

Blended Learning: An Experiment on Student Attitudes

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ABSTRACT

The findings of a number of recent empirical studies on blended learning support this pedagogy claiming many advantages such as the facilitation of independent and collaborative learning experiences. This study compares the attitudes towards blended learning of undergraduate students in the UAE before and after a full course exposure to blended learning, comparing results to the attitudes of students in a traditional course. An experimental research design was chosen for this research study, specifically a two-group pretest-posttest research design. Results show that exposure to blended learning serves as a trigger for changing students' attitudes towards blended learning in a positive manner and that lack of exposure does not change student attitudes.

KEYWORDS

Blended Learning, Education, Experimental Design, Online Learning, Students' Attitudes, Technology, Traditional Learning

1. INTRODUCTION

Blended learning methods of learning are increasingly used in education. Blending traditional learning with e-learning promises to maximize the advantages of both forms of learning (Wu, Tennyson and Hsia, 2010). Research confirms the efficiency of blended learning in learner engagement, learning experiences, and opportunities for students (Wilson & Randall, 2012), improvement in knowledge and self-awareness (Beyth-Marom, Chajut, Roccas, & Sagiv, 2003), achievement in learning outcomes, and developing skills for life-long learning (Lau, Lam, & Zhou, 2010).

Definitions of blended learning have a common element which is the combining of traditional, face-to face, classroom teaching and e learning resulting in a multimodal approach to teaching and learning. For example, Driscoll (2002) defines blended learning as the intermixing of instructional forms to achieve an educational goal, whereas Garrison and Kanuka (2004) explain that blended learning means integrating classroom teaching with online experiences. Singh (2003) views blended learning as the combination of different delivery media for meaningful and motivating learning. Live chats, self-paced learning, instant messaging, social networking, blogs and forums, applications, wikis, journals and webinars are examples of tools instructors can use to incorporate online opportunities in their blended learning classes. The definition of blended learning adopted in this study is the combination of traditional face-to-face classroom teaching and online learning incorporating all the above mentioned methods and more with traditional methods.

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The purpose of this study is twofold as it aims to compare: the attitudes towards blended learning of undergraduate students in the UAE before and after a full course exposure to blended learning; the before and after attitudes towards blended learning of, undergraduate students who attended a full blended learning course and the attitudes of those who attended a traditional course. The rationale underlying this research study is that understanding students' attitude towards different learning aspects is very important in the assessment of the students' readiness for blended learning, which is a prerequisite for successful implementation of blended learning (Tang and Chaw, 2013).

A number of studies may be found in literature on the attitudes towards a blended delivery of learning however this study is different in that it does not take a cross-sectional approach like the majority of studies (Tang and Chaw, 2013; Liu, Hu, Zhan and Yan, 2014; Emelyanova and Voronina, 2017; Akbarov, Gonen and Aydongan, 2018) that measure attitudes towards blended learning once, either at the start or end of a blended learning course. The contribution of this study is that it uses an experimental methodology measuring both pre-course and after course attitudes. A control group is also utilized that is exposed to traditional teaching and learning which allows for comparison and control of the effect of being exposed to a course in blended learning form.

2.0 RESEARCH PROPOSITION

2.1 Theory

The theoretical framework of this study is the amended research model by Tang and Chaw (2013). In this amended model the theme attitude towards blended learning is operationalized using five constructs and these are: attitude towards learning flexibility; attitude towards online learning; attitudes towards study management; attitudes towards online interaction; attitudes towards classroom learning. Attitudes towards classroom learning was found to have a negative relationship towards attitude towards blended learning.

2.2 Empirical Evidence

Research supports the idea of combining face-to-face instruction with an online delivery mode because such a combination provides better learning outcomes (Garrison & Kanuka, 2004). The trend of merging asynchronous internet technology with synchronous face-to-face interaction is associated with improved pedagogy and easier access to information (Bonk & Graham, 2004). Similarly, Garrison and Kanuka (2004) suggest that blended teaching can facilitate independent and collaborative learning experiences. Blended learning builds both a community of inquiry and a platform for free and interactive dialogue. In addition, Paechter and Maier (2010) refer to how university students speak in favour of blended learning. Students being digitally literate enhance the chances of extending their lessons and conversations beyond the classroom (Kasraie & Alahmed, 2014). Instructors-led live events and webinars provide students with asynchronous content to explore in their own time and at their own pace. The latter is followed up by classroom discussion or debate. It is evident that combining technologically mediated learning with class debates helps students gain more understanding of the subject matter, and develops their cognitive and social skills at the same time (Okaz, 2015).

Similarly to the advantages mentioned above Liu, Hu, Zhan and Yan (2014) in a study with medical students discovered that students thought blended learning was better and more helpful than traditional learning and e-learning. This study revealed that, in comparison with traditional learning, blended learning has a number of advantages: students have better access to the learning materials and greater independence in study; it is convenient and time-saving with e-learning platform; students' motivation is improved and involvement with the course is increased; students feel more in control of their learning and the learning is more efficient.

The focus of this study is the students' attitudes towards blended learning. Akbarov, Gonen and Aydongan (2018) define attitudes towards blended learning as comprising six learning aspects:

Table 1. Summary of the Items of Individual Constructs

Construct	Number of items	Items
Attitude towards learning flexibility (LF)	3	1. I would like to decide when I want to study. 2. I like to study at my own pace. 3. I would like to decide where I want to study.
Attitude towards online learning (OL)	6	4. I do not resist having my lessons online. 5. I believe the Web is a useful platform for learning 6. I am comfortable in using Web technologies to exchange knowledge with others 7. I can collaborate well with a virtual team doing assignments 8. I appreciate easy online access to my lecturer 9. I am comfortable with self-directed learning.
Attitude towards study management (SM)	4	10. I organize my time better when studying online. 11. I can study over and over again online. 12. Online learning motivates me to prepare well for my studies. 13. Online learning encourages me to make plans.
Attitude towards classroom learning (CL)	3	14. I find learning through collaboration with others face-to-face is more effective. 15. I learn better through lecturer-directed classroom-based activities. 16. I learn better when someone guides me personally.
Attitude towards online interaction (OI)	5	17. I find Web technologies easy to use 18. I would like to interact with my lecturer online. 19. I would like to interact with other students outside of the classroom. 20. I find it easy to communicate with others online. 21. I am familiar with Web technologies

learning flexibility, study management, technology, online learning, online interaction, and classroom teaching (Tang & Chaw, 2013). Attitudes investigated in such a way are also indicators of student's readiness for blended learning. Students who generally have positive attitudes (and great levels of motivation) toward learning also have more positive attitudes toward online learning in blended courses (Zhu, Au, & Yates, 2013).

Findings by Tang and Chaw (2013) show that students who have a positive attitude towards online learning, study management, online interaction, and learning flexibility are more likely to adapt to blended learning. On the other hand, there is a negative relationship between attitude towards

classroom learning and readiness for blended learning. The stronger the need for classroom learning, the less ready the students will be for blended learning

In a study carried out with 56 management undergraduate students Emelyanova and Voronina (2017) concluded that students' attitudes towards blended learning changed from mostly negative to largely positive for the majority of the students whose attitudes were tested both before and after the blended learning course. Resistance towards blended learning also reduced. After exposure to blended learning learners viewed it as an engaging, more effective, and supplemental instrument in addition to face-to-face classes. They felt that it could foster the achievement of learner autonomy through developing self-directed learning skills and enhancing intrinsic motivation. Such positive changes may only occur once students have acquired an active participative role in a blended learning course environment.

In a more recent study with 162 students, Akbarov, Gonen and Aydongan (2018) concluded that students had a more positive attitude towards blended learning than traditional learning. Students particularly enjoyed using their devices during the class and this increased the amount of time students' spent participating in classroom activities. Their attitudes towards the introduction of infographics and establishing paperless classroom were positive though not too positive.

In a study using similar methodology to the current study described in the next section, Korkmaz and Karakus (2009) investigated the impact of blended learning on students learning in a geography course. Pretest and post-test recordings were made and a control group was also utilized. Conclusions made from the study were that blended learning does positively influence student attitudes towards the course in comparison to traditional learning. Students' critical dispositions, critical thinking and overall attitudes towards to the geography course were better when the students were in a blended learning course in comparison to a traditional course.

2.3 Hypothesis

The following are the three hypothesis researched in this study:

- H1 There is a positive relationship between attitudes towards blended learning and exposure to blended learning
- H2 There is a positive relationship between attitudes towards blended learning and exposure to traditional learning
- H3 Attitudes towards blended learning are more positive following exposure to blended learning in comparison to exposure to traditional learning

3.0 METHOD

3.1 Experimental Research Design

An experimental research design was chosen for this research study, specifically a two-group pretest-posttest research design. Pretest-posttest designs are widely used in social science research mainly to compare groups and/or measure change resulting from experimental treatment (Dimitrov and Rumrill, 2003). In this research the pretest-posttest design is used for both comparative and measurement reasons.

In the Experimental Group the dependent variable, specifically the attitudes towards blended learning, is measured before and after a 16-week blended learning course in Business Ethics and Corporate Governance. The impact of the blended learning course on the attitudes of students is determined by calculating the differences between the first assessment of attitudes and the second assessment. In the Control Group the dependent variable does not change from that of the first group and is measured using the same measure, however this time the students are exposed to a 16-week traditional learning course in Business Ethics and Corporate Governance (therefore serving as a

control group). In trying to decrease the impact of confounding variables the same instructor is used for both the blended learning course and the traditional learning course. Also both courses will follow the same course learning outcomes, delivery framework and assessments.

3.2 Sample

Participants are all third year Emirati full-time students reading for a degree in business. Students freely chose to either register for a face-to-face traditional course or a course offered in blended learning format. Participants were aware of how the course would be run prior to registration. In order to ensure that both groups received an equitable experience in terms of course learning outcomes, a series of formative and summative assessments were conducted to ensure that both groups were achieving the desired learning outcomes.

A total of 95 students participated in this research study. 22 students participated from the class delivered in a face-to-face fully synchronous traditional mode (Control Group) whilst 73 students participated from the class delivered in a blended delivery mode (Experimental Group).

3.3 Instrument

The questionnaire is made up of the 21 items in table 1 representing all the 5 attitude constructs (attitude towards learning flexibility; attitude towards online learning; attitudes towards study management; attitudes towards online interaction; attitudes towards classroom learning) in the research model by Tang and Chaw (2013). The 21 items are measured on a five point Likert Scale. These items were originally 34 items and were matched with 6 constructs however these were reduced to 21 items and 5 constructs (attitudes towards technology was eliminated as a construct) following an exploratory factor analysis, an item analysis and a principals component analysis. All remaining items showed satisfactory Cronbach alpha. There is a negative relationship between items (Items 14, 15 and 16) representing attitude towards classroom learning and readiness for blended learning

3.4 Procedure

The following steps were pursued throughout the experimental operation:

1. The blended learning group and the traditional learning group were self-assigned based on student registration.
2. The blended learning group and the traditional learning group were oriented to the course and the mode of instruction in their first lesson.
3. As a pre-test, both groups were administered the 21-item attitude measurement online
4. All students' received 4 hours of instruction a week for 16 weeks following the same course learning outcomes, delivery framework and assessment. The instructor was the same person for both delivery modes.
5. The blended delivery of learning was composed of:
 - Synchronous teacher-led classroom instruction;
 - Synchronous teacher-led online instruction;
 - Online tutoring;
 - Online collaborative work;
 - Asynchronous project based learning;
 - Asynchronous and synchronous online discussions and group activities;
 - Asynchronous online self-reflection;
 - Asynchronous formative assessments;
 - Synchronous summative assessments

Table 2. Pre-traditional classes and Pre-blended learning class scores

	Mean	SD	Variance
Pre-traditional classes	3.24	.70	.50
Pre-blended learning classes	3.09	.69	.45

Amongst the Learning Management System (LMS) tools utilized in the blended delivery are: online journals; discussion boards; Wikis; Blogs; course chat; online quizzes; Nearpod.

The traditional class was exposed to traditional face-to-face teaching methods using synchronous: teacher-led classroom instruction; discussions; group work; self-reflection quizzes; project based learning; face-to-face tutorials; printed handouts; formative and summative assessments.

6. One week before the end of classes the 21-item attitude survey was re-administered as the posttest.

3.5 Analyses of data

Results were analyzed using, descriptive statistics, correlations and hypothesis testing. The use of pretest scores helped to reduce error variance, producing more powerful tests. The power of the test represents the probability of detecting differences between the blended learning group (Experimental Group) and the traditional learning group (Control Group) when such differences exist (Dimitrov and Rumrill, 2003).

4.0 RESULTS

4.1 Pre-test Results

The 95 participating students, specifically the control group in the traditional class (22 students) and the experimental group in the blended learning class (73 students), when tested for attitudes towards blended learning at the start of the classes scored similarly. Table 2 shows the slight difference in means, the similar standard deviation as well as variance between the scores for students in the traditional class (control group) and students in the blended learning class (experimental group) at the start of classes. On average all participants at the start of their classes, be it traditional or blended learning, leaned towards the central score on a scale from 1 to 5 with 1 representing a strong negative attitude towards blended learning and 5 representing a strong positive attitude towards blended learning.

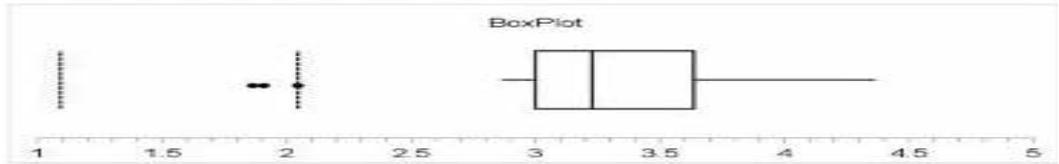
Figure 1 and 2 show the distribution of scores indicating three outliers for the traditional class (Control Group) and two outliers for the blended learning class (Experimental Group). Within the group of students in the blended learning class the three items contributing to outliers in scores were related to online learning, namely:

1. I can collaborate well with a virtual team doing assignments
2. I appreciate easy online access to my lecturer
3. I am comfortable with self-directed learning.

For the participants in the traditional class and those in the blended learning class the items receiving least scores were the items related to classroom learning, namely:

1. I find learning through collaboration with others face-to-face is more effective.
2. I learn better through lecturer-directed classroom-based activities.
3. I learn better when someone guides me personally.

Figure1. Distribution of score for traditional class



Students in both the Experimental and Control Groups showed least favorable attitude at the start of the semester towards aspects of classroom learning such as face-to-face collaborations, lecture directed learning and one-to-one guidance.

The weak difference in the mean of scores at the start of the research between the two groups reduces the presence of extraneous variables that might influence results. This weak difference between the two groups at the start of the research was further confirmed using Hypothesis Testing ($t(20) = 1$; $p=0.3$) and the Kendall Coefficient of Concordance. There is a significant degree of concordance between the Control Group and Experimental Group at the start of the classes (Kendall's $W = .4$; $p = .004$).

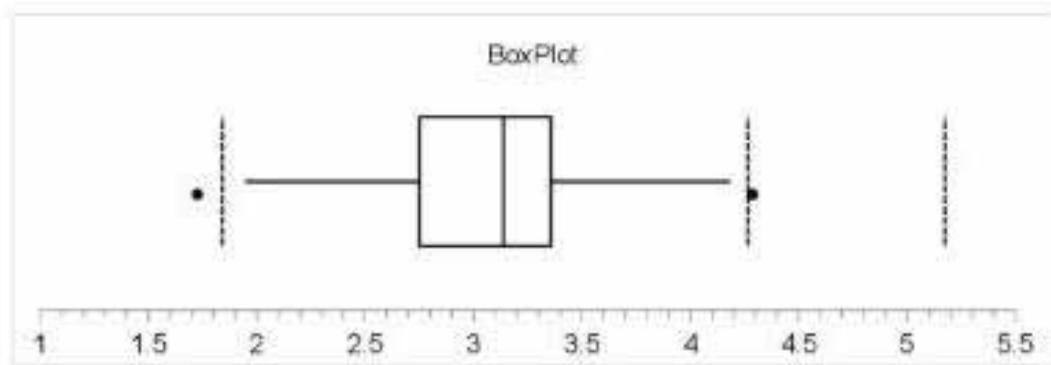
4.2 Post-test Results

At the end of the 16-week blended learning and traditional classes the 95 participating students, specifically the control group in the traditional class (22 students) and the experimental group in the blended learning class (73 students), were tested once again using the same measure as used in the pre-test.

Table 3 shows a larger difference in means between the blended learning class and the traditional class than that in Table 2. On average all participants at the start of their classes, be it traditional or blended learning, leaned towards the central score on a scale from 1 to 5 with 1 representing a strong negative attitude towards blended learning and 5 representing a strong positive attitude towards blended learning (Table 2). However, at the end of their classes whilst the students attending traditional classes maintained a similar overall mean score on their attitudes towards blended learning, on the other hand the group of students completing their blended learning classes recorded an increase in positive attitudes towards blended learning and therefore in their overall mean score (Table 3). The gap between the overall mean score for students attending traditional classes and students attending blended learning classes increased following exposure to both modalities of teaching.

Figure 3 and Table 4 show the percentage increase or decrease in the means on all 21 items on the attitude scale following the traditional classes (brown line graph) and blended learning classes (blue line graph). Participants attending the blended learning classes showed a greater increase in positive attitudes towards blended learning when compared to students attending the traditional classroom. All mean scores for students attending the blended learning classrooms increased with the exception of item 15 (I learn better through lecturer-directed classroom-based activities) whilst mean scores for students attending the traditional classrooms decreased for 8 items (items 2,3,7,11,12, 14, 15 and 21) shown in Table 1. Item 20 (I find it easy to communicate with others online) recorded a 96% increase in mean for students attending the blended learning class.

Figure 2. Distribution of score for blended learning class



4.3 Hypothesis Testing

H1 There is a positive relationship between attitudes towards blended learning and exposure to blended learning

The first hypothesis in this study is accepted and the null hypothesis that there is no relationship between attitudes towards blended learning and exposure to blended learning is rejected. There is a significant and positive difference in the pre-test scores ($M= 3.09$; $SD= .69$) and post test scores ($M= 3.54$; $SD= .79$) for the blended learning class; $t(21) = 2.749$, $p= 0.01$.

H2 There is a positive relationship between attitudes towards blended learning and exposure to traditional learning

The second hypothesis in this study is rejected and the null hypothesis that there is no relationship between attitudes towards blended learning and exposure to traditional learning is accepted. There is a no significant difference in the pre-test scores ($M= 3.24$; $SD= .70$) and post test scores ($M= 3.29$; $SD= .83$) for the traditional learning class; $t(20) = .254$, $p= 0.8$.

H3 Attitudes towards blended learning are more positive following exposure to blended learning in comparison to exposure to traditional learning

These results support the third hypothesis in this study. Figure 3 and Table 4 show sufficient evidence to reject the null hypothesis that attitudes towards blended learning are not more positive following exposure to blended learning in comparison to exposure to traditional learning is rejected.

5.0 DISCUSSION

5.1 Main Findings

The Experimental and Control Group at the start of the research showed similarity in attitudes towards blended learning. The attitude was mainly of ambiguity as would be expected of students filling in a questionnaire on something they have no experience of. The negative attitude recorded by previous studies (Emelyanova and Voronina, 2017) at the start of classes was not noted in this cohort of students.

Table 3. Post-traditional classes and Post-blended learning class scores

	Mean	SD	Variance
Post-traditional classes	3.2882	.83	21
Post-blended learning classes	3.5397	.75	21

The main finding at the end of the blended learning and traditional classes is that exposure to blended learning changes students' attitudes towards blended learning in a positive manner and that lack of exposure does not change student's overall attitude, however does result in the decrease of specific attitudes. The latter are spread across all five sets of attitudes towards blended learning, namely, attitude towards learning flexibility, attitude towards online learning, attitude towards study management, attitude towards classroom learning and, attitude towards online interaction.

Following exposure to blended learning classes students' attitudes increased positively by more than 50 percent on specific attitudes such as: the use of Web technologies to exchange knowledge with others; online access to one's lecturer; self-directed learning; organizing one's time better when studying online; studying over and over again online; online learning planning; ease of use of web technologies; online interaction with lecturers and other students; ease of online communication; familiarity with web technologies. These attitudes belong to the following domains: attitude towards online learning; attitude towards study management; attitude towards classroom learning; attitude towards online interaction.

Research results for students in the blended learning class show a transition from the unknown and uncertain to the stimulating, although new, study modality. Exposure to blended learning classes triggered positive attitudes towards the blending of traditional methods with online methods. The 96% increase in scores on item 20 (*I find it easy to communicate with others online*) for students attended blended learning is the result of the utilization by students of an online chat facility, the use of discussion boards, journals, blogs and Wikis. The latter are all LMS tools that appeal to Generation Z individuals, which generation participants form part of.

Corroboration of these positive attitudes is also found in literature as blended learning has been found to: facilitate learning and engagement (Wilson & Randall, 2012); improve knowledge and self-awareness (Beyth-Marom, Chajut, Roccas, & Sagiv, 2003); lead to the achievement of learning outcomes, and the development of skills for life-long learning (Lau, Lam, & Zhou, 2010); provide better access to the learning materials and greater independence in study; improve motivation and involvement with the course; increase student control of learning and improve learning efficiency (Liu, Hu, Zhan and Yan, 2014)

On the other hand the research results for students in the traditional class do not reflect such a transition because the trigger leading to change (namely, exposure to blended learning) was missing for this Control Group. The time that elapsed between the start of the course, that was marked by ambiguity towards blended learning, and the end of the traditional learning course did not serve to improve students attitudes due to lack of exposure and such lack of exposure also led to the decrease of specific attitudes. In the case of these students the phase of ambiguity that may lead to change was not made best use of as these students were not exposed to blended learning. On the other hand in the case of the blended learning students the phase of ambiguity was an opportunity to create change through exposure to blended learning that triggered a change in attitudes.

Current research results support previous research findings that students who have a positive attitude towards online learning, study management, online interaction, and learning flexibility are more likely to adapt to blended learning (Tang and Chaw, 2013). In addition results also support previous research that concluded that students' attitudes towards blended learning change positively for the majority of the students whose attitudes were tested both before and after the blended learning

course (Emelyanova and Voronina, 2017; Akbarov, Gonen and Aydongan, 2018; Korkmaz and Karakus, 2009).

5.2 Limitations

Efforts were made to rule out extraneous factors from the start of the research. For example by ensuring that the instructor assigned to the Control Group and Experimental Group is the same person, by randomly assigning students to groups, by measuring and confirming similarities in attitudes towards blended learning prior to the start of the traditional and blended learning lectures and, by choosing participants from the same year of tertiary education. Notwithstanding the sample size may be considered a limitation and repeating the study with a larger group of participants is recommended.

5.3 Implications

Non-exposure to a blended delivery of learning generates a sense of uncertainty in students as was observed in the initial phases of this study. However exposure to both synchronous teacher-led classroom and online instruction, online collaborative work with peers, asynchronous project based learning, asynchronous and synchronous online discussions, and online self-reflection, does improve students' attitudes towards learning flexibility, online learning, study management, classroom learning and, online interaction. Exposure to a blended delivery of instruction led student to appreciate the use of technology in facilitating a more independent learning experience comprised of self-directed learning and self-paced learning. However also offering greater ease in networking with one's teacher and peers which is reflected in the 96% increase on the item related to online communication. Generation Z individuals are less intimidated by technology than previous generations, appreciate independent thinking, and are well informed about issues related to technology (Fenech, Baguant and Abdelwahed, 2020); all characteristics that may account for a positive attitude towards blending technology and learning.

5.4 Recommendations

The main recommendation is to combine face-to-face instruction with, asynchronous and synchronous, learning technology that facilitates independent and collaborative learning experiences. Blended learning builds both a community of inquiry and a platform for free and interactive dialogue. It helps students gain more understanding of the subject matter, learning flexibility, and develops their cognitive and social skills at the same time.

On the recommendations for further research, research may be carried out on the influence of national culture on the attitudes of students towards blended learning. This study was carried out in the UAE where the national culture is supportive of innovation and use of technology in everyday life. Research may also be carried out comparing attitudes towards blended learning between courses that do not have a quantitative component and are theoretical by nature, for example human resource management and others that have a strong quantitative component, such as mathematics and accountancy.

6.0 CONCLUSION

In conclusion, attitudes towards blended learning do improve over exposure to the combining of traditional classroom teaching and e learning. There is an overall improvement in attitudes towards learning flexibility, attitudes towards online learning, attitudes towards study management, and attitudes towards classroom learning and, attitudes towards online interaction. However, non-exposure does not lead to such improvements and may lead to a decrease in specific attitudes related to blended learning, such as are the use of web technologies and virtual collaboration.

Figure 3. Percentage increase or decrease of Means for all items

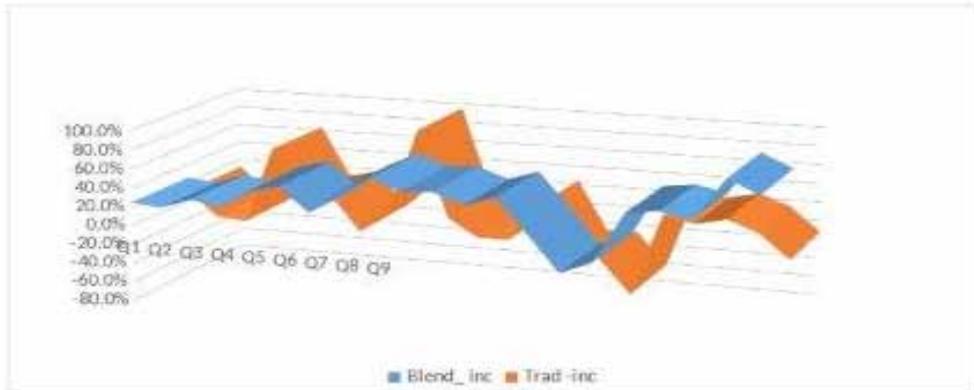


Table 4. Percentage increase or decrease of Means for all items

	Blended learning class	Traditional class
1. I would like to decide when I want to study	24.8%	11.0%
2. I like to study at my own pace	21.6%	-16.0%
3. I would like to decide where I want to study	32.8%	-18.2%
4. I do not resist having my lessons online	27.6%	63.2%
5. I believe the Web is a useful platform for learning	47.0%	10.0%
6. I am comfortable in using Web technologies to exchange knowledge with others	54.1%	17.7%
7. I can collaborate well with a virtual team doing assignments	29.2%	-19.1%
8. I appreciate easy online access to my lecturer	54.8%	8.6%
9. I am comfortable with self-directed learning	69.9%	94.7%
10. I organize my time better when studying online	58.8%	3.1%
11. I can study over and over again online	60.6%	-15.3%
12. Online learning motivates me to prepare well for my studies	49.6%	-15.1%
13. Online learning encourages me to make plans	60.2%	24.2%
14. I find learning through collaboration with others face-to-face is more effective	25.2%	-28.5%
15. I learn better through lecturer-directed classroom-based activities	-11.6%	-27.8%
16. I learn better when someone guides me personally	1.7%	-62.4%
17. I find Web technologies easy to use	54.6%	23.8%
18. I would like to interact with my lecturer online	58.7%	17.2%
19. I would like to interact with other students outside of the classroom	52.0%	24.6%
20. I find it easy to communicate with others online	96.0%	13.4%
21. I am familiar with Web technologies	82.0%	-12.0%

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