

The Effect of Forming Small Learning Communities through Padlet in Knowledge Building and Psychological and Cognitive Engagement for University Students

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ABSTRACT

The purpose of the present study is to identify the effect of forming small learning communities through Padlet in knowledge building and psychological and cognitive Engagement. Specifically, to discover the degree of continuity of the effect of forming small learning communities through Padlet in knowledge building and psychological and cognitive Engagement for University students, after a month from its application. And this study was applied to a sample consisting of (21) students studying the e-Learning diploma program at the College of Education at Princess Nourah University in Saudi Arabia with Average Age (22.38 ± 1.06). The researcher used Knowledge building test and a Psychological and cognitive Engagement questionnaire. In the statistical analysis of the data, the researcher depended on Mean, standard deviation, Paired-samples t-test, effect size (η^2) The main findings of the present study indicated that there is a significant difference between the degrees of the experimental group in the Pre-test and Post-test of knowledge building and Psychological and cognitive Engagement for the Post-test that is proven statistically. In both the Post-test and Follow-Up tests of knowledge building and psychological and cognitive engagement, there was no statistically significant difference between the experimental group. Considering the theoretical framework and previous studies, our results were discussed and interpreted. In light of the study results, some educational recommendations and study suggestions were presented.

Keywords: Small Learning Communities, Padlet, Knowledge Building, Psychological Engagement, Cognitive Engagement

1. INTRODUCTION

The aspiration of the Kingdom of Saudi Arabia vision 2030 (Higher Education) is to make learner the core of learning, not the teacher while focusing on building skills, refining character, instilling confidence, and building creativity, and building a school environment that is stimulating, attractive, and desirable to learn, linked to an integrated and supportive services system.

One of the supportive learning environments is Small Learning Communities (SLCs) which refer to all the efforts designed by the school to create a compact and more learning-oriented unit of the organization. (Oxley, 2007) The primary goal for these SLCs is to enhance the engagement of the students along with the involvement of the teachers. It has been believed by different educators that in small schools, teachers are aware of their students relatively better, and the students feel less alienated and isolated. In addition, it is also believed that in such schools, teachers develop innovative strategies and discrepancies found in the achievement gap can easily be minimized. (Cotton, 2001)

One of the technologies that can support learning and teaching activity in the classroom is Padlet. (Istianah, 2019) Recent trends in education recommend that the educational process is centered on the learner and encourage him to ask questions, collect data and investigate, find solutions and ways of cooperation between learners and their teachers. Technology has made this task easier, so there are many tools that do so, one of these tools is called the Padlet. Padlet is included in the list of free social networking sites where people get a chance of discussing and arguing certain topics easily while using multimedia elements to enhance their communication and expression. It is easier for the people to upload PDFs, documents, videos, images and share the links while exchanging comments on each other's posts. They can even make private and public walls and share information. (Algraini, 2014, p.16) Education institutions use devices such as iPads, tablets, and laptops to provide their students with the knowledge to compete in a technological world. (Johri & Misra, 2017)

Padlet has great importance in learning. It has been observed that Padlet gives a splendid opportunity for the instructors and learners to exchange personal experience whenever they want to. It is to be noted that people can get enough time to give a thought to their issues, to overcome their fears and challenges, to rectify their mistakes and share their knowledge while interacting with each other for the sake of fulfilling different tasks. As a result of this interaction, people can enhance their ability for composition and writing proficiency. Conclusively, using Padlet or CMC is useful for improving writing performance that is based on theories of language learning. (Awaludin, Karim, & Saad, 2017)

In addition, Padlet is considered as a useful tool in improving collaborative learning; it has many advantages, some of these advantages mainly include instant collaboration, easy to use, multimedia, and mobile. (Zhi and Su, 2015)

According to Fiester and Green (2016), using Padlet within classroom increases student's engagement, their collaboration with their peers; receive feedback and communication with the teacher. It also contributes to improving students' engagement and academic achievement rates. (Kleinsmith, 2017) The term student engagement can be deliberated as an individual's level of enthusiasm and interest in learning which has a direct impact on behaviour and academic performance. (Gallup, 2013)

In addition, Padlet also plays a crucial role in providing a chance of learning and grooming to the students through sharing of ideas and collaboration. This benefits the students to get an insight into their own learning pattern, which, in return, enhance their progress in language learning. (Putri & Umam, 2018, p.103) In 2019, Taylor stated that to support Knowledge Building, Padlet web-based software had been designed and modified to include scaffolding tools. (p.2)

According to Musu (2015), Padlet is an exceptional platform which can be used to visualize the entire process of collaborative knowledge building. Students engaging in Knowledge Building gain a deeper understanding of content knowledge and become self-directed learners in addition to creating and developing communal ideas. (Bereiter & Scardamalia, 2010)

It has been observed that when the idea of knowledge building is implemented to the classroom, it enhances individual responsibility, public knowledge, and student's engagement. The increased sense of individual responsibility eventually leads to in-depth learning at both individual and group level within a community where people have shared goals of solving real-life problems through higher-order thinking. In spite of the benefits of knowledge building or different thinking modes in the students, there is a missed opportunity of offering other channels to the students to pursue with the knowledge when they are working in the fields. (Huang, 2018, p.33)

1.1. QUESTIONS

The study is an attempt to answer the subsequent main question:

Q1- What is the Effect of Forming Small Learning Communities through Padlet in Knowledge Building and Psychological and Cognitive Engagement for University Students?

The aforementioned question is subdivided into furthermore questions:

Q1- What is the effect of forming small learning communities through Padlet in knowledge Building for University students?

Q2- What is the effect of forming small learning communities through Padlet in psychological and cognitive Engagement for University students?

Q3- What is the degree of continuity of the effect of forming small learning communities through Padlet in knowledge Building for University students, after a month from its application?

Q4- What is the degree of continuity of the effect of forming small learning communities through Padlet in psychological and cognitive Engagement for University students, after a month from its application?

1.2. OBJECTIVES

The present study aims at:

- 1- Identifying the effect of forming small learning communities through Padlet in knowledge building for university students.
- 2- Identifying the effect of forming small learning communities through Padlet in psychological and cognitive Engagement for University students.
- 3- Discovering the degree of continuity of the effect of forming small learning communities through Padlet in knowledge building for university students, after a month from its application.
- 4- Discovering the degree of continuity of the effect of forming small learning communities through Padlet in psychological and cognitive Engagement for University students, after a month from its application.

1.3. SIGNIFICANCE

The significance of this study can be stated as follow:

- 1- The results of the study may contribute to a qualitative shift in the outcomes of university education; by directing the attention of the teachers involved in curriculum development to the importance of small learning communities.
- 2- The study is considered in response to the recommendations of some previous studies which recommended the necessity of developing Knowledge building and Psychological and cognitive Engagement.
- 3- The study may introduce ideas for the use of modern measurement tools that are concerned with examining and investigating non-traditional variables among students, such as Knowledge building test and Psychological and cognitive Engagement questionnaire.
- 4- This study may raise some new research ideas among researchers in educational technology.
- 5- This study is in line with contemporary global trends in the field of educational technology.
- 6- The study may pave the way for future research examining the effect of the small learning communities on some cognitive and non-cognitive variables among university students.

1.4. LIMITS

Following are the limits that may impact the generalization of the study.

- 1- Spatial: This study was limited to the Education faculty, Princess Nourah University in Saudi Arabia.
- 2- Time: The study was conducted within the first semester of the academic year (2019/2020).
- 3- Participants: The participants were postgraduate students who are studying the e-Learning diploma program at the College of Education at Princess Nourah University in Saudi Arabia. The total sample was (21) students with Average Age (22.38±1.06) which enrolled on the mobile-learning course in their first year during the 2019/2020 academic year who had also volunteered to respond to interview questions.

1.5. HYPOTHESIS

1. There are statistically significant differences between the mean scores of experimental groups in the Pre-test and the Post-test of knowledge building for the Post-test.
2. There is no statistically significant difference between post-test and follow-up test scores among experimental groups of knowledge building.
3. There are significant statistical differences between the mean scores of the experimental groups in the Psychological and Cognitive Engagement Pre-test and Post-test for the post-test.
4. There is no statistically significant difference between mean scores of experimental groups in the psychological and cognitive engagement post-test and follow-up test.

5. LITERATURE REVIEW

In Zainuddin, Azmi, Yusoff, and Shariff (2020) study, participants were 39 postgraduate students enrolled in Business Statistics for Data Science, with the purpose of using Padlet for e-learning and engaging them in active learning. Students' engagement in classroom activities increased significantly when using active learning tools such as Padlet. Kleinsmith (2017) aimed at examining the role of Padlet in enhancing the fifth-grade students' engagement in basic mathematics skills in the classroom. Additionally, the aim is to shed light on the role of Padlet in enhancing the academic progress of the students in basic mathematics skills of fifth grade. The targeted participants for the study included the students from both fifth and sixth grades who received basic skill instruction in either language arts or mathematics. The final conclusion of the study led to the fact that Padlet can help to enhance the academic progress and engagement of the fifth-grade students for basic math skills in the classroom. More specifically, it was found out that Padlet enhances the mean engagement score on a weekly basis of 4 students out of 6 as well as the score of mean academic achievement on a weekly basis of 3 students out of 6. Nadeem (2019) aimed to investigate the perception of the students regarding the role of Padlet in learning and assessment on the four aspects of engagement in the classroom. The participants of the study included 27 female students from the sociolinguistic course of 3-credit, where Padlet was the main tool for learning and assessment. The main findings revealed that Padlet played a pivotal role in enhancing the engagement of the students. It also played the main part in offering the positive experience of assessments and fostering active learning. The perceived effectiveness of the Padlet was particularly due to the unique feature supporting collaboration among the students, which ultimately induce a positive learning environment. As an assessment tool, the drawback of this platform was found to be the lack of written feedback provided to the students. Nevertheless, teachers can also use a blending of online as well as written assessments to compensate for this lacking.

6. METHODOLOGY

The aim of the study is to measure the effectiveness of Forming Small Learning Communities through Padlet in Knowledge building and Psychological and Cognitive Engagement for University Students. Thus, the author

adopted the Quasi-experimental method and experimental method for designing the distinct two groups including experimental and control, where the experimental group was taught through Small Learning Communities through Padlet, while the control group was given the information in the traditional way.

6.1. POPULATION

The target participants of the present study included all the students in the College of Education at Princess Nourah University in Saudi Arabia, while the sample included two equivalent groups of the students of an e-Learning diploma program at the College of Education at Princess Nourah University in Saudi Arabia with Average Age (22.38 ± 1.06)

6.2. TOOLS

To achieve the aim of the study, a test of Knowledge building was prepared and Psychological and cognitive Engagement questionnaire conducted for measuring Psychological and cognitive Engagement.

6.2.1. THE KNOWLEDGE BUILDING TEST

The Knowledge building Test was developed to measure Knowledge building of female students at Princess Nourah University in Saudi Arabia; the test consists of (20) items were provided with a five-point Likert scale. It is to be noted that the participants were requested to answer each item based on the given rating scale: Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly Disagree (1).

After verifying the Factorial validity of the test, it was applied to a sample of (64) students. According to the results of the factorial analysis, just one factor explains (56.34%) of the variance in students' test performance, all items were saturated by substantial amounts on it; thus, it can be called a factor of Knowledge building, and it is well established.

The results of the factorial analysis revealed just one factor explains (56.34%) from the variance in students' performance on the test, and all items of the test were saturated by substantially on it; so, it can be called a factor of Knowledge building.

The standard validity of the method indicates that it can be used in this study as well as the reliability of the results. The reliability of knowledge building Test was calculated using Cronbach Alpha which was (0.793), While the reliability coefficient by test re-test method is (.822 **).

6.2.2. PSYCHOLOGICAL AND COGNITIVE ENGAGEMENT QUESTIONNAIRE

The researcher adopted Abelton (2013) Psychological and cognitive Engagement questionnaire and modified it. This questionnaire was prepared to measure Psychological and cognitive Engagement for female students at Princess Nourah University in Saudi Arabia. The questionnaire consists of (35) items; (19) items for Psychological Engagement, and (16) items for cognitive Engagement, the items on the questionnaire were given with four-point Likert scale. The respondents of the study were requested to respond the items of the questionnaire based on the given rating scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1).

After verifying the Factorial validity of the test, it was applied to a sample of (64) students. The results of factorial analysis, show that there is just one factor explains (61.08%) from the variance in students' performance on the questionnaire and all items of the questionnaire was saturated by substantially on it; so it can be called a factor of Psychological and cognitive Engagement, and there is a high level of validity in terms of its ability to be used in the current study and for relying on its results.

The reliability of Psychological and cognitive Engagement questionnaire was calculated using Cronbach Alpha which was (0.808), While the reliability coefficient by test re-test method is (.842 **).

6.3. DATA ANALYSIS AND PROCEDURES

The researcher depended on Mean, standard deviation, Paired-samples t-test, effect size (η^2) and using (SPSS 20).

7. RESULTS AND DISCUSSION

1. The First Hypothesis: There are statistically significant differences between the mean scores of experimental groups in the Pre-test and the Post-test of knowledge building for the Post-test.

To verify this hypothesis, Paired-samples t-test was used. The results are shown in the following table:

Table 1. The significance of the difference between the mean scores of experimental groups in the Pre-test and Post-test of knowledge building (N=21)

| Variables | Pre-test | | Post-test | | Significant differences | | Effect Size η^2 | |
|--------------------|----------|------|-----------|------|-------------------------|------|----------------------|-------|
| | Mean | SD | Mean | SD | t- Value | Sig | Value | Sig |
| Knowledge Building | 39.67 | 5.91 | 80.67 | 4.98 | 22.886 | .000 | 0.963 | Large |

Table 1 indicates that there are statistically significant differences at the significant level (.01) between the mean scores of the experimental group in the Pre-test and Post-test in knowledge building in favour of the Post-test. The result may be due to the effectiveness resulted from using Padlet in developing knowledge building for students at the College of Education at Princess Nourah University in favour of Post-test, Padlet is an effective tool in creating communal ideas, helping the students become self-directed learners and making them responsible for the learning process.

This finding is equivalent to what was found in the previous studies, which showed the effectiveness of Padlet in visualizing the process of collaborative knowledge building (Musu, 2015).

The Effect Size (η^2) of forming small learning communities through Padlet in developing knowledge building for students at the College of Education at Princess Nourah University in Saudi Arabia is large according to Cohen (1988) conventions for effect size (as cited in Corder; Foreman, 2009, p.59).

- The Second Hypothesis states that: There is no statistically significant difference between post-test and follow-up test mean scores among experimental groups of knowledge building.

To verify this Hypothesis, the researcher used Paired-samples t-test, and the results are shown in the following table:

Table 2. The significance of the difference between the mean scores of experimental groups in the Post-test and Follow-up test of knowledge Building (N=21)

| Variables | Post-test | | Follow-up test | | Significant differences | |
|--------------------|-----------|------|----------------|------|-------------------------|------|
| | Mean | SD | Mean | SD | t- Value | Sig |
| knowledge Building | 80.67 | 4.98 | 82.81 | 6.01 | 1.170 | .256 |

Table 2 indicates that there are no statistically significant differences at the significant level of (.05) between the mean scores of experimental groups in the Post-test and Follow-up test of knowledge building.

The result may be due to the continuity of the effectiveness resulted from using Padlet in teaching students at the College of Education at Princess Nourah University; this means that Padlet is an effective tool in developing knowledge Building.

- The Third Hypothesis states that: There are significant statistical differences between the mean scores of the experimental groups in the Psychological and cognitive Engagement Pre-test and Post-test for the Post-test.

To verify this Hypothesis, the researcher used Paired-samples t-test, and the results are shown in the following table:

Table 3. The significance of the difference between the mean scores of experimental groups in the Pre-test and Post-test of Psychological and cognitive Engagement (N=21)

| Variables | Pre-test | | Post-test | | Significant differences | | Effect Size η^2 | |
|--------------------------|----------|------|-----------|-------|-------------------------|------|----------------------|-------|
| | Mean | SD | Mean | SD | t- Value | Sig | Value | Sig |
| Psychological Engagement | 29.76 | 2.21 | 42.95 | 7.47 | 7.600 | .000 | .743 | Large |
| Cognitive Engagement | 22.86 | 2.69 | 34.71 | 6.45 | 6.470 | .000 | .677 | Large |
| Total degree | 52.62 | 3.67 | 77.67 | 13.07 | 7.658 | .000 | .746 | Large |

Table 3 indicates that there are statistically significant differences at the significant level of (.01) between the mean scores of experimental groups in the Pre-test and Post-test of Psychological and cognitive Engagement for the Post-test.

The result may be due to the effectiveness resulted from using Padlet in developing Psychological and cognitive Engagement for students at the College of Education at Princess Nourah University in favour of Post-test, Using Padlet helps students to organize information, link what they newly learn to their previous knowledge, and engaged in learning, Padlet also gives a platform for the students to participate actively and to engage in their learning, Padlet allows students to engage with their peers and lecturers at any time; So using Padlet increases the student’s engagement.

This finding is equivalent to other previous studies which showed the effectiveness of Padlet is used in increasing the engagement of students) Kleinsmith, 2017; Putri & Umam, 2018; Nadeem, 2019).

This is in line with Fiester and Green (2016) who asserted that Using Padlet within classroom increases student’s engagement, their collaboration with their peers, receive feedback from the teacher, and communicate with him,

Also, it is consistent with the study of Zainuddin et al. (2020) that Padlet has a significant effect on improving students’ engagement in classroom activities.

The Effect Size (η^2) of forming small learning communities through Padlet in developing Psychological and cognitive Engagement for students at the College of Education at Princess Nourah University in Saudi Arabia is large according to Cohen (1988) conventions for effect size (as cited in Corder; Foreman, 2009, p.59).

4. The Fourth Hypothesis states that: There is no statistically significant difference between mean scores of experimental groups in the psychological and cognitive engagement post-test and follow-up test. To verify this Hypothesis, the researcher used Paired-samples t-test, and the results are shown in the following table:

Table 4. The significance of the difference between the mean scores of experimental groups in the Post-test and Follow-up test of Psychological and cognitive Engagement (N=21)

| Variables | Post-test | | Follow-up test | | Significant differences | |
|---------------------------|-----------|-------|----------------|------|-------------------------|------|
| | Mean | SD | Mean | SD | t- Value | Sig |
| Psychological Engagement. | 42.95 | 7.47 | 41.05 | 4.10 | 1.052 | .305 |
| Cognitive Engagement. | 34.71 | 6.45 | 37.05 | 4.24 | 1.198 | .245 |
| Total degree | 77.67 | 13.07 | 78.10 | 6.77 | .123 | .903 |

Table 4 indicates that there are no statistically significant differences at the significant level of (.05) between the mean scores of experimental groups in the Post-test and Follow-up test of Psychological and cognitive Engagement.

5. CONCLUSIONS

The results of the study asserted that female students at Princess Nourah University in Saudi Arabia Knowledge building was developed, and their Psychological and cognitive Engagement was developed through the use of Forming Small Learning Communities through Padlet. The implications from the findings of this study support that Padlet is an effective tool that makes students participate in the classroom, engage with their peers and lecturers, create communal ideas, and become self-directed learners. This is very different from the conventional teaching method, which does not provide any choices for students.

Furthermore, in the present study, the main findings of post-test scores in one of the te groups, i.e., the experimental group increased statistically significant than that pre-test, this might be mostly due to the usage of the Padlet. This study suggests that knowledge Building, Psychological and cognitive Engagement knowledge can be significantly improved using Padlet tool.

5.1. RECOMMENDATIONS

The results of the study offer several recommendations for future research:

- 1- Applying Padlet to all the courses taught at Princess Nourah University.
- 2- Training faculty members for integrating Forming Small Learning Communities through Padlet into the teaching process is very helpful to students.
- 3- The need for conducting further studies on Forming Small Learning Communities through Padlet.
- 4- Training university students for using and applying Padlet in their education.

- 5- Paying more attention to enhance Knowledge building and Psychological and Cognitive Engagement among University Students.

5.2. SUGGESTIONS

- 1- To conduct a descriptive study on the reality of using Padlet in Saudi Arabia universities.
- 2- To conduct the study with a greater number of student participants, as well as examining if the number of days Padlet is used per week impacts Learner outcomes.
- 3- Investigating the effect of using Forming Small Learning Communities through Padlet on improving the academic achievement of female students at the Princess Nourah University.
- 4- This study can be replicated in other faculties in Saudi Arabia to investigate whether the results will be the same or not.

AVAILABILITY OF DATA AND MATERIAL

The authors confirm that the data supporting the findings of this study are available within the article. Raw data can be requested from the authors.

REFERENCES

- Algraini, F. (2014). The Effect of Using Padlet on Enhancing EFL Writing Performance. *Master degree*, Al-Imam Muhammad Ibn Saud Islamic University.
- Awaludin, F. A., Abd Karim, R., & Mohd Saad, N. H. (2017). Padlet: A Digital Collaborative Tool for Academic Writing. *Journal of Education and Social Sciences*, 8 (1), 179-184.
- Corder, G; Foreman, D. (2009). *Nonparametric statistics for non-statisticians A Step-by-Step Approach*. USA. New Jersey: John Wiley & Sons. Sons, Hoboken.
- Cotton, K. (2001). *New small learning communities: Findings from recent literature*. Portland, OR: Northwest Regional Educational Laboratory.
- Fiester, H. and Green, T. (2016) Student use of backchannels. *TechTrends*, 60(4), pp. 404–408. doi: 10.1007/s11528-016-0069-9.
- Gallup, Inc. (2013). U.S. overall: *Gallup Student Poll Results*. 1-6.
- Huang, R. (2018). *Towards the Realization of a Mobile Extended Knowledge Building Community*. Knowledge Building Summer Institute Toronto, Ontario, Canada August 14-17, pp.32-38
- Istianah, L. (2019) The use of Padlet application to improve writing skills of the tenth-grade students of SMK N2 Salatiga In the academic year 2018/2019. *Unpublished master thesis*, Faculty of state institute for Islamic studies, Iran
- Johri, P., & Misra, A. (2017). *Digital technology in classroom: Changing the face of education infographic*. In Smart Technologies for Smart Nation (SmartTechCon), International Conference On (pp. 405-406). IEEE.
- Kleinsmith, C. (2017). The effects of using Padlet on the academic performance and engagement of students in a fifth-grade basic skills mathematics classroom. *Theses and Dissertations*. 2403.
- Musu, Q. (2015). *Enhance Collaborative Learning by Visualizing Process of Knowledge Building with Padlet*. International Conference of Educational Innovation through Technology (EITT).
- Nadeem, N. (2019). Students' Perceptions about the Impact of Using Padlet on Class Engagement: An Exploratory Case Study: *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT)*, 9(4), 1-18, 10.4018/IJCALLT.2019100105.
- Oxley, D. (2007). *Small learning communities: Implementing and deepening practice*. Portland, OR: Northwest Regional Educational Laboratory.
- Putri, H& Umam, M. (2018). *The Use of Padlet in EFL Classroom: A case study of PMPBI Students 2017 the of State University of Jakarta*. The 2nd International Conference on Informatics for Development, PP101-104.
- Scardamalia, M., & Bereiter, C. (2010). A brief history of knowledge building. *Canadian Journal of Learning and Technology*, 37(1). Retrieved from <https://www.cjlt.ca/index.php/cjlt/article/view/26367>
- Taylor, S. (2019). *Knowledge Building as a future focus pedagogy in science classes. Presented at the NZARE Science Education SIG special one0-day research seminar*, Auckland, New Zealand.
- Zainuddin, N; Azmi, N; Yusoff, R& Shariff, S. (2020). Enhancing Classroom Engagement through Padlet as a Learning Tool: A Case Study. *International Journal of Innovative Computing*, 10(1)49-57.
- Zhi, Q., & Su, M. (2015). *Enhance Collaborative Learning by Visualizing Process of Knowledge Building with Padlet*. In Educational Innovation through Technology (EITT), 2015 International Conference of (pp. 221-225). IEEE.