

# ENHANCING STUDENTS' LEARNING AND SELF- EFFICACY THROUGH BLENDED LEARNING IN A TEACHERS' PROGRAM

By

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### ABSTRACT

*Blended Learning (BL) strategies play an important role in collaboration, communication skills, motivation, attitudes, interaction with the subject and practical skills. However, their relationship with students' learning and self efficacy were not studied enough and this was the focus of this study. Therefore, the aim of the study was to investigate the effectiveness of blended learning strategy on enhancing students' learning and raising their self efficacy. A sample of 28 students participated in the study. They were divided randomly into two groups. One group studied through blended learning (BL) strategy and the other through regular conventional methods. Both groups were asked to respond to a self efficacy scale and take achievement test. The results indicated that students in the blended learning strategy group outscored in grades significantly their counter partners in conventional method. However there were no significant differences among the two groups in the self-efficacy measures. Within the scope of this study, the results implied that BL in teacher education might be applied in order to provide better learning environment.*

*Keywords: Blended Learning, Self Efficacy, Students' Learning, Teacher Preparation Program.*

### INTRODUCTION

It was observed that e-learning has been questioned in term of its effectiveness in the learning process than that of blended learning, which is explained by Motteram (2006) as bringing together the traditional physical classes with the elements of virtual education. Moreover, Singh (2003) shows that e- learning is a part of blended learning and that blended learning mixes various event - based activities such as face – to - face classroom, live e-learning and self-based learning. DeGuia (2004) expressed an advantage of blended learning as a relaxation with differentiated instructions to meet student needs, styles and interest. Clark and Mayer (2008) indicated that there is a range of definitions of blended learning. For example, Thorne (2003) suggests that blended learning is the integration between e-learning and face-to-face instruction. Mayadas and Picciano (2007) on the other hand, defines blended learning as simply a combination of online learning and face-to-face instruction; Garnham and Kaleta (2002) define such 'hybrid' courses with a more sequential perspective as, conventional courses with parts of their instructional activities running online, so that such an arrangement considerably cuts down the time students

spend in face-to-face classrooms. Blended learning is not only to blend different media. In designing, developing and delivering different types of blends - component, integrated, collaborative or expansive – the learning outcome must be in focus. This cannot be investigated without a look at the learners, the learning culture, the learning resources, the electronic infrastructure, the scalability and the maintainability of the proposed solution. Keengwe and Kang (2013) stated that "When blended learning uses other pedagogical methods, such as problem-based learning and a community of inquiry, its effectiveness can be magnified. Therefore, it is necessary for teacher educators to integrate online activities and face-to-face activities in blended learning. Program designers should also connect online learning with face-to-face learning or with fieldwork in teachers preparation programs. Collaborative learning, project-based methods, and problem-based learning ought to be integrated in blended learning because these activities can minimize student teachers' isolation, and enhance better understanding of the curriculum" (p.491).

In the current study, blended learning took the form of a combination of face-to-face classroom teaching with

lecture and class formats and the use of an asynchronous online classroom. The students had to attend classes in person, but also had access to an asynchronous online classroom to undertake a range of learning activities based on their classes. These activities were included to enhance their knowledge through additional reading and through browsing relevant linked websites, with other activities such as self assessments, exercises and group tasks and structured discussions. The suggested strategy gives clues regarding improvement of the technology concepts. In addition, the researcher has an interest in understanding the students' needs in order to both increase the motivation and well-being of students and reduce student attrition. Many factors may affect academic achievement, psychosocial status, and personality. One particular factor that is of considerable interest is the domain of Self-Efficacy. Research has suggested that self-efficacy is important to not only the academic and social adjustment of students but also to their overall wellness and personal adjustment (DeWitz & Walsh, 2002; Solberg & Villareal, 1997). People with higher levels of self-efficacy tend to be more motivated, use more strategies, have higher achievement, and experience less stress and anxiety. For this reason, understanding self-efficacy is of utmost importance. The interest here is to show whether the strategy leads to the improvement of the technology concepts and better self-efficacy towards learning technology courses.

In the literature there were plenty of studies examining the potential of BL strategy on the learning process. They were presented in a chronological order from year 2002 and on. King (2002) explored the dynamics and experiences of the instructor and students participating in a hybrid/blended teacher education program. The conclusion was reached that blended learning may present an opportunity to develop interactive and collaborative learning communities for pre-service teachers by overcoming the drawbacks of online instruction and minimizing the inconvenience of traditional face-to-face instruction. Chen and Jones (2007) found that the majority of students in the blended learning section indicated that they would take another accounting course using that approach if it was offered. However, some interesting differences were

noted. Specifically, students in the traditional setting were more satisfied with the clarity of instruction. On the other hand, students in the blended-learning section felt more strongly that they gained an appreciation of the concepts in the field. Blended-learning students also indicated more strongly that their analytical skills improved as a result of the course. The results suggest that the two delivery methods were similar in terms of final learning outcomes, but that both may be improved by incorporating aspects of the other. In terms of the effects of BL strategy on self efficacy, Orhan (2007) found that students' self efficacy benefited from blended learning environment with self regulated learning strategies. EL-Deghaidy and Nouby (2008) conducted a study in which a cooperative-based blended e-learning environment was used. The study was carried out with 26 teacher candidates. There was an experimental group and a control group. The findings obtained demonstrated that the post-test mean scores of the teacher candidates in the experimental group (blended learning group) were higher than those of the teacher candidates in the control group.

Simsek (2009) examined the influence of the blended learning model on physics teacher candidates' attitudes towards web-based, computer-based and Internet-based instruction. The study was carried out within the scope of the course of Modern Physics Instruction. In order to determine students' attitudes towards web-based, computer-based and Internet-based instruction, a pretest was applied to the students before the application, while after the application, a posttest was applied to determine if there was a change in the students' attitudes. The study was conducted twice in the academic years of 2007 – 2008 and 2008 – 2009 by using the same scales. In the first application, the study group included 21 students, while the study group in the second application employed 29 students. The results of the study revealed that in both applications, the blended learning model significantly and positively influenced the physics teacher candidates' attitudes towards web-based, computer-based and Internet-based instruction.

Al-Saleem et al. (2010) attempted to investigate the effect of using blended learning on teaching English as a Foreign Language (EFL) on the students' oral skills. The result of the

study indicated that, blended learning enhanced significantly the EFL oral skills of the students of the experimental group due to the teaching treatment. This result explained that blended learning exposed students to unlimited interaction with a language user, using a sense of hearing, seeing and interacting. Also, the experimental groups were more interested in learning oral skills that leads to improving their performance. Hiltz and Murray (2005) found that face-to-face courses skillfully blended with online learning technologies and methodologies generally are rated by students as significant improvements over traditional face-to-face classes but that the pace of this change depends upon different social factors.

Lopez-Perez et al. (2011) indicated that the use of blended learning has a positive effect on reducing dropout rates and in improving exam marks. Moreover, the students' perceptions of blended learning are interrelated with their final marks depending on the blended learning activities and on the students' age, background and class attendance rate. Yapici and Akpyin (2012) found that the blended learning model contributed more to the students' biology achievement than traditional teaching methods and that the students' attitudes towards the Internet developed statistically significant. Al-saai et al (2011) investigated the effect of a blended e-learning environment on students' achievement and attitudes toward using e-learning at the university level. Results showed insignificant difference between the instructional treatments in gain scores of the achievement test. However, the results in the attitudes scale showed a significant difference in gain scores in favor of blended e-learning approach. Rowe, Frantz, & Bozalek (2012) indicated that there were practical benefits to explore the use of blended learning in clinical education among healthcare students. They found that blended learning has potential to enhance the development of a range of clinical competencies among healthcare students.

Currently, there is a growing concern about the effectiveness of the blended learning strategy. Shen et al. (2013) conducted a case study with mixed methods data collection analysis to examine the application of blended learning in accelerated post-baccalaureate teacher

education at the program level. Findings from their study support the viability and benefits of applying blended learning in teacher education at the program level. Al-ani (2013) provided supporting evidence to move forward towards a blended learning environment using MOODLE (Modular Object-Oriented Dynamic Learning Environment). Students' responses have shown the effectiveness of using MOODLE on their learning motivations, achievements, collaboration and communication skills. The results also demonstrated that using blended learning would help students to be more self-regulated and self-directed by reducing the number of days and hours spent in traditional face-to-face learning environments. Bhote (2013) confirmed that trainee teachers in the blended course were able to develop their professional skills and knowledge as effectively as those who attend non blended courses. He also found that this mode of delivery is cost efficient in its delivery. It is hoped that others within the educational sector, who may be seeking to develop similar programs, will find this research useful. Werth et al. (2013) investigated the use of blended learning in the classroom, including its perceived benefits and the barriers to implementation for teachers. In general, teachers experienced in blended learning found it to be a great benefit in allowing self-paced learning, providing resources to students who missed class or are struggling, obtaining and using student achievement data, providing feedback to parents, and differentiating instruction. Poon (2013) aimed to examine the benefits that blended learning provides to students' learning experiences. The discussion in Poon's paper has focused on lessons learned from academics in developing blended learning, and has reported students' perceptions of the blended learning environment. The data collected for the study included interviews with academics and responses from students in a questionnaire survey. The research findings formed the basis of recommendations for the development of learning and teaching practices and approaches that will enhance students' learning experiences.

It is observed from the above studies that, the blended learning environment may play an important role in achievements, collaboration, communication skills, motivation, attitudes interaction with the subject and

practical skills. However, the relationship with self efficacy was not studied enough and this was the focus of this study. Students often experience difficulties regarding the technology concepts. Sometimes, they lack the understanding ability to comprehend these concepts that is totally different from other concepts. If the achievement of the student is not improving self efficacy might be affected. Having self-efficacy regarding the technology concepts is essential to everybody living in the existing world. It is widely acceptable that students should master these concepts as early as possible to ensure that they will have the ability to fully understand the technology content in the future. If not taught well, students might have a difficulty in the future. They might not have the edge to compete globally if they do not have the self-efficacy towards learning in technology courses. Despite the fact that they may be using computers and technology in their daily life, learners might feel less confident to attend online classes, especially for the first time. They may not have enough of the necessary learning and technology skills for university and online learning (Kennedy, Judd, Churchward, Gray, & Krause, 2008; Mandernach, Donnelly, & Dailey-Hebert, 2006; Ratliff, 2009; Wojciechowski & Palmer, 2005). Therefore, online courses should be designed to support these learners so that their self-efficacy is improved and maintained. Some studies suggest that embedded learner control in online modules can enhance learning and increase positive attitudes (Chang & Ho, 2009; Ebner & Holzinger, 2007). However, few studies have examined the achievement and self-efficacy of online learners in a blended classroom. Because of the lack of studies in relation to BL in teacher education and lack of teacher educators' experience and competence in technology, it is anticipated that this study would contribute to research about teaching in teacher education and to the teacher educators in the integration of BL into their teaching. Therefore, this study in progress is intended to explore this missing piece of knowledge.

## The Research Questions

- What is the effect of a blended learning strategy based on enrichment activities on acquiring technology concepts and getting better self- efficacy towards

learning technology courses?

The study is intended to answer the following questions:

- What is the effect of using blended learning strategy based on enrichment activities on acquisition technology concepts?
- What is the effect of using blended learning strategy based on enrichment activities in improving self-efficacy towards learning technology courses?

## Hypotheses of The Study

The study attempted to explore the following two hypotheses:

- The usage of a proposed blended learning strategy based on enrichment activities leads to higher acquiring of technology knowledge.
- The usage of a proposed blended learning strategy based on enrichment activities leads to better self-efficacy.

## Purpose Of The Study

The purpose of this study is to test the effectiveness of the proposed learning strategy in teaching an introductory course in educational technology (TECH 1100, Instructional Technology: Field and Theory). It is a two credit - hour course taught for students majoring in Instructional Technology At The College Of Education Of Sultan Qaboos University. In detail, the proposed study investigates the impact of blended learning strategy in acquiring technology knowledge and determines whether it will lead to better self- efficacy towards learning technology courses in the future.

## Methods

### Population and Sample

The target population is all undergraduate students who are studying and will study educational technology courses at the Department of Instructional And Learning Technologies at the College of Education of Sultan Qaboos University with a total number of 128 students. The sample consists of students who studied TECH 1100: Instructional Technology : Theory and Field, in the year 2011 -2012 at the second semester with a total number of 28 divided into two classes. Each class consisted of 14 students. The

researcher chose one class randomly to be the experimental group. The period of study was about four weeks.

### *Variables of The Study*

The independent variable was the teaching method (categorical variable) which is the strategy of blended learning based on enrichment activities electronically in the MOODLE course management system. Both control and experimental group attended the f2f (Face to Face) classes. However, the experimental group was exposed to the enrichment program in the Virtual Learning Environment (VLE) which is MOODLE based.

The study involved two dependent variables which are achievement test-testing the acquisition of technology concepts and Self-Efficacy scale They are explained as follows

- The student achievement (quantitative variable) which was measured by a post test designed by the researcher. The post test consists of 20 items testing the students' ability in mastering technology concepts. Each item is worth two points.
- The student self-efficacy questionnaire towards learning technology courses restricted to the course "TECH1100" (quantitative variable) was also designed by the researcher. The questionnaire examines to what extent each skill has been accomplished and mastered according to the objectives of the course.

### *The Students' Self Efficacy Towards Learning Technology Courses Scale*

The aim of this scale was to measure the students' self efficacy towards learning technology courses after the treatment. The five –point Likert Scale was used to measure the students' responses. The levels of the scale responses were strongly agreed, agree, uncertain, disagree and strongly disagree. Scores from 1 to 5 were assigned for negative responses while scores from 5 to 1 were assigned for positive responses. To measure the self efficacy of any course, the researcher considered the outlines and objectives of the course. This is the base in designing the self efficacy scale regarding any course or content. So the self efficacy scale in this current study was designed by the

researcher himself on the light of the objectives of the course. The role of this scale was to measure to what extent the student could acquire a specific technology concept.

The first version of the scale was given to the reviewers to judge the statements according to the following:

- The clarity of the meaning of the statement to the respondents.
- The appropriateness of syntax of words to the intended respondents.

Reviewers suggested changes in some statements such as adding or deleting words. They also rewrote some statements in another way to be correct or clearer. The self efficacy scales for the experimental and the control groups were constructed using 16-items. Cronbach Alpha was 0.952 for experimental group and 0.891 for controls. The results of the self efficacy questionnaire were analyzed by scoring the responses on the five-point Likert scale ranged from "1" (Strongly Disagree) to "5" (Strongly Agree).

### *The Students' Course Achievement Test*

The second tool of the instruments of this study is the achievement test. This tool is used to test to what extent students from the experimental group master the technology concepts under the effect of the treatment and compare it to the control group who studied in a traditional way. The difference between the two groups in the performance of this test was analyzed. This test was designed by the researcher and used as a post test. The test consists of twenty questions. All are multiple choice questions designed in alignment with to the objectives.

In order to perform the t-test procedures, two assumptions of normality and homogeneity of variance were tested. The normality was evaluated by using the One Sample Kolmogorov Smirnov Test and the Shapiro- Wilk Test, and the Levene's Test was used for the equality of variances.

### *Results Related To The Students' Marks In The Previous Information Technology Course*

Results related to the students' marks in the Information Technology (IT) course at the foundation level were analyzed. Table (1) shows that the student in the experimental group scored equivalent to those in the control group (mean = 87.5) with less variations existing

| Group        | N  | Min | Max | Mean | Median | Std.Dev. |
|--------------|----|-----|-----|------|--------|----------|
| Experimental | 14 | 62  | 100 | 87.5 | 93     | 12.270   |
| Control      | 14 | 61  | 98  | 87.5 | 90     | 10.5884  |

**Table 1. Students' Marks on the Previous IT course**

| Group | stat | Kolmogorov Smirnov df | sig  | stat | Shapiro Wil df | Sig  |
|-------|------|-----------------------|------|------|----------------|------|
| Exp.  | .160 | 14                    | .200 | .899 | 14             | .111 |
| Cont. | .196 | 14                    | .151 | .879 | 14             | .057 |

**Table 2. Normality Tests of Marks of Previous Level**

among students in the control group (SD=10.59) than the experimental group (SD=12.27).

As a pre-requisite for t-test, the scores were analyzed to verify normality. From table (2), that Kolmogorov-Smirnov (control: p=0.151, experimental: p=0.200) and Shapiro Wilk test (control: p=0.057, experimental: p=0.111) for normality are not significant and hence distributions of scores are normally distributed.

The question was, Is there any difference between the mean scores of the experimental group and those of the control group prior to instruction? To answer this question, the null hypothesis was formulated. "There are no statistically significant differences between the marks obtained in the previous level of the experimental group and that of the control group". To test the significance of these differences between the mean scores of both groups on IT instruction, the independent t-test was computed as shown in tables 3&4..

As shown in table (3), the Levene's Test for equality of variances indicated that, the equal variances between the

|                             | Levene's Test for Equality of Variances |      | T-test for Equality of Means |        |      |
|-----------------------------|---|------|------------------------------|--------|------|
|                             | F                                       | sig  | T                            | df     | sig. |
| Equal variances assumed     | 1.096                                   | .305 | 1.029                        | 26     | .313 |
| Equal variances not assumed |   |      | 1.029                        | 24.672 | .313 |

**Table 3. The Independent T - Test between the Two Groups on the Marks of Previous Level**

| Group        | N  | Min. | Max. | Mean    | Median | Std. Deviation |
|--------------|----|------|------|---------|--------|----------------|
| Experimental | 14 | 30   | 100  | 70.0000 | 70.00  | 17.97434       |
| Control      | 14 | 30   | 80   | 51.7857 | 47.50  | 15.51763       |

**Table 4. Descriptive Statistics of the achievement in technology concepts for both groups**

control and experimental groups is assumed ( $p > .05$ ). And the t- test results indicated that no significant difference between the experimental group and controls in their level before the instruction begins ( $t = 1.029$ ,  $p = .313 > 0.05$ ). This finding supports the assumption that the groups are equivalent.

## Results

### The First Hypothesis

The first hypothesis stated that the usage of blended learning strategy leads to the acquiring of technology concepts. Table (4) shows the students' technology concepts achievement in the experimental group was higher than the student in the control group (mean = 70.0 and 51.79 respectively) with less variations existing among students in the control group (SD=15.51) than the experimental (SD=17.97).

As a pre-requisite for t-test, the scores were analyzed to verify normality. As shown in table (5), that Kolmogorov-Smirnov (control: p=0.120, experimental: p=0.200) and Shapiro Wilk test (control: p=0.154, experimental: p=0.592) for normality are not significant and hence distributions of scores are normally distributed.

The question was: "Is there any difference between the mean scores of the experimental group following blended learning strategy and those of the control group following the conventional instruction in technology concepts?"

To answer this question, the null hypothesis was formulated: "there are no statistically significant differences between technology concepts achievement of the experimental group and that of the control group due to the instructional strategies.

To test the significance of these differences between the mean scores of both groups on grammar in the post-test, the independent t-test was computed as shown in Table (5):

As shown in table (6), the Levene's Test for equality of

| Group | stat | Kolmogorov Smirnov df | sig  | stat | Shapiro Wil df | Sig  |
|-------|------|-----------------------|------|------|----------------|------|
| Exp.  | .176 | 14                    | .200 | .952 | 14             | .592 |
| Cont. | .204 | 14                    | .120 | .909 | 14             | .154 |

**Table 5. Normality Tests of Technology Concepts Achievement**

|                             | Levene's Test for Equality of Variances |      | T-test for Equality of Means |        |      |
|-----------------------------|---|------|------------------------------|--------|------|
|                             | F                                       | sig. | T                            | df     | sig. |
| Equal variances assumed     | .041                                    | .842 | 2.87                         | 26     | .008 |
| Equal variances not assumed |   |      | 2.87                         | 25.458 | .008 |

**Table 6. The Independent T-Test between the Two Groups on Technology Concepts Achievement**

variances indicated that the equal variances between the control and experimental groups is assumed ( $p > .05$ ). And the t- test results indicated that a significant difference exists between the experimental and control in technology concepts achieved ( $t=2.870$ ,  $p=.008 < 0.05$ ). This means that students' technology concepts achievement on the post-test which was improved due to the treatment in favor of the experimental group was taught by a blended learning strategy.

### The Second Hypothesis

The second hypothesis stated that the usage of blended learning strategy improves self-efficacy. Table (7) shows that the students' self efficacy towards learning technology courses, is higher for the experimental group than the students in the control group (mean = 3.9517 and 3.5672 respectively) with less variations existing among students in the control group ( $SD=.67804$ ) than the experimental group ( $SD=.74867$ ).

As a pre-requisite for t-test, the scores were analyzed to verify normality. As shown in table (8), that Kolmogorov-Smirnov (control:  $p=0.200$ , experimental:  $p=0.127$ ) and Shapiro Wilk test (control:  $p=0.295$ , experimental:  $p=0.121$ ) for normality are not significant and hence distributions of scores are normally distributed.

The question was: "Is there any difference between the mean scores of self efficacy towards learning technology courses of the experimental group following blended learning strategy and those of the control group following the conventional instruction ?

To answer this question, the null hypothesis was formulated:

| Group        | N  | Min. | Max. | Mean   | Median | Std. Deviation |
|--------------|----|------|------|--------|--------|----------------|
| Experimental | 14 | 2.00 | 5.00 | 3.9517 | 4.0588 | .74867         |
| Control      | 14 | 2.65 | 4.82 | 3.5672 | 3.3824 | .67804         |

**Table 7. Descriptive Statistics of Self Efficacy**

"there are no statistically significant differences between the self efficacy towards learning technology courses of the experimental group and that of the control group due to the instructional strategies. To test the significance of these differences between the mean scores of both groups on self efficacy in the post-test, the independent t- test was computed as shown in table (9).

As shown in table (9), the Levene's Test for equality of variances indicated that the equal variances between the control and experimental groups is assumed ( $p > .05$ ). And the t- test results indicated that no significant difference existed between the experimental and control in a self efficacy scale towards learning technology courses ( $t=1.424$ ,  $p=.166 > 0.05$ ). The students' self efficacy towards learning technology courses, on average, was higher in the experimental group than those in control group due to the instructional method, but the difference wasn't significant.

### Discussions

In this section, the statistical treatment has been discussed. The statistical program SPSS (Statistical Package for Social Science) was used to analyze if there was a statistically significant difference between the two groups by using alpha .05 levels. The tests used are Independent t-test or the Non Parametric Mann Whitney U-test depending on the normality of the data distribution.

In order to perform the t-test procedures, two assumptions of normality and homogeneity of variance were tested. The normality was evaluated by using the One Sample

| Group | stat | Kolmogorov Smirnov df | sig  | stat | Shapiro Wilk df | Sig  |
|-------|------|-----------------------|------|------|-----------------|------|
| Exp.  | .202 | 14                    | .127 | .902 | 14              | .121 |
| Cont. | .162 | 14                    | .200 | .929 | 14              | .295 |

**Table 8. Normality Tests of Self Efficacy**

|                             | Levene's Test for Equality of Variances |      | T-test for Equality of Means |        |      |
|-----------------------------|---|------|------------------------------|--------|------|
|                             | F                                       | sig  | T                            | df     | sig. |
| Equal variances assumed     | .000                                    | .983 | 1.424                        | 26     | .166 |
| Equal variances not assumed |   |      | 1.424                        | 25.749 | .166 |

**Table 9. The Independent T-Test between the Two Groups on Self Efficacy Scale**

Kolmogorov Smirnov Test and the Shapiro- Wilk Test, and the Levene's Test was used for equality of variances.

The results of the self efficacy questionnaire were analyzed by scoring the responses on the five-point Likert scale ranged from "1" (Strongly Disagree) to "5" (Strongly Agree).

The self efficacy scales for the experimental and the control groups were constructed using 16-items. Cronbach Alpha was 0.952 for experimental group and 0.909 for controls. The scores of the achievement test were analyzed to verify normality via Kolmogorov-Smirnov and Shapiro Wilk test.

The proposed learning strategy based on the enrichment activities used in the current study had a real effect in the acquiring of technology concepts. In fact, the experimental group performed significantly better in the test than the control group.

The first hypothesis was based on several studies that concentrate in the learning outcomes using blended learning. The study of Al Rusais (2003) found that there were statistically significant differences in the performance of the study samples in favor of the experimental group regarding the computer- assisted instruction program. Also, (Melton, B. F. Graf, H & Chopak-Foss, J, 2009) stated that satisfaction scores between blended and traditional classes were significantly different in favor of blended classes and blended students' overall grades were significantly higher. Results indicated that a blended course delivery is preferred over a traditional lecture format. Moreover, the study of London, Norman and Gurantz (2008) focuses on a large after - school provider and findings indicate that students attending the program, particularly at higher levels of attendance, have greater rates of gain in the listening and speaking portions. The results point to the need for increased examination of the link between in-school and out-of school activities in relation to technology concepts acquisition.

The second hypothesis was based on few studies that have been carried out on this concept of self efficacy in the academic settings. There is a strong relationship between self-efficacy and academic performances (Pajares, 1995). In their study, Mahyuddin et al (2006) found the relationship between students' self efficacy and their English language achievement and analysis showed positive correlations

between several dimensions of self efficacy and academic achievement. Achievement in technology concepts will improve when students have high self efficacy in technology courses. In related research, Schunk (1995) stated that when students are engaged in activities, self efficacy would be enhanced and when they are aware of it they would perform better.

## Recommendations

Based on the findings of this study, several recommendations can be made on the use of blended learning as a teaching strategy. Among these recommendations are the following:

- For colleagues who intend to use blended learning in the future, it is suggested that the teaching style should be kept simple, but that the individuals must be prepared to be experimental.
- Different modules and courses require different forms of blended learning to suit the course, the content, and the students' needs; therefore, having a flexible approach is important:
- Faculty should redesign the courses in a way that meets students' preferences and interest including variety of activities which result in active learning through blended learning strategy.
- Higher education institutions should focus on developing and improving teaching strategies in particular blended learning strategy.
- The virtual learning environment (VLE) should be one of the priorities in teaching and learning due to its flexibility for the learner.
- Conduct similar studies in using blended learning with other subjects.

## Conclusion

The purpose of this study was to test the effectiveness of the proposed BL strategy in teaching technology concepts for undergraduate students. In detail, the proposed study investigated the impact of this strategy in acquiring technological knowledge on one side and to determine whether it will lead to improvement in self- efficacy towards learning technology courses in the other.

The sample consists of the students who studied TECH 1100 Instructional Technology : Theory and Field, in the year 2011

-2012 at the second semester. The research method that was used in the study was the Quasi Experimental Design as it is the most suitable method to achieve the purpose of study and test the hypothesis of it.

Findings indicate that students who were exposed to the blended strategy and enrichment program performed academically better than the students who did not. There are significant statistical differences at the level ( $\alpha < 0.05$ ) between the two groups in achievement and self efficacy in favor of the experimental group indicating that enrichment activities had a strong impact on students' achievement. It shows that in the students' technology concepts achievement in the experimental group scored higher than the student in the control group (mean = 70.0 and 51.79 respectively) with less variations existing among students in the control group (SD=15.51) than the experimental (SD=17.97). The students' self efficacy towards learning technology courses, on an average, was higher in the experimental group than those in control group due to instruction method, but the difference wasn't significant. This indicated that there was no significant difference between the experimental and control in a self efficacy scale towards learning technology courses ( $t=1.424, p=.166 > 0.05$ ).

It can be concluded that the blended learning approach has two benefits. One comes from the benefits of face-to-face interaction between student to student and the face-to-face interaction between student to teacher, the other benefit come from online learning as well. In blended learning, the purpose is to establish a balance between online learning and face-to-face learning. In terms of the balance between face-to-face learning and online learning, the balance may vary from one course to another. Due to the basic features of some courses, face-to-face learning is used more, while in other courses online learning is used more. Still in another course, both learning methods are equally used (Osguthorpe and Graham, 2003). A conclusion for a better blend of technology and teachers, schools must first focus on implementation to combine excellent technology and teaching. They must find and use the best available digital tools while also dramatically increasing the students' access to excellent

teachers. It would be easy to move toward blended learning while leaving students' access to great teachers. Instead, schools should shift to blended learning while enhancing teaching effectiveness. Blended learning can make changes in the teaching profession, transforming it into the highly paid, opportunity-rich career the community needs it to be. And it can substantially boost the opportunities students have to learn and grow. To achieve that vision at scale, policymakers need to act and design a wide range of policies to produce a better blended learning in all schools.

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