research, was used to collect and analyse data, check compatibility results, and integrate results and conclusions. Mixed Method Research (MMR) is defined as a blend of qualitative and quantitative techniques generated by the researcher or by a research team. This approach aims to obtain depth as well as width of realisation or confirmation with a high level of support within a single study or directly related studies (Creswell and Clark, 2011).

According to Creswell (2008), mixed methods research is a specialised form of study that combines quantitative and qualitative data to observe, analyse and integrate. Moreover, according to Creswell and Clark (2011), the mixed method approach is a practical approach in which the researcher gathers data via both quantitative followed by qualitative techniques or vice versa, or even simultaneously (Creswell and Clark, 2011). Thus, the method that was used by the researcher involved firstly an experiment (with a quasi-experimental design) to gather the quantitative data, followed by interviews to gather the qualitative data.

Furthermore, if the researcher collects data through a quantitative approach (quasi-experimental design) and follows this up by conducting interviews with persons who participated in the experiment to discuss the experimental results in greater depth (Creswell and Clark 2011), the findings will be more useful and will generate added value. It should also be borne in mind that the conceptualised merging could take place in

a concurrent, sequential, parallel way. In other words, MMR is a methodological approach, which has been built on the basis that it may be more valuable and productive to consider how the strengths of quantitative and qualitative techniques can be combined such that the outcomes can enhance and develop the overall understanding of the topic of the study.

Arguably, this method has been developed in order to find more suitable answers to the questions. There are some of disadvantages regarding this approach, such as descriptive credibility, interpretive validity, a sense of legibility and the need for the researcher to learn more than one method. Some mixed method aspects of research continue to be fully operated by research methodologists, but these limitations can be addressed in order to limit its impacts and consequences and accomplish the maximum benefits from the mixed method approach (Ostlund, Wengstrom, and Dewar. 2011).

However, mixed method research has many strengths, such as the fact that the researcher can answer questions using a wider and more complete range of options and can also compensate for many of the weaknesses in one research methodology by using an alternative approach, whereas if one single means is used, there is a possibility that important findings will be missed. The continued development of guidelines will also help researchers to carry out mixed methods research, which in turn will raise the quality of research into e-learning in general and other learning styles (Migiro and Magangi 2011).

The quantitative and qualitative approach is important as it generates more in-depth and accurate information about the research topic. The first approach is the qualitative approach, and it is used to provide insights to help in developing ideas or hypotheses for potential quantitative research. It is also used to derive and become familiar with underlying reasons, opinions, and motivations. Qualitative data aggregates various methods using unstructured or semi-structured techniques. In addition, there are some popular methods used in qualitative approaches, such as including focus groups (group discussions), individual interviews, and participation/observations. This approach is used when the sample size is small, and where individuals are selected to fulfil a given quota. Moreover, the qualitative approach obtains more detail and greater amounts of

information, as it gives the respondents free space to explore their thoughts (Richard, 2009).

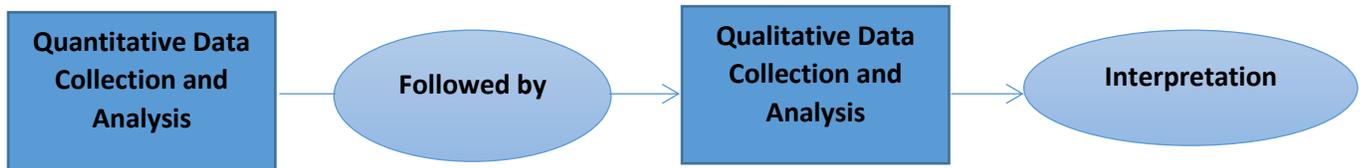
The second approach that will be applied in this study is the quantitative approach, which is usually used to determine problems by generating numeric data that can be converted into statistics. It is used to determine behaviours, situations, and points of view. Quantitative data collection methods are much more popular and structured than qualitative data collection methods. Quantitative data collection approaches include various types of surveys such as: online questionnaires, paper questionnaires, mobile surveys, face to face interviews, telephone interviews, longitudinal studies, online polls, website interceptors and finally systematic observation (Richard, 2009).

Usually there is confusion between the two types of researches: multi-methodology research and mixed-method. When adopting a multi-methodology research approach, the researcher utilises both quantitative and qualitative data but deals with both as distinct datasets, whilst when adopting a mixed methods research approach, the aim is to check whether there is a connection between both the qualitative and quantitative data (Migiro and Magangi 2011). The mixed methods approach is used in the current study, because this method can help the researcher to interpret facts, to avoid weakness points, to check compatibility and to address a question at different levels (Creswell and Clark 2011).

*Explanatory Sequential is a data gathering* design technique used within the mixed-methods approach. This design begins with gathering and analysing quantitative data, which is important to solve a research problem, followed by collecting qualitative data to facilitate the process of getting the outcomes. As a method, the distinguishing motive is its ability to combine the advantages of quantitative and qualitative data, which fits with various types of studies and enables investigators to interpret, analyse and solve the research problems (Creswell and Clark 2011).

For this study, if the data resources are inadequate to explain initial results perfectly, then another method is needed to enhance the primary method giving the experiment multi-phases; the *explanatory sequential* design is an appropriate method to

present excellent solutions to the current problem in the most effective manner, which is not found in other designs.



*Figure 4. 1: The Explanatory Sequential Design*

Moreover, it is worth mentioning that the case study method is used in many social science studies especially when in-depth explanations of a social behaviour are sought. Case studies explore and investigate contemporary real-life phenomenon through detailed contextual analysis of a limited number of events or conditions and their relationships. Moreover, the case study method enables a researcher to examine the data closely within a specific context. In most cases, a case study method selects a small geographical area or a very limited number of individuals as the subjects of study. This is unlike quantitative analysis, which observes patterns in data at the macro level, therefore because of the frequency of occurrence of the phenomena being observed; case studies observe the data at the micro level (Zainal, 2007).

Add to that, the collecting of data for collaborative learning depends mainly on constructivist theory where tools were designed according to this theory, which posits that knowledge is built and translated through students. The learning process must be understood as something learned through activation of the existing cognitive structures or building new cognitive structures that adapt to new input. Instead of passively acquiring knowledge, learning is related to all the students and teachers in the learning process (Migiuro and Magangi 2011). Furthermore, collaborative learning is described from different angles: social presence, motivational forces, cognitive presence and community of inquiry (Sandoval and Bell 2004). This means these theories include the constructivist theory of learning, which is described as an active construction of modern and contemporary new knowledge rooted in the learners' previous experience. On the practical side, constructivism aims generally to implant learning in realistic and relevant frameworks, bringing together a set of aspects in order to deal with the learning process

as a whole. Where the learning process consists of a system of education, the main design elements, collaborative design elements and learning assessment design elements, all create a learner-centred model to use in the general e-learning environment. The current research is looking at collaborative learning and its effects on the achievement of students, so for exploring issues and questions in this context the kind of research methods best to use depend mainly on constructivist theory.

In conclusion, the current study used mixed methods research, and because it is looking at the impacts of collaborative learning on the achievement of students, its research method must depend on constructivist theory. Thus, the next section provides a description of such methodology.

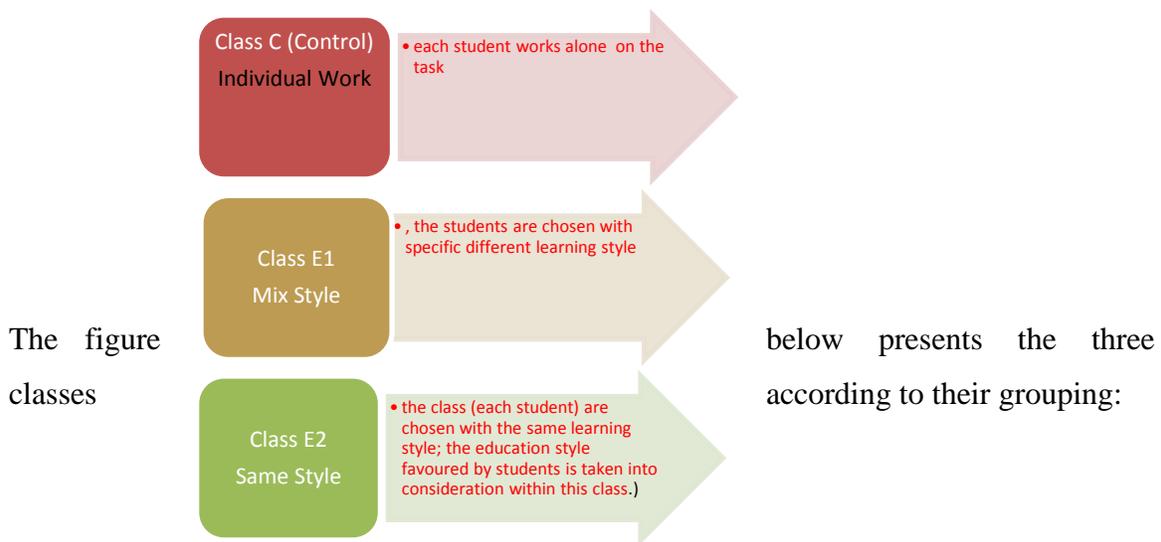
### **4.3 Description of Methodology**

It is preferable to use a comparative approach, and one issue that is of considerable significance is the mechanism by which the groups are formed. In this way, it is easy to embody the conceptualisation of the research – a comparative study – and it might be possible to go beyond the wider anticipated consequences.

The researcher depended on three classes to participate in the experiment (class C, class E1, and class E2) as table (4.1) shows, where each class was characterised by its situation: in the control class students performed a task separately, while in class E1 students performed a task by collaborating with each other and finally, in class E2 the education style favoured by students is taken into consideration. In other words, in the control class the students did not collaborate with each other and each student worked alone on the task. While in class E1, the students were placed in groups to collaborate with each other and work on the set task. The students were specifically chosen with different learning styles although they were not aware of their preferred learning style. Finally, in class E2, the students with the same learning style were placed in a group in which members assisted and supported each other as one body.

**Table 4. 1: Methodology Description**

Number of Classes for the experiment	General Description	Detailed Description
1	Class C Individual Work	In this randomly chosen class, the students work separately and do not collaborate. Each student works alone on the task (Control class).
2	Class E1 Mix Style	In this class, the students are placed in groups to collaborate with each other and work on the set task. In other words, the students are chosen with specific different learning styles which mean that these students are chosen without them knowing their preferred learning style.
3	Class E2 Same Style	In this class, the students are placed in a group in which members assist and support each other as one body. In other words, the elements of the class (each student) are chosen with the same learning style; the education style favoured by students is taken into consideration within this class.

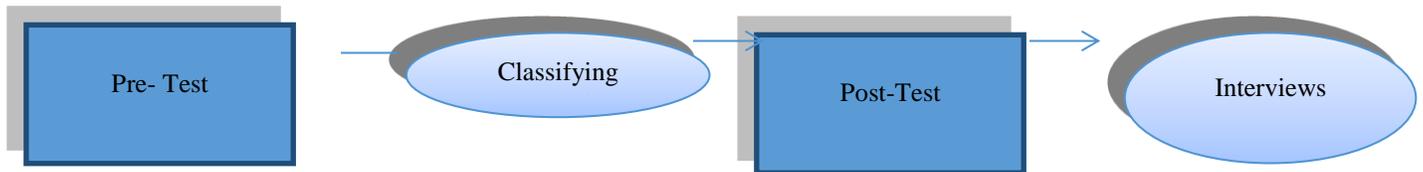


**Figure 4. 2: Sample Groups**

To achieve the desired aims of this study a pre-questionnaire was distributed to all students and their answers were used to classify them, based on their preferred learning style. The third (E2) class of students were selected based on their preferences in terms of learning style, so all were those who prefer collaborative learning (Sandoval and Bell 2004).

Following allocation into the above mentioned three groups (Individual Group, Team Work Group, and Collaborative Work Group), after a period of time, a post-test was applied to assess and compare progress and achievements of the students in each class/group.

This was followed by interviews with seventy-one of them to enhance our results and obtain more in-depth data from students regarding their preferred style after the classification process as well as valuable feedback. The figure below explains the sequential steps of this method:



*Figure 4. 3: Sequential Data Collection.*

In conclusion, in order to address the research question this study adopted a mixed methods approach, where the methodology design was experimental and consisted of setting up three groups, Control, Experimental 1 and 2, as seen in the works by Sandoval and Bell, (2004). Pre-tests and post-tests were used beside quasi-experimental methods.

#### **4.4 The Study Hypotheses**

This study is concerned with the impact of collaborative learning on the achievement of students with different learning styles within a blended learning environment. It also aims to examine the effect of including collaborative learning in an online Research Methods course at Qatar University (QU) on the achievement of students with different learning styles. Hence, this research will examine the following main hypotheses:

1. To examine the effect of collaborative/group work in a blended learning environment on students' Research Methods application skills, irrespective of their learning styles.
2. To examine the effect of learning styles, whether or not collaborative learning is used, on students' achievement related to the Research Methods Course in a blended learning environment
3. To examine the effect of learning styles, whether or not collaborative learning is used, on students' skills related to the Research Methods Course in a blended learning environment.

4. To examine the effect of collaborative learning on achievement related to the Research Methods Course in a blended learning environment for students with different learning styles.
5. To examine the effect of collaborative learning on application of skills related to the Research Methods Course in a blended learning environment for students with different learning styles.

## **4.5 Study Variables**

### **4.5.1 Independent Variables**

In this research the researcher considered Kolb's learning styles as independent variables within collaborative learning and these are categorised as follows:

- Diverging: a person with a diverging style has concrete experience (CE) and reflective observation (RO) as his or her dominant learning skills. Individuals with this learning style excel at observing tangible material from several different points of view.
- Assimilating: an individual with an assimilating style has abstract conceptualisation (AC) and reflective observation (RO) as his or her leading learning abilities. People with this learning style are best at synthesizing a widespread range of knowledge and driving it into short, logical form.
- Converging: a person with a converging style has abstract conceptualisation (AC) and active experimentation (AE) as his or her dominant learning skills. Persons who have this learning style are best at results applied using thoughts and concepts.
- Accommodating: a person with an accommodating style has concrete experience (CE) and effective experimentation (AE) as his or her dominant learning skills. Persons who have this learning style have the capability to learn from mainly "hands-on" experience.

#### **4.5.2 Dependent Variables**

Dependent variables are represented in students' achievements. To present the theoretical literature on the topic, the researcher depended on the following resources:

- Academic achievements, as assessed in the mid-term, final and practical exams and on-line course methodology.
- Educational attainment.
- Knowledge.

#### **4.5.3 Control Variables**

Since the current study will depend on an experimental approach, so it will depend on both a pre and post-test. A pre-test is given to measure the outcome variable before the experimental manipulation is implemented. A pre-test is followed by a post-test, which is the same test as the pre-test, after the experimental manipulation has been implemented. This pre/post-test design allows the researcher in the current study to test what the effect of collaborative learning has on the achievement of students with different learning styles at Qatar university, if any (Bell and Federman, 2013).

- A pre-test will be administered to the students before they are classified into groups based on their preferred learning style.
- A post-test will be applied to assess and compare progress and achievement of students with different learning styles at Qatar University.

### **4.6 Study Population**

For this study, students at Qatar University (QU) who study the Research Methods Course are targeted for the study sample.

#### **4.6.1 Study Sample**

The study sample was 81 female students, whose ages ranged between 19 and 22 years at the time of the study and who were registered in the three branches of the Research Methods course at Qatar University. The sample was divided into three classes: the control class (C), the first experimental class (E1) and the second experimental class (E2), each of which contained the same number of students (27 students in each group).

In the control class, each student was required to work individually. In the experimental class E1 students were divided into small groups of four students, such that every student in the same group had a different learning style. The second experimental class E2 was also divided into four groups but all students in the same group had the same Learning Style. The two experimental classes were to study the Research Methods course through collaborative learning, as well as face-to-face learning.

The students were asked to fill in a questionnaire, (Kolb's -this will be expanded on in a later section) three times in order to distinguish their learning styles, and some were eliminated from the analysis process due to instability in their learning style across the three responses. The final sample thus constituted 45 students in class C, 44 in class E1 and 46 in class E2. However, the final study sample was 81 female students and, equal numbers represented by the first 27 students' scores from each group were analysed in order to get more accurate results through comparing symmetric groups in terms of the numbers of students in each group.

Interviews were conducted with a representative and intentional sample consisting of seventy-one college students from the three classes. Face-to-face interviews (interviews with each student separately) were conducted in a suitable and quiet location at the College of Education.

## **4.7 Tools of Study**

Data were collected using a mixed methods approach, and there were two main sources of information for the gathering of data—primary sources and secondary sources—which were used to get enough data for this study. The sources were designated as shown below:

### **4.7.1 The Primary Source**

In this study, the primary source of gathering data was characterised mostly by questionnaires and interviews, which were designed in line with the study goals and objectives. Detailed descriptions of both tools are provided below, in terms of their contents, justifications for their choices, and further necessary details.

#### ***4.7.1.1 Kolb's LSI***

The questionnaire was used to categorise students in terms of different learning styles, as the objective of the study is to examine the effect of collaborative learning in a Research Methods course at Qatar University (QU) on the achievement of students with different learning styles. The LSI (learning style inventory) is dependent on Kolb's experiential learning concept and is superior to other measures of learning styles used in teaching because it draws upon the complete concept of learning and development (Kolb and Kolb 2005, p. 2).

#### ***4.7.1.2 Development and use of Kolb's LSI to identify and form student groups***

The main aim behind using this questionnaire was to investigate the impact of collaborative learning on the achievement of students with different learning styles. The questionnaire focused on the Kolb Learning Style Inventory, the teaching technique of the course and the course content:

- Appropriate statements were drawn from these questionnaires and restated and reformed to suit the needs of this research.
- The researcher then presented this questionnaire to her research supervisor at the University, and to some academic instructors working at Qatar University, who provided the researcher with valued notes and recommended some alterations.
- At this stage, the questionnaire consisted of twelve statements spread over the Kolb Learning Style Inventory dimensions.
- The questionnaire was then translated into Arabic by the researcher, because all course students are Arabs who might have had problems completing the questionnaire in English.
- Then, the questionnaire (Arabic version) was again presented to some of the academic instructors working at the Curriculum and Instruction Department for their views concerning the suitability of the translation, its clearness, the correlation of each question with respect to the questionnaire dimensions and the correctness of the Arabic grammatical phrasing of the questions. To increase the credibility of the study instrument, it was revised through various steps:

#### **4.7.1.2.1 Questionnaire Translation**

The first step was the translation of the questionnaire from English to Arabic. After the translation, it was revised by an Arabic language editor to improve its language. Then a professional colleague was asked, for whom English is her first language (native speaker) and Arabic is her second language, to re-translate the questionnaire (Arabic to English), to allow a comparison with the original version of the questionnaire with a colleague's version in order to check for differences in terms of translation and produce the final copy of the questionnaire before the distribution process. Thus, the questionnaire passed through three stages of translation and revision (English-Arabic-English), for both Arabic and English versions. Examples of these changes included the removal of some inappropriate words in the meaning and the grammatical structure, especially in the first paragraph of the cover page, such as the following sentence, "Write 4 to the sentence ending that defines how you learned best", which was modified to become "Write 4 next to the sentence ending that best defines your learning style".

The researcher chose a Likert-type scale for the questionnaire. This style involves asking the participants to respond to each report through ticking the suitable box from between four choices.

- The reliability of the questionnaire was confirmed and Cronbach's alpha was used to check the consistency of the results produced by the scale. According to Sekaran (2004), the values of Cronbach's Alpha for each variable of the questionnaire and for the entire questionnaire should exceed 0.60 in order to consider the result acceptable.
- To compute the reliability coefficient, SPSS was used (Cronbach's Alpha) to reflect the trustworthiness of the research instrument's data and its high consistency level.

#### **4.7.1.3 Interviews**

The study interviewed students to determine their views and sensitivities regarding the teaching technique used in the Online Research Methods Course. These interviews took place after the final exam, the practical exam and the questionnaire to explain the students' scores on these devices. Group interviews were used to offer a

degree of quality control regarding the various documents and focus attention on the main topics and issues in the study. They were also cost-effective in terms of numbers, peer discussion and connections. The questions and discussions in the interview referred to learning experiences within this module and sought to identify the difficulties the students faced, in addition to covering the benefits that they gained and lessons they learned through the stages of this module. Moreover, information about how students viewed their learning style after finishing this course was gathered.

Interviews were conducted with a representative sample consisting of seventy-one college students. Face-to-face interviews (interviews with each student separately) were conducted in a suitable and quiet location at the College of Education. These interviews were conducted with a total of seventy-one students from the three classes: twenty students (28.2%) from the control class C, twenty-five (35.2%) from the first experimental class (E1), and twenty-six (36.6%) from the second experimental class (E2). There were more students from the two experimental classes, as they worked in a collaborative environment, but the first class's point of view was still considered. In addition, the researcher requested the members' permission to use a voice recorder throughout the interviews to allow subsequent analysis of their responses. The next section will shed light on the measures that were used to assess students.

#### ***4.7.1.4 Final Exam***

Every year, the tests and exams for this Research Methods course are planned and set by expert persons consisting of a small group of instructors in the same section. The Research Methods class is a compulsory course. Thus, it is very important to check the validity and reliability of the exams for this course.

Consequently, the following points were checked in advance, as this exam would be used with the study research participants:

- The appropriateness and relevance of each question to the goals of the course.
- The appropriateness and relevance of each question to the purposes of the course units.
- The linguistic clarity of each question.
- The correctness of the scientific content of the questions.

- Making sure that each question measures what it purports to measure.

The importance of the final exam is summarised by its role as the main and most significant resource to measure students' achievement and their progress level in the curriculum. This exam is multiple-choice questions based on the content of the Research Methods course.

#### **4.7.2 Secondary Sources**

To present the theoretical literature on the subject, the researcher used the following resources:

- Arabic and English books and articles.
- Journals, articles, published papers and previous studies on the same subject from different countries.
- Internet sites and electronic publications.

#### **4.8 The Implementation Process (Procedures) of the Study**

- As formerly described, in the second semester of 2014, the three branches (classes) of student who were taking the Research Methods Course were selected for the researcher by the Department of Curriculum and Instruction. Thus, one group was selected at random (by the researcher) as the first experimental class, a second group was selected as the second experimental class for the experiment, and a third group was selected as the control class.
- As previously explained, the three branches (groups) were taking the Research Methods Course: the only difference was in the instruction technique used in the course.
- The researcher asked the College of Education to add her as instructor to the three groups in Blackboard.
- Some resources and learning supplies (books, educational links from the Internet, educational films, and PowerPoint presentations) were needed.
- At the beginning of the research process, some demographic data were collected from students in each group according to age, college, high school GPA,

academic disciplines, average use of computers and the internet, and marital status.

- The researcher informed all three classes of students about the study in the first meeting, and provided an information page and consent form (see Appendix), which she asked them to sign if they were willing to participate. The questionnaires were distributed as follow:
  - Week one: pre-test application (16/02/2014 to 20/02/2014) to classify them, based on their preferred learning style.
  - Week two: application questionnaire (23/02/2014 to 27/02/2014)
  - In the third week, the students were divided into classes:
    - Class (C) control - individual work
    - Class E1 (experimental) students with different learning styles working together in small groups (Mixed Learning styles).
    - Class E2 (experimental) teamwork in small groups (Same Learning style)
  - In the sixth week, the questionnaire (LSI) was applied for the second time (23/03/2014 to 27/03/2014).
  - The researcher intended to apply the questionnaire for the fourth time in May, but due to mid-season leave and the approaching final examinations, the seventeenth week had to be used for the application of the post exam from 25/05/2014 to 29/05/2014
  - In the seventeenth week, the interviews with students were conducted, to determine their views and sensitivities regarding the teaching technique used in the Online Research Methods Course.
  - The final exam took place between 08/06/2014 and 19/06/2014
  - Final results were obtained at the end of June 2014.
- The control class studied the Research Methods course using traditional and familiar methods used at the college i.e. face-to-face lectures on Tuesdays and Thursdays from 9 am to 11 am.
- Class interviews were conducted in the seventh week.

## **4.9 Challenges in the research process**

There are some obstacles facing research that affect the quality of information, so they must be taken into account, such as:

- There was a problem with lack of cooperation from faculty members in the College of Education at Qatar University. When the researcher sent them an email requesting permission to enable students to participate in the research, most of the members declined, except for Dr. Anoud Al Thani, who expressed welcome and willingness to cooperate in the implementation of this research.
- The research required the same teacher for the three classes (E1, E2, and C) which was not available and forced the researcher to divide the three classes as follows: Classes E1 and E2 were assigned to the same teacher and Class C to another teacher.
- The researcher also faced difficulty at the end of semester when one of the students made a complaint that her degree had been affected by her participation in the study. The researcher had designed exercises and assignments with the decision. But after investigation, it was found that all duties in the course specification were formalised by Qatar University. The University's policy is to have a committee for each course, who establish the goals, duties and costs with due respect to all scheduled exams, and grades were distributed before the researcher had applied her experience. In addition, there was the constraint that the researcher had to work under the Qatari University regulations, and was not able to change course content or the pedagogic approach.

## **4.10 Online Research Methods Course Design**

The Online Research Methods Course (ORMC) is defined as one of the standard academic theoretical courses that are provided to all Qatar University students. The goals of ORMC are represented in highlighting a generation of students that have many of the skills, abilities and capabilities, where students in this course have been subjected to training programmes and workshops. Online Research Methods is considered as a universal required course (module) for all students enrolled at the College of Education in

four academic departments: English, Physical Education, Art and Music. Since the current study revolved around this course it important to briefly describe this course.

The Online Research Methods Course contains units in the following fields: an introduction to the idea of curriculum (traditional and modern concepts); the elements of scientific research, research objectives and their importance. This is in addition to addressing any research proposal, which allows teachers to deal with the course content. It also deals with research methodology.

- **Definition of Objectives:**

The Online Research Methods Course is approved and provided by the Research Methods committee. The objectives of the course include understanding the concepts and components of the research process and clarifying research procedures. It also aims to clarify research problems and their sources, create awareness of different research paradigms and their implications for doing research, develop the ability to suitably select and cite information sources related to different study topics, develop the ability to effectively prepare a research proposal, and finally to understand and demonstrate commitment to research ethics. Moreover, this Online Research Methods Course consist of the following main contents (as described on the Qatar University website):

**Unit one: introduction**

At the end of this unit, the students are expected to be able to:

1. Describe the idea of the research.
2. Identify the objectives, types of scientific research methods, and characteristics of good research.
3. Explain the ways of acquiring knowledge and ethical issues in doing research.
4. Recognise the historical background and development of scientific research.

**Unit Two: Elements of scientific research**

At the end of this unit, the students are expected to be able to:

1. Identify research problems: definition, types of research problem, and sources of research problems, research problem selection criteria and research problem statements.
2. Determine the need for research questions and hypotheses, how questions differ from hypotheses, and the importance of hypotheses, hypothesis formulation standards, and types of hypothesis.

### **Unit Three: Research objectives and importance**

At the end of this unit, the students are expected to be able to:

1. Recognise research terminologies: theoretical and procedural definitions. Explain terminology definition standards. Understand the relationship among teaching and planning.
2. Identify research procedures: research methodology, research sample, population, and data gathering tools, research design and steps involved in conducting research. Understand the importance of the literature review, research determinants, results, recommendations, references, appendices.

### **Unit Four: Research proposal**

At the end of this unit, the students are expected to be able to:

1. Choose and formulate a research problem, relating it to the literature in the field (literature review/previous studies). Provide examples about warm-up lessons in a diversity of teaching positions.
2. Write an abstract, write a paragraph of a literature review, cite references within the paragraph, and give examples of reinforcement.

### **Unit Five: Research methods**

At the end of this unit, the students are expected to be able to:

1. Explain Survey methodology.
2. Explain Correlation methodology.
3. Explain Experimental methodology.
4. Explain Historical methodology.
5. Define Sampling.

6. Determining the time and the place that every method may be applicable.

#### **4.11 How to Teach the Experimental Classes and the Control Class**

In the context of the experimental classes, the researcher carried out the following experience with the students: through a face-to-face class, terms were clarified for the students using PowerPoint slides, though only briefly and not in detail. Some debate and team working followed this. Outside the class, the students were required to go online using the Blackboard ELE (for the first experimental class). These methods were also used by the second experimental class for online debating using a discussion board with other students in the course, conducting research and asking the instructor questions online if any clarification was required. After that, the students were given time to ask questions and make comments relating to the online discussion and online activities during a 15-minute period at the beginning of the lecture in the next face-to-face class.

In the context of the control class, the researcher used the well-established teaching approach used at Qatar University: that is, face-to-face blended learning of teaching alone.

- **Blackboard:**

The researcher decided to use Blackboard to benefit from its interactive environment, which enabled students to share in debates and activities or to share their ideas and experiences.

- Contact can occur between students and their colleagues or between the researcher and students, since Blackboard provides communication tools.
- Questions can be answered via the self-assessment tool offered by Blackboard, which transmits instant feedback to the student.
- The participant can also access reference books (reference activities) in Word and PDF formats.

##### **4.11.1 Assessment Method and Grading**

The Department of Curriculum and Instruction issued the researcher with directives on assessment methods and grading. As a result, the researcher was provided

with a copy of the assessment approach by the Head of Department for the online methods course, which had to be used:

**Table 4. 2: Assessment method for the Online Methods course**

Assessment Methods	Grades
Class discussions	5
Achievement Portfolio (Exercises-Poster)	20
Research proposal	25
Mid-term Test	20
Final Test	30
Total	100

This is considered the real implementation of the system to the online course method, and this stage comes after the development process.

#### **4.12 Pilot Study**

Prior to the planned study, a pilot study was conducted. Its aims were to test the research process, reduce any waste of time and effort, and solve unexpected problems. Gardner et al. (2003, p. 719) pointed out that to gain a robust understanding of a study design, a pilot study is necessary. Likewise, the advantages of a pilot study have been studied by several researchers in order to specify their ‘seaworthiness’. Therefore, the purpose of a pilot study is not only to gather research data: it aims to test and check procedures that are to be undertaken in the research, so that any modifications can be made before collecting the actual data. Moreover, the pilot study can identify whether the planned statistical analyses work or that any problems or mistakes that might occur in the data collection procedures or the statistical analyses can be corrected before the main study (Gardner et al. 2003).

From a statistical perspective, pilot studies are not effective for estimating the impact or efficiency of an association or its weaknesses or strength in an observational study. This is because pilot studies are very small and so it is not possible to obtain a dependable and reliable estimate of the effects of the study. This means, as Abu Hassan et al. (2006) pointed out, that the confidence interval around the experimental impact size will be very large, and there is a possibility that all values that occur within the confidence interval may be essential values of the actual effect size. The effect size is usually used for calculation in a pilot study based on the confidence interval, and the number of respondents needed in a large trial is significant to measure the effect that is statistically significant. The incorrect assumption here is that the resulting extent of the effects represents the true outcome. In order to provide an indication of variation, it is beneficial to use pilot studies as measurement for this aim, as the standard deviation can be used for calculations for the main study (Abu Hassan et al. 2006).

Thus, based on the above, the researcher conducted a pilot study for the purpose of detecting weaknesses in design and procedure, and also to provide proxy data for the selection of a probability sample. A pilot study collects data for a small-scale exploratory research project that uses sampling, but does not use difficult standards, and the purposes of a pilot study (Abu Hassan et al. 2006) are to:

- Examine questionnaire wording.
- Examine question sequencing.
- Examine questionnaire layout.

The test analysis procedures of the pilot study focus on the key factors which are used to shape the questionnaire, which contributes to obtaining the necessary data for answering the research questions afterwards.

Thus, based on the above, a pilot study is undertaken in order to detect design and instrumentation weaknesses, as well as to display proxy data that results from varied probability samples' sections. Overall, a pilot study comprises of data that is ascertained in order to create a small-scale exploratory research project utilising different levels of sampling and although it is rigorous set standards are not applied. The purposes of a pilot study (Abu Hassan1 et al. 2006) are to:

- Test the wording of the questionnaire.
- Test the sequencing of the questions.
- Test the layout and format of the questionnaire.
- Acquire a more substantial familiarity with the participants.
- Test the arrangements and organisation of fieldwork arrangements (when required).
- Produce trained fieldworkers (when required).

The test analysis procedures of the pilot study focus on the key factors that contribute to shaping the questionnaire, which then contribute to gaining the necessary data for answering the research questions afterwards. In conclusion, based on the test analysis of the pilot study the tools, techniques and inventories which were developed elsewhere, were adapted and validated and were suitable for use in Qatar.

#### **4.13 Ethical Issues**

Ethical issues can be defined as those that are related to the principles of morality (Orb 2000). Ethics are concerned with right and wrong in one's dealings, implying or conveying moral blessing in accordance with principles of conduct that are believed to be correct, especially those of a given profession or group. There are various reasons why it is crucial to adhere to ethical norms in research. Many ethical rules in research, for instance rules for writing, copyright and patenting contracts, data distribution policies, and privacy rules in equal review, are designed to keep intellectual property interests while supporting collaboration.

The ordinary researcher wants to receive credit for their contribution and does not want to have their ideas slanted or released too soon. Most importantly, the ethical patterns help to ensure that research can be made accountable to the public (Resnik and David, 2011, p. 57).

. Ethical issues were taken into serious account in order to complete the research to ensure that it conforms with the moral criteria of academic researchers and to ethical considerations in the Qatar.

All research projects have ethical issues concerning recruitment, volunteering, participants, and the right to withdraw, all of which are main ethical considerations that have been kept in mind during this research process (Anderson, 2009, p. 155). Ethical issues were taken into consideration while conducting the research to ensure that it conforms to the moral standards of researchers who work in academic areas. The researcher for this study asked for official consent from Qatar University before accessing its students. The university provided authorisation, and concerns relating to the research (such as objectives, access, and time) were tentatively outlined with the students involved. In accordance with the research instrument, this was done with full awareness. The researcher assured the University that the details and information from the methodology would not create any discrimination or bias. The process of data collection and storage was fully compliant with the Data Protection Act. In the context of anonymity and confidentiality, data were carefully and securely stored throughout the duration of the research, to guarantee the authenticity of the data collected. It is important to note that the data collected were primary data, which means that they come directly from the source.

Furthermore, Brunel University, London ethics policy stipulates that all researchers must apply for ethical approval and, subsequently, prior to embarking on this research, a request for such approval was obtained on 23/3/2014, although the study began on 16/2/2014. In addition, prior to the questionnaire process, all the participants were informed of the overall purpose of the research and suitable times for participation were arranged. Nonetheless, potential participants were duly notified about the ability to withdraw at any given time without needing to provide a reason.

The researcher ensured that there was no objection to the study on ethical grounds and was granted a letter of approval from the Research Ethics Committee of the Department of Education at Brunel University, London confirming permission to conduct the study (see Appendix). A letter was provided for the researcher from her research supervisor, Professor Mike Watts, requesting Qatar University to allow her to carry out the research at the College and to work with and teach three classes of students on the Research Methods Course 2014 (see appendix). Consent was also provided by the Dean of the College of Basic Education to the researcher's supervisor, confirming that the

College had decided to allow the researcher to carry out the research at the College of Basic Education (see Appendix).

The questionnaires were written and prepared using Microsoft Word, enabling the researcher to avoid needing to learn new skills and were collected upon completion, with their contents not being seen by anyone other than the researcher. This eliminated the chance of responses being altered, or misused by another party. To ensure that all data were obtained clearly, interviews were recorded, but only with the interviewees' permission. Audio recording of interviews brings several advantages: it is not possible for the researcher to take full notes in interviews, so recording can overcome this challenge by storing long-term 'notes'. The recordings also yielded transcripts, which assisted in the final analyses. Recording also frees up time in the interview for the researcher to observe the behaviours of participants, which can be used in the building of sense throughout the analysis. Audio recording is preferable to video recording in the context of Qatari traditions and culture. The interviewees were invited to freely convey their opinions by informing them that everything said would be held in the strictest confidence, and they were told that they were allowed to go beyond the pre-designed content of questions. Group interviews were used to offer a degree of quality control regarding the various documents and focus attention on the main topics and issues in the study. The interviews in this study were semi-structured for a similar reason that the questionnaires were. The advantage of structured interviews is that the standardisation of all questions can give quantifiable data in addition to replication possibilities. The data is also considered more reliable because of internal consistency that allows a degree of generalisation of the results to the population from which the sample was taken. However, restrictive questioning leads to restrictive answers and it can be insensitive to participants' need to express them.

The researcher guaranteed that the details and information from the methodology would not cause any possible discrimination or bias. Data collection and storage was done in strict accordance with the 'Data Protection Act'. With regards to anonymity and confidentiality, data was carefully and securely stored for the duration of the research, and this increased the authenticity of the data that was collected. It should be noted that data was collected as primary data, meaning it came directly from a source. Furthermore,

the questionnaire had been designed appropriately, based on the scientific research conducted in the field, and distributed according to acceptable means. The same methods were used while conducting interviews.

#### **4.14 Statistical Methods**

After collecting the data, the researcher utilised the Statistical Package for Social Sciences (SPSS) as a tool for analysing the data collected from the questionnaires. The statistical tests that were used in this research are presented below, alongside a brief explanation of each one derived from Walliman and Baiche (2001).

- Normal distribution of the data: to ascertain whether the data follow a normal distribution.
- Cronbach's alpha: a measure of internal consistency. Usually, it is used to measure the reliability of tools used to collect data.
- Independent sample T-tests were utilised for testing the quality of the experimental and control classes through the control variables.
- One-way analysis of variance (ANOVA) was used to compare student's achievement due to learning style.

Data collected from interviews were analysed by content analysis. The first definition of content analysis was by Berelson, whose study described it as 'the objective, systematic and quantitative description of the manifest content of communication' (Berelson, 1952, p. 18) but, over time, it has expanded to also include interpretations of latent content. There are several authors that have addressed content analysis (for example, Berelson, 1952; Graneheim & Lundman, 2004).

Content analysis was first developed in the social sciences as a way of studying cultures at a distance. It can be used to determine the beliefs, values, ideologies, role perceptions, behaviour norms and other elements of a culture through systematic analysis of its words and pictures. The basic technique of content analysis entails literally counting the number of times pre-selected words, themes, symbols or pictures appear in a given medium. More refined applications categorise and quantify relationships among the selected units.

Earlier uses of content analysis were usually limited to words, while more recent applications include computer-assisted colour breakdown of pictures and other advanced graphic analysis. Content analysis can be performed on printed material (newspapers, magazines, books) or on virtually any medium with verbal and/or visual content (radio and television programs, recorded meetings, movies, and songs) (Krippendorff, 1999).

Although content analysis was used in an objective and systematic manner starting in the 1920s and 1930s, it was performed largely by hand until the 1960s, when computers began to play an important role.

Throughout this research, results of interviews analysed by content analysis through coding and summarising of content, obtained valued outcomes.

#### **4.15 Summary**

In conclusion, this chapter began providing a full illustration of the approaches that were employed throughout this study and gives proper justification for choosing and using these methodologies. It then provided a clear description of the tools of data collection in terms of their design, contents and distribution procedures. This was then followed with a brief about the way in which collected data was interpreted and analysed, followed by a summary of the main ethical issues that this study took into consideration through the research stages. This chapter presented a proposal for the chosen model and variables for this study, after reviewing in brief the many studies on challenges. After reviewing this chapter, the reader will have a thorough understanding of the procedures and steps followed in the collection and analysis of the research data. The next chapter will explore the results of the study and discuss it in detail by comparing it with the results of previous studies to justify its conclusions.

## **Chapter 5: Analysis and Discussion of Results**

## **5.1 Discussion of Results**

While the previous chapter focused on the research methodology which was adopted for this study, after outlining and justifying the approaches and methods chosen for the study, and a brief explanation of each methodological tool chosen for data collection and analyses, this chapter will examine the process of analysing the collected data in the form of students' scores and interviews using SPSS and content analysis, followed by an explanation and discussion of the results in comparison with previous studies. Also, the following tests were applied:

- 1- Normal distribution of the data: to show whether the data follows a normal distribution.
- 2- Independent sample T-test: this test is used for measuring the variations in the achievement and skills of the students between the control class, who use individual learning, and the intervention class (E1), who use collaborative learning and work in a blended learning environment.
- 3- One-way ANOVA to assess the differences made by learning style on students' achievements and skills in the three classes.
- 4- Cronbach's alpha, to confirm the reliability and consistency of the tools used for the study.

### **5.1.1 Respondent Demographic Data**

The study sample included 81 students, whose ages ranged between 19 and 22 years at the time of the study and who were registered in the three branches of the Research Methods course at Qatar University. The sample was divided into three classes: as shown in table (5.1), the control class (C), the first experimental class (E1) and the second experimental class (E2), each of which contained the same number of students. In the control class, each student worked separately. The first experimental class was divided into small groups of four students, such that every student in the same group had a different learning style. The second experimental class was also divided into four groups but all students in the same group had the same learning style. The two experimental classes followed the course through collaborative learning, as well as face-to-face learning. The students were asked to fill in a questionnaire three times in order to

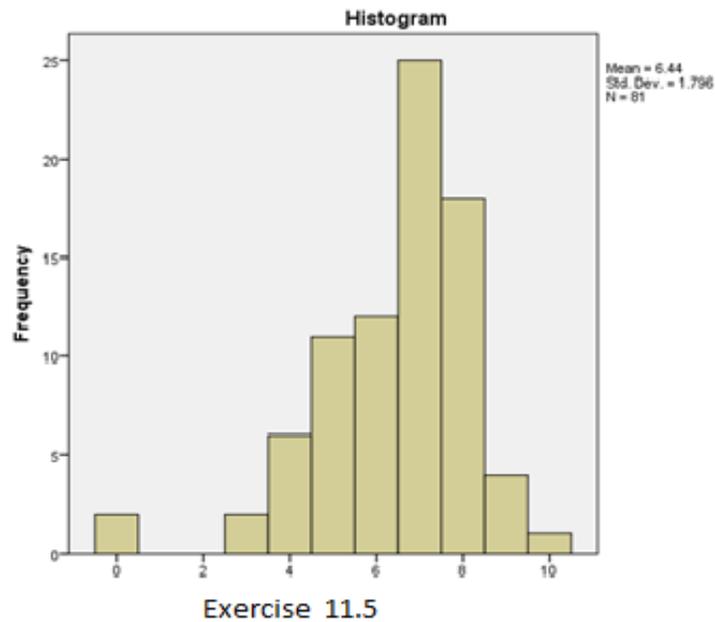
distinguish their learning styles, and some were eliminated from the analysis process due to instability in their learning style across the three responses. The final sample thus constituted 45 students from class 1, 44 from class 2 and 46 from class 3. Finally, the first 27 students' scores from each class were analysed in order to get more accurate results through comparing symmetric classes in terms of the numbers of students in each class. Table 5.1 shows the general equivalency of the groups to be studied.

**Table 5. 1: the sample of the study divided**

<b>Number of Classes</b>	<b>General Description</b>	<b>Detailed Description</b>	<b>The sample for each group</b>
<b>1</b>	Class C Individual Work	In this randomly chosen class, the students work separately and do not collaborate.	45
<b>2</b>	Class E1 Mix Style	In this randomly chosen class, the students are placed in groups to collaborate with each other and work on the set task.	44
<b>3</b>	Class E2 Same Style	In this class, the students are placed in a group in which members assist and support each other as one body.	46

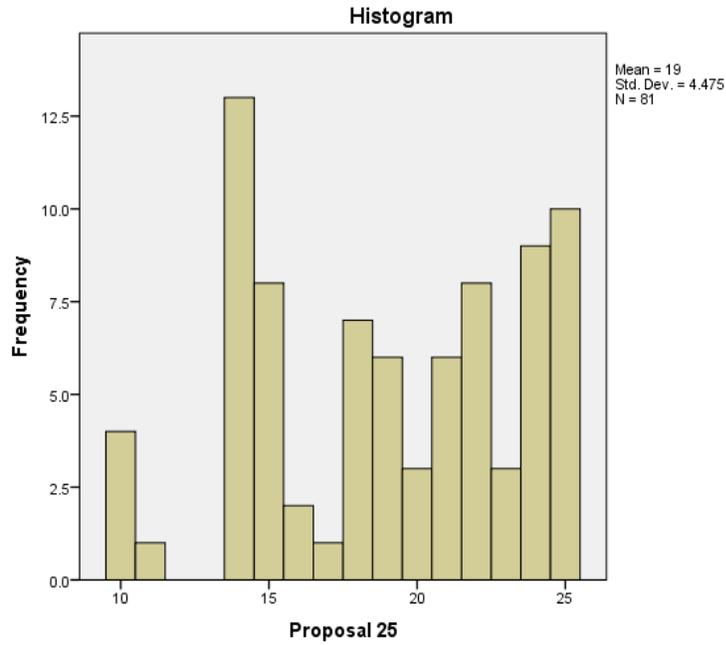
### 5.1.2 Normal Distribution of the Data

The normality test is necessary to see if the variables are normally distributed. The data are distributed in normality within a histogram graph. Figure (5.1) shows the histogram of major variables of the study for the principal's model. The shape of the histogram is acceptably close to the normal curve. This confirms that the data follow a normal distribution: i.e. they are parametric data. Figures 5.1 to 5.7 show the distribution of the data.



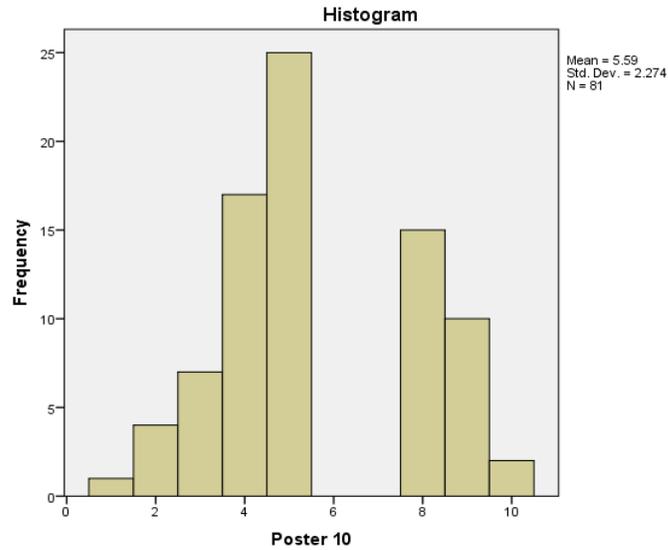
**Figure 5. 1: Distribution of the Exercise Data for Three Groups.**

The above figure (5.1) shows the tests of normality for the exercise data for the group variables, the probabilities (sig) are less than 0.05 for the variable so the data are subject to normal distribution.



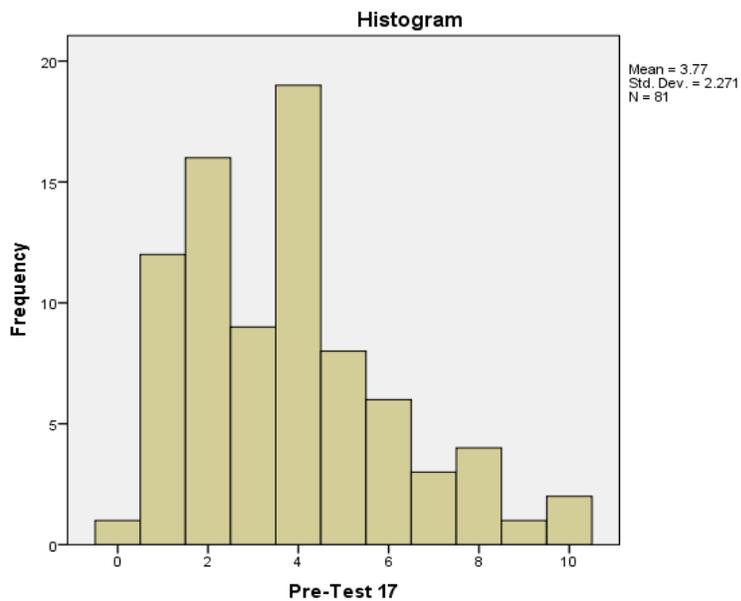
**Figure 5. 2: Distribution of the Proposal Data for Three Groups.**

The above figure (5.2) shows the tests of normality for the proposal data variable, the probabilities (sig) are less than 0.05 for the variable so the data are subject to normal distribution.



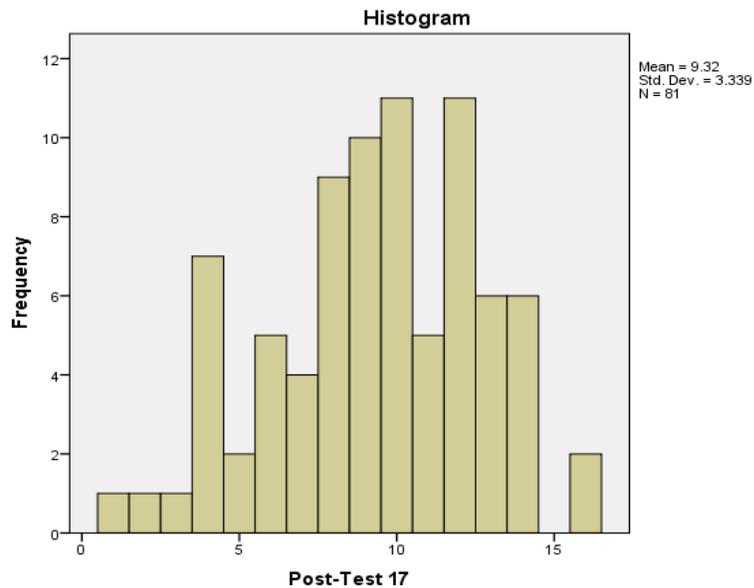
**Figure 5. 3: Distribution of the Poster Data for Three Groups.**

The above figure (5.3) shows the tests of normality for the poster data variable, the probabilities (sig) are less than 0.05 for the variable so the data are subject to normal distribution.



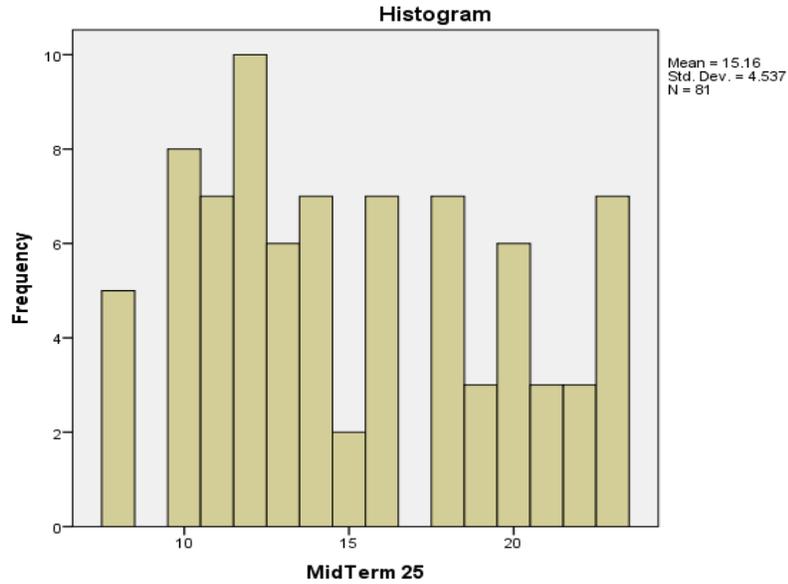
**Figure 5. 4: Distribution of the Pre-Test Data for Three Groups.**

The above figure (5.4) shows the tests of normality for the pre-test data variable, the probabilities (sig) are less than 0.05 for the variable so the data are subject to normal distribution.



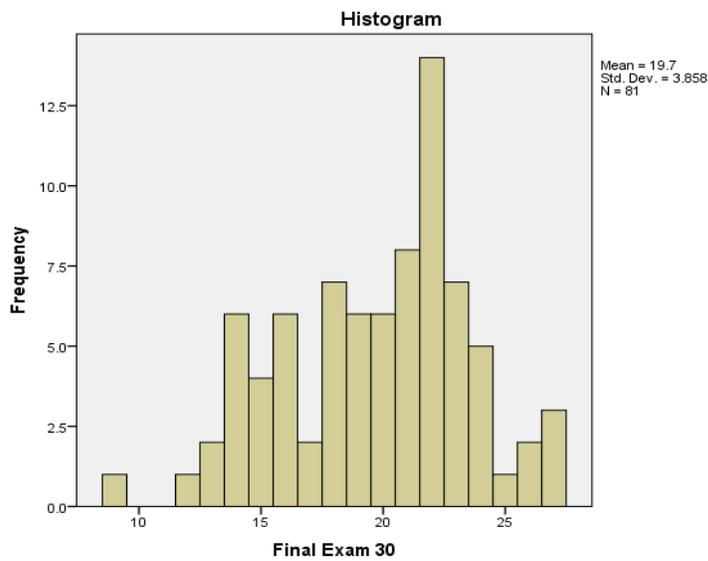
**Figure 5. 5: Distribution of the Post-Test Data for Three Groups.**

The above figure (5.5) shows the tests of normality for the post-test data variable, the probabilities (sig) are less than 0.05 for the variable so the data are subject to normal distribution.

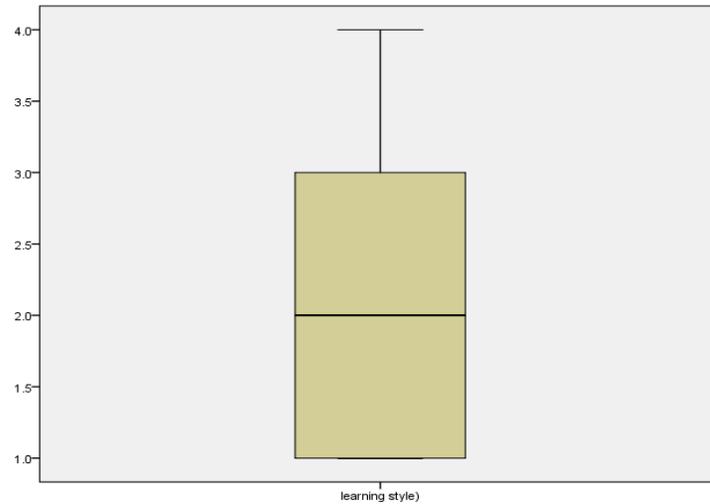


*Figure 5. 6: Distribution of the Mid-Term Data for Three Groups.*

The above figure (5.6) shows the tests of normality for the mid-term data variable, the probabilities (sig) are less than 0.05 for the variable so the data are subject to normal distribution.



*Figure 5. 7: Distribution of the Final Exam Data for Three Groups.*



**Figure 5. 8: Distribution of the Learning Style Data for Three Groups.**

The figure (5.8) shows the tests of normality for variables in teacher’s model, the probabilities (sig) are less than 0.05 for all variables so the data are subject to normal distribution.

### **5.1.3 Testing Hypotheses**

The current study aimed mainly to explore the effect of collaborative learning on students’ achievements with different learning styles and to achieve such an aim and to answer the research question it’s important to test research hypotheses. Therefore, in this section, the following hypotheses will be tested:

- There is a significant difference in the achievement of students who work individually in a blended learning environment in the control class and those who collaborate in a blended learning environment in the first experimental class.
- There is a significant difference on the achievement of students who engage in collaborative learning in a blended learning environment due to their learning style.
- There is a significant difference in the students' achievements in term of collaboration used in the three classes due to learning style.

**- Main Hypotheses**

**5.1.3.1 First Hypothesis**

**H1: There is a significant difference in the achievement of students who work individually in a blended learning environment in the control class and those who collaborate in a blended learning environment in the first experimental class.**

To test this hypothesis, an independent samples t-test was used to compare the control C and E1 classes to assess the effect of collaboration on students' achievements as follows:

**- Exercises**

An independent samples t-test was used to examine the effect of collaborative learning on the exercise scores of students by assessing the variations between the control class C and the first experimental class E1 in a blended learning environment. As shown in Table 5.2 below, the H1 hypothesis is accepted. This indicates that there was an essential difference in the exercise scores between the control class and the first experimental class. Sig value for (the exercise scores of students) was .000, which was less than  $\alpha$  (0.05), thus there was a statistically significant difference between the control class and the first experimental class in favour of the control class, where its mean value was (7.56). However, regarding the effect of collaborative learning, it can be concluded that there is no effect of collaborative learning on the exercise scores of students, as the mean value or difference is in favour of the control class, not the experimental class.

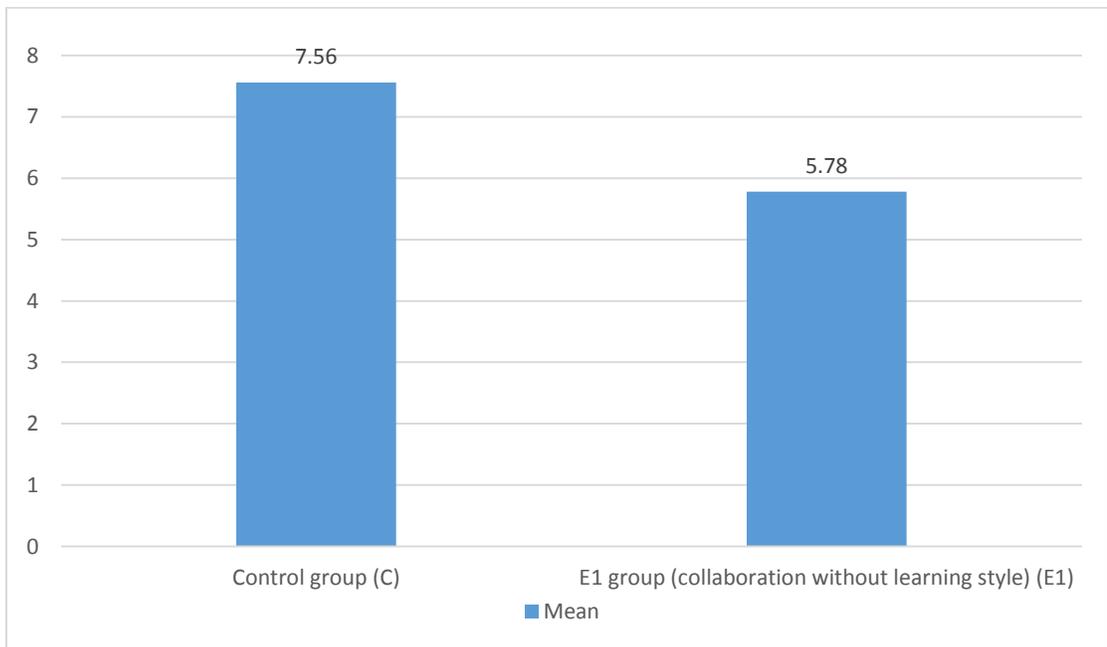
**Table 5. 2: Differences in the exercise scores between the Control Class and the First Experimental Class**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Exercises (11.5)	Equal variances assumed	1.862	0.178	4.348	52	0.000	1.778	0.409
	Equal variances not assumed			4.348	46.586	0.000	1.778	0.409

**Table 5. 3: Class Statistics for the exercise for the Control Class and the First Experimental Class**

	Class name	N	Mean Score	Std. Deviation	Std. Error Mean
Exercises (11.5)	Control class (C)	27	7.56	1.219	0.235
	E1 class (collaboration without learning style) (E1)	27	5.78	1.739	0.335

According to Table 5.3, the control class has a higher mean score (7.56) than the collaborating E1 class (5.78). This indicates that there is a significant difference in the exercise skills; with the control class C performing better than their peers in the experimental class E1.



**Figure 5. 9: Difference in Exercise Skills between the Control Class and the First Experimental Class**

**- Proposal**

An independent samples t-test was used to examine the effect of collaborative learning on the proposal scores of students by assessing the differences between the control class and the E1 class. As shown in the table below (Table 5.4), there is a significant difference in proposal scores between the control class and the first experimental class as the levels of probability (p) is 0.001, which is below the significance level of 0.05. The E1 class has a higher mean value (see Table 5.4). Thus, it can be concluded that there is an effect of collaborative learning on the proposal scores of students.

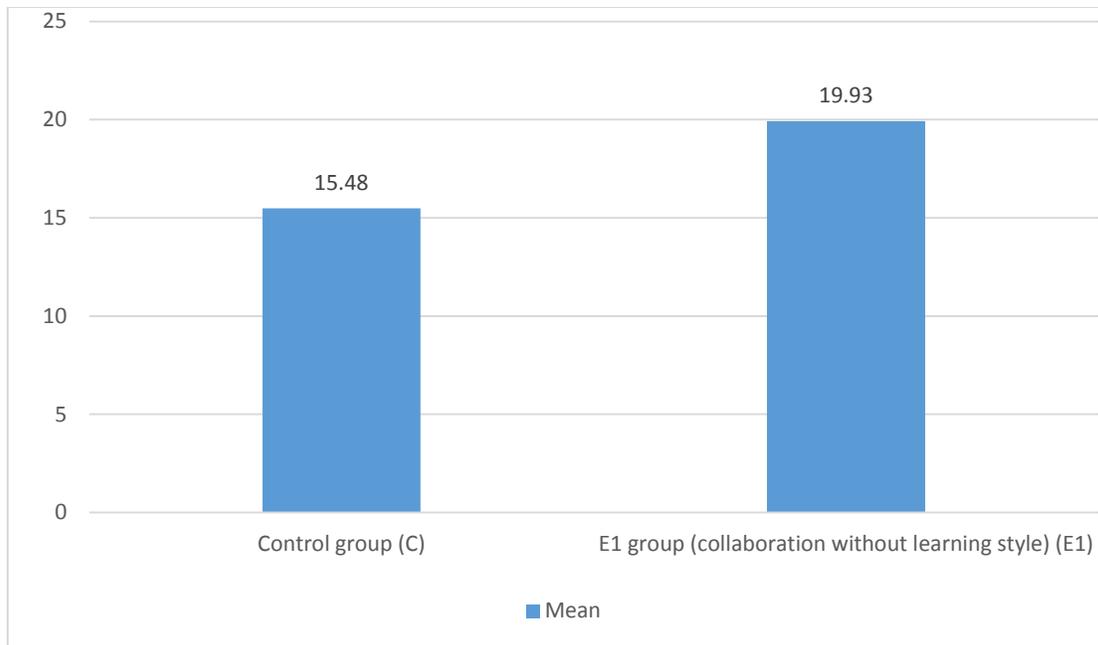
**Table 5. 4: Differences in the Proposal scores between the Control Class and the First Experimental Class**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Proposal (25)	Equal variances assumed	11.846	0.001	-4.527	52	0.000	-4.444	0.982
	Equal variances not assumed			-4.527	35.248	0.000	-4.444	0.982

**Table 5. 5: Class Statistics for the Proposal for the Control and E1 Class**

	Class name	N	Mean	Std. Deviation	Std. Error Mean
Proposal (25)	Control class (C)	27	15.48	1.909	0.367
	E1 class (collaboration without learning style) (E1)	27	19.93	4.731	0.910

According to Table 5.5 and Figure 5.10, the E1 class (collaboration without ranking students according to learning style) has a higher mean value (19.93) than the control class (15.48). This indicates that a significant effect of collaborative effort on students' achievement was found in their proposal scores, with the experimental class E1 performing better than their peers in the control class C.



***Figure 5. 10: Difference in the Proposal Skills between the Control Class and the First Experimental Class***

***- Poster***

An independent samples t-test was used to examine the effect of collaborative learning on poster scores of students by assessing the variation between the control class and the E1 class. From the table below (Table 5.6), there is a significant difference in poster scores achieved by the control class and the first experimental class E1, as the levels of probability (p) (2-tailed) is 0.000, which is below the significance level of 0.05. The control class has the higher mean value: see Table 5.7. Thus, it can be concluded that there is no effect of collaborative learning on the poster scores of students, as the mean score for the control class is higher than the mean score for the E1 class, which indicates that collaborative learning had no effect on class E1's scores for the poster task.

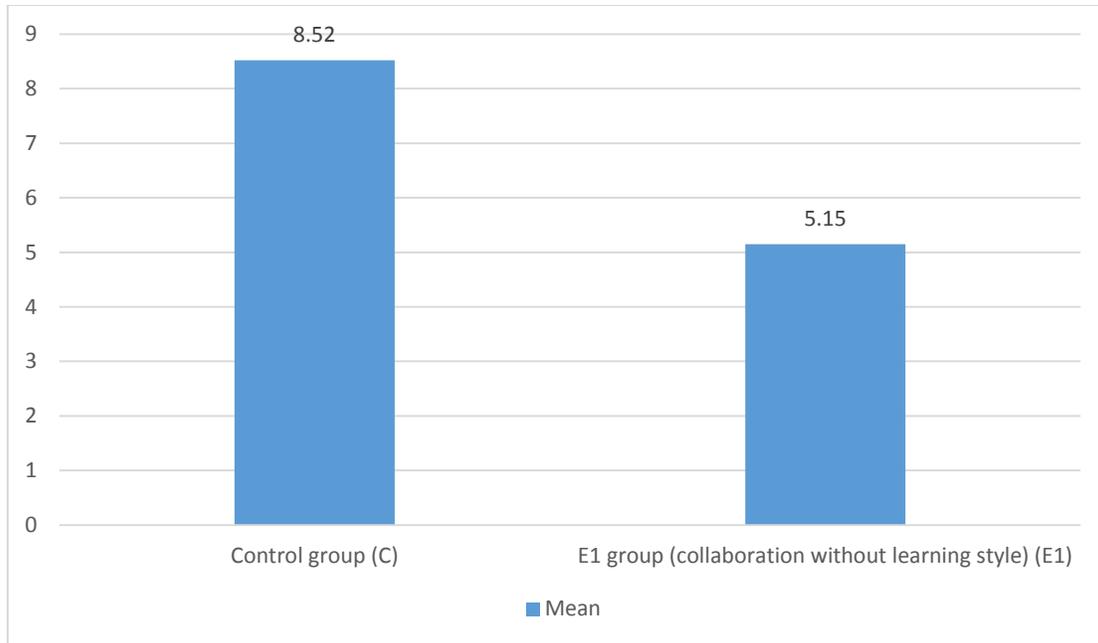
**Table 5. 6: Difference in the poster scores between the control class and the first experimental class**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Poster (10)	Equal variances assumed	2.787	0.101	-17.836	52	0.000	4.3702	0.245
	Equal variances not assumed			-17.836	41.921	0.000	4.370	0.245

**Table 5. 7: Class Statistics for poster scores for the control and The first experimental class**

	Class name	N	Mean	Std. Deviation	Std. Error Mean
Poster (10)	Control class (C)	27	8.52	0.643	0.124
	E1 class (collaboration without learning style) (E1)	27	5.15	1.099	0.212

According to Table 5.7 and Figure 5.11, the control class has a higher mean value (8.52) than the first experimental class (5.15): this indicates that significant differences were found in the poster scores, with the control class C performing better than their peers in the experimental class E1.



***Figure 5. 11: Difference in the Poster scores between the Control Class and the First Experimental Class***

***- Pre-test***

An independent samples t-test was used to examine the effect of collaborative learning on pre-test scores of students by assessing the differences between the control class and the first experimental class. As shown in Table 5.8 below, there is no significant difference on the pre-test achievement between the control class and the first experimental class, as the levels of probability (p) (2-tailed) is 0.620, which is above the significant level of 0.05. This means that collaborative learning has no effect on the scores between students in the first experimental class and the control class.

**Table 5. 8: Difference on the Pre-Test Achievement between the Control Class and First Experimental Class**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Pre-test (17)	Equal variances assumed	0.277	0.61	0.498	52	0.620	0.296	0.595
	Equal variances not assumed			0.498	51.195	0.620	0.296	0.595

**- Post-test**

An independent samples t-test was used to examine the effect of collaborative learning on post-test scores of students by assessing the differences between the control class and the E1 class scores. Table 5.9 below, shows there is no essential difference on the post-test scores between the control class C and the first experimental class E1, as the levels of probability (p) (2-tailed) is 0.208, which is above the significance level of 0.05. This indicates that collaborative learning does not enhance the scores of students in the first experimental E1 class, and thus has no effect on their achievements.

**Table 5. 9: Difference on the Post-Test Achievements between the Control Class and First Experimental Class**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Post-test (25)	Equal variances assumed	0.21	0.885	1.276	52	0.208	1.148	0.900
	Equal variances not assumed			1.276	51.875	0.208	1.148	0.900

**- Midterm**

An independent samples t-test was used to examine the effect of collaborative learning on the midterm scores of students by assessing the differences between the control class and E1 class. From the table below (Table 5.10), there is a significant difference in scores in the midterm examination between the control class and the first

experimental class, as the levels of probability (p) (2-tailed) is 0.000, which is below the significance level of 0.05. The mean score is significantly higher for the control class (See table 5.11). Thus, it can be concluded that collaborative learning did not enhance the experimental class's achievements in the midterm exam, and no effect of collaborative learning on this achievement could be observed.

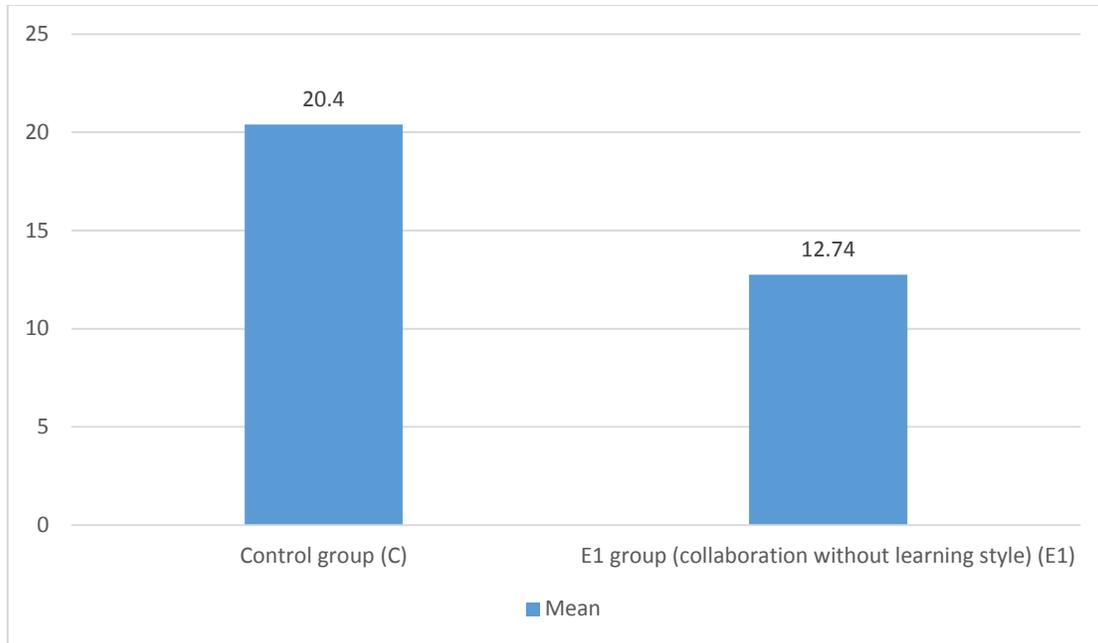
**Table 5. 10: Difference on the Midterm Achievement between the Control Class and First Experimental Class**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Midterm (25)	Equal variances assumed	0.002	0.964	8.878	52	0.000	7.296	0.822
	Equal variances not assumed			8.878	51.076	0.000	7.296	0.822

**Table 5. 11: Class Statistics for Midterm scores for the Control and E1 Class**

	Class name	N	Mean	Std. Deviation	Std. Error Mean
Midterm (25)	Control class (C)	27	20.4	3.216	0.619
	E1 class (collaboration without learning style)	27	12.74	2.809	0.541

According to Table 5.11 and Figure 5.12, the control class have a higher mean score (20.4) than the E1 class (12.74). This indicates that that control class are performing better than their peers in the experimental class E1, and there is no beneficial effect of collaborative learning on students' achievements in their midterm exam.



**Figure 5. 12: Difference on the Midterm Achievement between the Control Class and First Experimental Class**

**- Final exam**

An independent samples t-test was used to examine the effect of collaborative learning on students' final scores by assessing the differences between the control class and the first experimental class scores. Table 5.12 below, shows that there is no significant difference in final scores between the control class and the first experimental class, as the levels of probability (p) (2-tailed) is 0.031 which is above the significance level of 0.05. This indicates that collaborative learning did not enhance the scores of the E1 class.

**Table 5. 12: Difference in Final Achievement between the Control Class and the First Experimental Class**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Final exam (30)	Equal variances assumed	2.119	0.152	-2.223	52	0.031	-2.296	1.033
	Equal variances not assumed			-2.223	50.338	0.031	-2.296	1.033

### 5.1.3.2 Second Hypothesis

**H2: There is a significant difference in the achievement of students who engage in collaborative learning in a blended learning environment due to their learning style.**

To test this hypothesis, a one-way ANOVA test was used to examine the effect of different learning styles of students engaging in collaborative learning on their achievement for the control class C and the second experimental class E2. Student achievement was measured via scores achieved for the following tasks: exercises, a proposal, and a poster as well as a pre-post-test, midterm and final exams. Moreover, four learning styles were used in this study: diverging, accommodating, assimilating and converging.

#### - Exercises

Table 5.13 below, with a Sig value for the exercise scores of students was .481, which is more than  $\alpha$  (0.05), thus there is no statistically significant difference in the students' exercise scores due to differences in learning style. It can be concluded that difference in learning styles has no effect on students' exercise skills in collaborative learning environments.

**Table 5. 13: ANOVA for Exercises Skills of E2 Class**

Volume	Sum of Squares	DF	Sig.
Between group	8.988	3	0.481
Within group	81.012	23	
Total	90.000	26	

#### - Proposal

Table 5.14 below, shows that there is no significant difference in students' scores on the proposal due to differences in learning style, as the levels of probability (p) is

0.443, which is above 0.05. It can be concluded that learning style has no effect on the students' proposal task in a collaborative learning environment.

**Table 5. 14: ANOVA for proposal skills of E2 class**

Volume	Sum of Squares	DF	Sig.
Between group	41.757	3	0.443
Within group	344.762	23	
Total	386.519	26	

**- Poster**

As shown in Table 5.15 below, there is no significant variation in the students' scores for the proposal due to differences in learning style, as the level of probability (p) is 0.347, which is above 0.05. It can be concluded that difference in learning style has no effect on the students' proposal task in the collaborative learning environment.

**Table 5. 15: ANOVA for Proposal Skills of E2 Class**

Volume	Sum of Squares	DF	Sig.
Between group	3.236	3	0.347
Within group	21.431	23	
Total	24.667	26	

**- Pre-test**

As shown in Table 5.16 below, there is no significant variation in the students' achievements in the pre-test due to differences in learning style, as the levels of probability (p) is 0.523, which is above 0.05. It can be concluded that learning style has no effect on students' achievement in the pre-test in a collaborative learning environment.

**Table 5. 16: ANOVA for Pre-Test of E2 Class**

volume	Sum of Squares	DF	Sig.
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Between group	14.243	3	0.523
Within group	141.831	23	
Total	156.074	26	

**- Post-test**

Table 5.17 below, shows that there is a significant difference in the students' achievements in the post-test due to differences in learning style, as the levels of probability (p) is 0.012, which is below 0.05. The converging learning style has the highest mean score. It can thus be concluded that learning style does have an effect on students' achievement in the post-test in a collaborative learning environment.

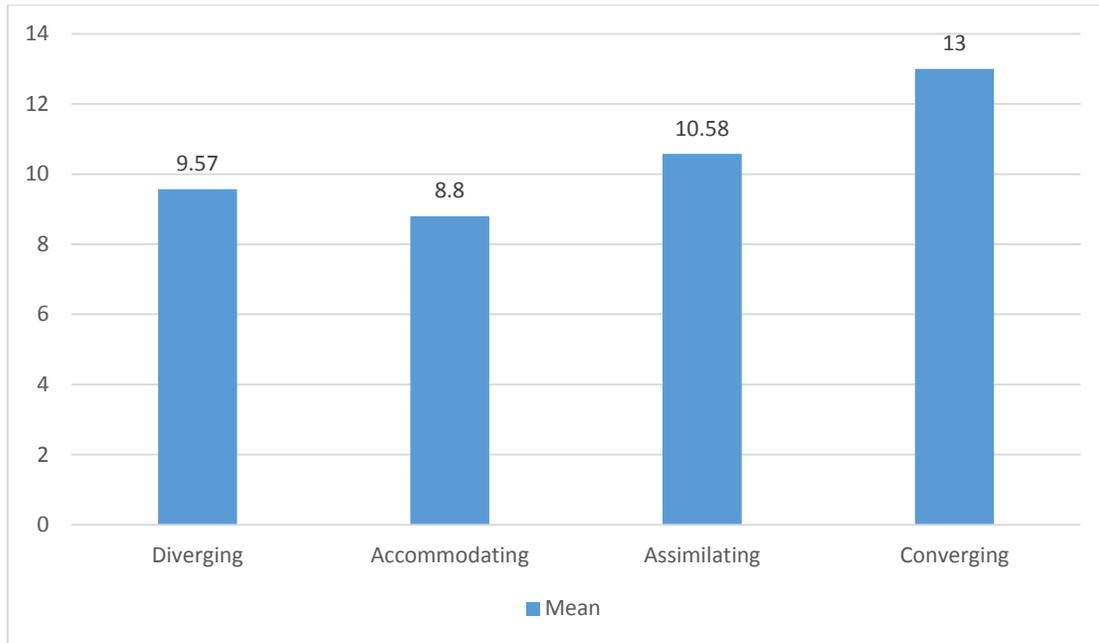
**Table 5. 17: ANOVA for Post-Test of E2 Class**

Volume	Sum of Squares	DF	Sig.
Between group	14.243	3	0.012
Within group	141.831	23	
Total	156.074	26	

**Table 5. 18: Descriptive Post-Test of E2 Class**

Volume	N	Mean
Diverging	7	9.57
Accommodating	5	8.80
Assimilating	12	10.58
Converging	3	13.00
Total	27	9.48

According to Table 5.18 and Figure 5.13, learners with a converging learning style have the highest mean score (13.00), which indicates that students with converging learning styles are performing better than their peers with other learning styles.



**Figure 5. 13: Difference on the Post-Test of E2 Class**

**- Midterm exam**

Table 5.19 below, shows that there is a significant difference in the students' achievements in the midterm exam due to different learning styles, as the levels of probability (p) is 0.002, which is below 0.05. The converging learning style has the highest mean score - see Table 5.20. It can be concluded that difference in learning style has an effect on the students' achievement in the midterm exam in a collaborative learning environment.

**Table 5. 19: ANOVA for Midterm Exam for E2 Class.**

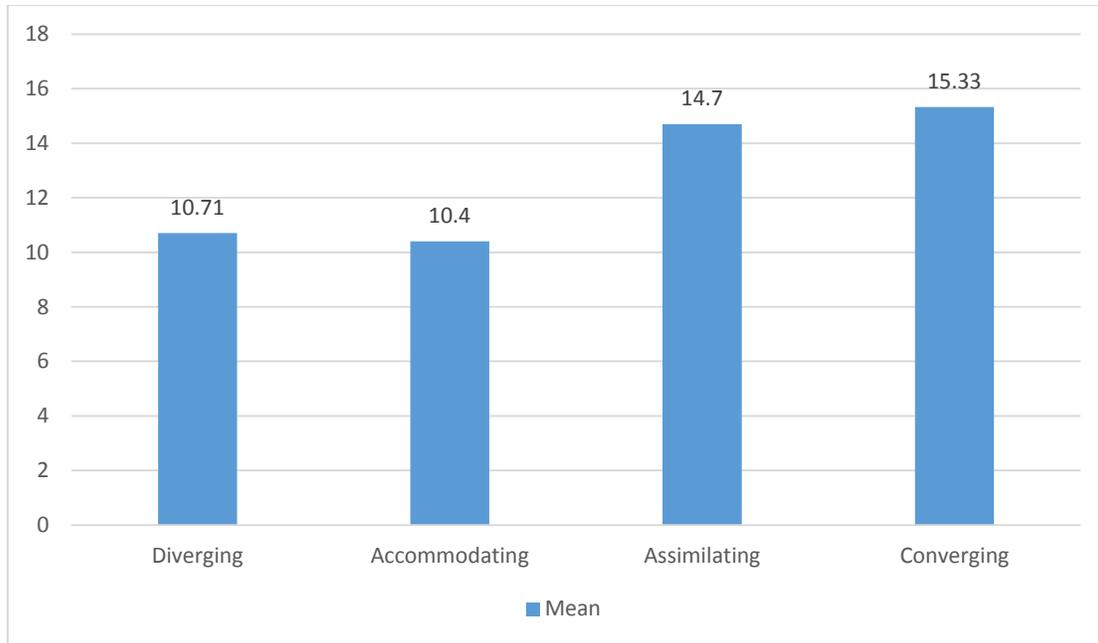
Volume	Sum of Squares	DF	Sig.
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Between group	100.668	3	0.002
Within group	108.962	23	
Total	209.630	26	

**Table 5. 20: Descriptive Statistics for Midterm Exam for E2 Class.**

Volume	N	Mean
Diverging	7	10.71
Accommodating	5	10.40
Assimilating	12	14.7
Converging	3	15.33
Total	27	12.70

According to Table 5.20 and Figure 5.14, students with the converging learning style have the highest mean score (13.00). These findings indicate that significant differences were found in the midterm exam, with students with the converging learning style performing better than their peers with other learning styles.



**Figure 5. 14: Difference in the Midterm exam of E2 Class**

**- Final**

Table 5.21 below, shows that there is a significant difference in the students' achievements in the final exam due to different learning styles, as the levels of probability (p) is 0.009, which is below 0.05. Again, the converging learning style has the highest mean score (see Table 5.22). It can be concluded that learning styles impact on the students' achievements in the final exam in a collaborative learning environment.

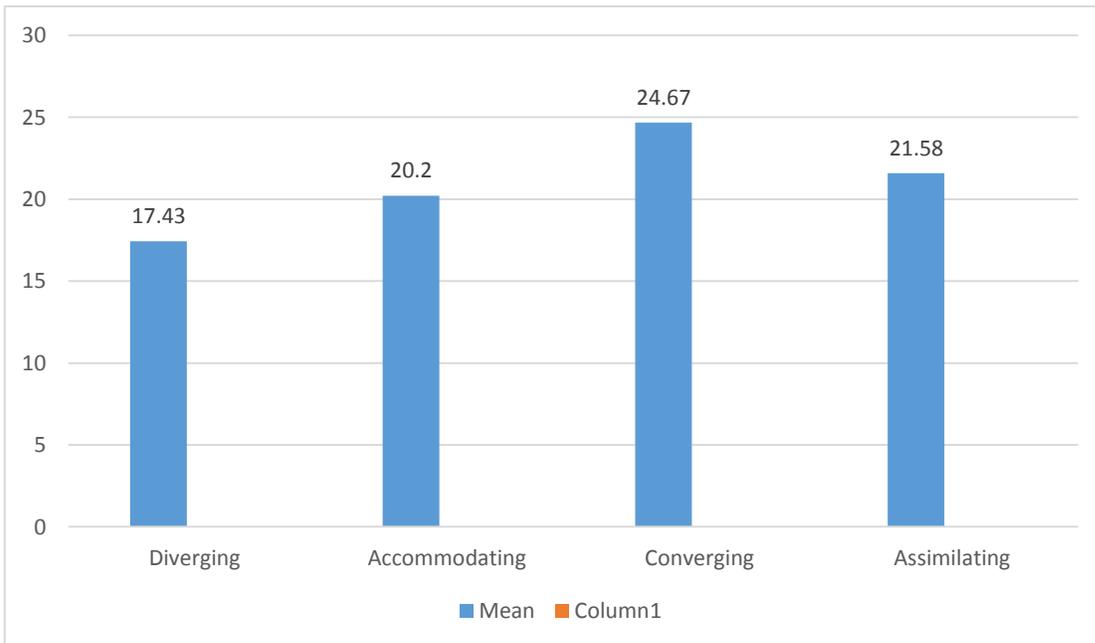
**Table 5. 21: ANOVA for Final Exam of E2 Class.**

Volume	Sum of Squares	DF	Sig.
Between group	132.421	3	0.009
Within group	206.098	23	
Total	338.519	26	

**Table 5. 22: Descriptive for Final Exam of E2 Class.**

Volume	N	Mean
Diverging	7	17.43
Accommodating	5	20.20
Assimilating	12	21.58
Converging	3	24.67
Total	27	20.59

According to Table 5.22 and Figure 5.15, the converging learning style has the highest mean value (24.67). This indicates that students with this learning style performed significantly better than their peers with the other learning styles.



**Figure 5. 15: Difference in the final exam scores of Class E2**

### 5.1.3.3 Third Hypothesis

**H3: There is a significant difference in the students' achievements in terms of collaboration used in the three classes due to learning style.**

To test this hypothesis, a one-way ANOVA was used to compare the three classes – the control class (C) and the first and second experimental classes (E1, E2) – to investigate the effect of different learning styles on the students' achievement and skills by assessing the differences in learning style in the three classes regardless of whether or not collaborative learning was used. The achievements and skills were measured using the scores achieved by the students for the following tasks: exercises, a proposal and a poster, as well as pre-post-test, midterm and final exam scores. The four learning styles considered were diverging, accommodating, assimilating and converging.

#### **- Control Class**

To test this hypothesis, a one-way ANOVA was used to investigate the effect of different learning styles on the students' achievement and skills where collaborative learning did not occur. The achievement and skills were studied through the use of students' scores on exercises, a proposal writing task and a poster, as well as their results for the pre-post-test, midterm and final exam.

#### **- Exercises**

For the control class, Table 5.23 below, Sig value for the exercise scores of students was 0.671, which is more than  $\alpha$  (0.05), thus there is no statistically significant differences in the exercise scores due to learning style where collaborative learning has not occurred. It can be therefore concluded that learning style has no effect on the students' scores in the exercise task where individual learning takes place.

**Table 5. 23: ANOVA for Exercises Skills of the Control Class**

Volume	Sum of Squares	DF	Sig.
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Between group	2.465	3	0.671
Within group	36.202	23	
Total	38.667	26	

**- Proposal**

Table 5.24 below, shows that there is no significant difference in the students' scores on the proposal task due to different learning styles where collaborative learning has not occurred, as the levels of probability (p) value is 0.842, which is greater than 0.05. It can be concluded that difference in learning style has no effect on the students' proposal task where individual learning takes place.

**Table 5. 24: ANOVA for Proposal Skills of the Control Class**

Volume	Sum of Squares	DF	Sig.
Between group	3.289	3	0.842
Within group	91.452	23	
Total	94.741	26	

**- Poster**

Table 5.25 below, shows that there is no significant difference in the students' scores for the poster task due to different learning styles where collaborative learning has not occurred, as the levels of probability (p) value is 0.836, which is greater than 0.05. It can be concluded that there is no effect of the difference of learning style on the students' poster task where individual learning takes place.

**Table 5. 25: ANOVA for Poster Skills of the Control Class**

Volume	Sum of Squares	DF	Sig.
--------	----------------	----	------

Between group	0.385	3	0.836
Within group	10.356	23	
Total	10.741	26	

**- Pre-test**

Table 5.26 below, shows that there is a significant difference in the students' achievement in the pre-test due to different learning styles where collaborative learning has not taken place, as the levels of probability (p) value is 0.024, which is smaller than 0.05. This difference is because the assimilating learning style has a higher mean value: see Table 5.27. It can be concluded that the difference in learning style has an effect on the students' achievement in the pre-test where individual learning has taken place.

**Table 5. 26: ANOVA for Pre-Test of the Control Class**

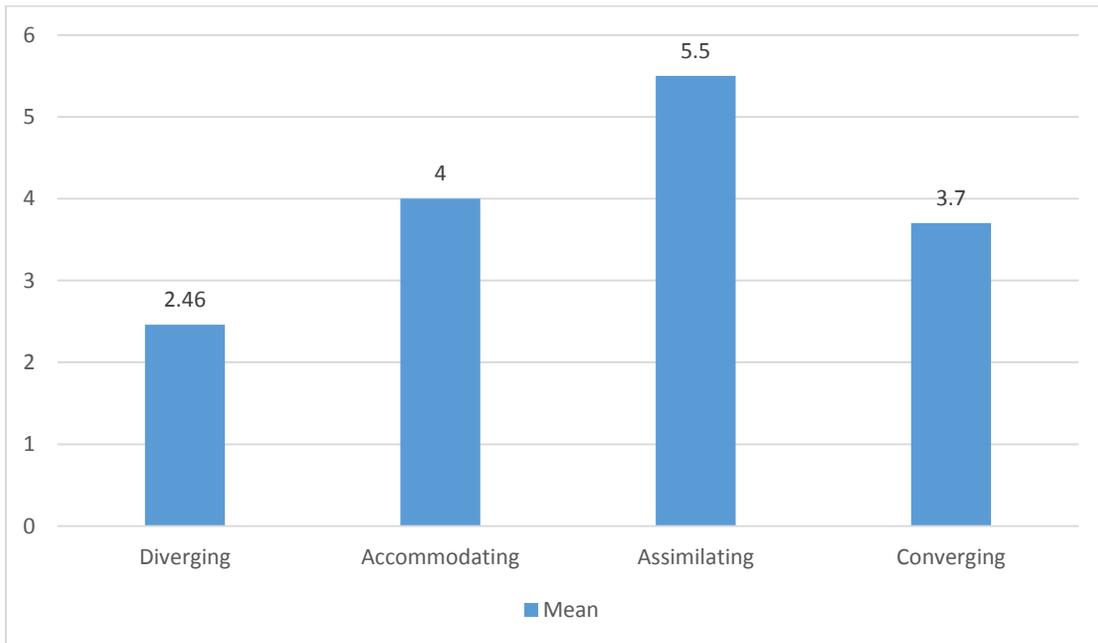
Volume	Sum of Squares	DF	Sig.
Between group	46.399	3	0.024
Within group	93.231	23	
Total	139.630	26	

**Table 5. 27: Descriptive Statistics for Pre-Test of the Control Class**

Volume	N	Mean
Diverging	13	2.46
Accommodating	4	4.00
Assimilating	8	5.50
Converging	2	4.00

Total	27	3.70
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According to Table 5.27 and Figure 5.16, learners with the assimilating learning style have the highest mean score (5.50). This indicates that significant differences were found in the pre-test achievement, with students with the assimilating learning style performing better than their peers with other learning styles.



**Figure 5. 16: Difference in the Pre-Test of the Control Class**

**- Post-test**

Table 5.28 below, shows that there is no significant difference in the students' achievements in the post-test in a blended learning environment due to different learning styles where collaborative learning has not taken place: the levels of probability (p) value is 0.169, which is above 0.05. It can be concluded that different learning styles have no effect on the students' achievement in the post-test where individual learning takes place.

**Table 5. 28: ANOVA for Post-Test of the Control Class**

volume	Sum of Squares	DF	Sig.
Between group	52.093	3	0.169
Within group	217.981	23	
Total	270.074	26	

**- Midterm**

Table 5.29 below, shows that there is a significant difference in the students' achievements in the midterm exam in a blended learning environment due to different learning styles where collaborative learning has not occurred, as the levels of probability (p) value is 0.002, which is below 0.05. This difference is because the assimilating learning style is associated with a higher mean value (see Table 5.30). It can be concluded that different learning styles have an effect on the students' achievement in the midterm exam where individual learning takes place.

**Table 5. 29: ANOVA for Midterm Exam of the Control Class**

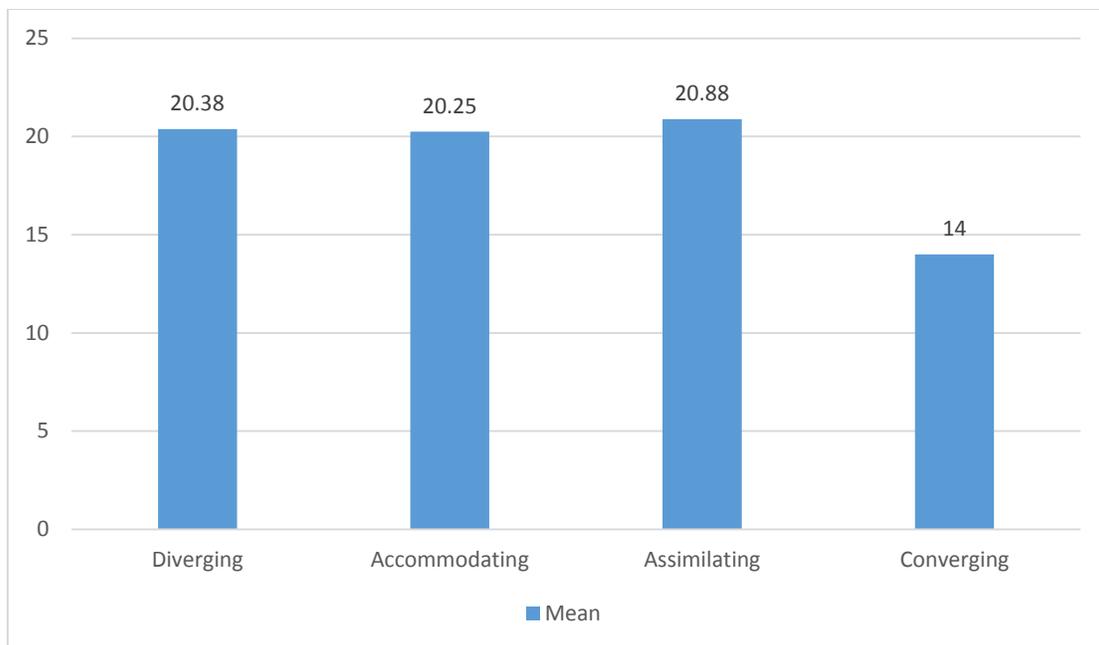
Volume	Sum of Squares	DF	Sig.
Between group	80.261	3	0.040
Within group	188.702	23	
Total	268.963	26	

**Table 5. 30: Descriptive Statistics for Midterm Exam of the Control Class**

Volume	N	Mean
Diverging	13	20.38
Accommodating	4	20.25
Assimilating	8	20.88

Converging	2	14.00
Total	27	20.04

According to Table 5.30 and Figure 5.17, students with the assimilating learning style have the highest mean score (20.88). This indicates that significant differences were found in the midterm exam scores, with students with the assimilating learning style performing better than their peers with other learning styles.



**Figure 5. 17: Descriptive statistics for Midterm Exam of the Control Class**

**- Final exam**

Table 5.31 below, shows that there is a significant difference in the students' achievement in the final exam due to different learning styles when collaborative learning has not occurred, as the levels of probability (p) value is 0.009, which is below 0.05. This difference is due to the assimilating learning style, which has a higher mean value (see Table 5.32). It can be concluded that learning style has an effect on the students' achievement in the final exam where individual learning takes place.

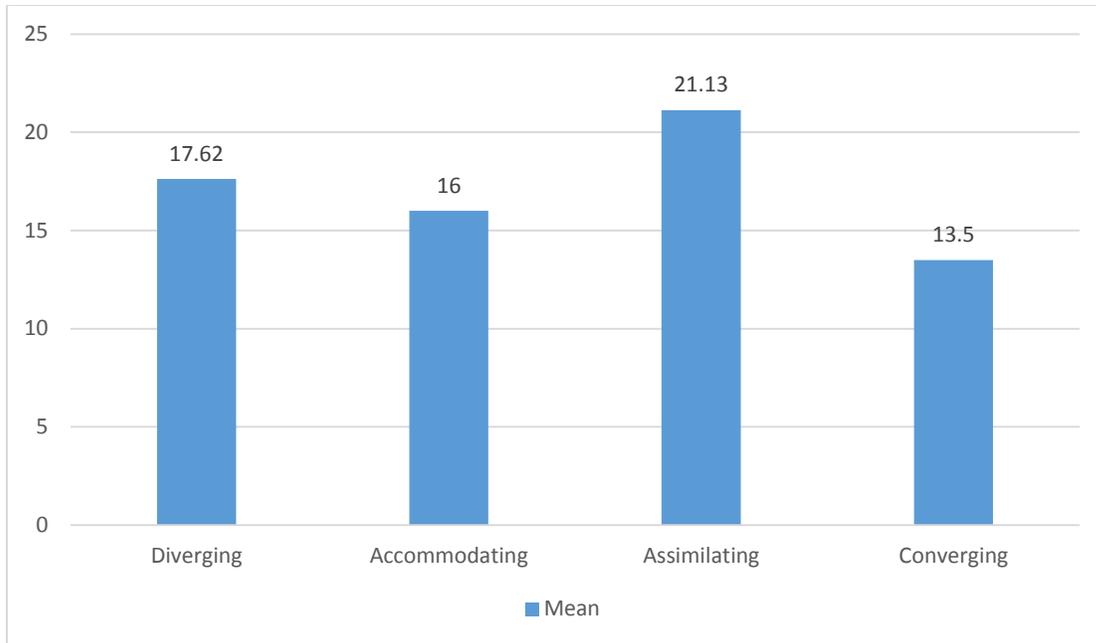
**Table 5. 31: ANOVA for Final Exam of the Control Class**

Volume	Sum of Squares	DF	Sig.
Between group	136.215	3	0.009
Within group	306.452	23	
Total	442.667	26	

**Table 5. 32: Descriptive statistics for Final Exam of the Control Class**

Volume	N	Mean
Diverging	13	17.62
Accommodating	4	16.00
Assimilating	8	21.13
Converging	2	13.50
Total	27	18.11

According to Table 5.32 and Figure 5.18, students with the assimilating learning style have the highest mean value (21.13): this indicates that significant differences were found in achievements in the final exam, with students with the assimilating learning style performing better than their peers with other learning styles.



**Figure 5. 18: Descriptive statistics for Final Exam of the Control Class**

**- First Experimental Class**

To test this hypothesis, a one-way ANOVA was used to examine the effect of different learning styles on the students' achievements and skills by assessing the differences in learning style for the first experimental class, where collaborative learning had occurred. Achievements and skills were examined via scores for exercises, a proposal writing task and a poster, as well pre-post-test, midterm and final exam scores.

**- Exercises**

For the E1 class, the table below (Table 5.33) shows that there is no significant difference in the students' exercise scores due to learning style where collaborative learning has occurred, as the levels of probability (p) value is 0.338, which is greater than 0.05. It can be concluded that different learning styles have no effect on the students' exercise skills in a collaborative learning environment.

**Table 5. 33: ANOVA for Exercises Skills of E1 Class**

Volume	Sum of Squares	DF	Sig.
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Between group	10.521	3	0.338
Within group	68.145	23	
Total	78.667	26	

**- Proposal**

Table 5.34 below, shows that there is no significant difference in the students' skills in a collaborative blended learning environment due to different learning styles, as the levels of probability (p) value is 0.836, which is above 0.05. It can be concluded that different learning styles have no effect on the students' proposal task in a collaborative learning environment.

**Table 5. 34: ANOVA for Proposal Skills of E1 Class**

Volume	Sum of Squares	DF	Sig.
Between group	20.820	3	0.836
Within group	561.032	23	
Total	581.852	26	

**- Poster**

Table 5.35 below, shows that there is no significant difference in the students' poster task in a collaborative blended learning environment due to different learning styles, as the levels of probability (p) value is 0.836, which is greater than 0.05. It can be concluded that different learning styles have no effect on the students' poster task in a collaborative learning environment.

**Table 5. 35: ANOVA for Poster Skills of E1 Class**

Volume	Sum of Squares	DF	Sig.
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Between group	2.157	3	0.643
Within group	29.250	23	
Total	31.407	26	

**- Pre-test**

Table 5.36 below, shows that there is no significant difference in the students' achievements in the pre-test in a collaborative blended learning environment due to differences in learning style, as the levels of probability (p) value is 0.256, which is greater than 0.05. It can thus be concluded that differences in learning style have no effect on the students' achievement in the pre-test in a collaborative learning environment.

**Table 5. 36: ANOVA for Pre-Test of E1 Class**

Volume	Sum of Squares	DF	Sig.
Between group	17.191	3	0.256
Within group	91.327	23	
Total	108.519	26	

**- Post-test**

Table 5.37 below, shows that there is no significant difference in the students' scores in the post-test in a collaborative blended learning environment due to different learning styles, as the levels of probability (p) value is 0.286, which is greater than 0.05. It can be concluded that different learning styles have no effect on the students' achievement in the post-test in a collaborative blended learning environment.

**Table 5. 37: ANOVA for Post-Test of E1 Class**

volume	Sum of Squares	DF	Sig.
Between group	44.350	3	0.286
Within group	253.650	23	
Total	298.000	26	

**- Midterm**

Table 5.38 below, shows that there is no significant difference in the students' achievements in the midterm exam in a collaborative blended learning environment as a result of different learning styles, as the levels of probability (p) value is 0.807, which is greater than 0.05. It can be concluded that learning style has no effect on the students' achievements in the midterm exam scores in a collaborative learning environment.

**Table 5. 38: ANOVA for Midterm Exam of E1 Class**

Volume	Sum of Squares	DF	Sig.
Between group	8.358	3	0.807
Within group	196.827	23	
Total	205.185	26	

**- Final exam**

Table 5.39 below, shows that there is no significant difference in the students' achievement in the final exam in a collaborative blended learning environment as a result of different learning styles, as the levels of probability (p) value is 0.553, which is greater than 0.05. It can be concluded that learning style has no effect on the students' achievement in the final exam in a collaborative blended learning environment.

**Table 5. 39: ANOVA for Final Exam of E1 Class**

Volume	Sum of Squares	DF	Sig.
Between group	26.132	3	0.553
Within group	280.386	23	
Total	306.519	26	

This section summarises the main quantitative findings of the study, providing detailed descriptions of each hypothesis as below:

**First hypothesis (H1):** To test this hypothesis, an independent sample t-test was used to compare the control and E1 classes to assess the effect of collaboration on students' achievements and skills.

**Second hypothesis (H2):** To test this hypothesis, a one-way ANOVA was used to examine the effect of differences in learning styles of students who followed collaborative learning on their achievements and skills by assessing the differences between the control class and the second experimental class. Achievements and skills were measured via scores for exercises, a proposal, and a poster as well as pre-post-test, midterm and final exams. Moreover, four learning styles were used in this study: diverging, accommodating, assimilating and converging.

**Third hypothesis (H3):** To test this hypothesis, a one-way ANOVA was used to compare the three classes –the control class (C) and the first and second experimental classes (E1, E2) – to examine the effect of different learning styles on the students' achievement and skills in the three classes regardless of whether or not collaborative learning was used. The achievements and skills were measured via scores for exercises, a proposal and a poster, as well as pre-post-test, midterm and final exam scores. Four learning styles were examined in this study: diverging, accommodating, assimilating and converging.

#### **5.1.4 Interview Results**

Having discussed the three classes' results through their achievements in the exams, posters, and proposal task, the study interviewed students to determine their views and sensitivities regarding the teaching technique used in the Online Research Methods

Course. These interviews took place after the last test, the practical exam and the questionnaire to explain the students' scores on these devices. Group interviews were used to offer a degree of quality control regarding the various documents and focus attention on the main topics and issues in the study.

The interviews in this study were semi-structured for a similar reason that the questionnaires were. Each interview lasted for about twenty minutes and contained 13 questions. The key feature of the structured interview is in the pre-planning of all the questions to be asked, to allow for exact replication of the interview with others.

The advantage of structured interviews is that the standardisation of all questions can give quantifiable data in addition to replication possibilities. The data is also considered more reliable because of internal consistency that allows a degree of generalisation of the results to the population from which the sample was taken. However, restrictive questioning leads to restrictive answers and can be insensitive to participants' needs to express themselves

The following section will present the qualitative results data, which were collected from such interviews.

The interview sample was made up of seventy-one college students, who were divided into three classes: twenty students (28.2%) from the control class, twenty-five (35.2%) from the first experimental group (E1), and twenty-six (36.6%) from the second experimental group (E2). Table 5.39 below, shows the distribution of the three groups.

**Table 5. 40: Classification of Three Classes**

	Frequency	Percent (%)
Control class	20	28.2
E1 class	25	35.2
E2 class	26	36.6
Total	71	100

Table 5.41 shows the socio-demographic characteristics of the students. A majority of the students (fourteen students: 19.7% of the sample) specialised in

international affairs. In this research, collaborative learning techniques were designed to examine their influence on the achievement of students with different learning styles, in addition to investigating whether collaborative learning in a blended learning environment had a major impact on students' achievements and skills irrespective of their learning styles, in light of the role played by learning style as an effective factor. Moreover, the achievements of students at two university-level Online Research Methods classes – which differ only in the degree of collaboration embedded – were analysed by using the students' learning style as a variable.

**Table 5. 41: Socio-Demographic Characteristics of the Students**

		Frequency	%
1.	Engineering	5	7.0
2.	Education	4	5.6
3.	Sociology	7	9.9
4.	International affairs	14	19.7
5.	Arts	3	4.2
6.	Social service	2	2.8
7.	Islamic studies	1	1.4
8.	Policies & planning	5	7.0
9.	Management	3	4.2
10	Vital medical	1	1.4
11	Languages	4	5.6
12	Biological science	1	1.4
13	Environmental science	2	2.8
14	Accounting	3	4.2
15	Administration and economy	2	2.8

16	Sport science	1	1.4
17	Arabic language and media	6	8.5
18	Computer science	1	1.4
19	Early childhood	1	1.4
20	Marketing	1	1.4
21	Law	1	1.4
22	General science	2	2.8
23	General Business	1	1.4
Total		71	100

Throughout this research, results of interviews were analysed by content analysis through coding and summarising of content, from which valued outcomes were obtained. Content analysis was first developed in the social sciences as a way of studying cultures at a distance. It can be used to determine the beliefs, values, ideologies, role perceptions, behaviour norms and other elements of a culture through systematic analysis of its words and pictures. The basic technique of content analysis entails literally counting the number of times pre- selected words, themes, symbols or pictures appear in a given medium.

Interviews were conducted with a representative sample consisting of seventy-one college students: twenty students (28.2%) from the control class C, twenty-five (35.2%) from the first experimental class (E1), and twenty-six (36.6%) from the second experimental class (E2. Face-to-face interviews (interviews with each student separately) were conducted in a suitable and quiet location at the College of Basic Education. There were more students from the two experimental classes, as they worked in a collaborative environment, but the first class's point of view was still considered. In addition, the researcher requested the members' permission to use a voice recorder throughout the interviews to allow subsequent analysis of their responses. The next section will examine the measures that were used to assess students.

The interview consisted of two parts; the first one was general information about the respondent, whereas the second one was the interview questions.

### **5.1.5 Interview Questions**

Regarding interviews that were conducted with students, the researcher summarised their answers according to study sub questions, knowing that the interviews were semi-structured interviews, as the language of the interview was in Arabic, and then translated into English, as follows:

#### **1. Do you prefer to perform tasks given to you by the course instructor by yourself? Why?**

Most of the students in the control class stated that they preferred to perform tasks by themselves. They preferred individual work to collaborative work for several reasons such as gaining more knowledge, learning from their mistakes, gaining a better and deeper understanding of the tasks' ideas, developing their skills, reducing time and effort, getting more accurate and efficient results and feeling more comfortable.

For example, interviewee 7 stated, *"I prefer to perform tasks given to me by the course instructor by myself, as I gain more knowledge and learn"*. Interviewee 4 said *"I prefer to perform tasks given to me by the course instructor by myself, because it is more accurate and efficient"*. Interviewee 2 stated, *"I prefer to perform tasks given to me by the course instructor by myself, because I will gain knowledge and learn"*. In addition, interviewee 3 responded, *"I prefer to perform tasks given to me by the course instructor by myself, because I feel more comfortable"*, while interviewee 6 said, *"I prefer to perform tasks given to me by the course instructor by myself, because it saves time and effort"*.

Similarly, most of the respondents from experimental class E2 also preferred to perform tasks by themselves. They cited several reasons, such as: reducing the problems that they face when working with other people; saving time and effort; feeling more adaptive and learning more in order to develop their practical and scientific knowledge, increasing their achievements, feeling more comfortable, increasing their understanding and being able think deeply about the tasks, gaining more knowledge, reducing their

mistakes, getting more organised and accurate information, getting the best results in the tasks and developing their skills.

For example, according to interviewee 7, *"I prefer to perform tasks given to me by the course instructor by myself, in order to reduce my mistakes and get more organised and accurate information that will lead me to get the best results in the tasks"*. Moreover, interviewee 2 said, *"yes, this makes me feel comfortable and increases my self-confidence"*, while interviewee 20 stated that working alone made it possible *"... to achieve my tasks rapidly with accurate and orderly results"*.

The majority of interviewees from experimental class E1 also stated that they preferred to perform tasks by themselves. They cited a number of reasons, including achieving better results, producing more accurate work, gaining more knowledge, saving time and effort, increasing their understanding of their roles and to help in evaluating their performance.

For example, interviewee 7 said: *"yes, it can be considered as indicator in evaluating my performance in doing tasks"*. Interviewee 4 said, *"Yes - it will reduce time and effort, as well as achieve the tasks accurately"*.

Thus, across all three classes, students agreed that they preferred to perform tasks by themselves, as it enabled them to save time and effort and to gain more knowledge.

## **2. Do you prefer to perform tasks given to you by the course instructor with your colleagues? Why?**

In the control class interviews, most of the students stated that they preferred to perform tasks given to them by the course instructor with their colleagues. They gave several reasons for their preference for teamwork, such as discussing and exchanging their ideas with each other, helping to solve problems faced by other students, increasing their understanding, discussing and comprehending tasks, gaining knowledge from each other, playing a beneficial role in achieving tasks, increasing information, learning from their mistakes, saving time and effort, achieving the tasks in good time, enhancing collaborative learning and achieving better performance.

For example, interviewee 1 said, *"I prefer to perform tasks given to me by the course instructor with my colleagues, because the teamwork is better for me and it saves time and effort"*. Interviewee 3 said, *"I prefer to perform tasks given to me by the course instructor with my colleagues, in order to exchange information and share opinions"*. In contrast, other students stated that they did not prefer to perform tasks set by the course instructor with their colleagues because the teamwork might waste their time and effort and decrease their focus, leading to less accurate outcomes. Some stated that they sometimes preferred to perform tasks collaboratively in order to gain more information and exchange ideas.

On the other hand, most of the students from class E2 stated that they did not prefer to perform tasks collaboratively, because many of them were not sufficiently responsible to fulfil their role in the team. They cited a number of other reasons, including: wasting time, other students causing problems, disrupting task completion, negative aspects such as dependency on others, reducing their focus and lacking understanding of their mistakes. However, some stated that they sometimes preferred to perform tasks with colleagues in order to save time and effort through distributing tasks to each member of the team, as well as to gain more knowledge. A small number of students stated that they preferred to perform tasks with colleagues because this allowed them to exchange opinions, gain more information, solve problems, save time and effort, make better achievement of tasks, share ideas and engage in discussion to find the best solutions.

For example, interviewee 1 said, *"I do not prefer to perform tasks given to me by the course instructor with our colleagues, as it causes lots of problems"*. In contrast, interviewee 3 said, *"I prefer to perform tasks given to me by the course instructor with my colleagues, in order to save time and effort through good distribution of roles to each member of the team"*.

Respondents from experimental class E1 provided a diversity of opinions about the preference for teamwork or individual work. Some of them stated that they preferred to perform tasks with colleagues in order to enhance participation among the students and create a better environment for learning, which would lead to better achievement of tasks.

For example, interviewee 7 said that teamwork "...enhances the collaboration among students and has a positive effect on the learning process and achievement of the tasks". In contrast, other students stated that they sometimes preferred to perform tasks with peers, as it could reduce their workload and save time and effort. Interviewee 6 said, "sometimes, because it will save time and effort". Other students indicated that they did not prefer to perform tasks collaboratively, because mostly their colleagues did not collaborate well with others, such as interviewee 2, who said, "No, students do not achieve their role effectively".

These three classes disagreed with each other, as most of the students from the control class stated that they preferred to perform tasks with their peers, while students from class E2 did not. Students from class E1 had a range of opinions: some stated that they preferred to perform tasks with colleagues whilst others did not, and a few stated that they preferred to perform tasks with colleagues on some occasions but not others.

### **3. How do you feel when working in a class?**

In the control class interviews, most of the students stated that they felt anxiety and did not adapt quickly to working with other members of the team. Interviewee 7 stated "I feel anxiety when working in a class". Interviewee 4 "I do not quickly adapt to the members in the team". Other interviewees stated that they felt comfortable when working in a class, such as interviewee 4: "I feel comfortable and quickly adapt to the members of the team".

Similarly, most of the students from class E2 also stated that they felt anxious and did not quickly adapt to the other members in the team. Interviewee 20 stated, "I feel anxious when working in a class, because I'm thinking all the time about the score that I will get for the task". Another interviewee 4 said, "I feel anxiety when they are working in a class, because I cannot be sure if the tasks will be finished in time".

Similarly, many of the students from class E1 also experienced anxiety and did not quickly adapt to working with other members of their teams. Interviewee 2 stated, "I feel anxious when working in a class because most of the students do not take enough responsibility for their role in the team", while interviewee 3 claimed "I feel anxious when working in a class because of wasting time".

Respondents from the three classes agreed that they experienced anxiety when working in classes and did not quickly adapt to teamwork, in other words they cannot quickly adapt to the other members in the team

#### **4. How would you describe your abilities as a team member?**

In interviews with students from the control class C most of the students described themselves as effective team members, citing reasons such as accepting other members' opinions, discussing and sharing ideas with each other. For example, interviewee 7 said, *"I'm an effective team member because I discuss, share ideas with others and accept other members' opinions"*.

Most of the interviewees from class E2 also described themselves as effective team members through accepting other members' opinions, discussing and sharing ideas with each other. Interviewee 7, for example, stated, *"I'm an effective team member by giving suggestions and supporting my ideas and suggestion with important points that will make our achievements better"*.

Interviewees from class E1 also described themselves as effective team members for the same reasons. Interviewee 7 said, *"I'm an effective team member through continuing active collaboration with each member in the team"*.

Thus, students across all three classes described themselves as effective team members through accepting other members' opinions, discussing issues and sharing ideas.

#### **5. Are you more active in data work or through cooperation with other individuals?**

Most of the interview respondents from the control class C and class E1 stated that they were more active in data work than in cooperation with other individuals. Interviewee 7 from the control class stated, *"I'm more active in data work – I find it easier than cooperation"*, with interviewee 3 from class E1 confirming, *"I feel more active when I work with others in data work and cooperate"*

Interestingly however, according to E2 class interviews, most of the students stated that they are more active through cooperation with other individuals than with data work. Interviewee 19 said, *"I'm more active through cooperation with other individuals,*

*because this saves effort and time, and distributes the tasks to each person, reducing overload so that each member in the team can achieve his/her task".*

Thus, students in the control and E1 classes reported that they were more active with data work than through cooperation with other individuals, but most of the respondents from class E2 disagreed, indicating that they are more active through cooperation with other individuals than with data work.

## **6. What tasks or projects need teamwork to accomplish?**

In interviews with student from the control class most of the students stated that the proposal task needed teamwork to accomplish it. Interviewee 8 said, "*The proposal tasks require teamwork*", while interviewee 6 stated, "*The large research tasks (such as the proposal) do require teamwork*".

However, most of the students in class E2 stated that the proposal tasks need teamwork to accomplish. For example, interviewee 12 stated, "*the tasks that do require teamwork are the tasks that need more research and time to accomplish, such as proposal tasks*".

Most of the students in class E1 agreed. Interviewee 12 stated, "*The tasks that do require teamwork are the graduated tasks such as proposal tasks*".

Thus, the three classes agreed that the proposal tasks need teamwork to accomplish.

## **7. What are the tasks or duties that do not require teamwork and can be achieved alone?**

In the control class interviews, most of the students stated that the poster and exercise tasks, as well as exams, do not require teamwork and can be accomplished alone. For example, interviewee 3 stated, "*The poster and exercise tasks and the exams do not require teamwork and the student can do them by himself*".

Students from classes E1 and E2 generally agreed. For example, interviewee 15 from class E2 said, "*the poster and exercises tasks do not require teamwork and the student can do them by himself*".

In addition, according to E1 class interviews, most of the students stated that the poster and exercises tasks do not require teamwork and the student can do them by himself. Interviewee 9 stated, *"I felt I didn't need team work in the poster and exercise "*.

These three classes agreed that the poster and exercises tasks do not require teamwork and the student can do them by himself.

## **8. What are the challenges of collaborative learning?**

Respondents from the control class interviews mentioned a range of challenges, including class opinion, coordinating with each other, dividing tasks between team members, sharing opinions and helping each other. For example, interviewee 6 stated, *"the biggest challenges in teamwork are class opinions"*. In addition, interviewee 1 said, *"The variation in the class's opinions is a challenge in the teamwork"*, while interviewee 2 mentioned the difficulty of *"getting results out of large numbers of views"*.

Interviewees from class E2 mentioned saving time and effort, understanding each other, keeping focused on the tasks, convincing others of one's opinion, coordinating with each other, making great efforts to achieve a good job, discussion and effective participation in teamwork, sharing information and better understanding of how to deal with others. Interviewee 6 stated that, *"the greatest challenges in teamwork are making great efforts to achieve a good job, and effective participation in teamwork and discussing and sharing information"*.

Students in class E1 stated that achieving work, adapting to teamwork, accepting ideas and understanding them are the biggest challenges in teamwork: interviewee 6 said, *"accepting and understanding ideas are the biggest challenges in teamwork"*.

These three classes agreed that the biggest challenges in teamwork are coordination, accepting each other's ideas and understanding them.

## **9. Through this experience, what was your role within your class?**

Most of the students in the control class C suggested their roles in teamwork were as follows: (1) researcher, searching for references on specific topics; (2) divider, sharing out roles to each member in the team, (3) leader, coordinating the team, and (4) effective

member, through sharing and giving information. For example, interviewee 1 said, *"my role within our class is a leader"*.

Class E1 group interviewees mentioned: (1) researcher, searching for references on specific topics, (2) divider, sharing out roles among team members, (3) leader, coordinating the teamwork, (4) effective members, sharing and giving information, (5) writers, and (6) collectors of specific information. For example, interviewee 1 said, *"my role within the group is leader, coordinating each member in the team"*.

Similarly, in class E2, the roles mentioned were as follows: (1) researcher, searching for references on specific topics, (2) divider, sharing out roles, (3) leader, coordinating the teamwork, (4) effective member, sharing and giving information and (5) explaining points to other members. Interviewee 9 said, *"My role within our class is an effective member through sharing and giving information "*.

These three groups agreed that the key roles within teams were as follows: (1) researcher, searching for references on specific topics, (2) divider, sharing out roles among team members, (3) leader, coordinating the team, and (4) effective members, sharing and giving information.

#### **10. Through this experience, did you share out your work?**

Most of the students in all three classes stated that through the collaborative learning experience, the work was divided among all members of the class. As interviewee 5 stated, *"Yes, the work is divided"*.

#### **11. Through this experience did each person clearly know his role?**

The majority of the students in all three classes stated that through the collaborative learning experience, all members of the class clearly knew their roles.

#### **12. How many times did you contact your class members?**

Most of the students in the control class C reported that they had been in contact with other members of the class between ten to fifteen times; for example, interviewee 9

said "10 to 15", while interviewee 1 also reported that such contact had occurred *"between 10 and 15 times"*.

In contrast, members of class E2 said that their groups had been in touch three to four times, while the majority of members of class E1 said that their groups had been in contact twenty-one times or more. Therefore, there was significance difference between the three classes in terms of group contact.

### **13. Do you think that teamwork disrupts or impairs task completion?**

Most of the students in the control class believed that collaborative learning disrupts or impairs task completion due to lack of cooperation, frequent controversy and lack of time commitment. For example, interviewee 3 said, *"I think that teamwork disrupts or impairs tasks completion due to lack of cooperation and frequent controversy, which is a difficulty in class working"*. In addition, interviewee 1 said, *"I think that teamwork disrupts or impairs tasks completion, because of lack of time commitment in class working"*.

Similarly, the majority of respondents from class E2 agreed that teamwork disrupts or impairs task completion, with lack of collaboration being the main issue mentioned. For example, interviewee 16 said, *"Yes, there is sometimes no collaboration with each other in the teamwork"*. Another interviewee (14) said, *"I think that teamwork disrupts or impairs task completion due to lack of cooperation in teamwork"*. In addition, interviewee 10 mentioned *"wasting time"* as another way in which teamwork disrupts task completion.

Class E1 group interviewees agreed with these points, and members of this class raised another factor: interviewee 7 stated, *"Some students lack responsibility, which leads to lots of wasted time"*.

Thus, all three classes agreed that teamwork disrupts or impairs task completion for several reasons, such as lack of cooperation and frequent controversy, lack of responsibility on the part of some students, lack of collaboration and inadequate time commitment.

In conclusion, the key findings emerging from the interviews represented with:

- The majority of interviewees from experimental class E1 stated that they preferred to perform tasks by themselves. They cited a number of reasons, including achieving better results, producing more accurate work, gaining more knowledge, saving time and effort, increasing their understanding of their roles and helping in evaluating their performance.
- Respondents from experimental class E1 provided a diversity of opinions about the preference for teamwork or individual work. Some of them stated that they preferred to perform tasks with colleagues in order to enhance participation among the students and create a better environment for learning, which would lead to better achievement of tasks.
- Respondents from the three classes agreed that they experienced anxiety when working in groups and did not quickly adapt to teamwork, in other words they cannot quickly adapt to the other members in the team
- Students across all three classes described themselves as effective team members through accepting other members' opinions, discussing issues and sharing ideas.
- Students in the control and E1 classes reported that they were more active with data work than through cooperation with other individuals, but most of the respondents from class E2 disagreed, indicating that they are more active through cooperation with other individuals than with data work.
- The three classes agreed that the proposal tasks need teamwork to accomplish.
- The three classes agreed that the poster and exercises tasks do not require teamwork and the student can do them by himself.
- The three classes agreed that the biggest challenges in teamwork are coordination, accepting each other's ideas and understanding them.
- The three groups agreed that the key roles within teams were as follows: (1) researcher, searching for references on specific topics, (2) divider, sharing out roles among team members, (3) leader, coordinating the team, and (4) effective members, sharing and giving information.
- All three classes agreed that teamwork disrupts or impairs task completion for several reasons, such as lack of cooperation and frequent controversy, lack of

responsibility on the part of some students, lack of collaboration and inadequate time commitment.

## **5.2 Summary**

This chapter has introduced and explored the major quantitative findings of the study, providing detailed descriptions of the results for each hypothesis in addition to tabulated data. It has also presented the results of the interviews in order to support the quantitative results.

Throughout the chapter, it has appeared that collaborative learning has an effect on some tasks but not all. It had no effect on the students' exercises and poster tasks or on their scores for the midterm exam. Collaborative learning had a significant effect on the students' proposal task scores between the control class and the first experimental class; however, it had an effect on students' scores in the exams (mid and final).

Learning styles have a significant effect on the post-test, midterm and final exam scores of students learning collaboratively with the same learning style in a blended learning environment. Differences in learning style had no significant effect on the achievements of collaborative learners in the exercises, proposal writing and poster task, or in the pre-exam. Moreover, there was a significant difference in the students' pre, midterm and final exam scores in a blended learning environment due to learning style where collaborative learning did not occur. Students with an assimilating learning style did significantly better in these exams. However, significant differences were found in the students' scores for their exercises, proposal and poster tasks or for their post exam due to learning style where students had not learned collaboratively. Finally, learning styles have no significant effect on the students' achievement (scores for the exercises, proposal and poster task, and for the pre, post, midterm and final exam) in a blended learning environment where collaborative learning had taken place.

# Chapter 6: Analysis and Discussion of Results

## 6.1 Discussion of Results

This chapter will discuss the research results in relation to the research questions against the background of previous research covered in the literature review.

**Do the achievements and skills of students who work individually in a blended learning environment in the control class C differ from those who collaborate in a blended learning environment in the first experimental class E1?**

The study's main findings confirmed that there was a significant difference in the achievement and skills of the control class students, who worked individually, in exercises and poster tasks and in the midterm exam compared to those in the first experimental class E1, who collaborated in a blended learning environment. This difference was in favour of the control class C: thus, it can be concluded that collaborative learning did not have a beneficial effect on the students' exercises and poster skills or in their scores for the midterm exam. Collaborative learning had a significant effect on the students' proposal writing scores between the control class C and the first experimental class E1 (collaborative with different learning styles). Other than that, there was no significant difference in the achievements and skills of students who worked individually in the pre-test, post-test and the final exam between the control class C and the first experimental class E1, who collaborated in a blended learning environment. This indicates that collaborative learning had no effect on students' scores in these exams.

This effect concurs with the findings of many previous studies: for example, Waring and Evans (2014) stated that students must engage with each other, especially on long-term tasks, in order to gain more knowledge and share ideas, which will make them learn better than they would if working individually. It also supports Gulbahar and Alper's (2011) finding that most learners have different learning styles based on their individual characteristics, and thus prefer to choose facilitating and learning situations and interactions individually, especially in asynchronous learning activities (like the

poster task in this study). However, Gulbahar and Alper (2011) also found that learners prefer collaborative learning in synchronous learning activities such as exercises and exams, but the present findings do not support this. Moreover, this study agreed with Lee and Kim (2014), who found that Korean students prefer individual learning to collaborative learning styles. It also found that most students prefer diverging and assimilating learning styles to converging and accommodating styles. Moreover, Shen, Hiltz and Bieber (2008) found a significant relationship between collaborative learning and students' exam scores, as their collaborative class achieved higher exam scores than the individual class, and this was agreed with by with the current study. In addition, Adas and Bakir (2013) found a significant difference in students' achievement scores, with the experimental class performing better than their peers in the control class. The experimental students stated that they enjoyed relating inside instructions and illustrations to outside activities using technology. Additionally, Frey and Kaff (2014), in a study focusing on a comprehensive school, found a positive effect of course content and teaching in collaborative learning on the post-course knowledge of students in terms of awareness of the school's practice for students with disabilities and enhancing their knowledge.

However, the present findings disagree with the results reported by Hassan, Fong and Idrus (2011), which showed a significant difference on post-test skills between students who followed collaborative learning and students who followed individual learning in a blended learning environment. In contrast, Yang (2012) found a positive significant effect in the experimental class (collaborative students using a digital game-based learning strategy) in terms of improvement in their problem-solving skills. There was no significant improvement in the control class C using traditional instruction. The experimental class also had higher learning motivation than the control class C. The present findings also disagree with Hassan and Fook (2014), who found that scores on Arabic language achievement for students using collaborative learning were significantly higher than those of students without collaborative learning in a blended learning environment.

Moreover, Zhu (2012) indicated that collaborative learning might improve not only the total individual performance, but also class performance, through raising the

quality of tasks completed, such as improving the formulation of ideas and opinions. Zhu also found that collaborative learning increased the learning activities for knowledge construction by class interaction. In addition, Cash (2013) showed that students undertaking collaborative learning scored significantly better than those engaged in individual learning in the performance of high-risk reading taught with the Reciprocal Mapping intervention.

The present findings also disagree with Essaid et al. (2011), who found a significant difference in post-test scores between students using collaborative and non-collaborative learning, with those engaged in collaborative learning achieving higher scores. They also found a significant difference between learning achievement and performance. Additionally, Rosen and Rimor (2009) found a significant relationship between students' achievements and different learning styles. Collaborative students scored better in the collective standards of knowledge building than did individual students, while individual students achieved higher scores in the personal standard of knowledge construction (arguing and debating theoretical considerations to verify their performance) than did collaborative students. Collaborative students had more collective knowledge than did individual students. Similarly, Boström and Hallin (2013) found a significant difference between collaborative students and individual students in admission scores. All the students in their study preferred collaborative learning. They found that nursing students preferred a converging and accommodating learning style. On the other hand, one-third of the students in their second and third years preferred a diverging and assimilating learning style.

Maesin et al. (2009) found that all the undergraduate students in their study preferred collaborative learning in English lessons. Moreover, Azani (2010) found a positive relationship between cooperative learning and students' achievement in face-to-face and online environments. They stated that collaborative learning enabled students with low abilities to improve their knowledge of tasks, which led them to increase their grades in tests. In addition, Azani (2010) indicated that all students in their study believed that collaborative learning would improve their achievements better than individual learning. Furthermore, Khan (2013) indicated that collaborative learning improves students' empowerment in a blended learning environment. The present findings

supported those reported by Al-Saai et al. (2011), who found no significant difference in students' pre- and post-achievement scores between individual learning and collaborative learning in a blended learning environment. However, they disagree with the significant difference in the scores gained by students undertaking individual and collaborative learning, with higher scores for those using collaborative learning. In addition, Cooley, Holland, Cumming, Novakovic and Burns (2014) found that some students stated that the collaborative learning develops and improves their interpersonal skills, while others showed negative attitudes towards collaborative learning because they did not have enough ability to collaborate well in groups without direct intervention. A positive significant difference was also found in pre- and post-course scores between the collaborative group and individual learners, with the collaborative group scoring higher through evaluation of continuation of collaborative learning when returning to university, as well as perceived group supportiveness and effectiveness.

### **What is the effect of the different learning styles of students who follow collaborative learning on their achievement and skills in a blended learning environment?**

From the above results, after reviewing the hypothesis testing, the main finding was that there were significant differences in the post-test, midterm and final exam scores of students who undertook collaborative learning with the same learning style in a blended learning environment due to their learning style, with the converging learning style being associated with significantly higher scores. Thus, there was an effect on the post-test, midterm and final exam scores of students engaged in collaborative learning with the same learning style in a blended learning environment due to their learning style. On the other hand, differences in learning style had no significant effect on the achievements of collaborative learners in the exercises, proposal writing and poster task, or in the pre-exam.

This effect concurs with the findings of numerous previous studies. For example, Çakıroğlu (2014) stated that learning style has a positive effect on students' achievement in online synchronous settings, with this effect being seen in converging and accommodating learners. These results also support the findings of Yang (2012), who

showed that converging and assimilating learning styles had a significant effect on mid-test and post-test scores. Moreover, Essaid et al. (2011) showed that the appropriate learning style and collaborative learning led to improved outcomes in a virtual learning environment. Generally, it was also found that the converging learning style of the collaborative students improved the learning environment. The authors concluded, however, that these results demonstrate that students knew the learning process and preferred collaborative learning, but that they preferred the individual learning process in the post-test. Furthermore, Li (2015) discovered that students preferred using a wiki as a collaborative learning tool, and that there were significant differences between the different learning styles in terms of accepting a wiki in the learning process, with students with converging and accommodating learning styles being more accepting of this tool. Moreover, Sharma (2011) observed that there was a positive significant relationship between learning style and academic achievement in secondary school students: as the students' achievement increased, it led to improvements in the learning process. Sharma concluded that the academic achievement of secondary school students is one factor that impacts on the learning style. No significant effect of gender on students' academic achievements was found, although there were significant effects of learning style, with the diverging and assimilating learning style having an impact on achievements.

The results of the present study also concur with those of Tsay and Brady (2012), who found that collaborative learning had a positive impact on students' academic performance. Moreover, there was a significant difference in task scores between students with different learning styles, with the approaches of converging and accommodating learning having a significant beneficial effect. In addition, Zapalska and Brozik (2006) found a positive effect on learning style and improvement in achievements in an online learning environment. They also found that each learner might use several learning styles in order to get the best knowledge in a specific manner, which led to improvements in their academic achievement in online learning. Accommodating learning was found to lead to the greatest improvement in the academic learning process in the individual learning style. The authors also stated that in order to increase students' ability and control and thus to improve their academic achievement, teachers should share information about the best learning styles and their effective use in an online

learning process. In addition, online learning environments allow students to choose the best learning style to cope with different approaches and teaching methods. There was a positive significant difference between collaborative learners with different learning styles in terms of the effectiveness of the learning process in respect of cognitive learning style. Zapalska and Brozik (2006) concluded that appropriate online course design and the use of the newer version of the questionnaire for learning style classifications could lead to a learning process that is suitable for all kinds of students.

The present results disagreed with those reported by Şengül et al. (2013), who found that teachers prefer assimilating and converging learning styles. Teachers in their study stated that the collaborative learning style could improve the learning process. They found that most of the students in the mathematics department had an assimilating learning style, while only a small number had an accommodating learning style. They also found that most of the teachers in their study preferred the assimilating learning style, while only a small number of teachers preferred the accommodating learning style. However, it appeared that learning styles had no significant effect on academic tasks. Older students preferred the converging learning style, while younger students preferred the assimilating style. It was also indicated that teachers prefer the assimilating learning style for students, and that students aged 23 and over also prefer the converging learning style. There was no significant relationship between learning style and gender.

### **What is the effect of learning style on the students' achievement and skills whether or not collaboration exists?**

From the above results and after reviewing the hypothesis tests above, the main findings may be confirmed as follows:

#### **Control Class:**

There was a significant difference in the students' pre, midterm and final exam scores in a blended learning environment due to learning style where collaborative learning did not occur. This difference was due to the learning style, with the assimilating learning style showing the best results. However, there was no significant difference on the students' scores for their exercises, proposal and poster skills or for their post exam in an e-learning environment due to learning style where collaborative learning did not occur.

**First Experimental Class (E1):**

Learning style had no significant effect on the students' skills and achievement (scores for the exercises, proposal and poster task, and for the pre, post, midterm and final exam) in a blended learning environment where collaborative learning occurred.

This effect concurs with the findings of several previous studies. For example, Conner and Sliwka (2014) indicated that sometimes collaborative classes of learners with the same learning style do better than collaborative classes of learners with different learning styles and vice versa, depending on the nature of the tasks. Furthermore, Manochehr (2006) stated that learning style has an effect on the achievements and skills of students who work individually in a blended learning environment. The lecture, paper and exam scores of the students who worked individually and followed an assimilating learning style in an e-learning environment were better than those of their peers who followed other learning styles.

However, the present findings are in contrast to the results of Essaid et al. (2011), who found a significant effect of learning style in students undertaking non-collaborative learning, depending on the nature of the tasks performed. They also indicated that students with individual learning styles usually follow the assimilating learning style. In addition, Ali (2011), examining both collaborative and individual learning, found no significant effect of learning style on students' knowledge and application in a project management course at a level of higher education institution in Trinidad and Tobago. Moreover, Merchant et al. (2014) found a significant difference in students' knowledge between the different learning style and tasks, with converging and accommodating learning styles having a positive effect. The assimilating learning style was found to be the best, as it is more suitable for declarative tasks, while the converging learning style is more suitable for procedural tasks. In addition, individual learning was found to improve the performance of the students more than collaborative learning.

The present results agreed with those reported by Kuoet et al. (2015), who found a significant difference between collaborative learning with the same learning style and collaborative learning with different learning styles, with the former showing better results. In addition, the performance of the collaborative students with the same learning style was

much better than that of individual students. The performance of students working collaboratively was better than that of individual students, whether they worked with others who had the same or different learning styles. Moreover, there were no significant differences between the four learning styles (diverging, assimilating, converging and accommodating) in terms of learning performance in collaborative learning with different styles. The collaborative students working in classes with the same learning style were able to communicate, negotiate and achieve consistent answers. However, the performance of collaborative students working in classes with different learning styles was not significantly different from those with the same learning style, but the collaborative students with different learning styles did better than those with the same learning style in the post-test. Students with the converging and accommodating learning styles achieved the highest scores in collaborative classes with the same learning style, while among collaborative students working in classes with the same learning style, the different learning styles had no significant effect on the students' achievements scores. Moreover, Lee and Kim (2014) found that most of the Korean students in their study of auditory style preferred individual learning with diverging and assimilating learning styles, while some preferred individual learning with converging and accommodating styles and only a small number preferred collaborative learning. They suggested that the students prefer to study English with a more diverging and assimilating learning style rather than a converging and accommodating style. Additionally, most of the collaborative students working in classes with the same learning style achieved greater improvement in their English scores than did collaborative students working in classes with different learning styles. Learning style also had a significant effect on the performance of collaborative learners working in classes with the same learning style.

The present results agreed with those reported by Saadi (2012), who concluded that there is a positive relationship between learning styles and students' reading achievement in individual learning style and suggested that the planning of the reading curriculum in the Saudi education system must take into account the different learning styles to fit with the learners' demands.

In contrast, García-Ros et al. (2008) found that the diverging learning style had a positive effect on motivation and the level of learning in students working collaboratively

in classes with the different learning styles. This led them to conclude that the students with the diverging learning style could get more information and collaborate more effectively with each other, whether their class was homogeneous or heterogeneous in learning style. Moreover, Huang et al. (2012) demonstrated a significant relationship between different learning styles and students' performance through the mediation of online participation. Collaborative students with an assimilating learning style had a higher level of performance, while collaborative students with diverging and accommodating learning styles had a lower level of performance. Prior knowledge had a positive impact on the moderator between online participation and learning performance. Furthermore, there were no significant differences between the collaborative learning group with the same learning style and the collaborative learning group with different learning styles in the learning process in a collaborative learning environment. However, there was a significant difference between the different learning styles in terms of understanding of learning goals and objectives, with the simulation learning style being associated with better understanding of learning goals and objectives in a collaborative learning environment compared to other learning styles, and thus with greater improvements in the learning process. They suggested the use of simulations and experiential exercises instead of the accommodating and converging learning styles in the learning process. Collaborative learning with the same or different learning style was better at improving the learning process. In addition, Markulis and Strang (2012) concluded that in order to improve their academic achievement, learners must know about differences in learning style and which ones are suitable for the tasks set. The results of the present study are in contrast to the findings of Hassan et al. (2011), who indicated that collaborative students working in groups with different learning styles achieved significantly higher scores in the post-test on the perceptions of communication skills compared to individual students in a blended learning environment.

## **6.2 Summary**

This chapter has offered a summary of the study's major results, and then discussed them in comparison with previous studies.

The study findings disagreed with the results of the majority of previous studies, which found that the achievements and skills of students engaged in collaborative learning appeared better than those undertaking individual learning in a blended learning environment.

Our study found that in the majority of the tasks, collaborative learning has no beneficial effect, and that students tend to prefer individual learning, although they find collaborative learning useful in some tasks. Regarding learning style, the present findings concur with the previous literature in some areas but not others.

# **Chapter 7: Summary of Results, Conclusions, and Recommendations**

This chapter introduces a summary of the study results and provides conclusions based on these results, as well as recommendations and suggestions for further research based on the obtained findings.

## **7.1 Summary of the Purpose and Questions of the Study**

This study set out to establish the effect of including collaborative learning in an online Research Methods course at Qatar University (QU) on the achievement of students with different learning styles. The key problem of the study can be summarised in answering three main questions:

1. Do the achievements and skills of students who work individually in a blended learning environment in the control class differ from those who collaborate in a blended learning environment in the first experimental class?
2. What is the effect of the different learning styles of students who follow collaborative learning on their achievements and skills in a blended learning environment?
3. What is the effect of learning style on the students' achievements and skills whether or not collaboration exists?

This study answered the research questions through adopting an experimental approach and using mixed methods, represented in questionnaires and interviews, to collect the required data. The first stage was the process of collecting and analysing quantitative data (which was done using a quasi-experimental approach) to address the three questions studied above, followed by the collection and analysis of qualitative data (using class interviews) to support the quantitative results. Also, the study sample consisted of eighty-one students at Qatar University, with equal numbers for each class, represented by the first twenty-seven students from each of the three classes, in order to

get more accurate results through comparing symmetric classes in terms of the numbers of students in each class and accurate learning styles.

## **7.2 Summary of Study Variables**

In this study, the independent variable was whether the teaching method used collaborative learning (collaborative/group work versus non-collaborative/individual work). The adoption of collaborative learning was applied within a blended learning environment to assess its effect on participants' achievements and skills. Furthermore, the dependent variable was represented in students' achievements in all types of exercises and exams. Learning styles represent the moderating variable in the first individual class, which moderated and made a difference to the achievement of the students. In the second and third experimental classes, learning style moderated the relationship between collaborative learning and students' achievements.

## **7.3 Summary of Study Results**

**Results related to the first question of the study:** Do the achievements and skills of students who work individually in a blended learning environment in the control class differ from those who collaborate in a blended learning environment in the first experimental class?

The study's main findings for this question confirmed that there was a significant difference in the achievements and skills of the control class students, who worked individually, in exercises and poster tasks and in the midterm exam compared to those in the first experimental class, who collaborated in a blended learning environment. This difference was in favour of the control class: thus, it can be concluded that there was no beneficial effect of collaborative learning on the students' exercises and poster skills or in their scores for the midterm exam. Collaborative learning had a significant effect on the students' proposal writing scores between the control class and the first experimental class (collaborative with different learning styles). However, there was no significant difference in the achievement and skills of students who worked individually in the pre-test, post-test and the final exam between the control class and the first experimental class, who collaborated in a blended learning environment. This indicates that collaborative learning had no effect on students' scores in these exams.

## **Results related to the first hypothesis of the study**

**H1: There is a significant difference in the achievements of students who work individually in a blended learning environment in the control class and those who collaborate in a blended learning environment in the first experimental class.**

To test this hypothesis, an independent sample t-test was used to compare the control and E1 classes to assess the effect of collaboration on students' achievements and skills. Each skill was tested separately as follows:

- **Exercises:** there was a significant difference in the exercise skills, with the control class performing better than their peers in the experimental class. It can be concluded that there is no effect of collaborative learning on the exercise scores of students, as the mean value or difference was in favour of the control class, not the experimental class. Thus, the hypothesis H1 is accepted.
- **Proposal:** there was a significant effect of collaborative learning on students' achievement in their proposal scores, with the experimental class performing better than their peers in the control class. Thus, the hypothesis H1 is accepted.
- **Poster:** there is no effect of collaborative learning on the poster scores of students, as the mean score for the control class is higher than the mean score for the E1 class, which means that collaborative learning had no effect on class E1's scores for the poster task. Thus, the hypothesis H1 is accepted.
- **Pre-test:** collaborative learning has no effect on the scores of students in the first experimental class when compared with the control class. Thus, the hypothesis H1 is rejected.
- **Post-test:** collaborative learning does not enhance the scores of students in the first experimental class, and thus has no effect on their achievements. Thus, the (H1) hypothesis H1 is rejected.
- **Midterm exam:** no effect of collaborative learning on this achievement could be observed because collaborative learning did not enhance the achievements of the experimental class in the midterm exam. Thus, hypothesis H1 is rejected.

- **Final exam:** there is no effect of collaborative learning on students' final scores in terms of the differences between the control class and the first experimental class. Thus, hypothesis H1 is rejected.

**Results related to the second main question of the study:** What is the effect of the different learning styles of students who follow collaborative learning on their achievements and skills in a blended learning environment ?

The main finding for this question was that there were significant differences in the post-test, midterm and final exam scores of students who undertook collaborative learning with the same learning style in a blended learning environment due to their learning style, with the converging learning style being associated with significantly higher scores. Thus, there was an effect on the post-test, midterm and final exam scores of students engaged in collaborative learning with the same learning style in a blended learning environment due to their learning style. On the other hand, differences in learning style had no significant effect on the achievements of collaborative learners in the exercises, proposal writing and poster task, or in the pre-exam.

### **Results related to the second hypothesis of the study**

**H2: There is a significant difference in the achievements of students who engage in collaborative learning in a blended learning environment due to their learning style.**

To test this hypothesis, a one-way ANOVA was used to examine the effect of differences in learning styles of students who followed collaborative learning on their achievements and skills by assessing the differences between the control class and the second experimental class. Achievements and skills were measured via scores for exercises, a proposal, and a poster as well as pre-post-test, midterm and final exams. Moreover, four learning styles were used in this study: diverging, accommodating, assimilating and converging.

- **Exercises:** there was no significant difference in the students' exercise scores due to differences in learning style. It can be concluded that differences in learning styles have no effect on students' exercise skills in collaborative learning environments. Thus, hypothesis H2 is rejected.

- **Proposal:** there was no significant difference in students' scores on the proposal due to differences in learning style. It can be concluded that learning style has no effect on students' proposal writing skills in a collaborative learning environment. Thus, hypothesis H2 is rejected.
- **Poster:** there was no significant difference in the students' scores for the proposal due to differences in learning style. It can be concluded that difference in learning style has no effect on the students' proposal writing skills in the collaborative learning environment. Thus, hypothesis H2 is rejected.
- **Pre-test:** there was no significant difference in the students' achievements in the pre-test due to differences in learning style. It can be concluded that learning style has no effect on students' achievement in the pre-test in a collaborative learning environment. Thus, hypothesis H2 is rejected.
- **Post-test:** there was a significant difference in the students' achievements in the post-test due to differences in learning style. The converging learning style has the highest mean score. It can be concluded that learning style does have an effect on students' achievements in the post-test in a collaborative learning environment, and this indicates that students with converging learning style are performing better than their peers with the other learning styles. Thus, the hypothesis is accepted.
- **Midterm exam:** there was a significant difference in the students' achievements in the midterm exam due to different learning styles. The converging learning style has the highest mean. Thus, it can be concluded that difference in learning style has an effect on the students' achievement in the midterm exam in a collaborative learning environment. These findings indicate that significant differences were found in achievements in the midterm exam, with students with the converging learning style performing better than their peers with the other learning styles. Thus, the hypothesis is accepted.
- **Final exam:** there was a significant difference in the students' achievements in the final exam due to different learning styles. It can be concluded that learning style has an effect on the students' achievements in the final exam in a collaborative learning environment. These findings indicate that students with this style performed

significantly better than their peers with the other learning styles. Thus, the hypothesis is accepted.

**Results related to the third main question of the study:** What is the effect of learning style on the students' achievement and skills whether or not collaboration exists?

From the above results and after reviewing the hypothesis tests above, the main findings may be confirmed as follows:

**Control Class:** There was a significant difference in the students' pre, midterm and final exam scores in a blended learning environment due to learning style where collaborative learning did not occur. This difference was due to the learning style, with students with the assimilating learning style doing significantly better. However, there was no significant difference in the students' scores for their exercises, proposal and poster skills or for their post exam in a blended learning environment due to learning style where collaborative learning did not occur.

**First Experimental Class (E1):** Learning style had no significant effect on the students' skills and achievement (scores for the exercises, proposal and poster task, and for the pre, post, midterm and final exam) in a blended learning environment where collaborative learning occurred.

**Results related to the third hypothesis of the study:**

**H3: There is a significant difference in the students' achievements in term of collaboration used in the three classes due to learning style.**

To test this hypothesis, a one-way ANOVA was used to compare the three classes –the control class (C) and the first and second experimental classes (E1, E2) – to examine the effect of different learning styles on the students' achievement and skills by assessing the differences in learning style in the three classes regardless of whether or not collaborative learning was used. The achievements and skills were measured via scores for exercises, a proposal and a poster, as well as pre-post-tests, midterm and final exam scores. Four learning styles were examined in this study: diverging, accommodating, assimilating and converging.

## - Control Class

To test this hypothesis, a one-way ANOVA was used to examine the effect of different learning styles on the students' achievements and skills where collaborative learning did not occur. The achievements and skills were studied through the use of students' scores on exercises, a proposal writing task and a poster, as well as their results for the pre-post-test, midterm and final exam.

- **Exercises:** there was no significant difference in the students' scores on exercise skills due to learning style where collaborative learning has not occurred. It can be concluded that learning style has no effect on the students' scores on exercise skills where individual learning takes place. Thus, the hypothesis is rejected.
- **Proposal:** there was no significant difference in the students' scores on the proposal task due to different learning styles where collaborative learning has not occurred. It can be concluded that difference in learning style has no effect on the students' proposal writing skills where individual learning take place. Thus, the hypothesis is rejected.
- **Poster:** there was no significant difference in the students' scores for the poster task due to different learning styles where collaborative learning has not occurred. It can be concluded that there is no effect of the difference of learning style on the students' poster skills where individual learning take place. Thus, the hypothesis is rejected.
- **Pre-test:** there was a significant difference in the students' achievements in the pre-test due to different learning styles where collaborative learning has not occurred; this difference is because the assimilating learning style has a higher mean score. It can be concluded that the difference in learning style has an effect on the students' achievement in the pre-test where individual learning takes place. This indicates that significant differences were found in the pre-test achievement, with students with the assimilating learning style performing better than their peers with other learning styles. Thus, the hypothesis is accepted.
- **Post-test:** there was no significant difference in the students' achievements in the post-test in a blended learning environment due to different learning styles where collaborative learning has not occurred. It can be concluded that different learning

styles have no effect on the students' achievement in the post-test where individual learning takes place. Thus, the hypothesis is rejected.

- **Midterm:** there was a significant difference in the students' achievements in the midterm exam in a blended learning environment due to different learning styles where collaborative learning has not occurred. This difference is because the assimilating learning style is associated with a higher mean score. It can be concluded that different learning styles have an effect on the students' achievement in the midterm exam where individual learning takes place. This indicates that significant differences were found in achievement in the midterm exam, with students with the assimilating learning style performing better than their peers with other learning styles. Thus, the hypothesis is accepted.
- **Final exam:** there was a significant difference in the students' achievements in the final exam due to different learning styles when collaborative learning has not occurred. This difference is due to the assimilating learning style, which has a higher mean score. It can be concluded that learning style has an effect on the students' achievement in the final exam where individual learning take place. This indicates that significant differences were found in achievements on the final exam, with students with the assimilating learning style performing better than their peers with other learning styles. Thus, the hypothesis is accepted.

#### **- First Experimental Class**

To test this hypothesis, a one-way ANOVA was used to examine the effect of different learning styles on the students' achievement and skills by assessing the differences in learning style for the first experimental class, where collaborative learning had occurred. Achievements and skills were examined via scores for exercises, a proposal writing task and a poster, as well pre-post-test, midterm and final exam scores.

- **Exercises:** there was no significant difference in the students' exercise scores due to learning style where collaborative learning has occurred. It can be concluded that different learning styles have no effect on the students' exercise skills in a collaborative learning environment. Thus, the hypothesis is rejected.

- **Proposal:** there was no significant difference in the students' skills in a collaborative blended learning environment due to different learning styles. It can be concluded that differences in learning style have no effect on the students' proposal skills in a collaborative learning environment. Thus, the hypothesis is rejected.
- **Poster:** there was no significant difference in the students' poster skills in a collaborative blended learning environment due to different learning styles. It can be concluded that there is no effect of the different learning style on the students' poster skills in a collaborative learning environment. Thus, the hypothesis is rejected.
- **Pre-test:** there was no significant difference in the students' achievements in the pre-test in a collaborative blended learning environment due to differences in learning style. It can thus be concluded that differences in learning style have no effect on the students' achievements in the pre-test in a collaborative learning environment. Thus, the hypothesis is rejected.
- **Post-test:** there was no significant difference in the students' achievement in the post-test in a collaborative blended learning environment due to different learning styles. It can be concluded that there is no effect of the different learning styles on the students' achievements in the post-test in a collaborative e-learning environment. Thus, the hypothesis is rejected.
- **Midterm:** there was no significant difference in the students' achievements in the midterm exam in a collaborative blended learning environment as a result of different learning styles. It can be concluded that learning style has no effect on the students' achievements in the midterm exam in a collaborative learning environment. Thus, the hypothesis is rejected.
- **Final exam:** there was no significant difference in the students' achievement in the final exam in a collaborative blended learning environment as a result of different learning styles. It can be concluded that learning style has no effect on the students' achievements in the final exam in a collaborative blended learning environment. Thus, the hypothesis is rejected.

## 7.4 Reliability and Validity

Reliability means that if a research procedure or method is repeated, the results will be similar or identical (Bush, 2002). It serves as a guarantee that replicating the total research process will achieve consistency (Bush, 2002). Meanwhile, validity is seen as a tool to specify whether the research accurately portrays the phenomenon that it seeks to describe (Bush, 2002). In order to judge the whole research study, it is essential to assess its validity and reliability. However, data from an interpretive study have different reliability rules from scientific research, as shown by researchers (Golafshani, 2003).

Furthermore, validity is the degree or the extent to which a testing instrument can assess what the researcher is really trying to assess (Sekaran, 2004). In other words, it is necessary to demonstrate the validity of the instruments used for collecting data, which in this case are represented by questionnaires and interviews. The first English versions of the questionnaire and the interview were sent to supervisors, who proofread them. The comments received from my supervisors led to a number of changes in the questionnaire and interview items, as well as expanding my imagination regarding overall enhancements for both the questionnaire and the interview schedule. As a result, some items were eliminated or added to construct the final copies of the instruments. Also, I used another method to validate the Arabic version of the questionnaire and interview based on my supervisors' direction, which was to pilot the first tool—the questionnaire—by distributing it to five of my friends and asking them to answer the items and give feedback regarding the questions' structure and meanings, in order to assess the instrument in terms of appropriateness and clarity and to measure its reliability. In light of this feedback, I modified unclear statements such as the sentence that verifies the response scale in the first paragraph of the cover page, which was *“Writing 4 next to the sentence ending that describes how you learned best, and so on down to one for the sentence ending that seems least like the way you learned. Be sure to rank all the endings for each sentence”*. After modification, this sentence became *“Write 4 next to the sentence ending that best describes your way of learning; write 1 for the sentence ending that seems least like or far away from your way of learning. This means that scores from 1, 2, 3, and 4 represent the degree of your agreement regarding each sentence on how it describes your preferred way of learning”*. I also piloted the second tool—the interview—

–by distributing it to three of my friends and asking them to behave as if they were students participating in this experiment, and to give me feedback regarding the questions' structure and meanings, as well as answering them, in order to assess the instrument in terms of appropriateness and clarity and to measure its reliability. In light of this feedback, some questions in the interview guide were modified and rechecked, such as one of the questions from class A, which was “*Do you think that the help and cooperation of your colleagues will help in better understanding and accomplishing your tasks?*” After modification, this question became “*Do you think that cooperation with your colleagues will help in better understanding and accomplishing of your task?*” Moreover, these changes were reflected in the Arabic version, which was modified accordingly.

According to Sekaran (2004), reliability refers to the degree to which the dimension is free of accidental errors and offers consistent data. This study used Cronbach’s Alpha to test the consistency of the results produced by the scale. According to Sekaran (2004), the values of Cronbach’s Alpha for each variable of the questionnaire and for the entire questionnaire should exceed 0.60 in order to consider the result acceptable. The higher the value of Cronbach’s Alpha is, the greater the consistency of the instrument and the more trustworthy its data. The reliability of the data collected through the pilot study questionnaire was calculated using SPSS, and the value of Cronbach’s Alpha was 0.85, which is considered to be a very good result. This reflects the trustworthiness of the research instrument’s data and its high consistency level.

## **7.5 Research Limitations**

It is possible that any research faces limitations, which could influence the quality of the collected information. Some of the limitations of this study are represented in the literature on intentions to adopt an e-learning theory of education in general and collaborative learning in particular. This theory aims to provide a rational relationship between theoretical viewpoints on learning with e-tools and techniques, so as to consider technology and learning contexts as a mixture of two related and supportive components for e-learning environmental criteria.

In this study, the limitations were presented by the questionnaire and interview distribution, particularly given that the target sample was made up of students at Qatar University. The researcher faced difficulty in the process of reaching students and then asking them for their help, and it required official effort. The results obtained from the current study introduce an initial exploration of collaborative learning in Qatar University. However, since the sampling approach depended on responses from students in Qatar University specifically, the generalisability of the study's results is limited. An additional limitation of this study was that the participation of students was voluntary. Thus, due to the fact that these participating individuals came from only one specific city in Qatar and do not represent all students on the Research Methods course at Qatar University, the overall findings need to be viewed with caution.

The secondary data on the methodology were extracted from the limited available sources to serve the purposes of this research and to present the necessary data for the topic under investigation: that is, to examine the extent of the benefits of collaborative learning within the environment of e-learning, in light of the role played by learning style as an effective factor to:

- Examine the effect of collaborative/class work in a blended learning environment on students.
- Identify the effect of collaborative/class work on students' Research Methods application skills irrespective of their learning styles.
- Examine the effect of learning styles regardless of whether or not collaborative learning is used.

Further limitations of this research can be summarised as the negative impact of collaborative learning on students' achievements because of the prevailing thinking and beliefs instilled in students, the negative effect of teachers on the students, and the lack of interest in collaborative learning and teamwork at Qatar University.

The research provides information about the collaborative/class work in a blended learning environment on students' Research Methods knowledge only in Qatar University. Future studies may also need to target one full academic year rather than four months, and measure the students' achievements more than once with certain periods of

time between measurements. Moreover, other limitations of this research related to the questions in the questionnaires. For example, when the researcher converted the questionnaire to Arabic, most of the questions required approximately the same response, which caused confusion and conflict in students' responses. In addition, these similarities of responses in the learning style questionnaire required many steps, and were very demanding for the researcher.

## **7.6 Research Contributions**

This study plays a significant role, contributing to knowledge by presenting original results from Qatar University and the Qatari education system and enhancing the learning process through the progression of students' knowledge and practical skills. It also proposes ideas about how learning styles can have an impact on education in general.

The education sector is considered crucial in achieving sustainable development, which is an essential requirement of any reform process related to upgrading the community and its components, and has become necessary for technology. Thus, the issue is obviously relevant to teachers, researchers, and individuals. To conclude, the education process must be developed in an integrated manner and with a comprehensive outlook, and the search is thus beginning for modern teaching and learning methods. Thus, it is more advantageous to challenge long-term education prospects in order to contribute to the creation of a strategic plan.

Additionally, this study contributes to the development of the educational process, the adoption of modern teaching methods, the accommodation of the steadily increasing numbers of students seeking to obtain a university education and the adoption of the principles of lifelong learning and self-learning. It diffuses the literature on the benefits offered by modern information technologies and the ability to disseminate knowledge among the educated in many ways. By attempting to investigate and discuss the concept of learning styles and their relationships with e-learning, it adds new and valuable information to the literature on this issue. Overall, this research contributes in the process of growing empirical research on collaborative e-learning by providing rich information

about the factors that motivate students in Qatar University and the problems they face in different learning styles, regardless of whether or not collaborative learning is used.

## **7.7 Recommendations and Suggestions**

In light of the study's results and findings, the following recommendations can be made:

- The attention of decision-makers at universities in Qatar should be drawn to the need to improve educational skills and competencies, including understanding of the use of effective tools such as personal profiles in e-learning systems.
- E-learning success stories need to be published and communicated. Such stories will help universities to adopt collaborative learning to fight inner hurdles, and help with the reduced societal education, which puts the student in a difficult position between parents and universities.
- University strategies should be directed towards overcoming any restrictions or weaknesses in the tools used in educational skills and competencies, and towards providing the freedom for students to choose their learning style.
- Instructors in universities should focus on giving motivational encouragement and support to learners in collaborative learning. This may also help to harbour positive attitudes and allow for more interdependence and social interaction between group members in different styles of e-learning
- Universities' environment should be appropriate in order to incorporate learning styles into classroom activities and focus on giving motivational encouragement and support to students in collaborative learning.
- It is essential to establish e-learning centres in Qatar universities, distributed in specific centres in colleges, and to provide educationalists who are specialised and qualified in collaborative learning styles, so that instruction on this type of learning is based on correct educational roots using precise scientific techniques. This should be achieved through the procedures of moving from a status of hard theoretical knowledge to a status of dynamic interactive themes for students,

rather than being fulfilled simply through the superficial design of collaborative learning styles.

In light of the study's results and findings, the researcher concludes that it is essential to conduct more research that aims towards filling some of the gaps in this area. In particular, it is important to focus on barriers and constraints to collaborative learning that could affect students, with comparisons between public and private universities.

Moreover, further research is required to create proper measures that concentrate on characteristics of collaborative e-learning. In addition, it might be valuable for researchers to conduct research on the other universities that encourage the use of collaborative learning and complete tasks through online learning by comparing collaborative learning (learning in groups) and individual learning, or research on learning style preferences that influence the originality of learners in different courses and disciplines.

As a result, to improve the achievement of students as well as the quality of the Online Research Methods courses in the future, teachers should conduct research on students' needs and difficulties and be willing to change some of the teaching and learning contexts in line with students' abilities and regarding different contexts, such as academic and in-house services.

In sum, more research is required to shed light on collaborative e-learning issues that might be encountered by students and universities and might limit their involvement, particularly in the Middle East. Further studies are needed to shed light on the attitudes and difficulties that teachers are exposed to as they use collaborative learning style methods in teaching.

## **7.8 Conclusion**

First, it is becoming an important step for all Qatari academic institutions to adopt the most suitable approaches to encourage and support students in their learning. As this study has demonstrated, collaborative learning represents one of the effective approaches that should be introduced. However, a suitable environment must be put in place to facilitate this adoption. Culture could play a significant role, as seen in the present study:

students in Qatar University see collaborative learning as appropriate for some tasks, but in other contexts they prefer individual work. This is related to culture and the way they have been raised by their families and schools.

A further important conclusion is that the combination of collaborative learning and e-learning environments has a good and positive effect on students, as they become more enthusiastic and interested. This sheds light on the importance of combining technology with modern education strategies.

Another element that was observed to have a positive impact and really make a difference in collaborative learning was the students' learning style, which reflects a cornerstone in affecting their behaviour when they work together, and thus affects their achievement. In future, this could be a turning point for e-learning and other learning strategies.

Therefore, the best approach for improvement is to continue to evolve through improving the understanding of such strategies in order to identify the strengths and weaknesses in the application of the collaborative approach. These factors are also important in addressing the contents of the entire system, such as teaching presence, distance education, collaborative pedagogy and critical thinking.

## References

### Arabic References

- Abu Zaid, A. (2011) 'The Effect of Kolb's Theory "Model/Learning Styles" on Achievement Levels and Attitude in Biology Learning', *College of Education Journal*, 11(1), 222-272.
- Al-Shehri, H.R. (2009) 'Thinking and Learning Style of Taibah University Students', *Umm Al-Qura University Journal of Educational and Psychological Sciences*, 1(2), 354-400.
- Ghoneim, M. and Budi, Z. (2012) 'Differences in learning style and their relationship to some variables of academic students of the Faculty of Education. King Faisal University', *Researches and Studies on the Egyptian Association for Reading and Literacy*, 125(1), 167-237.
- Jizani, M. (2007) 'The effect of learning styles on students' intelligence in Basic Education College', *Journal of the College of Basic Education*, 10(51), 279-308.

### English References

- Abu Hassan, Z., Schattner, P. and Mazza, D. (2006) 'Doing a pilot study: why is it essential?' *Malaysian Family Physician*, 1 (2&3), pp. 70-73.
- Adas, D. and Bakir, A. (2013) 'Writing difficulties and new solutions: blended learning as an approach to improve writing abilities', *International Journal of Humanities*, 3(9), 254-266.
- Al-Sulaiti, H. (2011) *Intervention of the State of Qatar*. 4<sup>th</sup> Ed. Permanent Mission of the State of Qatar to the United Nations: New York.
- Akyol, Z. and Garrison, D. (2011) 'Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning', *British Journal of Educational Technology*, 42(2), 233 – 250.
- Al-Ammari, J. A. (2004) *Benefits and barriers to implementing computer use in Qatari elementary schools as perceived by female teachers: an exploratory study*. Doctoral dissertation, Ohio University. 1-245.

- Ali, H. (2011) 'A comparison of cooperative learning and traditional lecture methods in the project management department of a tertiary level institution in Trinidad and Tobago', *The Caribbean Teaching Scholar*, 1(1), 365-377.
- Allinson, C. W. and Hayes, J. (2012) *The Cognitive Style Index: Technical Manual and User Guide*. London: Pearson Education.
- Al-Obaidli, K. (2010) *Women ESL teachers' perception about their roles and professional development needs in Qatar's education for a new era*. Doctoral dissertation, University of Birmingham, 1-346.
- Alonso, F., López, G., Manrique, D. and Viñes, J. M. (2005) 'An instructional model for web-based e-learning education with a blended learning process approach', *British Journal of Educational Technology*, 36(2), 217-235.
- Al-Saai, A., Al-Kaabi, A. and Al-Muftah, S. (2011) 'Effect of a blended e-Learning environment on students' achievement and attitudes toward using e-Learning in teaching and learning at the university level'. *International Journal for Research in Education (IJRE)*, 29, 34-55.
- Alsaleh, B. (2005) *Instructional design and its application in e-learning*. King Saud University. Retrieved Oct 14, 2011 from: [http://faculty.ksu.edu.sa/6544/Pages/Published\\_Papers.aspx](http://faculty.ksu.edu.sa/6544/Pages/Published_Papers.aspx).
- Alzaghoul, A. F. (2012) 'The implication of the learning theories on implementing e-learning courses'. *The Research Bulletin of Jordan ACM*, 11(11), 27-30.
- Anderson, K. R. (2008) *Co-teaching: A literature review*. Saskatchewan, Canada: The Ministry of Education.
- Attard, A., Di Loio, E., Geven, K. and Santa, R. (2010) *Student-centered learning: An insight into theory and practice*. Partos Timisoara, Bucharest: T4SCL, pp. 6-15.
- Awla, H. A. (2014) Learning styles and their relation to teaching styles. *International Journal of Language and Linguistics*, 2(3), 241-245.
- Azani, H. (2010) *The effect of cooperative learning on students' performance in a computer course using blackboard*. Department of Mathematics and Computer science, Qatar University Doha, Qatar.
- Azani, H. (2011) 'The effect of cooperative learning on students' performance in computer course using blackboard'. *International Institute of Informatics and*

- Systemics*, 1-5. Available at:  
[http://www.iis.org/CDs2011/CD2011SCI/EISTA\\_2011/PapersPdf/EA487QS.pdf](http://www.iis.org/CDs2011/CD2011SCI/EISTA_2011/PapersPdf/EA487QS.pdf).  
[2/8/2015].
- Bakar, Z. A. and Ali, R. (2013) 'Cognitive Styles in Students' Learning and Quality Education: An Exploration of the Fundamental Issues Underpinning', *In 2nd International Seminar on Quality and Affordable Education*. (pp. 536-541). ISQAE.
- Bañados, E. (2013) 'A blended-learning pedagogical model for teaching and learning EFL successfully through an online interactive multimedia environment', *Calico Journal*, 23(3), 533-550.
- Barkley, E. F., Cross, K. P. and Major, C. H. (2014). *Collaborative learning techniques: A handbook for college faculty*. John Wiley & Sons.
- Bath, D. and Bourke, J. (2010) *Getting started with blended learning*. Griffith Institute for Higher Education (GIHE): London 1-63.
- Baum, S., and Payea, K. (2004). Education pays 2004: The benefits of higher education for individuals and society: Trends in higher education series (College Board Report 5664. Education Pays 2004: Trends in Higher Education Series, pp. 1-53.
- BbWORLD. (2013). Blackboard - BbWorld 2013 + devcon. Available At:  
[https://www.blackboard.com/resources/events/bbworld13/collateral/bbworld\\_2013\\_program\\_50290\\_web.pdf](https://www.blackboard.com/resources/events/bbworld13/collateral/bbworld_2013_program_50290_web.pdf).
- Bell, B. S. and Federman, J. E. (2013) 'E-learning in Postsecondary Education', *The Future of Children*, 23(1), 165-185.
- Berelson, B. (1952), *Content Analysis in Communication Research*, The Free Press, Glencoe, Illinois.
- Bjekic, D., Krneta, R. and Milosevic, D. (2010) 'Teacher Education from E-Learner to E-Teacher: Master Curriculum', *Turkish Online Journal of Educational Technology-TOJET*, 9(1), 202-212.
- Bonk, C. J. and Graham, C. R. (2004) *Handbook of blended learning: Global Perspectives, local designs*. San Francisco, CA: Pfeiffer Publishing.

- Boström, L. and Hallin, K. (2013) 'Learning style differences between nursing and teaching students in Sweden: a comparative study', *International Journal of Higher Education*, 2(1), 22-34.
- Bower, M. and Richards, D. (2006) 'Collaborative learning: Some possibilities and limitations for students and teachers', *In Proceedings of the Conference for the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE '06)*, *ACM Transactions on Computing Education*, 9 (1), 79-89.
- Boyle, T., Bradley, C., Chalk, P., Jones, R. and Pickard, P. (2003) 'Using blended learning to improve student success rates in learning to program', *Journal of Educational Media*, 28(2-3), 165-178.
- Brandenburg, T. (2012) *Bridging the knowledge gap: Internationalization and privatization of higher education in the state of Qatar and the Sultanate of Oman*. Doctoral dissertation, Universities bibliotheca Mainz, 1- 329.
- Brewer, D. J., Augustine, C. H., Zellman, G. L., Ryan, G. W., Goldman, C. A. and Ryan, G. (2007) *Education for a New Era: Design and Implementation of K-12 Education Reform in Qatar*. Santa Monica: Rand Corporation.
- Brindley, J., Blaschke, L. M. and Walti, C. (2009) 'Creating effective collaborative learning groups in an online environment'. *The International Review of Research in Open and Distance Learning*, 10(3), 1-13.
- Bush, T. (2002) *Authenticity-reliability, validity and triangulation*. In: M. Coleman and A. Briggs (eds.), *Research Methods in Educational Leadership and Management*. London: Sage.
- Çakıroğlu, Ü. (2014). 'Analyzing the effect of learning styles and study habits of distance learners on learning performances: A case of an introductory programming course'. *The International Review of Research in Open and Distributed Learning*, 15(4), 261-185.
- Cao, Y. (2006) *Effects of field dependent-independent cognitive styles and cueing strategies on students' recall and comprehension*. Doctoral dissertation, Virginia Polytechnic Institute and State University.

- Cash, T. (2013) *The effect of reciprocal mapping on high-risk sixth-grade students' social studies achievement*. Florida International University (FIU) Electronic Theses and Dissertations University Graduate School, 1-195.
- Cassidy, S. (2004) 'Learning styles: an overview of theories, models, and measures', *Educational Psychology*, 24(4), 419-444.
- Coffield, F., Moseley, D., Hall, E. and Ecclestone, K. (2004) *Learning styles and pedagogy in post-16 learning: A systematic and critical review*. London: LSRC Learning and Skills Development Agency.
- Colt, D. L. (2008) *Cognitive presence among mathematics teachers*. Doctoral Thesis, Montana State University.
- Conner, L. and Sliwka, A. (2014) 'Implications of research on effective learning environments for initial teacher education' *European Journal of Education*, 49(2), 165-177.
- Cooley, S. J., Holland, M. J., Cumming, J., Novakovic, E. G. and Burns, V. E. (2014) 'Introducing the use of a semi-structured video diary room to investigate students' learning experiences during an outdoor adventure education group work skills course', *Higher Education*, 67(1), 105-121.
- Course, S. T. (2002) 'Information and Communication Technologies in Distance Education. United Nations Educational', *Scientific and Cultural Organization*, 2-118.
- Crawley, G. M. and O'Sullivan, E. (2007) *How to Write a Research Proposal and Succeed*. Edition 1. Published by John Wiley & Sons, Ltd.
- Creswell, J. and Clark, W., (2011) *Designing and conducting mixed methods research*, 2nd edition. Los Angeles; London: Sage.
- Creswell, J. W. (2008) *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage.
- Denzin, K. N. and Lincoln, Y. S. (2009), *Qualitative research*, Yogyakarta: PustakaPelajar
- Dillenbourg, P. (1999) *What do you mean by collaborative learning? Collaborative-learning: Cognitive and Computational Approaches*. Oxford: Elsevier.

- Dooley, C. A. and Harkins, D. A. (2010) 'Viewing contextual style in context: Cognitive style of clinicians-in-training', *American Journal of Psychological Research*, 6(1), 1-9.
- Dooly, M. (2008a) Constructing knowledge together. In M. Dooly (ed.) *A guidebook to moderating intercultural collaboration online*. Bern: Peter Lang (pp. 21-45).
- Dooly, M. (2008b) *Tele Collaborative Language Learning. A guidebook to moderating intercultural collaboration online. Constructing Knowledge Together* Bern: Peter Lang.
- Driscoll, M. (2002) Blended Learning: Let's get beyond the hype. *Learning and Training Innovations Newslines*. Retrieved Sep 5, 2009 from <http://www.ltimagazine.com/ltimagazine/article/articleDetail.jsp?id=11755>.
- Dunn, R., Griggs, S. A., Olson, J., Beasley, M. and Gorman, B. S. (1995) 'A meta-analytic validation of the Dunn and Dunn model of learning-style preferences', *The Journal of Educational Research*, 88(6), 353-362.
- Economic and Social Commission for Western Asia (ESCWA). (2007) National Profile of the Information Society in Qatar. *Economic and Social Commission for Western Asia (ESCWA)*, 1-17.
- Eiter, M. and Woll, T. (2011) *Breaking the Mold on Blended Learning*. St. Louis: A Unicom Research Study.
- El-Mowafy, A., Kuhn, M. and Snow, T. (2013) 'Blended learning in higher education: Current and future challenges in surveying education', *Issues in Educational Research*, 23(2), 132-150.
- Essaid El Bachari, E. H. A. and El Adnani, M. (2011) E-Learning personalization based on dynamic learner's preference. *International Journal of Computer Science & Information Technology (IJCSIT)*, 3(3), 200-216.
- Faruji, L. F. (2012) 'Teachers' Teaching Styles at English Language Institutes in Iran', *International Journal of Social Sciences and Education*, 2(1), 364-373.
- Felder, R. and Brent, R. (2007) *Active Learning: Models from the Analytical Sciences*. Mabrouk, P.A. ed. ACS Symposium Series 970, and Chapter 4, pp. 34-53. Washington, DC: American Chemical Society.

- Freedman, R. D. and Stumpf, S. A. (1978) 'What can one learn from the Learning Style Inventory?' *Academy of Management Journal*, 275-282.
- Frey, L. M., & Kaff, M. S. (2014) Results of co-teaching instruction to special education teacher candidates in Tanzania. *Journal of the International Association of Special Education*, 15(1), 4-101.
- Friend, M., Cook, L., Hurley-Chamberlain, D. and Shamberger, C. (2010) 'Co-teaching: An illustration of the complexity of collaboration in special education', *Journal of Educational and Psychological Consultation*, 20(1), 9-27.
- García-Ros, R., Pérez, F. and Talaya, I. (2008) New university students' instructional preferences and how these relate to learning styles and motivational strategies. *Electronic Journal of Research in Educational Psychology*, 6(3), 547-570.
- Gardner, G., Gardner, A., MacLellan, L. and Osborne, B. (2003) 'Reconceptualising the objectives of a pilot study for clinical research', *International Journal of Nursing Studies*, 40(7), pp. 719–724.
- Garrison, D. and Arbaugh, J. B. (2007) 'Researching the community of inquiry framework: Review, issues, and future directions', *Internet and Higher Education*, 10(1), p. 157 – 172.
- Garrison, D. R. (2011) *E-Learning in the 21st century: A framework for research and practice*. Taylor and Francis. 49-71.
- Garrison, D. R. and Cleveland-Innes, M. (2005) 'Facilitating cognitive presence in online learning: Interaction is not enough', *The American Journal of Distance Education*, 19(3), 133-148.
- Garrison, D. R. and Kanuka, H. (2004) 'Blended learning: Uncovering its transformative potential in higher education', *The Internet and Higher Education*, 7(2), 95-105.
- Garrison, D., Anderson, T. and Archer W. (2000) 'Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education', *the Internet and Higher Education*, 2(2-3), 87 – 105.
- Garrison, D., Anderson, T. and Arher, W. (2013) 'Critical thinking, cognitive presence, and computer conferencing in distance education', *American Journal of Distance Education*, 15(1), 7 – 23.

- Ghaleb, F., Daoud, S., Hasna, A., ALJa'am, J. M., El-Seoud, S. A. and El-Sofany, H. (2006) E-Learning model based on semantic web technology. *International Journal of Computing and Information Sciences*, 4(2), 63-71.
- Glick, D. (2008) *An Effective Blended Learning Solution Overcoming Pedagogical and Technological Challenges in a Remote Area-A Case Study*. In Proceedings of the Chais conference on instructional technologies research. Raanana: The Open University of Israel (pp. 36-42).
- Golafshani, N. (2003) Understanding reliability and validity in qualitative research, *Qualitative Report*, 8(4), pp. 597–607.
- Golub, J. (1988) *Focus on Collaborative Learning. Classroom Practices in Teaching English, 1988*. National Council of Teachers of English (NCTE), 1111 Kenyon Rd., Urbana, IL 61801 (Stock No. 17538-015, \$7.50 member, \$9.95 nonmember).
- Gonzalez, G. (Ed.). (2008) *Facing human capital challenges of the 21st century: Education and labor market initiatives in Lebanon, Oman, Qatar, and the United Arab Emirates* (Vol. 786). Santa Monica: Rand Corporation.
- Graf, S. and Lin, T. (2008) 'The relationship between learning styles and cognitive traits—Getting additional information for improving student modelling', *Computers in Human Behavior*, 24(2), 122-137.
- Graneheim, U. H. and Lundman, B. (2004), 'Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness', *Nurse education today*, 24(2), 105-112.
- Graven, O., Hansen, H. and MacKinnon, L. (2009) 'A computer game modelling routing in computer networks as abstract learning material in a blended learning environment', *International Journal of Emerging Technologies in Learning (iJET)*, 4(2009), 18-22.
- Greenberg, A., (2012) Qatar University Case Study: Blended Learning and the College of Pharmacy. *Wainhouse Research Paper: echo360*, September, 2-5.
- Greener, S. L. (2008) 'Self-aware and self-directed: Student conceptions of blended learning', *Journal of Online Learning and Teaching*, 4(2), 243-253.
- Gregorc, A. F. (1982) *An adult's guide to style*. Columbia, Conn: Gregorc Associates.

- Gros, B. (2001) 'Instructional design for computer-supported collaborative learning in primary and secondary school', *Computers in Human Behavior*, 17(5), 439-451.
- Grubisic, A., Stankov, S., Rosic, M. and Zitco, B., (2009) Controlled experiment replication in evaluation of e-learning system's educational influence. *Computers & Education*.
- Gulbahar, Y. and Alper, A. (2011) Learning preferences and learning styles of online adult learners. In A. Mendez-Vilas (ed.) *Education in a technological world: communicating current and emerging research and technological efforts*, pp. 270-278.
- Gulc, E. (2006) *Using blended learning to accommodate different learning styles*. Higher Education Academy), [online], From <http://escalate.ac.uk/downloads/2917.pdf>.
- Harris, L., Sadowski, M. and Birchman, J. (2007) 'A comparison of learning style models and assessment', *Instruments for University Graphics Educators*. 70(1), 14-24.
- Hasan, M. A. (2003) Using principles of activity theory to design online e-learning modules supported by cooperative learning activities on the Blackboard system. *Recent Advances in Modern Educational Technologies*, ISBN: 978-1-61804-180-7, 94-99.
- Hasan, M. A. and Fook, F. S., (2012) E-Learning modules supported by cooperative learning: Impact on Arabic language achievement among Qatar University students. *Journal of Research in Education*. 1, 1-16.
- Hassan, M. A. and Fook, F. S. (2014) E-learning modules supported by cooperative learning: Impact on Arabic language achievement among Qatar University students. *Near and Middle Eastern Journal of Research in Education*, 1(1), 1-16.
- Hassan, M. A., Fong, S. F. and Idrus, R. M. (2011) Impact of E-Cooperative Learning Modules on Interpersonal Communication Skills. *Recent Researches in Education*. 25-30.
- Headquarters, C. (2007) A New System for K-12 Education in Qatar. *RAND-Qatar Policy Institute*. ISBN-13: 978-0-8330-4007-7, 1-5. Available at: <http://www.rand.org/> [2/8/2015].
- Hodges, C. B. (2004) 'Designing to motivate: Motivational techniques to incorporate in e-learning experiences', *The Journal of Interactive Online Learning*, 2(3), 1-7.

- Hodgkinson, G. P. and Sadler-Smith, E. (2003) 'Complex or unitary? A critique and empirical re-assessment of the Allinson-Hayes Cognitive Style Index', *Journal of Occupational and Organizational Psychology*, 76(2), 243-268.
- Honey, P. and Mumford, A. (2000) *The learning styles helper's guide*. Maidenhead, Berkshire: Peter Honey.
- Howles, L. (2007) 'Learning styles: What the research says and how to apply it to designing e-learning', *In ASTD International Conference and Exposition: Atlanta, Georgia*.
- Huang, E. Y., Lin, S. W. and Huang, T. K. (2012). 'What type of learning style leads to online participation in the mixed-mode e-learning environment? A study of software usage instruction', *Computers and Education*, 58(1), 338-349.
- IctQATAR. (2014) Qatar's National ICT plan 20/15. *Advancing the Digital Agenda*, 1-46. Available at: <http://www.ictqatar.qa/ar>
- IctQATAR. the Supreme Council of Information and Communications Technology (2007) *ITWorx Helps Qatar Take the Lead in Education Reform*. ITWorx EDUCATION. 1-2.
- Jackson, C. J., Furnham, A., Forde, L. and Cotter, T. (2000) 'The structure of the Eysenck personality profiler', *British Journal of Psychology*, 91(2), 223-239.
- Jerman-Blažič, B., and Klobučar, T. (2005) 'Privacy provision in e-learning standardized systems: status and improvements'. *Computer Standards & Interfaces*, 27(6), 561-578.
- Johnson, M. (2005) Effective practice with e-learning. *British Journal of Educational Technology*, 36(4), 697-698.
- Jones, S. H. and Wright, M. (2012) 'Does cognitive style affect performance on accounting examination questions?', *Global Perspectives on Accounting Education*, 9, 31-52.
- Joniak, A. J. and Isaksen, S. G. (1988) 'The Gregorc Style Delineator: internal consistency and its relationship to Kirton's adaptive-innovative distinction', *Educational and Psychological Measurement*, 48(4), 1043-1049.
- Joy, S., and Kolb, D. A. (2009) 'Are there cultural differences in learning style?' *International Journal of Intercultural Relations*, 33(1), 69-85.

- Kanuka, H. and Garrison, D. (2004) 'Cognitive Presence in Online Learning', *Journal of Computing in Higher Education*, 15(2), 21 – 39.
- Karkouti, I. M. (2016). Qatar's Educational System in the Technology-Driven Era: Long Story Short. *International Journal of Higher Education*, 5(3), p182-189.
- Kassaian, Z. and Ayatollahi, M. A. (2010) 'Teaching Styles and Optimal Guidance in English Language Major', *Quarterly journal of Research and Planning in Higher Education*, 16(1), 131-152.
- Kazu, I. (2009) 'The effect of learning styles on education and the teaching process', *Journal of Social Sciences*, 5(2), 85-94.
- Kenney, J. and Newcombe, E. (2011) 'Adopting a blended learning approach: Challenges encountered and lessons learned in an action research study', *Journal of Asynchronous Learning Networks*, 15(1), 45-57.
- Khan, H. U. (2013) Use of e-learning tools to solve group work problems in higher education: a case study of Gulf Country. *Advances in Computer Science*, 2(3), 90-96.
- Khodr, H. (2011) 'The dynamics of international education in Qatar: exploring the policy drivers behind the development of Education City', *Journal of Emerging Trends in Educational Research and Policy Studies*, 2, 514-25.
- Kleitman, S., and Gibson, J. (2011). 'Metacognitive beliefs, self-confidence and primary learning environment of sixth grade students', *Learning and Individual Differences*, 21(6).
- Kolb, A. and Kolb, D. (2005) *The Kolb Learning Style Inventory*. Boston, MA: Hay Resource Direct
- Kolb, A. Y. (2005) *The Kolb learning style inventory—version 3.1 2005 technical specifications*. Boston, MA: Hay Resource Direct.
- Kolb, D.A. (1984) *Experiential learning: Experience as the Source of Learning and Development*. New Jersey: Prentice-Hall Inc.
- Kolb, Y. and Kolb, D.A. (2005) *The Kolb Learning Style Inventory – Version 3.1: 2005 Technical Specifications*. Hay group: Experience Based Learning Systems Inc.
- Koob, J. J. and Funk, J. (2002) 'Kolb's learning style inventory: Issues of reliability and validity', *Research on social work practice*, 12(2), 293-308.

- Koohang, A., Riley, L., Smith, T. and Schreurs, J. (2009) 'E-learning and constructivism: From theory to application', *Interdisciplinary Journal of E-Learning and Learning Objects*, 5(1), 91-109.
- Kordjamshidi, P. and Moens, M. F. (2013) *Designing constructive machine learning models based on generalized linear learning techniques*. In *Proceedings of the NIPS workshop on constructive machine learning*, 1-5, available at <https://lirias.kuleuven.be/bitstream/123456789/426759/1/KordjamshidiMoensNIPS-WS-2013.pdf> [21/4/2015].
- Krippendorff, K. (1999), *Content analysis: An introduction to its methodology*. Sage.
- Kumar, R. (2005), *Research methodology: a step-by-step guide for beginners*, Pearson Education, Australia.
- Kuo, Y. C., Chu, H. C., and Huang, C. H. (2015) A learning style-based grouping collaborative learning approach to improve EFL Students' performance in English courses. *Journal of Educational Technology and Society*, 18(2), 284-298.
- La Lopa, J. M. (2013) 'The Difference between Bigfoot and learning styles: there may be better evidence to support the existence of Bigfoot', *Journal of Culinary Science and Technology*, 11(4), 356-376.
- Laal, M. and Ghodsi, S. M. (2012). Benefits of collaborative learning. *Procedia-Social and Behavioral Sciences*, 31, 486-490.
- Laal, M. and Laal, M. (2012) Collaborative learning: what is it? *Social and behavioural Sciences*, 31, p.p 491 – 495
- Lai, E. R. (2011) *Collaboration: A literature review* (Vol. 2). Pearson Research Report.
- Leacock, T. L. and Nesbit, J. C. (2007) 'A framework for evaluating the quality of multimedia learning resources', *Educational Technology and Society*, 10 (2), 44-59.
- Lee, B. and Kim, H. (2014) 'What can we learn from our learners' learning styles?' *English Language Teaching*, 7(9), 118-131.
- Li, K. M. (2015) 'Learning styles and perceptions of student teachers of computer-supported collaborative learning strategy using wikis', *Australasian Journal of Educational Technology*, 31(1), 32-50.

- Liao, H. C. (2006) *Effects of cooperative learning on motivation, learning strategy utilization, and grammar achievement of English language learners in Taiwan*. Doctoral Dissertation, University of New Orleans.
- Lindeman, K. W. and Magiera, K. (2014) 'A co-teaching model: committed professionals, high expectations, and the inclusive classroom', *Odyssey: New Directions in Deaf Education*, 15, 40-45.
- Lindsay, J., (2010) E-Learning for Life Strategic Management Plan: A 21st Century Initiative for the Next Generation. *Qatar Academy 2007-2010*, 1-15.
- Lowyck, J. and Pöysä, J. (2001) 'Design of collaborative learning environments', *Computers in Human Behavior*, 17(5), 507-516.
- Lu, S. J. (2007) 'Developing initial collaborative e-learning environments'. *Journal of Educational Practice and Research*, 20(1), 37-64.
- Macpherson, A. (2008) *Cooperative learning group activities for college courses*. British Columbia: The Centre for Academic Growth, Kwantlen Polytechnic University.
- Maesin, A., Mansor, M., Shafie, L. A. and Nayan, S. (2009) 'A study of collaborative learning among Malaysian undergraduates', *Asian Social Science*, 5(7), P70-76.
- Maguire, C. and Zhang, J. (2007) *Blended Learning in the Development Context: Experience with GDLN in Asia-Pacific*. Tokyo Development Learning Centre Japan/World Bank Distance Learning Partnership Project: Tokyo.
- Mampadi, F., Chen, S. Y., Ghinea, G. and Chen, M. P. (2011) 'Design of adaptive hypermedia learning systems: A cognitive style approach', *Computers & Education*, 56(4), 1003-1011.
- Mandic, D., Pelemis, M., Pasalic, S., and Lalic, N., (2012) Computer-based information system in education. *Recent Researches in Artificial Intelligence and Database Management*, 231 – 236.
- Manochehr, N. N. (2006) 'The influence of learning styles on learners in e-Learning environments: An empirical study', *Computers in Higher Education Economics Review*, 18(1), 10-14.
- Manolis, C., Burns, D., Assudani, R. and Chinta, R. (2013) 'Assessing experiential learning styles: A methodological reconstruction and validation of the Kolb Learning Style Inventory', *Learning and Individual Differences*, 23(1), 44 – 52.

- Marcus, G., Taylor, R. and Ellis, R. A. (2004) 'Implications for the design of online case based learning activities based on the student blended learning experience'. In *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference*. Perth, W.A.: ASCILITE (pp. 557-586).
- Markulis, M. and Strang, R., (2002) 'Learning cooperatively may not be learning collaboratively!' *Developments in Business Simulation and Experiential Learning*, 29(1), 114-120.
- Marsh, D. (2012) *Blended learning: creating learning opportunities for language learners*. Cambridge University Press: Cambridge.
- Marshall, J. M. (2002) *Learning with technology: Evidence that technology can, and does, support learning*. PhD thesis. San Diego State University.1-26.
- Mason, R. and Weller, M. (2000) 'Factors Affecting Student Satisfaction on a Web Course: Education at a Distance', *Australian Journal of Educational Technology*, 16(2), p. 173-200,
- Masri, S. and Wilkens, K. (2011) Higher Education Reform in the Arab World. *The Brookings Project on US Relations with the Islamic World*. 1-13.
- Mayes, T. and De Freitas, S. (2004) Review of e-learning theories, frameworks and models. *JISC e-learning Models Desk Study*, (1), 1-43.
- McKerlich, R., Riis, M., Anderson, T. and Eastman, B. (2011) 'Student perceptions of teaching presence, social presence, and cognitive presence in a virtual world', *Journal of Online Learning and Teaching*, 7(3), 324- 336.
- McMahon, S. (2010). 'Rape myth beliefs and bystander attitudes among incoming college students', *Journal of American College Health*, 59(1).
- Merchant, Z., Goetz, E. T., Cifuentes, L., Keeney-Kennicutt, W. and Davis, T. J. (2014) 'Effectiveness of virtual reality-based instruction on students' learning outcomes in K-12 and higher education: A meta-analysis', *Computers and Education*, 70, 29-40.
- Migiro, S. O. and Magangi, B. A. (2011) 'Mixed methods: A review of literature and the future of the new research paradigm', *African Journal of Business Management*, 5(10), pp. 3757 – 3764.

- Moini, J. S., Bikson, T. K., Neu, C. R., DeSisto, L., Al Hamadi, M., Al Thani, S. J. and Al Misnad, F. B. S. (2011) The Reform of Qatar University. *QNRS Repository*, 2011(1), 4175.
- Montgomery, S. and Groat, L. (1998) 'Students' Learning Styles and their Implications for Teaching', *CRLT Occasional Papers, The centre for Research on Learning and Teaching, The University of Michigan*, 10(1), 1-8.
- Moore, J. L., Dickson-Deane, C. and Galyen, K. (2011) "E-Learning, online learning, and distance learning environments: Are they the same?" *The Internet and Higher Education*, 14(2), 129-135.
- Muir-Herzig, R.G. (2004) 'Technology and its impact in the classroom', *Computers and Education* 42, 111-131.
- Murawski, W. W. and Dieker, L. (2008) '50 Ways to keep your co-teacher strategies for before, during, and after co-teaching', *Teaching Exceptional Children*, 40(4), 40-48.
- Myers, I. B. (2012) *The Myers-Briggs Type Indicator: Manual*. Palo Alto, CA, U: WC Personality, Inc.
- Nasser, R. (2017) Qatar's educational reform past and future: challenges in teacher development. *Open Review of Educational Research*, 4(1), 1-19.
- Oakley, B., Felder, R. M., Brent, R. and Elhadj, I. (2004) 'Turning student groups into effective teams', *Journal of Student Centered Learning*, 2(1), 9-34.
- Ocak, M. A. and Akçayır, M. (2013) 'Do motivation tactics work in blended learning environments? The ARCS model approach', *International Journal of Social Sciences & Education*, 3(4), 1058-1070.
- Orb, A. (2000) 'Ethics in Qualitative Research', *Journal of Nursing Scholarship*, 33(1), pp. 93-96.
- Ostlund, U., Kidd, L., Wengstrom, Y. and Dewar, N., (2011) 'Combining qualitative and quantitative research within mixed method research designs: A methodological review', *International Journal of Nursing Studies*, 48, p. 369 – 383.
- Oudeyer, P. Y. and Kaplan, F. (2008) 'How can we define intrinsic motivation?' In *Proceedings of the 8th International Conference on Epigenetic Robotics*:

- Modelling Cognitive Development in Robotic Systems*. Lund: Lund University Cognitive Studies.
- Pange, A. and Pange, J. (2011) 'Is E-learning based on Learning Theories?' *World Academy of Science, Engineering and Technology*, 56, 62-66.
- Pardales, M. and Girod, M. (2006) 'Community of Inquiry: Its past and present future', *Educational Philosophy and Theory*, 38(3), 299–309.
- Pena-Shaff, J. B. and Nicholls, C. (2004) Analyzing student interactions and meaning construction in computer bulletin board discussions. *Computers and Education*, 42(3), 243-265.
- Pluye, P., Gagnon, M., Griffiths, F. and Johnson-Lafleur, J., (2009) 'A scoring system for appraising mixed methods research, and concomitantly appraising qualitative, quantitative and mixed methods primary studies in Mixed Studies Reviews', *International Journal of Nursing Studies*, 36, p. 529–546.
- Qatar university site  
[http://www.qu.edu.qa/education/accreditation/overview/leadership\\_master/documents/educ\\_606.pdf](http://www.qu.edu.qa/education/accreditation/overview/leadership_master/documents/educ_606.pdf) seen at 16-2-2014
- Qatar's National ICT Plan (2013) *Whole-of-government for better public service Delivery State of QATAR*. Qatar's National ICT Plan, 1-14
- Quinn, P. (2006) *Cooperative Learning and Student Motivation*. Education and Human Master's Thesis State University of New York College.
- Resnik, A. and David, B. (2011), 'Scientific Research and the Public Trust', *Science and Engineering Ethics*, 17(3), 399 – 409.
- Richard, T. (2009). Qualitative versus Quantitative Methods: Understanding Why Qualitative Methods are Superior for Criminology and Criminal Justice. *Journal of Theoretical and Philosophical Criminology*, 1(1).
- Richmond, A. and Cummings, R. (2005) 'Implementing Kolb's Learning Styles into Online Distance Education', *International Journal of Technology in Teaching and Learning*, 1(1), 45-54.
- Riding, R. and Rayner, S. (2013) *Cognitive styles and learning strategies: Understanding style differences in learning and behavior*. Routledge: David Fulton Publishers.

- Romani, V. (2009) 'The politics of higher education in the Middle East: Problems and prospects'. *Middle East Brief*, 36, 1-8.
- Rosen, Y. and Rimor, R. (2009) 'Using a collaborative database to enhance students' knowledge construction', *Interdisciplinary Journal of E-Learning and Learning Objects*, 5(1), 187-195.
- Ruengtam, P. (2012) 'Learning efficiency in theoretical subjects of interior architecture by cooperative/collaborative learning technique', *Procedia - Social and Behavioral Sciences*, 68(1), 281 – 294.
- Ruiz, J. G., Mintzer, M. J. and Leipzig, R. M. (2006) 'The impact of e-learning in medical education', *Academic Medicine*, 81(3), 207-212.
- Rupp, R. (2009). Higher education in the Middle East: Opportunities and challenges for US universities and Middle East partners. *Global Media Journal*, 8(14).
- Saadi, I. A. (2012) *An examination of the learning styles of Saudi preparatory school students who are high or low in reading achievement*. Doctoral dissertation, Victoria University Melbourne, Australia, 1-373.
- Sadler-Smith, E. (2001) 'The relationship between learning style and cognitive style', *Personality and Individual Differences*, 30(4), 609-616.
- Sandoval, W. and Bell, P. (2004) Design-based research methods for studying learning in context: introduction, *Educational Psychologist*, 39(4), p. 199 – 201.
- Sanjaya, R. and Wijaya, H. P. S. (2007) 'The importance of students 'collaboration in the e-learning implementation'. *Celt*, 7(1), 1.
- Sekaran, U. (2004) *Research methods for business: a skill building approach*, 4th Edition. New Jersey: Wiley.
- Sen, S. and Yilmaz, A. (2012) 'The effect of learning styles on students' misconceptions and self-efficacy for learning and performance', *Procedia - Social and Behavioral Sciences*, 46(1), 1482 – 1486.
- Şengül, S., Katrancı, Y. and Bozkuş, F. (2013) 'Learning styles of prospective teachers: Kocaeli University case', *Journal of Educational & Instructional Studies in the World*, 3(2), 1-12.

- Sessoms, D. (2008) 'Interactive instruction: Creating interactive learning environments through tomorrow's teachers', *International Journal of Technology in Teaching and Learning*, 4(2), 86-96
- Sharma, P. (2011) 'A study of learning-thinking style of secondary school students in relation to their academic achievement', *International Journal on New Trends in Education and Their Implications*, 2(4), 115-123.
- Shea, P. and Bidjerano, T. (2009) 'Cognitive presence and online learner engagement: a cluster analysis of the community of inquiry framework', *Journal of Computing in Higher Education*, 21(3), 199 – 217.
- Shen, J., Hiltz, S. R. and Bieber, M. (2008) 'Learning strategies in online collaborative examinations. Professional Communication', *IEEE Transactions on Professional Communication*, 51(1), 63-78.
- Singh, H. (2003) 'Building effective blended learning programs', *Educational Technology* 43(6), 51-54.
- So, H. J. and Brush, T. A. (2008) Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education*, 51(1), 318-336.
- Solís-Gadea, H. R. (2010). 'Education for global citizenship: the role of universities in the maintenance of civilization in the context of late modernity and globalization some comments on the Mexican case', *Procardia-Social and Behavioural Sciences*, 2(2).
- Soyemi, J., Ogunyinka, O. I. and Soyemi, O. B. (2012) 'Integrating self-paced e-learning with conventional classroom learning in Nigeria's educational system', *Mediterranean Journal of Social Sciences*, 3(4), 127-133.
- Stacey, E. and Gerbic, P. (2008) *Success factors for blended learning. Hello! Where are you in the landscape of educational technology?* Proceedings ascilite: Melbourne 2008, 964-968.
- Stahl, G., Koschmann, T. and Suthers, D. (2006) 'Computer-supported collaborative learning: An historical perspective'. *Cambridge handbook of the learning sciences*, 409-426.

- Staker, H. and Horn, M. B. (2012) *Classifying K-12 Blended Learning*. Innosight Institute. 1-22. Available at: [www.innosightinstitute.org](http://www.innosightinstitute.org).
- Stasz, C., Eide, E. R. and Martorell, P. (2008) *Post-secondary education in Qatar: Employer demand, student choice, and options for policy*. Santa Monica: Rand Corporation.
- Sugie, S. (2012) Instructional design of the communicative blended learning for Chinese as a foreign language. In *COLLA 2012, The Second International Conference on Advanced Collaborative Networks, Systems and Applications*, 24-29<sup>th</sup> June, 18-22.
- Sun, C. T., Wang, D. Y. and Chang, Y. Y. (2013) 'Effects of thinking style on design strategies: Using bridge construction simulation programs', *Educational Technology and Society*, 16(1), 309-320.
- Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y. and Yeh, D. (2008) 'What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction', *Computers and Education*, 50(4), 1183-1202.
- Swan, K., Garrison, D. and Richardson, J. (2009) *A constructivist approach to online learning: the Community of Inquiry framework, information technology and constructivism in higher education*. Progressive Learning Frameworks, PA: IGI Global, (43–57).
- Swan, K., Shen, J. and Hiltz, S. R. (2006) Assessment and collaboration in online learning. *Journal of Asynchronous Learning Networks*, 10(1), 45-62.
- Swanson, K. and Hornsby, K. (2000) 'The Community of Inquiry: A survey of traditional classroom and webcourse application', *Analytic Teaching*, 21(2), 233-250.
- Szyjko, C. (2012) A modern model of education system management in Qatar. *Zarządzanie I Edukacja*, 82, 119-134.
- Taasila, V. and Raij, K. (2012) Philosophical review of pragmatism as a basis for learning by developing pedagogy. *Educational Philosophy and Theory*, 44(8), 831-844.
- Taber, K. S. (2011) Constructivism as educational theory: Contingency in learning, and optimally guided instruction. *Educational theory*, 39-61.

- Taradi, S. K., Taradi, M., Radić, K. and Pokrajac, N. (2005) 'Blending problem-based learning with Web technology positively impacts student learning outcomes in acid-base physiology', *Advances in Physiology Education*, 29(1), 35-39.
- Thomas, P. Y. and Reinders H. (2010) Learning and Instructional Systems Design. In M. Thomas and H. Reinders (eds), *Task-Based Language Learning and Teaching with Technology*. New York: Continuum, pp. 181-238.
- Torrissi-Steele, G. (2011) 'This thing called blended learning—a definition and planning approach', *Res. Dev. High. Educ*, 34, 360-371.
- Tsai, A. (2011) 'A hybrid e-learning model incorporating some of the principal learning theories', *Social Behavior and Personality: An International Journal*, 39(2), 145-152.
- Tsay, M. and Brady, M. (2012) 'A case study of cooperative learning and communication pedagogy: Does working in teams make a difference?' *Journal of the Scholarship of Teaching and Learning*, 10(2), 78-89.
- Tshabalala, M., Ndeya-Ndereya, C. and van der Merwe, T. (2014) 'Implementing blended learning at a developing university: obstacles in the way', *Electronic Journal of e-Learning*, 12(1), 101-110.
- Tu, C. H. and McIsaac, M. (2002) 'The relationship of social presence and interaction in online classes', *The American Journal of Distance Education*, 16(3), 131-150.
- Vengopal, K. and Mridula, K. (2007) 'Styles of learning and thinking', *Journal of the Indian Academy of Applied Psychology*, 33(1), 111-118.
- Vermunt, J. D. (1998) 'The regulation of constructive learning processes', *British Journal of Educational Psychology*, 68(2), 149-171.
- Vicente-Molina, M. A., Fernández-Sáinz, A., and Izagirre-Olaizola, J. (2013). 'Environmental knowledge and other variables affecting pro-environmental behaviour: comparison of university students from emerging and advanced countries', *Journal of Cleaner Production*, 61, pp. 130-138.
- Wagner, N. L., Hassanein, K. and Head, M. M. (2008) Who is Responsible for E-Learning Success in Higher Education? A Stakeholders' Analysis. *Educational Technology & Society*, 11(3), 26-36.

- Walliman, N. and Baiche, B. (2001) *Your research project: a step-by-step guide for the first-time researcher*. London: Sage Publications.
- Warger, T. and Dobbin, G. (2009) Learning environments: where space, technology, and culture converge. *EDUCAUSE Learning Initiative*. 1-14.
- Waring, M. and Evans, C. (2014) *Understanding pedagogy: Developing a critical approach to teaching and learning*. Routledge: New York.
- Watson, J. (2008) *Blended learning: the convergence of online and face-to-face education. promising practices in online learning*. North American Council for Online Learning.
- Watt, C. (2013) OER in Qatar. *POERUP Project Reports Published*. 1-35.
- Weber, A. S. (2010) *Web-based learning in Qatar and the GCC states*. Center for International and Regional Studies. Georgetown University, School of Foreign Service in Qatar, 1-31.
- Wigfield, A. and Eccles, J. S. (2000) 'Expectancy–value theory of achievement motivation', *Contemporary Educational Psychology*, 25(1), 68-81.
- Willis, L. D., Kretschmann, G., Lewis, K. and Montes, C. (2014) 'An engaging pedagogy for social education: co-teaching in a teacher education program', *The Social Educator*, 32(3), 23-36.
- Yamani, S. (2006) Toward a national education development paradigm in the Arab World: A comparative study of Saudi Arabia and Qatar. *The Fletcher School Online Journal for issues related to Southwest Asia and Islamic Civilization* Spring 2006, 1-8.
- Yang, Y. T. C. (2012) 'Building virtual cities, inspiring intelligent citizens: Digital games for developing students' problem solving and learning motivation', *Computers and Education*, 59(2), 365-377.
- Yukselturk, E. and Bulut, S. (2007) 'Predictors for student success in an online course', *Educational Technology & Society*, 10 (2), 71-83.
- Zainal, Z. (2007). Case study as a research method. *Journal Kemanusiaan*, 9.
- Zapalska, A. and Brozik, D. (2006) Learning styles and online education. *Campus-Wide Information Systems*, 23(5), 325-335.

- Zhang, L. F., Sternberg, R. J., & Rayner, S. (2012). *Handbook of intellectual styles: Preferences in cognition, learning, and thinking*. Springer Publishing Company.
- Zhu, C. (2012) Student satisfaction, performance, and knowledge construction in online collaborative learning. *Educational Technology and Society*, 15(1), 127–136.
- Zhu, C., Valcke, M. and Schellens, T. (2010) 'A cross-cultural study of teacher perspectives on teacher roles and adoption of online collaborative learning in higher education', *European Journal of Teacher Education*, 33(2), 147-165.

## **Bibliography**

- Ghaith, O. (2009) Effects of Collaborative Learning on the Achievement of Students with Different Learning Styles at Qatar University (QU)

# Appendices

## Appendix 1: Approval letter from the Research Ethics Committee of Brunel University London

Head of School of Sport & Education  
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23<sup>rd</sup> January 2014

Dear Aisha

**RE24-13 The effect of collaborative learning in an online research methods course at Qatar University on the achievement of students with different learning styles**

I am writing to confirm the Research Ethics Committee of the School of Sport and Education received your application connected to the above mentioned research study. Your application has been independently reviewed to ensure it complies with the University/School Research Ethics requirements and guidelines.

The Chair, acting under delegated authority, is satisfied with the decision reached by the independent reviewers and is pleased to confirm there is no objection on ethical grounds to grant ethics approval to the proposed study.

Any changes to the protocol contained within your application and any unforeseen ethical issues which arise during the conduct of your study must be notified to the Research Ethics Committee for review.

On behalf of the Research Ethics Committee for the School of Sport and Education, I wish you every success with your study.

Yours sincerely

A handwritten signature in black ink, appearing to read "R. Godfrey".

PP Dr Richard J Godfrey  
**Chair of Research Ethics Committee**  
School Of Sport and Education



THE QUEEN'S  
ANNIVERSARY PRIZES  
FOR HIGHER EDUCATION  
2011

## **Appendix 2: Letter from my research Supervisor to the College of Basic Education**



To: Dr. Hissa Saddiq  
Qatar University  
P O Box 2713  
Qatar

Brunel University, Uxbridge,  
Middlesex, UB8 3PH, UK

Telephone +44 (0)1895 274000

Web [www.brunel.ac.uk](http://www.brunel.ac.uk)

11 December 2013

Dear Dr. Saddiq

This is to confirm that Mrs. Aisha Al-kaabi is currently a doctoral student working with me on her PhD. Mrs. Al-kaabi is exploring the effects of collaborative learning in an online Research Methods course at Qatar University (QU) on the achievement of students with different Learning Styles, and intends to conduct the majority of her fieldwork in Qatar University. In this, she will be working within my guidance, and her fieldwork is scheduled to extend over the second semester next academic year, the six-month period from mid-February 2014 to mid-July 2014.

Her approach is quasi-experimental, and the fieldwork covers the entire semester.

Please accept my thanks for allowing this cooperation with her research study

Mrs. Al-kaabi is a highly valued student in Education at Brunel, and we are looking forward to some successful outcomes from her fieldwork

Yours sincerely

Mike Watts

Professor of Education

بسم الرحمن الرحيم

السيدة عميدة كلية التربية

الدكتورة / حصة صادق

المحترمة

الرجاء من سيادتكم التعاون مع السيدة /عائشة فضل الكعبي وتسهيل اجراءات تطبيق دراستها على مقرر (مهارات البحث - EDUC 201 Research Methods) ربيع 2014 حيث ان عنوان البحث هو (اثر التعلم التعاوني واساليب التعلم على تحصيل طلاب جامعة قطر) علما بانني المشرف عليها طوال فترة الدراسة بإذن الله

وتفضلوا بقبول فائق الاحترام

الاستاذ الدكتور مايك واتس

كلية التربية والرياضة البدنية

**Appendix 3: Approval letter form the chairperson of the research ethics Committee of the College of Education at Qatar University for the Approval of the Submitted Proposal.**



Qatar University Institutional Review Board  
**QU-IRB**

March 23, 2014

Ms. Aisha Fadel A.A. Al-Kaabi  
College of Education  
Qatar University  
Tel.: + 974 55848657  
Email: [aisha.alkaabi@qu.edu.qa](mailto:aisha.alkaabi@qu.edu.qa), [afa779@hotmail.com](mailto:afa779@hotmail.com)

Dear Ms. Aisha Al-Kaabi,

**Sub.: Research Ethics Review Exemption**  
**Ref.: Project titled, "The effect of collaborative learning in an online Research Methods course at Qatar University (QU) on the achievement of students with different Learning Styles"**

We would like to inform you that your application along with the supporting documents provided for the above proposal, is reviewed and having met all the requirements, has been exempted from the full ethics review.

Please note that any changes/modification or additions to the original submitted protocol should be reported to the committee to seek approval prior to continuation.

Your Research Ethics Approval No. is: **QU-IRB 302-E/14**  
Kindly refer to this number in all your future correspondence pertaining to this project.

Best wishes,

A handwritten signature in blue ink that reads "K. Alali".

Dr. Khalid Al-Ali  
Chairperson, QU-IRB



## Appendix 4: Information Sheet and a consent form for the students

**Brunel**  
**UNIVERSITY**  
L O N D O N

Brunel University, Uxbridge,  
Middlesex, UB8 3PH, UK

Telephone +44 (0)1895 274000

Web [www.brunel.ac.uk](http://www.brunel.ac.uk)

### Information sheet and consent form

I am a postgraduate research student at Brunel University School of Sport and Education, United Kingdom. I am doing experimental research about the effect of Collaborative Learning in an online Research Methods course at Qatar University (QU) on the achievement of students with different Learning Styles through EDUC 201 (Research Methods).

Please take a few minutes to read the objectives of this study and then decide if you would like to take part in this study

#### Research objectives:

- 1 - The impact of cooperative learning in electronic learning environments on academic achievement
- 2 - The impact of learning styles in electronic learning environments on academic achievement

\*Note :

You can withdraw from the study in any time without affecting on the decision process

( ) I am happy to participate

( ) I do not agree to participate

Name of student: -----

ID Number: -----

Signature: -----

Date: -----

The researcher

Aisha Al-kaabi

عزيزتي الطالبة

انا طالبة دكتوراه في جامعة برونييل -كلية التربية والرياضة البدنية -المملكة المتحدة . واقوم باجراء بحث تجريبي لمعرفة  
(اثر التعلم التعاوني واساليب التعلم على تحصيل الطلاب في جامعة قطر) وتطبيق البحث على مقرر مهارات البحث ( EDUC  
(201 Research Methods

الرجاء منك عزيزتي الطالبة قراءة اهداف البحث ومن ثم اتخاذ القرار بالمشاركة او عدمها

اهداف البحث:

- 1- اثر التعلم التعاوني في بيئات التعلم الالكترونية على التحصيل الدراسي
- 2- اثر اساليب التعلم في بيئات التعلم الالكترونية على التحصيل الدراسي

ملاحظة:

يمكنك الانسحاب من التجربة في اي وقت دون التأثير على سيرك في المقرر

موافق على المشاركة

غير موافق على المشاركة

الاسم: -----

رقم القيد: -----

التوقيع: -----

التاريخ: -----

## Appendix 5: Student Learning Style Questionnaire

### The Kolb Learning Style Inventory

I would be very grateful if you could complete the questionnaire. It should only take a few minutes of your time. Needless to say, all information provided will be treated with strict confidence and individual firms will not be identified.

ID:..... Collage:.....

Specialization:.....

Read the sentences carefully. Each sentence has four endings. Rank the endings for each sentence according to how well you think each ending describes the way you learned. Write **4** next to the sentence ending that describes how you learned best, and so on down to **1** for the sentence ending that seems least like the way you learned. Be sure to rank all the endings for each sentence. Do not give two endings the same number.

4=most like you  
1=least like you

N	Sentences	Your response	Your response	Your response	Your response
example	When I learn عندما اتعلم	I am happy اكون سعيدا ( )	I am careful اكون حذرا ( )	I am fast اكون سريعا ( )	I am logical اكون منطيقا ( )
1	When I learn عندما اتعلم	I like to deal with my feelings افضل التعامل ( ) بأحاسيسي	I like to think about ideas افضل التفكير ( ) بالأفكار	I like to be doing things افضل عمل الأشياء ( )	I like to watch and listen افضل ( ) الاستماع والمشاهدة
2	I learn best when اتعلم افضل عندما	I listen and watch carefully استمع واشاهد ( ) بحرص	I rely on logical thinking اعتمد على ( ) التفكير المنطقي	I trust my hunches and feelings عندما اعتمد على ( ) حدسي ومشاعري	I work hard to get things done اعمل جاهدا ( ) لإنجاز الامور
3	When I am learning عندما اتعلم	I tend to reason things out اميل الى سبب ( ) الأشياء	I am responsible about things انا مسؤول عن ( ) الأشياء	I am quiet and reserved اكون هادئ ( ) ومتحفظ	I have strong feelings and reactions لدي مشاعر ( ) قوية وكذلك ردود افعال
4	I learn by اتعلم عن طريق	feelings المشاعر ( )	doing الافعال ( )	watching المشاهدة ( )	thinking التفكير ( )
5	When I learn عندما اتعلم	I am open to new experiences اكون منفتح على ( ) تجارب جديدة	I look at all sides of issues اطلع الى كل ( ) جوانب الموضوع	I like to analyse things, break them down into their parts افضل تحليل ( ) الأشياء وتجزئتها	I like to try things out افضل تجربة ( ) الأشياء
6	When I am learning عندما اتعلم	I am an observing person انا شخص ( ) ملاحظ	I am an active person انا شخص ( ) نشط	I am an intuitive person انا شخص حدسي ( )	I am a logical person انا شخص ( ) عقلاني
7	I learn best from اتعلم بشكل افضل من	Observation الملاحظة ( )	Personal relationships العلاقات ( ) الشخصية	Relation theories العلاقات النظرية ( )	A chance to try out and practice الفرصة من ( ) التجريب والاداء
8	When I learn عندما اتعلم	I like to see results from my work احب رؤية نتائج ( ) عملي	I like ideas and theories احب الأفكار ( ) والنظريات	I take my time before acting اخذ وقت قبل اتخاذ ( ) الفعل	I feel personally involved in things اشعر ( ) باندماجي في الأشياء
9	I learn best from اتعلم افضل	I rely on my observations عندما اعتمد ( ) على ملاحظاتي	I rely on my feelings عندما اعتمد ( ) على حواسي	I can try things out for myself عندما استطيع ( ) تجربة الأشياء بنفسي	I rely on my ideas عندما اعتمد ( ) على افكاري
10	When I am learning عندما اتعلم	I am a reserved person متحفظ ( )	I am an accepting person متقبل ( )	I am a responsible person مسؤول ( )	I am a rational person عقلاني ( )
11	When I learn عندما اتعلم	I get involved اندمج في ( ) الموقف	I like to observe احب ( ) الملاحظة	I evaluate things اقيم الأشياء ( )	I like to be active احب ان اكون ( ) نشطا
12	I learn best when اتعلم افضل عندما	I analyse ideas احلل الأفكار ( )	I am receptive and open-minded اتقبل الاخرين ( ) ومنفتح	I am careful حذر ( )	I am practical عملي ( )

Thank you for completing this questionnaire

## Appendix 6: Example of one group's interview

اهلا وسهلا بك في هذه المقابلة

سوف اسالك بعض الاسئلة الخاصة عن تجربتك في هذا المقرر

س1: هل تفضل القيام بأداء المهام المعطاة لك من قبل مدرس المقرر بنفسك؟ لماذا؟.....

.....  
.....  
.....

س2: هل تفضل القيام بإداء المهام المعطاة لك من قبل مدرس المقرر بمشاركة زملائك؟ لماذا؟..

.....  
.....  
.....

س3: كيف تشعر عند العمل داخل مجموعة؟

قلق

.....

مرتاح

.....

لايهم

.....

لا اتكيف بسرعة

.....

اتكيف بسرعة

.....

س4: كيف تصف قدراتك كعضو داخل مجموعة؟

فعال

.....

لا حيز تلقي الأوامر

.....

اتقبل اراء الاخرين

.....

اناقش

ادافع عن وجهتي نظري

س5: هل انت أكثر نشاطا من خلال العمل مع البيانات او من خلال التعاون مع أفراد اخرين؟

س6: ماهي المهام او المشاريع التي تحتاج الى عمل جماعي لإنجازها؟ اذكر امثلة

س7: ماهي المهام او الواجبات التي لا تحتاج الى عمل جماعي ويستطيع الطالب تأديتها بنفسه؟ اذكر امثلة

س8: ماهي جوانب التحديات في العمل الجماعي؟

س9: من خلال هذه التجربة ماذا كان دورك داخل المجموعة؟

س10: هل تم تقسيم العمل؟

س11: هل كان دور كل شخص واضح؟

س12: كم مرة اتصلت بأفراد مجموعتك؟ .....

سواء بالأيمل

او اتصال هاتفي

او رسالة هاتفية

س13: ماهي الصعوبات التي واجهتك من خلال العمل في مجموعة؟

.....  
.....

س12: في الواجبات الفردية

هل كنت تفضل العمل مع مجموعة من زملائك لإنجاز الواجبات المعطاة لك من قبل مدرس المقرر؟ لماذا

.....  
.....

س13: هل العمل داخل مجموعة يعطل او يعيق انجاز المهام؟ لماذا

.....  
.....

رقم القيد: .....

التخصص: .....

م	الحالة	اوافق	لا اوافق
1	اخذ وقت لتكيف مع المهام الجديدة		
2	المهام السهلة تناسبني أكثر		
3	اثق في المعلومات التي اجمعها من زملائي		
4	العمل داخل مجموعة أفضل بكثير من العمل لوحدني		
5	اضع دائما امامي السؤال (ماذا سيحدث لو قمت بهذا؟)		
6	أفضل ان اجمع البيانات من مصدرها (كتاب-خبر-موقع) بدلا من الاشخاص		
7	اخذ وقت للتفكير قبل اصدار القرار		
8	أفضل التفكير المنطقي للتوصل الى النتيجة		
9	التحليل الزائد للمهمة قد يضيع فرصة ايجاد الحل		
10	التطبيق العملي أفضل من النظرية		
11	في رأي جلسات العصف الذهني لا تساعد على حل المشكلة		
12	أفضل المحاضرة النظرية على المحاضرة العملية		
13	قد نتعلم من الآخرين		
14	الشاملة للمهمة تؤدي لاستنتاج حلول أفضل		
15	أجرب التطبيق العشوائي لإيجاد الحل		

## Appendix 7: Research Methodology Course Syllabus



QATAR UNIVERSITY  
COLLEGE OF EDUCATION

### Research Methodology Course Syllabus

1434-2013

Fall

**By**

**Research method committee**

Dr. Patricia R. Kerr Member	Dr. Yahya Khadum Al-Nakeeb Member
Dr. Chris Coughlin Member	Dr. Nassra Reda Al-Banai Member
Dr. Maha HR Ellili Member	Dr. Ahmed Abdulrahman Al-Emadi Member
Ms. Lana Sameer Bibi Member	Dr. Adel Mouneer Aboelrous Member
	Dr. Alanood Mubarak Al-Thani Coordinator

**COURSE INFORMATION**

Course Name: Research Methods  
Course Number:.....  
Course group Number:.....  
Credit Hours:.....  
Course Status: theoretical course.  
Time:.....  
Location:.....  
Department :.....

**FACULTY INFORMATION**

Name:.....  
Office Telephone Number /Location:.....  
Office Hours:.....

**COURSE DESCRIPTION**

This course is designed to help undergraduate students understand what research is, how it is conducted and its place in academic disciplines. The focus will be on assisting students in developing practical research skills and strategies to enhance academic and professional success. Major emphasis will be on helping students understand the basic concepts of research as well as the different research paradigms and their implications for doing research. Another focus will be on assisting students with developing the ability to effectively prepare a research proposal. Other course topics include research ethics, experimental and non-experimental research, and acquiring electronic and non-electronic information resources for research purposes. Delivery methods used in this course will integrate active and experiential activities in the teaching and learning process. Student learning outcomes will be assessed using a multidimensional approach.

## **COURSE OBJECTIVE**

The course aims at assisting students to:

1. Understand the concepts and components of the research process.
2. Clarify research procedures.
3. Clarify research problems sources.
4. Create awareness of different research paradigms and their implications for doing research.
5. Develop the ability to appropriately select and cite information sources related to different research topics.
6. Develop the ability to effectively prepare a research proposal.
7. Understand and demonstrate commitment to research ethics.

## **COURSE LEARNING OUTCOMES**

- |   |             |
|---|-------------|
| 1. Describe the various concepts, components of research as an inquiry process.   | Objective 1 |
| 2. Differentiate between good and poor quality research.  | Objective 1 |
| 3. Justify the importance of doing research in different contexts.  | Objective 2 |
| 4. Distinguish between experimental and non-experimental research in terms of definitions, assumptions, and procedures.         | Objective 3 |
| 5. Select a significant research theme/topic.   | Objective 6 |
| 6. Search the literature using electronic and non-electronic resources to retrieve appropriate information related to research. | Objective 4 |
| 7. Select the appropriate documentation style to consistently cite sources.   | Objective 4 |
| 8. Abide by standard ethical guidelines during all stages of the research process.  | Objective 5 |
| 9. Write a well-designed research proposal.   | Objective 6 |

### COURSE CONTENT :

week	Topic
1	<b>Introduction</b> of course syllabus
	Basic concepts of research. Objectives, types, of Scientific Research methods, Characteristics of good research.
2	Ways of acquiring knowledge. Ethical issues in doing research Historical background and development of scientific research. <b>Ex1,2</b>
	<b>Elements of scientific research:</b> <b>Research problem:</b> definition, sort of research problem, sources of research problem, research problem selecting criteria. Research problem statement. <b>Research problem hypothesis/questions:</b> Why some research do not need hypothesis need questions?. How question differ from hypothesis?. Importance of Hypothesis, hypothesis formulation standards, type of hypothesis. <b>Ex 3</b>
3	<b>Research objectives and importance:</b> <b>Research terminologies:</b> theoretical, procedural definitions. Terminology definition standards. <b>Research procedures:</b> research methodology, research sample, population, data gathering tools, research design, research conducting steps. Literature review. Research determinations, results, recommendations, references, appendices. Differences between research and the research proposal and the article <b>Ex 4</b>
	Information literacy workshop, Acquiring information from electronic and non-electronic resources(QU library).
4	<b>Research proposal:</b> definition, its components Choosing and formulating a research problem, relating it to the literature in the field (literature review/previous studies). <b>Ex5</b>
	writing abstract, writing a paragraph of literature review, references citation within the paragraph, in the index. <b>Ex6</b>
5	Choosing and formulating a research problem, relating it to the literature in the field and writing abstract. <b>Ex7</b>
	writing a paragraph of literature review. <b>Ex8</b>
6	<b>Research methods:</b> <b>Survey methodology:</b> Definition, types, when to use, conducting steps, methodology evaluation. <b>Ex9</b>
	<b>Correlation methodology:</b> Definition, when to use, conducting steps, methodology evaluation. <b>Ex10</b>
7	<b>Casual comparative methodology:</b> Definition, when to use, variables controlling, research design, conducting steps, methodology evaluation. <b>Ex 11</b>
	<b>Experimental methodology:</b> Terminology, Experimental methodology definition, characteristic, when to use, variables control methods, Experimental method type, differences between Experimental methodology and Casual comparative methodology, Experimental methodology evaluation.
8	<b>Experimental methodology:</b> Terminology, Experimental methodology definition, characteristic, when to use, variables control methods, Experimental method type, differences between Experimental methodology and Casual comparative methodology, Experimental methodology evaluation. <b>Ex 12</b>

	<p><b>Introduction to qualitative methodology:</b> Origin, rational, definition, characteristic, types, when to use, data gathering tools, conducting steps, results reliability and validity, qualitative report model(example).</p>
9	<p><b>Introduction to qualitative methodology:</b> Origin, rational, definition, characteristic, types, when to use, data gathering tools, conducting steps, results reliability and validity, qualitative report model(example).</p> <p><b>Historical methodology:</b> definition, characteristic, conducting steps, resources external and internal criticism definition, historical studies examples, methodology evaluation.</p>
10	<p><b>Case study:</b> definition, technique rationality, characteristic, conducting steps, methodology evaluation.</p> <p><b>Sampling:</b> Samples using rational, short historical background of sampling method development, sampling methods, selection sample procedures, sample types(probability based sampling-simple random- systemic-stratified-cluster) and (non-probability based sampling purposive, coincidence, quota) Characteristics of good sample.</p>
11	<p><b>Sampling:</b> Samples using rational, short historical background of sampling method development, sampling methods, selection sample procedures, sample types(probability based sampling-simple random- systemic-stratified-cluster) and (non-probability based sampling purposive, coincidence, quota) Characteristics of good sample.</p> <p><b>Data collection instruments:</b> <b>Observation:</b> definition, when to use, types, conducting steps, observation problems, observation technique evaluation.</p>
12	<p><b>Interview:</b> short historical background of interview development, definition, importance, when to use, types, conducting steps, choosing interview type criteria, general consideration must take in account when conducting interview, interview reliability and validity, interview technique evaluation.</p> <p><b>Questionnaire:</b> definition, types, when to use, conducting steps, how to developing questionnaire, questionnaire data coding, evaluating the tool.</p>
13	<p><b>Tests and Rating scales:</b></p> <ul style="list-style-type: none"> <li>○ <b>Achievement test:</b> definition, types, how to develop achievement test, when to use, Characteristics of good achievement.</li> <li>○ <b>Psychological test:</b> how to develop psychological test, evaluating tests.</li> <li>○ <b>Rating scale:</b> definition, when to use, evaluating rating scale tool.</li> </ul> <p><b>Descriptive statistics (1):</b> Definition of statistic, measurement level, type of variables according to their measurement level, normal distribution, data tabulation. Instrument psychometrics characteristic assessment methods(validity, reliability).</p>
14	<p><b>Descriptive statistics (2):</b> Measures of central tendency, Measures of dispersion, correlation. Descriptive statistic implementation (spss). <i>Ex 13 in the lab.</i></p>

### TEACHING AND LEARNING STRATEGIES:

Because of the interactive nature of the course, a variety of instructional strategies will be used, including:

- E-learning environments through the use of the Blackboard system supported with including multi media presentations and discussions.
- Small and large group discussions.
- Inductive and deductive methods.
- Lectures supported with appropriate media.
- Brainstorming sessions.
- Workshops.
- Problem based learning.
- Guided discovery approach.
- Case study method.

### ASSESSMENT TOOLS:

	Tool	Point
1.	Class discussions	5
2.	Achievement Portfolio (Exercises-Poster)	(20) (15exercises 5-poster)
3.	Research proposal	25
4.	Med term	20
5.	Final exam	30

### UNIVERSITY EVALUATION SYSTEM

Percentage	Letter Grade
90-100	A
85-89	B+
80-84	B
75-79	C+
70-74	C
65-69	D+
60-64	D
59 and below	F

**Course Instructions:**

- Each Student is expected to submit his assignments in time, if student face any difficulties in submission he should contact course instructor , and according to instructor he may accept his apology and set another date or refuse.
- Assignment delay:
  - Assignment will be canceled if student was absent in assignment submission day without medical excuse.
  - One day delay 25% off of the assignment full grade.
- If assignments was not according to instructions given and described in course syllabus, it could be rejected, or returned to student to modified it,(point deduction) student in this case could not get higher than B in the course.
- Assignment submission instructions:
  - All written assignments should:
    - Uploaded in Bb Safe-assign in on the specified due date.
    - have a cover sheet with assignment title, student name, course title, and date.
    - Be word processed, double spaced, and in 12 point standard font.
    - Use appropriate citations and references in APA style.
    - Use correct grammar and spelling.

**QU regulation:**

- Student should attend 75% of course classes. If student more than 25% (7 classes) student consider failed.
- Student has the right to drop the course according to QU regulations.

**General behavior regulation:**

Each student should be committed to:

- Well representative of learning environment.
- Submit assignment in due date.
- Switch mobile off.
- University etiquette, dress, public behavior.

If the student behave in unaccepted way, should be transferred to department head combined with a report

## University Etiquette : Dress, public behavior

Qatar University is an academic institution of higher education which entails an appropriate frame for behaviors in various contexts. How students and other members of the community present themselves to each other and to outside stakeholders play a major role in instilling an appreciation of values and ethics. As any other learning opportunity, learning to use socially acceptable manners and selecting attire appropriate to specific occasions and activities are critical factors in the total educational process. Clothing that reveals too much cleavage, your back, your chest, your feet, your stomach or your intimate clothes is not appropriate for Universities and educational settings. Any clothing that has words, terms, or pictures that may be offensive to other members of the community is unacceptable. Inappropriate trousers or pants include sweatpants, exercise pants, Bermuda shorts, short shorts, shorts, and leggings. Casual dresses and skirts, and long skirts are acceptable. Dress and skirt length should be at a length at which you can sit comfortably in public. Short, tight skirts that ride halfway up the thigh are inappropriate for classes and university functions in general. Mini-skirts, sun dresses, beach dresses, see-through garments and spaghetti-strap dresses or shirts are inappropriate for the University. Perfumes and make-up should be in good taste, and the rule is to wear them with restraint. Fad hair styles including, but not limited to, unnatural coloring of hair, dreadlocks, or unconventional cuts are not permitted. Visible tattoos must be completely covered.



### **ACADEMIC HONESTY**

Qatar University is an academic community actively engaged in scholarly pursuits. As members of this community, students are expected to recognize and honor standards of academic and intellectual integrity. The College of Education supports the ideals of scholarship and fairness by rejecting all dishonest work when it is submitted for academic credit. Qatar University encourages students to be responsible and accountable for their decisions and actions. Any attempt by students to present the work of others as their

own or to pass an examination by improper means is regarded as a most serious offense and renders those students who do so liable to disciplinary action. Assisting another student in any such dishonesty, or knowing of this dishonesty and not reporting it, is also considered a grave breach of honesty. Academic dishonesty and plagiarism are described on *page 37 in the Qatar University Student Handbook*.

#### **Special Needs Section**

Student Activities building Men's Campus: 44033854, Fax: 44838925;  
Women's Campus: 44033843, Fax: 44839802; Email:  
[specialneeds@qu.edu.qa](mailto:specialneeds@qu.edu.qa); Office hours: 7:30 AM – 2:30 PM

#### **SPECIAL NEEDS**

In accordance with Law No 2 of the year 2004, and Article 49 in the Constitution of Qatar: "Education is the right of all.", and "the State shall extend efforts to achieve fair and appropriate access in education for all". Qatar University seeks to ensure fair and appropriate access to programs, services, facilities, and activities for students with special needs. Any student who feels s/he may need an accommodation based on the impact of a disability should contact the instructor privately to discuss your specific needs. Please contact the Office for Disability Services to coordinate reasonable accommodations for students with documented disabilities.

#### **STUDENT COMPLAINTS POLICY**

Students at Qatar University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

#### **LEARNING SUPPORT**

Qatar University operates Learning Support Centers on each campus to provide services to students to supplement their in-class instruction and ability to meet course requirements. These services include tutoring, acquiring efficient learning skills and strategies, academic and learning assessment (in conjunction with the Counseling Center), and writing labs and workshops. Information about the Learning Center may be found at <http://www.qu.edu.qa/students/services/slsc/>

## REFERENCES

- Printed Materials

Fellow, Richard (2005). *Research methods construction*. Oxford Black: Well Science Ltd.

Mc Queen, Ronald A. (1999). *Research Methods in Psychology A practical Introduction*. London: Prentice – Hall Europe.

McNiff, Jean (1995). *Action Research; Principles & Practice*. London: Rutledge.

Atweh, Bill (1998). *Action Research in practice: Partnerships for Social Justice in Education*. London; Rutledge.

Reason, Peter ed( 2002 ) . *Hand book of action Research; Participative Inquiry and Practice*. London Sage.

Gubrium, Jaber F. (2002). *Handbook of interview research: context & method*. London: Sage Publication.

Blaxter. Loraine (2005). *How to research*. Maidenhead Open University press.

Camic, Paul Marc (2003). *Qualitative research in Psychology; expanding perspectives in methodology and design*. Washington, DC American Psychological Association.

Mason, Jennifer (2002) . *Qualitative researching*. London: Sage Publication.

Bell, Judith (1999). *Doing your research project; a guide for first- time researchers in education and social science*. Buckingham Open University press.

Brown, Andrew (1998). *Doing research / reading research; a mode of interrogation for education*. London; Flamer Press.

Lyons, Evanthia (2007). *Analyzing qualitative data in psychology*. London; Sage Publication Ltd.

Laws, Sophie (2003). *Research for development; a practical guide*. London; Sage publication.

### **- Online Resources**

Research Methods and Resources

<http://www.lrs.org/resources.php>

Electronic Resources for Research Methods

<http://informationr.net/rm/>

Social Research Methods

<http://www.socialresearchmethods.net/>

Methods in Behavioral Research

<http://methods.fullerton.edu/>

Research Methods Tutorials

<http://www.socialresearchmethods.net/tutorial/tutorial.htm>

Action Research Resources

<http://www.scu.edu.au/schools/gcm/ar/arhome.html>

Building Portfolios

<http://tc.eserver.org/dir/Portfolios>

Portfolio Resources for Students

<http://staff.washington.edu/duttro/pfol4stds.html>

Electronic Portfolios

<http://www.electronicportfolios.com/portfolios.html>

Developing a skills portfolio

<http://www.auckland.ac.nz/uoa/cs-developing-a-skills-portfolio/>

Evaluation of Information Sources

[http://www.vuw.ac.nz/staff/alastair\\_smith/evaln/evaln.htm](http://www.vuw.ac.nz/staff/alastair_smith/evaln/evaln.htm)

APA Style Resources

<http://www.psvchwww.com/resource/apacrib.htm>

**Appendix 1**  
**COURSE MATRIX**

Assessment method	Learning out comes	Objectives
Research proposal Tests	Describe the various components of research as an inquiry process. Differentiate between good and poor quality research.	1
Research proposal Tests Exercises	Justify the importance of doing research in different contexts. Construct a framework to demonstrate the relationship between the different components of the research process.	2
Tests Exercises	Distinguish between experimental and non-experimental research in terms of definitions, assumptions, and procedures. Select appropriate research methods for the research problem.	3
Research proposal Exercises	Search the literature using electronic and non-electronic resources to retrieve appropriate information related to research. Incorporate selected information into different components of the research. Select the appropriate documentation style to consistently cite sources.	4
Research proposal Poster Exercises	.Abide by standard ethical guidelines during all stages of the research process.	5
Research proposal Tests Exercises	Write a well-designed research proposal. Select a significant research theme/topic.	6

**Appendix 2**  
**Interactive Participation Scoring rubric**  
(Score: 5)

Participations	Points
1. Asking questions related to lecture subject.	0.5
2. Answering questions raised by other students.	1.5
3. Express opinions, Point of view in logical sequence.	1
4. Discuss other student point of views, Based on evidence, facts, related to course topics.	2
Total	5

**Appendix 3**  
**Student Achievement Portfolio (Exercises-Poster)**

Score: 20

(15exercises 5–poster)

points	Exercises	Exercise-n
2	Identifying research problem	1
1	Scientific research ethics	2
3	Scientific research procedures	3
2	Writing, Formulating, generating hypothesis	4
0.5	Research Proposal Elements	5
2.5	Reference documentation (APA)	6
1	Write Abstract (Grade by Teaching assistant)	7
5	Paragraph writing skills	8
1	Survey method	9
1	Correlational research method	10
1.5	Casual-Comparative Research(ex-post facto)	11
1.5	Experimental research methods	12
3	Statistical implementation	13
25	Total	

Instructor chose exercises total points to 15.

All Ex are based computer administration, except Ex 6,7,8,13, scored manually.

**Poster scoring rubric**

Elements	Components	Points
Introduction	General perception of the subject. Abstract of previous studies Un answered Questions of research problem by previous studies. Illustrate the importance of answering these questions Identify hypotheses / research questions	2
Methodology	Determining the appropriate research methodology( Survey – Correlational) Experimental design. Description research population, sample. Description research instrument (type-title). Determine appropriate data analysis- statistical method States field work procedures.	2
Anticipated results	State Anticipated answers to all research questions / hypotheses.	0.5
References	<ul style="list-style-type: none"> <li>• Cite references in Alphabetical order, according to APA style.</li> <li>• Relation to research subject.</li> <li>• Novelty of References publishing date, consideration</li> </ul>	0.5
Poster design Method	Proposed in paper-Microsoft windows PowerPoint- publisher..	
Total		5point

#### Appendix 4

##### Research Proposal scoring rubric (Score: 25)

Elements	Components	Points
Proposal overall body structure	<ul style="list-style-type: none"> <li>• Language accuracy, integrity, avoid slang words</li> <li>• Research proposal elements organization, according to scientific sequence.</li> <li>• Fonts, punctuation, numbering, footnotes, avoid images designs, color fonts.</li> </ul>	2
Title	<ul style="list-style-type: none"> <li>• Formulate accurate title (using needed words only)</li> <li>• Direct and High correlate with proposal stated problem, question.</li> <li>• Correlate with proposal variables.</li> </ul>	1
Introduction	<p>Introduction components (fields) are clear (preface-content- summary) according to the examples done in the lecture.</p> <p>Preface:</p> <ul style="list-style-type: none"> <li>• Introduce the research problem( wither theories, problem need to be solved, develop).</li> <li>• Describe research purposes, importance (the idea, rational of the research).</li> </ul> <p>Content:</p> <ul style="list-style-type: none"> <li>• discusses literature review, research related to the topic, with citation.</li> </ul> <p>Hypotheses/questions Summary:</p> <ul style="list-style-type: none"> <li>• at the end of the introduction hypotheses questions addressed.</li> </ul>	1
Research problem	<p>Introduce problem in a way that reflect logical sequence of information and literature development, shows relation between variables. By using these strategies:</p> <ul style="list-style-type: none"> <li>• Illustrate the continuity and the Correlation of current research problem with previous in the same field.</li> <li>• Introduce questionable, contradictory, element, thoughts, results, and its relations.</li> <li>• Introduce hypotheses, questions, logic , rational (why chosen).</li> <li>• After addressing the research problem, rephrase it in question format.</li> </ul>	2
Research purpose and importance	<p>Research theoretical practical importance:</p> <ul style="list-style-type: none"> <li>• Clear objectives, achievable.</li> <li>• Supported by statistics.</li> <li>• Previous studies recommendations.</li> <li>• Introduce problem importance for the society.</li> <li>• Offer theoretical practical solutions.</li> <li>• Correlate with research hypotheses, questions.</li> <li>• Discusses research expected results effect on related fields, student clarify his point of view, generate extrapolate new ideas.</li> </ul>	2
literature review (2-4 pages)	<ul style="list-style-type: none"> <li>• Literature aliments represent and correlate with research variables.</li> <li>• Literature aliments Based on Theoretical background.</li> <li>• Literature review aliments written in 3-4 pages, developed information in logical sequence.</li> </ul>	2
Previous studies (5-3)	<ul style="list-style-type: none"> <li>• Titles are related to research problem and variables.</li> <li>• Organized according to variables, or publishing date.</li> <li>• Abstract for each study.</li> </ul>	3
Hypotheses, questions	<ul style="list-style-type: none"> <li>• Hypotheses, questions aligned with research method (survey/questions not hypotheses..)</li> <li>• Hypotheses are measureable ( hypotheses stricter, procedural..)</li> <li>• Hypotheses capability to explain research problem aspects.</li> </ul>	2
Research terminology	<ul style="list-style-type: none"> <li>• Research terminology are specified accurately (all terminologies)</li> <li>• Theoretical definition for terminologies ,with citation.</li> <li>• Procedural definition for terminologies.</li> </ul>	2

Research methods	<ul style="list-style-type: none"> <li>• Research method appropriate for research problem.</li> <li>• Procedural field work(informative descriptions of field procedures that enable researchers to repeat the same research).</li> </ul>	1
Tools (data gathering tools)	<p>Data collection tools:</p> <ul style="list-style-type: none"> <li>• Appropriate data collection tools to research methodology(survey –correlative-experimental.. etc.) &amp; research field (quantitative –qualitative). This paragraph should be written clearly descriptively, that specify research procedures. For example: in humanities &amp; social science, student use interview, he must describe interview procedures, type, questions, relation to research method &amp; questions. Also if he used survey. In natural science, student describe experimental design, type of tests (pretest –posttest), relation to experimental methodology &amp; questions.</li> <li>• Describe tools standardization procedures, reliability validity methods, coefficient</li> <li>• Develop new tools if there were no propitiate ones.</li> <li>• Using triangulation data gathering method (when using more than one tool , student describe data tools vs. research questions in a table).</li> </ul>	2
Research Sample, population	<ul style="list-style-type: none"> <li>• Sample size, type appropriate to research method, objectives, questions.</li> <li>• Representative sample of research population.</li> <li>• Describe research population, sample accurately: <ul style="list-style-type: none"> <li>a. Describe sample specification, method(random, cluster, purposive..)</li> <li>b. Describe population specification.</li> </ul> </li> </ul>	2
Data analysis (Statistical Procedures)	<ul style="list-style-type: none"> <li>• Appropriate to what hypotheses / questions measuring</li> <li>• Appropriate to Variable Measurement level.</li> <li>• In line with procedural variable(terminology) definition.</li> <li>• Appropriateness to the research methodology.</li> <li>• Data Coding map.</li> </ul>	1
Research references citation	<ul style="list-style-type: none"> <li>• Fully cite all sources referenced in the project proposal.</li> <li>• cite references According to APA style within the paragraph.</li> <li>• cite references According to APA style in research index.</li> <li>• Novelty of References publishing date (50% printed during the past five years)</li> <li>• Sources variety(books, journals, theses, interviews..)</li> </ul>	2