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THE USE OF CSCL ENVIRONMENT TO PROMOTE STUDENTS' ACHIEVEMENT AND SKILLS IN HANDMADE EMBROIDERY

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ABSTRACT*: The study aimed to investigate the effect of using computer- supported collaborative learning environment in promoting students' achievement and skills in Handmade Embroidery. To achieve this aim, an achievement test and an observation card for students' performance in embroidery were developed. Basic Support for Cooperative work (BSCW) was also used to support collaborative work via Internet. Furthermore, the study adopted the experimental approach to determine the relationship between the independent variable, which was (CSCL), and the dependent variables represented in academic achievement and skill performance. The study was carried out on (50) female students from the fourth level of Home Economics department at the college of education. Participants were distributed into two equal groups of (25) students in each. The experimental group was taught through CSCL while the control group studied through the traditional ways of teaching. The study concluded that CSCL environment was more effective than the traditional ways of teaching in promoting students' achievement and skills in handmade embroidery.*

KEYWORDS**:** Computer-supported collaborative learning, CSCL environment, Academic Achievement, Handmade Embroidery, Home Economics, Students' performance

INTRODUCTION

Collaborative learning is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together (Smith & MacGregor, 1992: 9). It is based on the idea that learning is naturally a social act in which the participants talk among themselves (Gerlach, 1994). A group of students engaged in collaborative learning works together to achieve shared goals (Chiu, 2004: 365). More specifically, it is based on the model that knowledge can be created within a population where members actively interact by sharing experiences and take on asymmetry roles (Mitnik, et.al. 2009: 330). It also involves the mutual engagement of participants in a coordinated effort to solve the problem together, and leads to deeper level learning, critical thinking, shared understanding, and long-term retention of the learned material (Kreijns, et.al. 2003: 337). Knowledge construction develops in a collaborative learning environment where students communicate by sharing information in groups for solving given tasks (Shukor, et.al. 2014: 216). Lehtinen, et.al. (1999) argues that preparing learners for participation in a networked, information society in which knowledge will be the most critical resource for social and economic development is one of the basic requirements for education in future . Computer-supported collaborative learning (CSCL) is one of the most promising innovations to improve teaching and learning with the help of modern information and communication technology.

Computer-supported collaborative learning (CSCL) is an emerging branch of the learning sciences concerned with studying how people can learn together with the help of computers (Stahl, et.al., 2006: 409). It combines both lines of thinking in order to improve learning and instruction in various areas of education (Dillenbourg & Fischer, 2007: 111). It enables all participants to express themselves and make significant contributions to the final product (Rimor, et.al., 2010: 356). Furthermore, it is as a dynamic, interdisciplinary, and international field of research focused on how technology can facilitate the sharing and creation of knowledge and expertise through peer interaction and group learning processes (Resta & Laferrière, 2007: 67). Online collaborative learning allows discussion to occur at greater depth where knowledge can be constructed remotely (Shukor, et.al., 2014: 216). The primary aim of CSCL is to provide non-task contexts that allow social, off-task communication (e.g. casual communication) and that facilitate and increase the number of impromptu encounters in task and non-task contexts through the inclusion of persistent presence and awareness through time and space of the other members of the distributed learning group (Kreijns, et.al., 2003: 349).

The field of CSCL is also increasingly becoming a trans-disciplinary field of inquiry including cognitive science, learning sciences (psychology, computer science, education), educational psychology, educational technology, communication, epistemology, social psychology (small group research), artificial intelligence, and informatics (group support systems) (Resta & Laferrière, 2007: 67). More specifically, this field draws heavily on learning theories such as constructivist and social cognitivist learning theories. With respect to social interaction that is central to collaborative learning, collaborative learning builds upon the socio-cultural theory where a causal relationship exists between social interaction and individual cognitive change (Dillenbourg, et.al., 1996:193 & Shukor, et.al., 2014: 217).

CSCL environments include synchronous and asynchronous software, text-based, audio-based or video-based communication tools, as well as shared workspaces (Dillenbourg & Fischer, 2007: 111). It also includes interactive group learning, deep learning, sustained critical discourse, social construction of knowledge, and competency-based learning. It is known as learning based on the acquisition of knowledge, skills, and attitudes, in addition to the application in an ill-structured environment. Furthermore, it focuses on embracing group learning, critical thinking, constructivist learning, and competency-based learning and emphasizes social interaction (Kreijns, et.al., 2002 & Kirschner, et.al., 1997).

Therefore, researchers of the present study have thought of using CSCL environment to promote students' achievement and skills in handmade embroidery because of a set of factors such as the increased interest in cooperative learning and the exchange of experience among learners, as well as the rapid and successive progress in the field of technology were the first of these factors. The noticeable and repeated decline in the achievement and skills of home economics students in handmade embroidery constituted the second factor that led to conducting this study.

RELATED LITERATURE

Shukor, et.al. (2014) claim that previous studies found that students prefer to share and compare the available information rather than progressing to construct new

knowledge during collaborative discussions. It shows that students tend to interact at the level of rapid consensus, where students tend to accept peers' opinions not necessarily, because they agree with each other, but merely to hasten the discussion. CSCL environments also increases their potential to support current insights in teaching and learning that rely heavily on the social interaction amongst the group members (Kreijns, et.al., 2002). Furthermore, it is important to emphasize the fact that the use of technology in learning environments should be based on the prevalent educational theories, (Sanchez & Tangney, 2006), which in turn applies to CSCL environment as a form of technology employment in the educational process.

It is worth mentioning that CSCL environment in the present study was based on a number of those theories. Learning according to situated Learning theory, for instance, is not merely an acquisition of knowledge by learners, but rather it is primarily a process of social participation (Brown, et.al., 1989). The main implications of this theory with regard to CSCL environment are summarized in the fact that it emphasizes the social context and participation in learning. Among its applications are discussions and working groups. While learning according to Sociocultural Theory happens at first, in a social form through the interaction with the social environment more than its occurrence in a personal way, (Vygotsky, 1978). Implications of such theory are summed up in what is so called social context and participation CSCL environment. Among the applications of this theory are forums, tools of web 2.00 (social networking), (Nilgun & Metcalf, 2011). The hypothesis of Dialogue Learning can be summed up in "learning is embedded in dialogue between various cognitive regimes" statement, (Sharples, 2002). Dependence on interaction and communication is the most important implication of this hypothesis. Communication among peers and collaborative work are the most important applications of dialogue learning hypothesis, (Nilgun & Metcalf, 2011).

Many of the studies conducted in this field showed that the use of CSCL environment was encouraging and effective in developing learners' achievement and skills. Baharudin & Harun (2014) for example aimed to identify the best pattern of interaction that occurs in the PBL-CSCL learning environment that helps to maximize students' critical thinking skills and cognitive performance. Findings showed that PBL-CSCL learning environment improved students' performance and their understanding in the "Programming Language Concepts and Paradigms" course. It also improved their level of critical thinking skills. Ada (2009), also found that the use of CSCL environment produced some good practice that supported student-centered learning and prepared students to be lifelong learners. Iinuma, et.al. (2016) showed that administering CSCL improved students` awareness in collaborative skills such as interpersonal skills, inquiry skills and group management skills, as well as it raised their` confidence level of computer skills. Dewiyanti, et.al. (2007) aimed to gain response from distance students on their experiences with collaborative learning in asynchronous computer supported collaborative learning (CSCL) environments. Findings showed that the distance learners appreciated the opportunities to work collaboratively. They showed positive experiences and were quite satisfied with collaborative learning. Findings also proved that group product influences group process regulation and group cohesion influences students satisfaction with collaborative learning. Villiers & Roode (1998) found out that CSCL can be effectively implemented in an IS teaching environment and can be utilized to achieve

specific objectives apart from simply enhancing the teaching process. It could develop learners' communication skills; prepare students for work environment, enable tertiary institutions to share certain workloads and make effective use of their scarce resources.

As well as previous studies that aimed to test the effectiveness of using CSCL environment on students' achievement and performance skills, the present study seeks to answer the following questions:

i. What is the effect of using Computer-Supported Collaborative Learning (CSCL) in promoting the achievement of Home Economics students enrolled in "Handmade Embroidery" course?

ii. What is the effect of using Computer-Supported Collaborative Learning (CSCL) in promoting the skill performance of Home Economics students enrolled in "Handmade Embroidery" course?

METHODOLOGY

The present study seeks to investigate the effect of using Computer-supported collaborative learning (CSCL) in promoting the achievement and skills of College of Education students in handmade embroidery. Mainly, it tries to answer the question "What is the effect of using Computer-Supported Collaborative Learning (CSCL) in promoting students' achievement and skills in handmade embroidery? The sample consisted of (50) female students in their fourth level at the department of Home Economics at the college of education at Najran University. Participants were randomly distributed into two equal groups of (25) students in each. The experimental group was taught through CSCL while the control group studied through the traditional ways of teaching.

Design of the course's website

Basic Support for Cooperative work (BSCW) system was used to design and develop the educational website for "handmade Embroidery" course after the revision of many instructional design models. Students' characteristics, determination of the course aims and content and the design of the educational activities were accounted for in this educational website. Figure (1) shows the Workspaces of Handmade Embroidery Course in BSCW, while figure (2) presents the main screen of Handmade Embroidery Course in BSCW

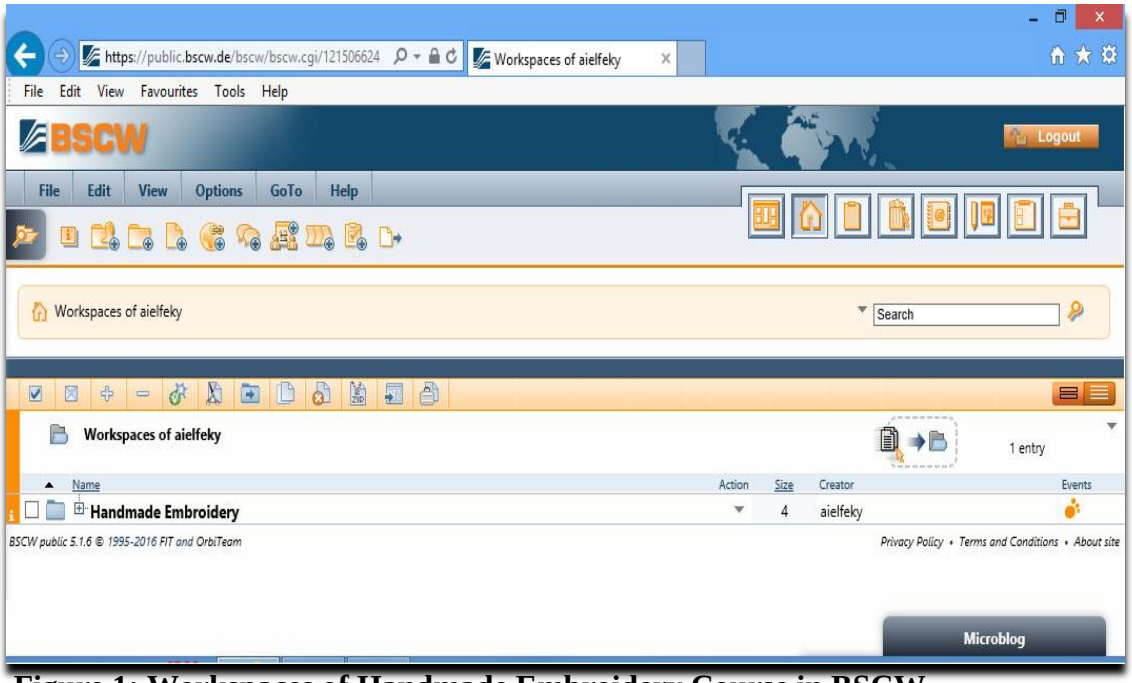

Figure 1: Workspaces of Handmade Embroidery Course in BSCW

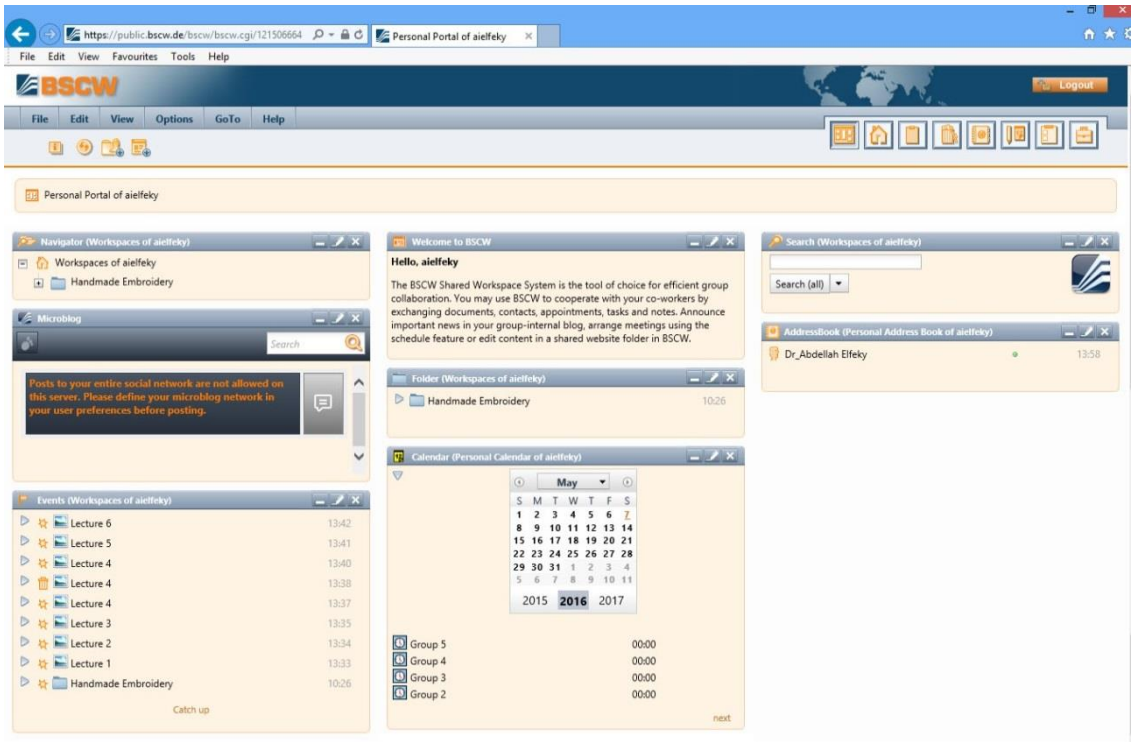

Figure2: The main screen of Handmade Embroidery Course in BSCW

Students in the experimental group were divided into small working groups of (5) students in each. Then they were asked to cooperate with each other across the handmade embroidery forum, which was attached to the educational website, as shown in figure (3) to accomplish the cooperative project. Besides, it is worth mentioning that students in the control group were also divided into smaller groups of

(5) students in each and were requested to cooperate with each other face to face in the laboratory for the completion of the cooperative project.

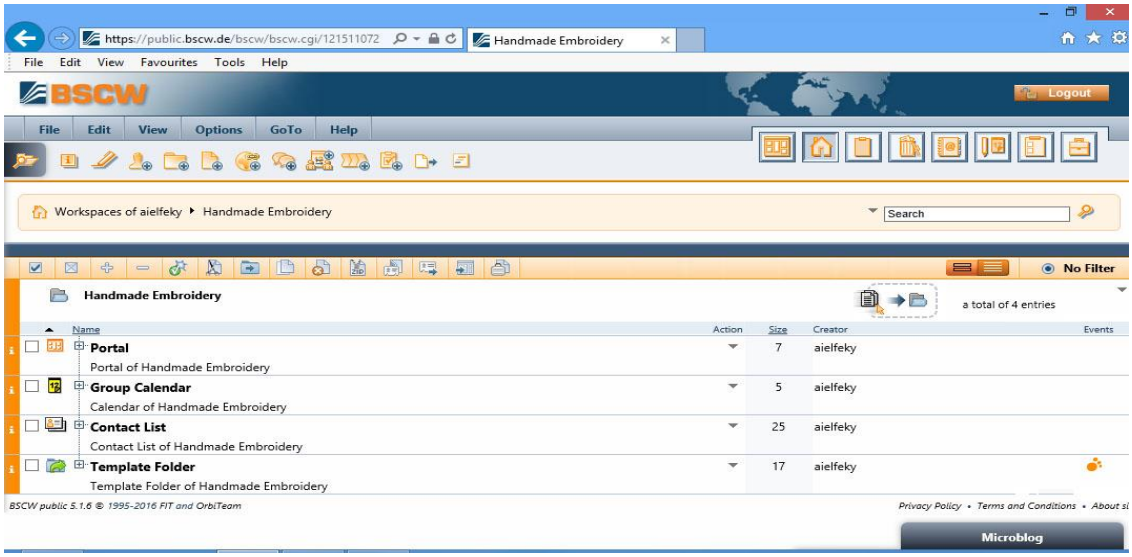

Figure 3: Elements of "Handmade Embroidery" course

A set of activities in the form of homework for students to accomplish individually was added al the cooperative project as shown in figure (4). In addition, the content of "Handmade Embroidery" course that consisted of (14) lectures using PowerPoint presentations, photos and Pdf. Files was also added to the website.

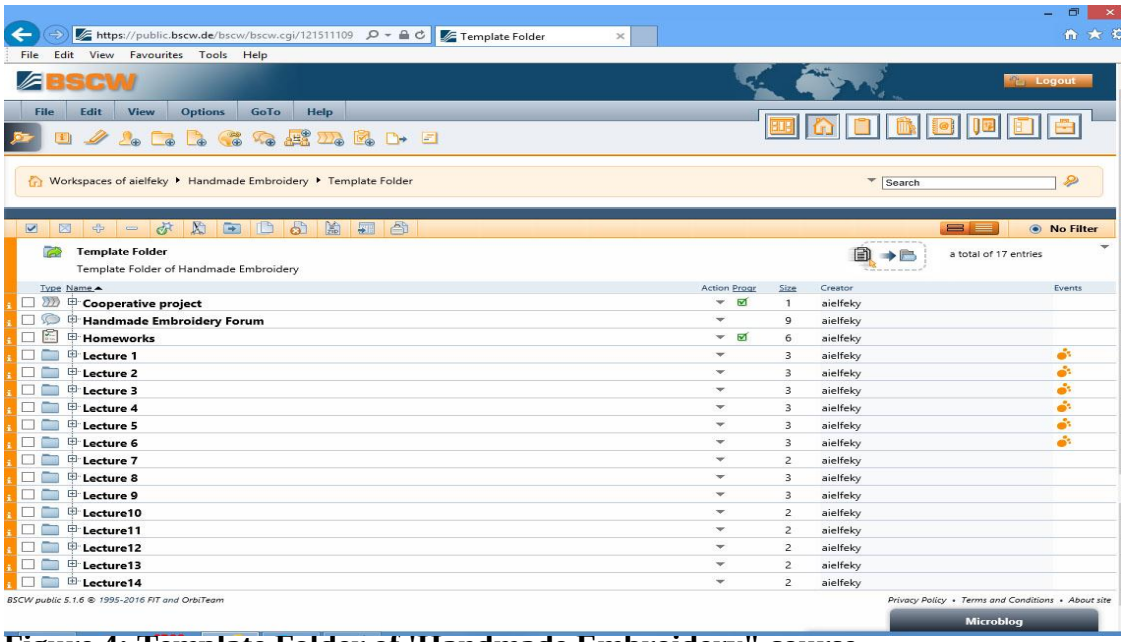

Figure 4: Template Folder of 'Handmade Embroidery" course

Study instruments

For the sake of checking study hypotheses, the researchers prepared an achievement test and an observation card for students' skill performance in "Handmade Embroidery" course.

The achievement test

Test items were written based on the desired learning outcomes of "Handmade Embroidery" course, taking into account the academic level of students participating in the present study. The test consisted of (5) items of completion type, (5) true/false items, and two essay questions. The test was piloted on a group of (10) students from the college of education to determine the needed time, test reliability and test validity. At the end of the pilot study, the time needed for students was decided to be (30) minutes. Test reliability was extracted using Cronbach Alpha and was (0.88), which indicated that results would be trustful when applied to the actual study sample.

The observation card

An observation card to measure the participants' performance in Handmade Embroidery Skills was prepared which included six fields in its final version. For the sake of checking its validity, it was presented to a group of arbitrators who were experts in the field of education technology, home economics, curriculum and instruction. All arbitrators were requested to check the procedural card drafting, clarity, and the possibility of observing performance. Reliability coefficient was calculating through the agreement coefficient of assessors' estimations by Cooper equation as below.

$$\text{Agreement percentage} = \frac{\text{Number of minor skills agreed upon}}{\text{Number of minor skills agreed upon+ number of minor skills disagreed upon}} X100$$

Two female colleagues of Home Economics department were requested to evaluate students' skills after presenting the observation card and clarifying its content to them. Each observer did performance observation of three students. After that, the agreement coefficient of observers' evaluation of each student was calculated. Table (1) illustrates the observers' agreement coefficient on the performance of the three students.

Table 1: **Observers' agreement coefficient on students' performance**

Agreement coefficient on performance of the first student	**Agreement coefficient on performance of the second student**	**Agreement coefficient on performance of the third student**	**Mean of agreement coefficients on performance of the three students**
87%	84%	86%	85.66%

Table (1) shows that the mean of the agreement coefficients of observers' evaluation of the three students' performance was (85.66%) indicating that the observation card was fit and trustful to be used as a measurement instrument.

Study Design

The quasi- experimental approach design was used for data collection in the present study. Pretest and posttest of two equivalent groups were used as shown in Table 1.

Table 2: **Research Design**

	Pre-test	Treatment	Post-test
Experimental Group	O1	X1	O2
Traditional Group	O1	X2	O2

Note. O_1: Achievement/ Handmade Embroidery Skills of pretest

O_2: Achievement/ Handmade Embroidery Skills of posttest

X_1: The use of CSCL environment

X_2: The use of traditional teaching method

Pre-application of study instruments

To make sure of groups' homogeneity before the experimentation and to determine their academic levels, participants in both groups were pre-tested and observed using the developed achievement test and observation card. ANOVA was used to analyze the results and identify the significant differences between both groups if found.

Groups' homogeneity regarding the achievement test

Table (3) illustrates the differences between both groups with regard to their achievement pre-test.

Table 3: **Significance of differences between the experimental and traditional groups in the achievement pre-test**

	Sum of Squares	**DF**	**Mean of Square**	**F. ratio**	**Sig.**
Between Groups	2.00	1	2.00	1.50	0.227
Within Groups	64.00	48	1.333		
Total	66.00	49			

Results of the statistical treatment, as shown in table (3), indicate that F. ratio (1.50) was insignificant (α=0.05). That is, there were no significant differences between both groups in the achievement pre-test, which means that all participants' academic achievement levels were homogeneous before experimentation.

Groups' homogeneity regarding the observation card

Table (4): **illustrates the differences between both groups with regard to their skills pre-observation.**

	Sum of Squares	DF	Mean of Square	F. ratio	Sig.
Between Groups	8.00	1	8.00	3.310	0.075
Within Groups	116.00	48	2.417		
Total	124.00	49			

Results of the statistical treatment, as shown in table (4), indicate that F. ratio (3.31) was insignificant (α=0.05). That is, there were no significant differences between both groups in the handmade embroidery skill pre-observation, which means that all participants' skill performance levels were homogeneous before experimentation.

RESULTS

After the completion of basic experiment and documenting students' grades in the experimental and control groups on the achievement test and observation card, T. test for the independent samples was used to determine the significance of differences between students' modified gain ratio regarding their academic achievement and handmade embroidery skills.

Results related to students' academic achievement

Table (5) shows the modified gain ratio regarding students' academic achievement in both groups after the experimentation, i.e. in the achievement posttest.

Table 5: **The difference between students' modified gain ratio in the two groups regarding academic achievement**

Group	N	M	SD	Mean Difference	T. Ratio	Sig.
Experimental Group	25	15.56	1.04403	3.00	7.566	0.020
Traditional Group	25	12.56	1.68523			

Table (5) reveals that the difference in the modified gain ratio of students' mean score in the experimental and control groups was (7.566). Mean score of students in the experimental group was (15.56), while the mean score of students in the control group was (12.56). Thus, it can be said that at (α=0.05) the T. value was significant. In other words, there were significant differences between students' grades in both groups in favor of the group that had the highest mean score, i.e. the experimental that was taught via the use of Computer Supported Collaborative Learning environment. In other words, the use of CSCL environment had an effect in promoting the academic achievement of students enrolled in "Handmade Embroidery" course.

Results related to students' skill performance in handmade embroidery

Table (6) shows the modified gain ratio regarding students' skill performance in both groups after the experimentation, i.e. in the handmade embroidery skills.

Table 6: **The difference between students' modified gain ratio in the two groups regarding skill performance in handmade embroidery**

Group	N	M	SD	Mean Difference	T. Ratio	Sig.
Experimental Group	25	22.60	1.60728	4.16	6.837	0.048
Traditional Group	25	18.44	2.58328			

Table (6) illustrates that the difference in the modified gain ratio of students' mean score in the experimental and control groups was (4.16). Mean score of students in the experimental group was (22.60), while the mean score of students in the control group was (18.44). Thus, it can be said that at (α=0.05) the T. value was significant. In other words, there were significant differences between students' grades in both groups in favor of the group that had the highest mean score, i.e. the experimental that was taught via the use of Computer Supported Collaborative Learning environment. In other words, the use of CSCL environment had an effect in promoting the skills of students enrolled in "Handmade Embroidery" course.

DISCUSSION

Previous results can be explained in light of the following points:

1. The non-restriction to both space and time factors allowed the provision of content through CSCL environment to students, which added the advantages of easiness and quick information access.
2. The employment of handmade embroidery discussion forum tool in conducting distant debates among students themselves, on one hand and between students and their teacher, on the other hand helped to exchange experience; answer students' questions; and gain information, concepts and knowledge, which led to high levels of academic achievement and skill performance.
3. Students' interaction with the content that was presented by text, photographs and drawings helped to make concepts more clearer and stimulated students' motivation to learn.
4. The repeated access to the content provided via CSCL environment helped to account for the individual differences among students. Each student according to their capabilities a learned according to her abilities, readiness and pace.
5. The subjection of students to six types of homework that could cover all course aspects motivated them to access the content repeatedly to identify the right answers, which led to the development of their knowledge and skill aspects.
6. Student's distant interaction via smaller groups of five in the cooperative project helped the development of skill aspects within smaller groups that constituted the experimental group.

CONCLUSION

The present study examined the effect of using CSCL environment in promoting students' achievement and handmade embroidery skills. Results proved that there was a statistically significant difference between the modified gain ratios of participants in both groups in favor of the experimental group that was taught via the use of CSCL environment.

To have a look at samples of students' products and make comparisons, see figures from 5- 11.

Figure 5: Gift box cover embroidered with satin ribbons, strings and other accessories (the experimental group)

Figure 6: A cushion embroidered with satin ribbons, strings and other accessories(experimental group)

Figure 7: Cloth bag embroidered with cotton threads(experimental group)

Figure 8: Gift box cover embroidered with satin ribbons and Al Sarema ribbons (the experimental group)

Figure 9: A cushion embroidered with satin ribbons, threads and some other accessories (control group)

Figure (10): A cushion embroidered with cotton strings (the control group)

Figure (11): Cloth bag embroidered with cotton strings (the control group)

Recommendations for Future Research

In light of the concluded findings of the present study, researchers put forward the following set of recommendations:

1. The use of CSCL environment in similar educational situations.
2. The use of CSCL environment when developing students' Handmade Embroidery skills at the college of education.
3. The use of CSCL environment the colleges of education by instead of the traditional education.
4. All universities and educational institutions should be interested in raising the awareness of faculty members and students of the importance of CSCL environments and their role in improving the educational process.
5. Train the faculty members on how to use CSCL environments and prepare their courses to suit it through training courses to develop their capabilities.

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