Effect of Digital Interactive Classroom Using Thing Link Platform on Technical Nursing Students' Knowledge Retention and Learning Motivation

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Abstract

Background: *Nursing faculties need to understand the unique aspects of digital interactive classrooms and develop a new pedagogy for teaching in the virtual classroom through innovative educational technology methods. One of the learning and teaching tools that promotes digital interactive classrooms and virtual reality, is the ThingLink application. The ThingLink application has a user-friendly interface that allows students to engage with learning content and visualize new information in three modes: watching instructional videos, looking at pictures, reading relevant texts, and brief descriptions of learning content and visualizing information.* ***Aim:*** *To determine the effect of digital interactive classrooms using the ThingLink platform on nursing students' knowledge retention and learning motivation.* ***Settings:*** *This study was carried out at El Qabbary Technical Nursing Institute, Alexandria Governorate.* ***Subjects:*** *It included 69 nursing students who represented all nursing students registered in the fourth academic level and enrolled in the "Fundamentals of Nursing Course" during the first semester of the academic year 2021-2022.* ***Tools:*** *Two tools were used for data collection. Tool one "Nursing Students' Knowledge Questionnaire" Tool two is the "Motivated Learning Strategies Questionnaire (MLSQ)".* ***Results:*** *The study showed that there were highly statistically significant differences between the groups after 3 weeks and after 3 months of applying Thinglink application in relation to students' knowledge retention (p= 0.000, and 0.000 respectively) in favor of the study group and There were highly statistically significant differences between groups in relation to the learning motivation before and after 3 months of applying the intervention (p=0.000*) in favor of the study group.* ***Conclusion:*** *The Thinglink platform had a positive impact and effective tool that played a crucial role in improving knowledge retention, motivation, and active engagement among nursing students at Elqabbary Nursing Institute.* ***Recommendations:*** *Educational workshops should be conducted for all nurse educators to raise awareness about digital interactive classrooms using the Thinglink application in different manners as (virtual reality, augmented reality, electronic portfolios, scenario-based learning, flipped classrooms, and blended learning…)*

Keywords: digital interactive classroom, Thinglink platform, knowledge retention, learning motivation.

Introduction

The technological advances in the 21st century have induced a profound change in higher education and society in general. In nursing education, educational technology has been implemented in clinical and classroom settings for students to access the teaching content at anytime and anywhere. Moreover, many educational technologies and digital interactive tools are used widely in nursing education such as; MOOCs, Electronic–Exam; virtual reality, Mobile technology, Google Classroom, Gamification, Kahoot tools, Quizlet, Classpoint, E-learning, and ThingLink which can make classes more inclusive learning environments, foster collaboration, inquisitiveness, and enable teachers to collect data (Abdellah, 2023; Edutech for Teachers, 2020; Frith, 2022; Hwang et al., 2022; Lee, 2022).

One of the learning and teaching tools that promote virtual reality; is the ThingLink platform, which was announced as a winner of the Ed TechX Global summit in Eroup (EdTechXGlobal, 2017). Furthermore, Thinglink has been selected to receive the UNESCO King Hamad bin Isa-Al-Khalifa Prize for using Information Technology (ICT) in Education (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019, 2021). And also, received the 2023 BETT award in the higher education digital learning product category (Bett, 2023).

Thinglink platform is a Finnish media and education technology formed by Ulla-Maaria Koivula in the United States (Ball, 2023a, 2023b; Inozemtseva et al., 2018). It is a multimedia teaching and learning tool, that can assist educators in a variety of fields by facilitating the introduction of new material, strengthening group dynamics among students, promoting comprehension, supporting individual student learning, and making it simple and quick for teachers to arrange and present animated media to their classes. By just clicking on a button, users may arrange photographs into interactive albums that can be embedded (Abdulrahaman et al., 2020).

Numerous studies have demonstrated that ThingLink user-friendly interface is intended to actively involve students with the learning material and assist them in visualizing the newly presented information in three ways: (i) through watching instructional videos and examining related pictures, (ii) through reading relevant text and summaries, and (iii) through hearing audio that has been annotated within the program.

The Thinglink platform improves students' knowledge achievement, their information retention and helps them to be internally motivated. (Inozemtseva et al., 2018; Pringle et al., 2022; Roslan & Sahrir, 2020). According to Staples et al., (2022), students may exhibit intrinsic motivation when they find an activity appealing or pleasurable by nature, or they may exhibit extrinsic motivation when they are motivated by an external reward related to the action.

Also, this is supported by Dias and Victor (2022), whose findings showed that technology increased interest, creativity, enthusiasm, engagement, motivation, independence, and self-regulation, and improved productivity in students. Moreover, student response has demonstrated ThingLink's ease of use and accessibility. Because ThingLink allows users to explore, collaborate, create, ask questions, and learn new things, its use has grown in recent years. Furthermore, the ThingLink platform helps students learn more effectively, retain material better, and develop an internal desire for learning without the need for outside incentives (Appasamy, 2018; Roslan & Sahrir, 2020).

Moreover, the keys to raising student achievement are to provide students with a solid foundation of basic skills and motivate them to learn to reach effective achievement and students' knowledge retention. Kawasaki et al. (2022) identified knowledge retention as one of the critical elements that enable institutions to preserve their superior knowledge and sustain long-term performance. The relationship between motivation and academic success has also been well-studied. This is because motivation is seen to be a key indicator of academic success and an important academic result (Wasserman & Wasserman, 2020). During the researcher's work in Elqabbary educational

institution, she observed that there was no technological support in educational process. Moreover, students ordinarily and regularly forget what they have learned in their classes. Therefore, a common goal of all educators is to increase the long-term knowledge retention of learners and increase the process of being motivated.

Taking into consideration the previous points and the importance of educational technology tool. So, the researcher will use the ThingLink platform to help students develop advanced, cognitive skills, modify their learning attitude, enrich their enthusiasm for learning and increase students' knowledge retention and learning motivation.

Aims of the Study

This study aims to determine the effect of digital interactive classrooms using the Thinglink platform on technical nursing students' knowledge retention and learning motivation.

Research hypotheses

*Nursing students who learn by using the ThingLink platform exhibit higher knowledge retention levels than those who do not.

*Nursing students who learn by using the ThingLink platform exhibit higher learning motivation levels than those who do not.

Materials and Method

Materials

Design: A quasi-experimental research design was used for conducting this study.

Settings: This study was conducted at El Qabbary Technical Nursing Institute, in Alexandria governorate, which is affiliated with the Ministry of Health.

Subjects: The subjects of this study comprised all nursing students (69) who were registered in the fourth academic level and enrolled in the "Fundamentals of Nursing Course" during the first semester of the academic year 2021-2022.

Tools: Two tools were used in this study for data collection.

Tool I: Nursing Students' Knowledge Questionnaire:

This tool was developed by the researcher after reviewing the fundamentals nursing book assigned to these students by the Ministry of Health. It was used to assess the nursing students' knowledge and information retention level of fundamentals of nursing courses. It included structured questions that corresponded to the learning objectives of the course. Questions consisted of 30 questions with 3 categories; MCQ (10 questions /10 grades), True& false (10 questions /10 grades), and matching (10 questions /10 grades). The correct answer was taking one grade and the incorrect answer was taking zero. The total score was 30 grades, which was interpreted as follows: less than 48% indicates a poor knowledge rate, ≥ 48 -72 % signifies a moderate knowledge rate, and > 72% points to a high knowledge rate. The higher the score the higher the knowledge retention level.

The tool's reliability was calculated using Cronbach's Alpha test and it was reliable and the test coefficient value was 0.757. Students' personal and academic characteristics sheet was attached to the tool which included: name, age, gender, E-mail, computer level, and English level).

Tool II: Nursing Students' Motivated Learning Strategies Questionnaire (MSLQ). This tool was developed by Duncan and McKeachie (2010). It was adapted by the researcher to be applicable for measuring technical nursing students' learning motivation.

It consists of 25 statements with 5 points Likert scale ranging from strongly agree (5) to strongly disagree (1). The total score ranged from 25 to 125 and was interpreted as follows; from 25 < 60 low learning motivational level, from ≥ 60-90 moderate motivational level, and >90- 125 high motivational level. The tool's reliability was calculated using Cronbach's Alpha test, it was reliable and the test coefficient value was 0.898.

Method

An approval from the Research Ethics Committee (REC) at the Faculty of Nursing; was obtained. Permission from the director of the Elqabbary Institute of Nursing was obtained for data collection after an explanation of the purpose of the study. Tools' content validity was tested by a jury of five experts in the nursing education field and the necessary modifications were done which

included some modifications in sentence formation. A pilot study was carried out on 10% of the sample size (7 students) to ascertain the clarity and applicability of the tools. Those students are included in the study.

The results of this study revealed that; all the tools were clear and applicable and no modifications were done. The student was allocated randomly as:

Study group (I): It comprised 34 nursing students; who received the content of the Fundamentals of Nursing course using face-to-face lecture through the electronic Thinglink interactive classroom platform.

Control group (II): It comprised 35 nursing students; who received the content of the Fundamentals of Nursing course using face-to-face lecture through traditional classroom.

Data collection phases: The study was carried out through three phases: preparation, implementation, and evaluation

Phase I: Preparation: This phase included four preparations; the researcher, the content, the students, and the classroom environment.

1-Researcher's preparation: The researcher buys the Thinglink application platform, then reads the available evidence about the digital Thinglink interactive classroom platform from books, digital libraries, and websites including the national and international thesis related to the topic.

2-Content preparation: it included selecting the "Fundamentals of Nursing course'' as it is the core course in the institute and the first nursing course in the English language after Arabic general courses. The Thinglink platform program consisted of 12 units, conducted over 14 weeks, 1 lecture for 3 hours/ week. It started in the first semester of the fourth academic year of the institute. The researcher prepared the design for the Thinglink platform program that includes (Date, time, title, ILOS, programmed feature in use, Teaching and learning activities, and link resources).

3-Student preparation: For the study group students: An orientation session was conducted for them to explain the purpose of the study, their roles, course objectives, duration of the course, and the importance of using the thinglink platform.

4-The environment preparation

-Physical environmental preparation: provide a classroom with an internet resource (an internet device was provided by the researcher) and check the availability of adequate light, chairs, and whiteboard.

-Psychological environmental preparation includes acknowledgment, encouragement, and feedback.

Phase II: The Implementation

In this phase, the researcher implemented the Thinglink program lesson plan through:

1-Pretest: The researcher performed a pretest for the study and control groups using tools I and II to assess the student's knowledge and motivated learning. Tool I, and Tool II were administered electronically for control groups in WhatsApp group and study groups in the Thinglink application., The researcher briefly explained, specifically how to respond to the items**.**

2-Active processing: The study program was applied on 14 weeks / 1 lesson/ 3 hours/week. Before this semester, orientation for the study group was done after an explanation of the study aim then the thinglink password was distributed to students. Each lecture was planned and designed on the program as hyperlink content for videos, audio, 2D and 360 images, posters, concept maps, Google Maps, pdf, PowerPoints, mind maps, and game-based learning as evaluation methods, related to each topic for the lectures. All lectures were augmented in the immersive reader book in the Thinglink program.

The researcher monitored students during access to the application from their mobile devices and opened spots one by one to illustrate the lecture. The researcher prepared flash cards and game questions to share the course content questions in the classroom with the Kahoot online question-and-answer technique as a formative evaluation tool. This dimension contains items that focus on the construction, reconstruction, and presentation of information. After finishing the Thinglink program, the researcher shared the link for students' WhatsApp groups to prepare for the lecture the day before. The classroom management rules were applied during this phase.

Phase III: The Evaluation

In this phase, the researcher assessed the students in both the study and control groups by tool I to evaluate their knowledge. This tool was

measured twice, after 3 weeks and after 3 months from ending the application. Tool II was measured once at the end of the course to determine their learning motivation.

Ethical considerations:

Written informed consent was obtained from the participating nursing students in the study before data collection and after the explanation of the aim of the study. Confidentiality of the collected data was assured. The researcher emphasized that participation in the study was entirely voluntary and withdrew from the study without any penalties. Anonymity was ascertained.

Statistical analysis

Data was coded and fed to the computer and analyzed using IBM SPSS software version 20.0**.** (Armonk, NY: IBM Corp) Qualitative data were described using numbers and percentages. The Kolmogorov-Smirnov test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation, and median. The significance of the obtained results was judged at the 5% level. The following statistical tests were used: The Kolmogorov-Smirnov, Chi-square test, Monte Carlo correction, Marginal Homogeneity Test, Paired t-test, Mann-Whitney test, Wilcoxon signed ranks test, and Pearson coefficient.

Results

Table 1 presents the distribution of technical nursing students in the study and control groups according to their personal and academic characteristics. It revealed that the majority of the students in the study group were less than 20 years old, compared to nearly three-quarters of the control group (85.3 %, 74 .3%) respectively. All of them in both the fourth groups were female in the academic semester (100%). Furthermore, the majority of students in the study group compared to two-thirds of the control group had good computer skills (91.2%, 62.9%) respectively. Regarding their levels in English, two-thirds of the study group had a good English level, compared to less than half of them in the control group (67.6%, 48.6%) respectively.

Table 2 shows a Comparison between the students in the study and control groups in relation to their knowledge levels before, after 3 weeks, and after 3 months of the application of the Thinglink platform. It was found that there were statistically significant differences between the study group and control groups in relation to knowledge retention test 1 (3 weeks) after application of the Thinglink platform and in retention test 2 (after 3 months) from ending the platform in favor of the study groups in knowledge retention test 1and in knowledge retention test 2.

Table 3 displays a comparison between the study and control groups according to their levels of motivation before and after the application of the Thinglink platform

It was found that there were statistically significant differences between the study and control groups in students' motivation in favor of the study groups after the application of the Thinglink platform (0.001*).

Table 4 shows a correlation between students' knowledge and motivation regarding the study and control groups. In relation to the study groups; there was a very weak positive relation between students' knowledge and motivation in the pretest (0.064) with no statistically significant difference (0.72). while after 3 weeks and after 3 months, there was a moderate positive relation between students' knowledge and motivation (0.440*, 0.436*) with highly statistically significant differences was occurred (0.009, 0.01) respectively.

In relation to the control groups; there was a weak positive relation between students' knowledge and motivation in the pretest (0.127) but after 3 weeks changed to very positive weak relation (0.330) and after 3 months changed to a negative very weak relation (-0.045) with no statistically significant difference between the knowledge and motivation was occurred.

Discussion

Educational technology has become the cornerstone of educational quality. Attention to the application of educational technologies in their various forms according to the capabilities of each country as a basis for development and renewal in educational institutions to improve educational outputs. (Appasamy, 2018; Roslan & Sahrir, 2020).

The ThingLink platform is one of the learning and teaching tools that promote digital interactive classrooms and virtual reality. Also, it is the most promising interactive visual platform that is being used in the contemporary classroom quickly and easily. It provides users with the ability to organize images into embeddable interactive albums with the click of a button (Jeffery et al., 2022).

In regard to the first hypothesis, it was seen that there were statistically significant differences between the study and control groups after the application of the Thinglink program in relation to nursing student's knowledge retention tests. Also, most of the students converted from low achievement before the application to high achievement and retention levels after the application of the Thinglink program. These results came in congruence with the study of Appasamy (2018) which concluded that the Thinglink program had a positive impact on students' achievement and information retention.

In the same line, Abdulrahaman et al. (2020) found that the Thinglink program had a positive impact on students' achievement and recommended that the use of Web 2.0 technologies like ThingLink, can help promote collaborative social learning and teaching. Also; Radianti et al. (2020) and Loureiro et al. (2021) concluded that the Thinglink application was mature enough to be used for teaching procedural, practical knowledge, and declarative knowledge" as has been used in various fields such as fire safety, surgery and nursing which improved knowledge retention and facilitate the application of classroom learning to clinical practice.

Furthermore, Alzahrani (2022) and Dias and Victor (2022) findings showed that; the thinglink increased interest, creativity, enthusiasm, engagement, motivation, independence and self-regulation, and improved productivity in students.

The positive significance in nursing student's knowledge retention tests may be due to Thinglink has many digital tools and resources that can be used in conjunction with each other to enhance nursing education and improve knowledge retention among students. The key is to select tools that are well-suited to the learning objectives and needs of the students and to integrate them in a thoughtful and effective way.

In regard to the second hypothesis, it was seen that there were statistically significant differences were found between study and control groups and within the study group and control groups after application of the Thinglink program in favor of study groups in relation to student motivation. This result came in congruence with the study of Moreover, Appasamy (2018) found that; most students are more satisfied and motivated when students learn using the Thinglink application as compared to the face-to-face approach.

For more evidence, Fredriksson et al. (2023) added that "with digital interactive classrooms, students can have access to personalized learning experiences that help students feel more in control of their learning and more motivated to succeed**.** Furthermore; Fredriksson et al. (2023) Found that; thinglink increased students' engaged and motivation in learning through the multiple features as 360 tours and rotates pictures.

The positive significance in a student's motivation may be due to using the digital interactive technology in the classroom, which has become a more important strategy for improving educational quality than the use of traditional methods.

Correlation between students' knowledge and motivation

According to the current study, there is a strong correlation was found between the students' knowledge and motivation. This result align with Kriston (2016) study , which demonstrated that the Thinglink had represented a very high impact on students' achievement, acquiring knowledge and information retention and increased students' motivation. For more evidence, De Leeuw et al.(2020) found that there is a positive correlation between nursing knowledge and learning motivation. As nurses gain more knowledge in their field, they tend to become more motivated to learn about new developments and advancements.

Furthermore; Camacho-Sánchez et al. (2022) demonstrated that the thinglink

promotes motivation among nursing students, which can help to increase their engagement in the learning process and promote better knowledge retention over time. This can be achieved through a variety of strategies, such as incorporating interactive digital platforms like Thinglink, providing opportunities for collaborative learning and problem-solving, and offering regular feedback and positive reinforcement.

The positive correlation between students' knowledge and their learning motivation may be due to firstly, self-efficacy: Students with higher levels of knowledge may have a greater sense of self-efficacy, which can increase their motivation to learn more. Secondly, interest: students who have a strong interest in a particular subject or topic may be more motivated to learn about it, and this interest may also lead to greater knowledge. Also, learning strategies: Students who use effective learning strategies, may be more successful in acquiring knowledge, and this success may in turn increase their motivation to learn more**.**

Overall, it is likely that the relationship between knowledge and learning motivation is complex and multifaceted, and may be influenced by a wide range of individual, environmental, and contextual factors.

Conclusion

Based on the findings of the current study, it could be concluded that the implementation of the Thinglink platform has contributed to the development of knowledge retention and motivation among students of the Elqabbary Institute of Nursing. Finally, the research findings and results showed that: ThingLink is a powerful way to use technology to make education more engaging. And, that makes annotating digital items super simple, which can use images, pictures, videos, or 360-degree interactive images for tagging. Adding tags, allows students to interact with the media, drawing more detail from it.

Recommendations

Based on the findings of the present study, the following recommendations are offered:

Recommendations for the school administration:

- Providing technological infrastructure and resources for the success of interactive classrooms is essential in classroom settings.

Recommendations for the nursing educator:

- Develop and conduct thinglink workshops for all nurse educators, at Elqabbary Nursing Institute to raise their awareness about the importance of digital interactive classrooms and to increase their competencies in applying it.

Recommendation for further studies:

- Study to determine the effect of Thinglink application on student clinical performance.

Tables

Table 1: Distribution of nursing students in the control and study groups according to their personal and academic characteristics.

Personal and academic data	Study (n =34)		Control (n =35)		p
	No.	%	No.	%	
Age					
<20	29	85.3	26	74.3	0.256
≥20	5	14.7	9	25.7	
Sex					
Female	34	100.0	35	100.0	–
Semester level					
4th semester	34	100.0	35	100.0	–
Computer skills					
Very good	0	0.0	13	37.1	^{MC}p <0.001*
Good	31	91.2	22	62.9	
Poor	3	8.8	0	0.0	
English level					
Very good	10	29.4	17	48.6	
Good	23	67.6	13	37.1	
Poor	1	2.9	5	14.3	

χ^2:Chi-squaree test MC: Monte Carlo
p: p-value for comparing between the studied groups *: Statistically significant at $p \leq 0.05$

Table (2): Comparison between the students in the study and control groups in relation to their knowledge levels before, after 3 weeks, and after 3 months of the application of the Thinglink platform

Nursing Students' knowledge level	Study (n =34)						Control (n =35)						Test of sig.(p_1)	Test of sig.(p_2)	Test of sig.(p_3)
	Pretest		knowledge test after 3 weeks		knowledge test after 3 months		pretest		knowledge test after 3 weeks		knowledge test after 3 months				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Poor	31	91.2	3	8.8	7	20.6	33	94.3	26	74.3	27	77.1	χ^2=0.248 (^{FE}p=0.673)	χ^2=37.835* (<0.001*)	χ^2=23.696* (<0.001*)
Moderate	3	8.8	4	11.8	12	35.3	2	5.7	6	17.1	6	17.1			
High	0	0.0	27	79.4	15	44.1	0	0.0	3	8.6	2	5.7			
Fr. (p_0)	**51.113* (<0.001*)**						**5.375 (0.068)**								
Total Score	**(0 – 30)**						**(0 – 30)**						U=512.0 (0.167)	U=98.50* (<0.001*)	U=180.50* (<0.001*)
Min. – Max.	6.0 – 21.0		7.0 – 25.0		7.0 – 25.0		7.0 – 21.0		3.0 – 22.0		3.0 – 22.0				
Mean ± SD.	8.47 ± 4.02		20.71 ± 3.97		18.26 ± 5.36		7.94 ± 3.37		9.46 ± 6.60		9.09 ± 6.34				
Median	7.0		22.0		19.0		7.0		7.0		7.0				
% Score															
Min. – Max.	20.0 – 70.0		23.33 – 83.33		23.33 – 83.33		23.33 – 70.0		10.0 – 73.33		10.0 – 73.33				
Mean ± SD.	28.24 ± 13.39		69.02 ± 13.25		60.88 ± 17.87		26.48 ± 11.23		31.52 ± 22.0		30.28 ± 21.12				
Median	23.33		73.33		63.33		23.33		23.33		23.33				
Fr. (p_0)	**49.890*(<0.001*)**						**0.087 (0.957)**								

SD: **Standard deviation** χ^2: **Chi-square test** FE**: Fisher Exact** **Fr**: **Friedman test** **U: Mann Whitney test**

p_0: p-value for comparing between the studied periods in each group

p_1: p-value for comparing the studied groups in the **knowledge retention test (after 3 weeks of application of the Thing Link platform**)

p_2: p-value for comparing the studied groups in the **knowledge retention test (after 3 months of application of the Thing link platform**)

p_3: p-value for comparing between the studied groups in **Retention** *: Statistically significant at $p \leq 0.05$

Table (3): Comparison between the study and control groups according to their levels of motivation before and after the application of the Thinglink platform

Motivation	Study (n =34)				Control (n =35)				Test of sig.(p_1)	Test of sig.(p_3)
	Before application		After application		Before application		After application			
	No.	%	No.	%	No.	%	No.	%		
Low	15	44.1	3	8.8	17	48.6	10	28.6	χ^2=3.552 (0.169)	χ^2=13.043* (0.001*)
Moderate	8	23.5	10	29.4	13	37.1	18	51.4		
High	11	32.4	21	61.8	5	14.3	7	20.0		
MH. (p_0)	2.840* (0.005*)				1.964 (0.051)					
Total Score	(30–150)									
Min. – Max.	30.0 – 139.0		30.0 – 139.0		30.0 – 120.0		30.0 – 120.0		t=1.015 (0.314)	t=4.086* (<0.001*)
Mean ± SD.	77.91± 34.1		101.68±29.71		70.46±26.13		72.71±29.16			
Median	70.50		107.50		77.0		71.0			
% Score										
Min. – Max.	0.0 – 90.83		0.0 – 90.83		0.0 – 75.0		0.0 – 75.0			
Mean ± SD.	39.93±28.51		59.73 ± 24.76		33.71±21.78		35.60±24.30			
Median	33.75		64.59		39.17		34.17			
tp. (p_0)	2.876* (0.007*)				0.542 (0.591)					

SD: Standard deviation t: Student t-test χ^2: Chi-square test tp: Paired t-test MH: Marginal Homogeneity Test p_0: p-value for comparing between the studied periods in each group p_1: p-value for comparing between the studied groups in pre p_2: p-value for comparing between the studied groups in post *: Statistically significant at $p \leq 0.0$

Table (4): Correlation between knowledge and motivation within the study and control group

Knowledge	Motivation			
	Study (n =34)		Control (n =35)	
	r	P	r	p
Pre-test	0.064	0.719	0.127	0.466
Knowledge retention test (after 3 weeks)	0.440*	0.009*	0.330	0.053
Knowledge retention test (after 3 months)	0.436*	0.010*	-0.045	0.796

r: Pearson correlation coefficient *: Statistically significant at $p \leq 0.05$

Value: very weak (0.00-0.19) weak (0.20-0.39) moderate (0.40-0.59) strong (0.60-0.79) very strong (0.80-1.

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