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Student Nurses' Perception of the Impact of Information Technology on the Quality of Teaching and Learning

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Abstract The purpose of this paper was to investigate student nurses' perception of the impact of using information technology (IT) on the quality of teaching and learning of critical care nursing. This study was carried out at Faculty of Nursing, Mansoura University, Egypt. The sample included 163 of fourth year Bachelor of Nursing students enrolled in critical care nursing course (CCNC) during the academic year 2007-2008. Data were collected using a questionnaire sheet which gathered information about student nurses' IT skills and use, perception of the access to and use of IT at Faculty of Nursing, perception of the impact of using IT on teaching and perception of the impact of using IT on learning critical care nursing (CCN). Data were analyzed using the Statistical Package for Social Sciences version 9.0 for windows. The findings indicate that student nurses had positive perception of the impact of using IT on the quality of teaching and learning CCN. Students wanted access to IT at the Faculty and expressed their need for more training on using the Internet and Microsoft PowerPoint, and for IT resources in classrooms.

Key words: Information technology, Students' perception, Teaching, Learning

INTRODUCTION

The current revolution in technology plays a major role in recent transformation of nursing education. IT raised the expectations of both students and teachers. Chalk and blackboard are no longer enough for nursing students' education. The traditional approach of education, which assumes that the teacher is the sole source of knowledge and deposits it into passive students, is no longer accepted.[1] The Oxford Dictionary of English defined IT as *"the branch of technology concerned with the dissemination, processing, and storage of*

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information using computers". [2]

Technology is seen as a catalyst for teaching and learning, and a driving force of shifting towards a more eclectic set of learning activities.[3] It affects the way teachers teach and students learn.[4] IT creates new ways of thinking, learning and solving problems for students.[5] It allows students to be more independent and responsible learners, and more interactive in communication with their colleagues.[6] It also encourages teachers to develop their skills and use a variety of teaching styles. Hence, IT is rapidly becoming an integral part of nursing education.

The literature highlighted the need for integrating IT into nursing education.[7, 8] In fact, IT has been extensively used in nursing education in the United States of America and Europe.[7, 9, 10, 11, 12] In 1992 the American Nursing Association (ANA) recognized nursing informatics as a distinct specialty area within nursing. In 1994 the ANA defined nursing informatics as *"the specialty that integrates nursing science, computer science, and information science in identifying, collecting, processing and managing data and information to support nursing practice, administration, education, research and the expansion of nursing knowledge"*.[13] In Britain, the NHSIA (2001) has emphasized the importance of technology integration in preregistration education, and has listed computer knowledge and IT competencies required of nurses.[14] Similarly, the Australian Nursing Federation, together with Royal College of Nursing Australia recommended the development of national information technology and information management competency standards for nurses, and the adoption of a competency model.[15] This actually emphasizes the importance of IT skills for nurses' professional development and advancement.[16]

Integrating IT into nursing education was seen as a means for improving the quality of nursing care. Increasingly, IT is playing a

very important role in daily nursing practice. The use of computerized patient documentation systems is important to patient operations and safety, particularly in an environment that relies on IT.[17] For example, in the ICU which is a high technology environment, nurses need to be competent in dealing with machines that sound an alarm when their patients' vital signs go in dangerous directions.[18] In order for nurses to be able to deal with such technology effectively and safely, they need to develop their IT skills.[19]

The use of IT in nursing education has received increasing attention over the recent years in Egypt. In response to the recommendations of the Ministry of Higher Education to improve the quality of education through adoption of new teaching methods and advanced technology, Critical Care Nursing Department (CCND) at Faculty of Nursing, Mansoura University was one of the pioneers in using IT as a tool for teaching and learning CCNC. Educators used IT as a means for improving learning, enhancing student engagement and making critical care nursing education more interesting and convenient.

Positive IT outcomes in education depend greatly on teachers, students and the availability of technology resources. Teachers' IT skills, teaching style and attitude influence the effective use of IT in classroom.[20] Additionally, the success of using IT depends to a considerable extent on students' acceptance and use of IT in learning.[21] Students' perception of the impact of IT is central to the educational process, and shapes the direction of its future use. Understanding the impact of IT informs us about its value for students, and suggests ways in which technology implementation can be enhanced and supported.[22] In the absence of published information about the impact of using IT in nursing education in Egypt, this study was designed to address this area.

Aim

The main aim of this study was to investigate student nurses' perception of the impact of using IT on the quality of teaching and learning of critical care nursing.

Material and Methods

Study design

The study had a cross sectional descriptive design.

Setting

This study was carried out at Faculty of Nursing, Mansoura University, Egypt. The Faculty includes 8 academic departments; one of them is CCND which is responsible for teaching three courses, First Aid Course for first year nursing students, Emergency Nursing Course for second year nursing students and Critical Care Nursing Course for fourth year nursing students. CCND adopted technology in teaching, but IT was used extensively in teaching and learning CCNC for the fourth year Bachelor of Nursing students.

Sample

The sample included all fourth year Bachelor of Nursing students enrolled in CCNC during the first semester of the academic year 2007-2008, who accepted to participate in the study (n = 163 out of 180). The response rate was 90.5%.

The study tool

The research instrument used in this study was a questionnaire developed from relevant literature.[5, 23, 24, 25, 26] It is composed of four sections. Section one (table 1) is designed to collect information about student nurses' IT skills and use, and it comprises four questions concerning students' years of IT experience, IT sources and skills, and how they gained computer skills. Section two (table 2) focuses on student nurses' perception of the access to and use of IT at Faculty of Nursing. Section three (table 3) assesses student nurses' perception of the impact of using IT on teaching CCNC, and section four (table 4) addresses student nurses'

perception of the impact of using IT on learning CCNC. The second, third and fourth sections included 22 items, structured as statements, in the form of a 5-point likert scale from 1 to 5, where 5 refers to "strongly agree", 4 refers to "agree", 3 for "uncertain", 2 for "disagree" and 1 refers to "strongly disagree". For these three sections, students were asked to indicate the degree to which they agree or disagree with the proposed statements by checking one of five alternatives ranging from strongly disagree to strongly agree. At the end of the questionnaire sheet, there was a free space for participants' free comments concerning the use of IT in teaching and learning CCNC.

The questionnaire was reviewed by three experts in the filed of education technology from the Communication and Information Technology Center at Mansoura University. Based on their comments and feedback, some items were revised and rephrased to improve clarity. The tool was developed in English, and then translated into Arabic version by the researchers. To ensure the validity of the translation, back translation technique was used.[27, 28] The questionnaire was translated from English into Arabic and then from Arabic into English. The two versions of translation were compared and modifications were done accordingly. Then, the translated questionnaire was reviewed by a lecturer from Faculty of Education, English Department, Mansoura University.

Alpha Crombach test was used to test the reliability of the tool.[29, 30] The closer the alpha is to 1.0, the more reliable the test is. Coefficients ranging from 0.70 to 0.94 are acceptable for most instruments.[31] In this study, Alpha score for the 22 items of the tool (sections 2, 3 & 4) was 0.80 which confirms the tool reliability.

METHODS

A permission to conduct the study was obtained from the Dean of Faculty of Nursing. For the purpose of this study, IT

was used in teaching CCNC in a form of PowerPoint presentations in the classroom, videos of CCN procedures, access to the Faculty Electronic lab, and access to relevant web sites. Students were divided into fourteen groups, each group included from 12 to 13 students. Each group was assigned to prepare a project relevant to critical care procedures or topics using IT. The proposed activities involved developing a Maquette, providing a PowerPoint presentation or designing a Poster presentation. Considering the fact that not all students were familiar with using computers and Internet, a facilitator from critical care faculty staff was assigned to supervise and instruct each group. Students were given 5 weeks to complete the assignments and provide a presentation for their product. Each project was evaluated by a three member committee from CCND.

The questionnaire was piloted on 10 students from the first, second, third and fourth year Faculty of Nursing students, Mansoura University. The aim of the pilot study was to assess the clarity of the statements and make necessary amendments prior to the main study. The students of the piloting group were asked to read the statements carefully, complete the questionnaire and highlight statements that require more clarification. Based upon students' comments, some of the statements were rephrased. The questionnaire was administered to the students at the end of the course in January 2008. Participants were asked to fill in the questionnaire in the teaching hall during the last lecture in critical care course. They were assured that participation in the study was voluntary, and that those who declined involvement in the study would not be penalized or affected in any way. Data were collected anonymously.

Data analysis

Data were analyzed using the Statistical

Package for Social Sciences (SPSS) version 9.0 for windows. Statistical methods used included frequency, percentage, mean and standard deviation.

RESULTS

Table 1 summarizes student nurses' IT skills and use. The data showed that about half of participants (52.8%) reported using IT for less than one year, 8.6% used IT for more than 3 years and 9.8% did not use it at all. The primary source of access to IT was the Internet Café (42.3%). Other sources, in order of ranking, were home (26.4%), college (13.5%) and friends (10.4%), and 7.4% reported having no IT access. Students reported having different IT skills, such as word processing (24.5%), Internet use (24.5%), PowerPoint (9.2%) and Electronic mail (4.9%), and 26.4% of students reported having no IT skills. Students acquired IT skills from a variety of sources including friends and relatives (38.6%), self taught (21.5%) and computer classes (12.3%).

Table 2 illustrates student nurses' perception of the access to and use of IT at the Faculty of Nursing. The majority strongly agreed or agreed that all students must have access to computers (99.4%) and Internet at Faculty of Nursing (96.9%). They emphasized the need for the availability of a computer advisor all the time to assist students when needed (98.2%). They also highlighted the need for more training on using Internet and Microsoft PowerPoint (97%), and IT equipment and resources in each classroom (97%). For interpretation, the total score for the second section (student nurses' access to and use of IT at Faculty of Nursing) is 25. Positive perception is reflected by 70% (17.5) or above, 50% (12.5) neutral and below 50% negative perception. Overall, student nurses' perception of the use of and access to IT at Faculty of Nursing is positive (with the total mean score $X \pm SD$ 23.6±1.4).

Table 3 points to student nurses'

perception of the impact of using IT on teaching CCNC. The majority of students strongly agreed or agreed that using IT enhanced teaching CCNC (96.9%), allowed teachers to present information in a variety of formats (97.5%) and helped students to visualize lecture materials which made learning more interesting (95.7%). They believed that IT was useful in teaching only when the teacher was able to master technology (90.1%) and was ineffective when the teacher used it only as a means for reading the lecture (72.4%). Despite most students (64.4%) strongly agreed or agreed that IT provides more opportunities for interaction between students and teachers, a considerable number of students were either uncertain (23.3%) about this issue, or disagreed with this statement (10.4%). The total score of the third section (student nurses' perception of the impact of using IT on teaching CCNC) is 35. Positive perception is reflected by 70% (24.5) or above, 50% (17.5) neutral and below 50% negative perception. In general, IT has a positive impact on teaching CCNC from student nurses' perspectives (with the total mean score X ± SD 28.5±5.7).

Table 4 illustrates student nurses' perception of the impact of using IT on learning CCNC. Most students strongly agreed or agreed that using IT in classroom attracts students' attention and enhances receiving of information (95.1%), stimulates critical thinking and imagination (73.6%), and provides a variety of learning styles (78%). The majority reported that IT was a useful tool for collecting information for their assignments (77.3%) and preparing them in a creative way (83.5%), and for enhancing students' confidence when presenting their work (82.2%). Despite the general agreement about the impact of IT on learning CCNC, there was a considerable uncertainty concerning whether IT encourages students' active participation in their learning (22.7%),

allows students to exchange ideas and information with other colleagues (27%), or stimulates students' critical thinking (19%). About half of students (52.5%) believed that using IT was costly. The total score for section D (the impact of IT on learning CCN) is 50, positive perception is reflected by 70% (35) or above, 50% (25) or above neutral and below 50% (less than 25) negative perception. In general, IT has a positive impact on students' learning of critical care nursing course from student nurses' perspectives (with the total mean score X ± SD 41.4±8.3).

The total score of sections 2, 3 and 4 is 110. Positive perception is reflected by 70% (77) or above, 50% (55) or above neutral and below 50% (less than 55) negative perception. Overall, the use of IT in teaching CCNC has a positive impact on the process of teaching and learning from student nurses' perspectives (with the total mean score X ± SD 89.4±8.9).

The results showed a positive correlation between students' years of IT experience, and their perception of the impact of IT on the process of teaching and learning (Table 5). Moreover, students' IT skills had a positive significant correlation with students' perception of the impact of IT on enhancing teaching, exchanging ideas and information with colleagues, preparing and presenting assignments, creativity in preparing assignments and enhancing students' confidence when presenting their work (Table 6).

DISCUSSION

The results of this study revealed that using IT in classroom has a positive impact on the quality of teaching and learning from student nurses' perspectives. Students strongly expressed the need to access computers and Internet at the Faculty for preparing their assignments. They demanded training programs on using the Internet and Microsoft PowerPoint. This could indicate that the current computer classes at Faculty of Nursing are

inadequate for developing students' IT skills. Student nurses also emphasized the need for IT resources in all classrooms. The data pointed to an important fact, that is, the ability of teachers to master technology made IT a useful teaching tool. This is in the same line with Fetter's (2009) findings which illustrated student nurses' belief that faculty should possess IT skills to be proficient teachers and role models.[16] This actually reflects the importance of developing teachers' IT skills on the outcome of students' learning. This supports Fabry and Higgs (1997) suggestion of investing time, money and resources in teachers who have greatest impact on students,[32] and Ornes and Gassert, (2007) who highlighted the need to increase faculty knowledge and understanding of the nursing informatics competencies that relate to beginning nurses.[17]

The results showed the benefits of using IT from student nurses' perspective. Using IT enhanced teaching CCNC, allowed teachers to present information in a variety of formats and made CCNC more interesting. Besides, it attracted students' attention in classroom, enhanced their reception of information; stimulated their critical thinking and imagination, and provided them with a variety of learning style. IT was also a useful tool for students in preparing their assignments and presenting them confidently. These findings are congruent with the results of other studies which examined students' perceptions and attitude towards computer technology and Internet in education. [6, 33, 34, 35, 36] In Turkey, Sagin Simsek (2008) found that students were satisfied with the application of information and communication technologies in their reading courses and had positive attitudes towards online courses.[34] It was also found that on line courses helped students to be more independent and responsible learners and using the Internet made them

more interactive with their colleagues.[6]

Interestingly, the primary source for students' access to IT was the internet Café and only 13.5% of students used the college IT resources. This actually explains why half of students considered IT costly. This could be partly due to the limited IT resources located for students at Faculty which made them pay to use the IT in internet Café. Unexpectedly, 26.4% of students had no computer skills at all, only 12.3% gained computer skills from attending computer class at the Faculty and 21.5% were self taught. These are very interesting findings considering the fact that Faculty of Nursing students study computer sciences in the first, second and third year for four semesters.

CONCLUSIONS

In summary, the findings showed that student nurses have positive perception of the impact of using IT on the quality of teaching and learning CCNC. Students' inadequate access to IT at Faculty of nursing is a very important concern that needs to be dealt with. Computer courses should be designed to develop students' IT skills and meet their needs. The successful use of IT in classroom can not only be achieved by students' positive perception of the IT, but also by teachers' mastery of technology, and the availability of computer technology in classrooms. Therefore, the Faculty must invest more money in increasing IT resources and developing teachers' as well as students' computer skills.

RECOMMENDATIONS

1. There is a need to improve IT resources at Faculty of Nursing to meet students' needs.
2. There is a need for more integration of IT in teaching and learning.
3. More attention must be given to computer courses aims, content and the practical applications.
4. While this study investigated the impact of IT on the quality of teaching

and learning from the perspectives of students, future research could consider adoption of IT from the perspectives of teachers.

Limitations of the study

This study used a self report questionnaire which is a strong tool for providing insight on individuals' perception, attitude, feelings and other information that can not easily be observed (Talbot, 1995). However, this method may limit participants' responses into specific choices, and may not give an opportunity to determine why people perceive things in a certain way.

Table 1: Student nurses' IT skills and use

Item	Frequency	%
Since when you are using IT?		
Do not use it	**16**	**9.8**
Less than one year	**86**	**52.8**
From 1-2 years	**30**	**18.4**
More than 3 years	**14**	**8.6**
What are your sources to access IT?		
None	**12**	**7.4**
Home	**43**	**26.4**
College	**22**	**13.5**
Friends	**17**	**10.4**
Internet Café	**69**	**42.3**
Which of the following IT skills you posses?		
None	**43**	**26.4**
Word processing	**40**	**24.5**
PowerPoint	**15**	**9.2**
Internet	**40**	**24.5**
Electronic mail	**8**	**4.9**
All of the above	**15**	**9.2**
Others (computer games)	**2**	**1.2**
How did you gain computer skills?		
Computer classes at Faculty	**20**	**12.3**
Friends & relatives	**63**	**38.6**
Self learning	**35**	**21.5**
All of the above	**6**	**1.2**
Others: no computer skills	**39**	**26.4**

Table 2: Student nurses' perception of access to and use of IT at Faculty of Nursing

Item	Frequency	%
1- All students should have access to computers at the Faculty		
Strongly disagree	**0**	**0**
Disagree	**0**	**0**
Uncertain	**1**	**0.6**
Agree	**29**	**17.8**
Strongly agree	**133**	**81.6**
2- Students should have access the Internet at Faculty to collect information for their assignments		
Strongly disagree	**0**	**0**
Disagree	**0**	**0**
Uncertain	**5**	**3.1**
Agree	**40**	**24.5**
Strongly agree	**118**	**72.4**
3- Computer advisor should be available all the time to assist students when needed		
Strongly disagree	**0**	**0**
Disagree	**0**	**0**
Uncertain	**3**	**1.8**
Agree	**45**	**27.6**
Strongly agree	**115**	**70.6**
4- Training programs must be arranged for students on how to use the Internet and Microsoft PowerPoint		
Strongly disagree	**0**	**0**
Disagree	**1**	**0.6**
Uncertain	**4**	**2.5**
Agree	**35**	**21.5**
Strongly agree	**123**	**75.5**
5- Each classroom must be equipped with IT equipment and resources		
Strongly disagree	**1**	**0.6**
disagree	**2**	**1.2**
Uncertain	**2**	**1.2**
Agree	**35**	**21.5**
Strongly agree	**123**	**75.5**
Overall mean scores X ± SD	**23.3±1.4**	

Table 3: Student nurses' perception of the impact of using IT on teaching Critical Care Nursing Course

Item	Frequency	%
1- Using IT in classroom enhances teaching CCN		
Strongly disagree	**0**	**0**
Disagree	**1**	**.6**
Uncertain	**4**	**2.5**
Agree	**84**	**51.5**
Strongly agree	**74**	**45.4**
2- Using IT in classroom allows teachers to present information in a variety of formats		
Strongly disagree	**0**	**0**
Disagree	**0**	**0**
Uncertain	**3**	**1.9**
Agree	**74**	**45.4**
Strongly agree	**85**	**52.1**
3- Using IT at classroom helps students to visualize critical care lecture materials which makes learning more interesting		
Strongly disagree	**0**	**0**
Disagree	**0**	**0**
Uncertain	**7**	**4.3**
Agree	**59**	**36.2**
Strongly agree	**97**	**59.5**
4- IT provides more opportunities to interactions between students and teachers		
Strongly disagree	**3**	**1.8**
Disagree	**17**	**10.4**
Uncertain	**38**	**23.3**
Agree	**76**	**46.6**
Strongly agree	**29**	**17.8**
5- Using IT at classroom saves teachers' time and effort		
Strongly disagree	**1**	**.6**
Disagree	**3**	**1.8**
Uncertain	**10**	**6.1**
Agree	**71**	**43.6**
Strongly agree	**78**	**47.9**
6- IT is a useful tool only if the teacher is able to master technology		
Strongly disagree	**2**	**1.2**
Disagree	**2**	**1.2**
Uncertain	**12**	**7.4**
Agree	**85**	**52.1**
Strongly agree	**62**	**38.0**
7- Using IT is ineffective when the teacher uses it only as a mean for reading the lecture		
Strongly disagree	**9**	**5.5**
Disagree	**22**	**13.5**
Uncertain	**14**	**8.6**
Agree	**72**	**44.2**
Strongly agree	**46**	**28.2**
Total mean score X ± SD	**28.5±5.7**	

Table 4: Student nurses' perception of the impact of using IT on learning Critical Care Nursing Course

Item	Frequency	%
1- Using IT in critical care nursing course classes attracts students' attention and enhances receiving of information		
Strongly disagree	**0**	**0**
Disagree	**6**	**3.7**
Uncertain	**2**	**1.2**
Agree	**109**	**66.9**
Strongly agree	**46**	**28.2**
2- Using IT in presenting critical care subjects in classroom stimulates students' critical thinking & imagination		
Strongly disagree	**2**	**1.2**
Disagree	**10**	**6.1**
Uncertain	**31**	**19.0**
Agree	**87**	**53.4**
Strongly agree	**33**	**20.2**
3- IT encourages students' active participation in their learning		
Strongly disagree	**1**	**0.6**
Disagree	**25**	**15.3**
Uncertain	**37**	**22.7**
Agree	**80**	**49.1**
Strongly agree	**20**	**12.3**
4- Using IT provides students with a variety of learning styles		
Strongly disagree	**0**	**0**
Disagree	**18**	**11.0**
Uncertain	**18**	**11.0**
Agree	**101**	**62.0**
Strongly agree	**26**	**16.0**
5- IT allows students to exchange ideas and information with other colleagues	**12**	**7.4**
Strongly disagree	**49**	**30.1**
Disagree	**44**	**27**
Uncertain	**37**	**22.7**
Agree	**21**	**12.9**
Strongly agree		
6- Using IT allows access to large amount of information at low cost		
Strongly disagree	**21**	**12.9**
Disagree	**64**	**39.3**
Uncertain	**25**	**15.3**
Agree	**40**	**24.5**
Strongly agree	**13**	**8.0**

7- Using IT in classroom is a useful mean for students in preparing their assignments and presenting them in a variety of formats		
Strongly disagree	**2**	**1.2**
Disagree	**13**	**8.0**
Uncertain	**22**	**13.5**
Agree	**95**	**58.3**
Strongly agree	**31**	**19.0**
8- IT allows students to be creative in preparing their assignments		
Strongly disagree	**2**	**1.2**
Disagree	**10**	**6.1**
Uncertain	**15**	**9.2**
Agree	**86**	**52.8**
Strongly agree	**50**	**30.7**
9- IT encourages students to be producers of information and not only passive receivers		
Strongly disagree	**2**	**1.2**
Disagree	**12**	**7.4**
Uncertain	**27**	**16.6**
Agree	**85**	**52.1**
Strongly agree	**37**	**22.7**
10- Mastering IT enhances student's confidence when presenting their assignment		
	0	**0**
Strongly disagree	**9**	**5.5**
Disagree	**20**	**12.3**
Uncertain	**94**	**57.7**
Agree	**40**	**24.5**
Strongly agree		
Total mean score X ± SD	**41.4±8.3**	

Table 5: Correlation between students' years of experience of using IT and the perception of the impact of IT on teaching and learning CCN

Impact of IT	Years of experience	
	r	P
Using IT in classroom enhances teaching CCNC	**.194***	**.013**
Using IT in classroom allow teachers to present information in a variety of formats	**.164***	**.036**
IT provides more opportunities to interactions between students and teachers	**.132**	**.092**
IT is a useful tool only if the teacher able to master technology	**.178***	**.023**
Using IT is ineffective because the teacher depends on it as a mean for reading the lecture	**.009**	**.911**
Using IT at classroom attracts students' attention and enhances receiving of information	**.215****	**.006**
Using IT in presenting subjects in classrooms stimulates students' critical thinking & imagination	**.173***	**.028**
IT encourages students active participation in their learning	**.096**	**.222**
Using IT provides students with a variety of learning styles	**.273****	**.000**
IT allows students to exchange ideas and information and web sites with other colleagues	**.260****	**.001**
Using IT allows access to large amount of information at low cost	**.013**	**.865**
IT allows students to be creative in preparing their assignments	**.164****	**.036**
IT encourages students to be producers of information and not only passive receivers	**.146**	**.062**
Mastering IT enhances student's confidence when presenting their assignment	**.329****	**.000**

Table 6: Correlation between student nurses' IT skills and their perception of the impact of IT on teaching and learning CCN

Impact of IT	Students' IT skills	
	r	P
Using IT in classroom enhances teaching CCN	.194*	.013
Using IT in classroom allows teachers to present information in a variety of formats	.153	.052
Using IT in classroom helps students to visualize lecture materials and make learning more interesting	.073	.355
IT provides more opportunities to interactions between students and teachers	.096	.222
IT is a useful tool only if the teacher able to master technology	.002	.982
Using IT is ineffective because the teacher depends on it as a mean for reading the lecture	-.070	.378
Using IT in classroom attracts students' attention and enhances receiving of information	.037	.640
Using IT in presenting subjects classrooms stimulates students' critical thinking & imagination	-.041	.602
IT encourages students' active participation in their learning	.055	.482
Using IT provides students with a variety of learning styles	.144	.068
IT allows students to exchange ideas and information an web sites with other colleagues	.168*	.032
Using IT allows access to large amount of information at low cost	-.045	.571
Using IT at classroom is a useful means for students in preparing their assignments and present them in a variety of formats	.175*	.025
IT allows students to be creative in preparing their assignments	.243*	.002
IT encourages students to be producers of information and not only passive receivers	-.032	.686
Mastering IT enhances student's confidence when presenting their assignment	.304**	.000

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