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Research Article

# The Utilization of E-Poster in Teaching and Learning

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## ABSTRACT

Posters thrive in education libraries or classrooms as attractive items, yet few realize the educational potential of the poster. Posters are a colorful eye-catching learning media that could boost the learning atmosphere. E-Poster sessions have become common as a presentation mode for virtual conferences as well as face-to-face learning. These poster sessions comprise numerous forms of information captured in digital formats such as videos, interactive lectures, slideshows, photo albums, short games, and other elements. E-Posters could be archived to the Web, to digital sources or libraries, or to more closed collections. This paper aims to further advance the value of the e-poster as a new useful teaching instrument in the educational setting.

**Keywords:** *E-Poster; Teaching and Learning; Teaching Instrument*

## 1. INTRODUCTION

With globalization, the research approaches in social sciences continue to progress at an ever-increasing pace. Advances in computer technologies have exponentially increased the rate at which data are collected, accumulated, disseminated and applied. There is a critical need for evidence-based learning to align the link between current research and pedagogical practice. This paper addresses this need through the creation of collaborative learning communities from a crucial starting point: 'thinking about thinking via experiential learning', i.e., the enhancement of learning through individual reflection, group reflection, and the inquiry process.

The COVID-19 pandemic has challenged the fundamental nature of experiential learning. A concerted action, constant reflection and some flexibility were required of instructors and students to develop innovative approaches to meet the core competency expectations in subject matter. This engaged scholarship opportunity allowed students to experiment with e-software and education resources such as WebTC, Adobe Spark Post, Adobe Illustrator etc. As such, this paper aligns teaching and learning to the research method using approaches that enhances student engagement and the alignment to desired learning outcomes and professional practice. The aim was to shift the assessment-driven motivation of students toward intrinsic motivation through collaborative inquiry and encourage them to reflect on their own learning as they integrate theory with practice. The approach centers on the creation of learning communities structured to facilitate students' metacognitive awareness of both individual and collaborative learning processes. The integration of

reflection, analysis and critique of process (as opposed to outcome) into a research-based e-poster project enhances student learning by reinforcing the iterative process. The strategic structure of the online and face-to-face components of the collaborative inquiry process acknowledges and builds upon the discipline, culture, and social diversity of the class.

## 2. LITERATURE REVIEW

### 2.1. THE POTENTIAL OF E-POSTER

An experiment by (Shin, 2012) on 744 participants attending a Korean Society of Nephrology Congress, where a total of 207 e-posters were displayed simultaneously with traditional poster formats. Findings revealed that based on items such as legibility, readability, accessibility and scientific value of the poster presentations, most respondents recommended using the e-poster system in future conferences. A later research by Ken M, Tamsin T.J, Raymond E. ( 2018) indicates that it is possible to teach medical and health sciences students the basics of e-poster design, and extend their communication abilities into the realm of electronic communication. Interestingly, recent research on learning styles conducted on more than 1000 university students in Malaysia, Indonesia and China by Sagadavan and John (2019) and Lai and Lee (2019) highlighted that most learners are visual learners and this could be a new common learning style of digital natives who have benefited from the advancement of computer technology. The study also revealed that students chose social media as the most favored choice of communication for academic learning and took accountability for their learning process supporting the findings of the studies of Zhang et. al. (2019), Yang et. al. (2017) and Lai (2013) on student selection of social media for learning. A research on sixty-one Indonesian secondary level students on their speaking ability revealed that there is a significant difference between students taught through Problem Based Learning (PBL) using e-poster and those taught through the conventional method. The students who were taught through PBL using E-poster significantly outperformed those who were taught through a conventional method Winasih, W. W., Cahyono, B.Y., & Prayogo, J. A. (2019). Given the increased interest in e-posters, attention should be paid to evaluating and identifying the usefulness and educational effects of e-poster presentations as part of a university teaching tool instrument be seen as a creative way of helping students develop and focus their arguments concerning their course work assignments. This approach also has potential to help students develop their own voices in an academic setting (Lynch, 2018, Robbins, 2016).

### 2.2. TEACHING INSTRUMENT (E POSTER)

Poster presentations at academic conferences are evolving, and electronic posters (e-posters) are becoming increasingly popular. E-posters have evolved from a static sheet of paper to a dynamic and interactive experience that actively engages the audience and allows the poster designer to present material in multimedia and multilingual settings (Powell-Tuck, Leach, and Maccready 2002; Masters, Gibbs, and Sandars 2016; Carter 2016). As academic conferences increasingly rely on e-posters, it should be an important teaching

instrument to ensure students are prepared for this new mode of presentation. Furthermore, as academic conferences increasingly rely on e-posters in presentations, some e-poster creation instruction, design and practice should be required as part of a teaching instrument. Moreover, learning designs that leverage powerful experiences will include creative and repeated reflections, for metacognitive gains which could lead to transformative outcomes for learners and their teachers (Taylor & Cranton, 2012). Fink (2013) argues that reflection assignments serve as an ideal assessment of student learning, especially in assessing reflection assignments for content, emotional changes, gains in perspective, and students' observations which can showcase student knowledge, ability and talent (Heinrich et al., 2015) And what better way to assess skills and abilities these than via e-posters.

### 2.3. Electronic

E poster is a type of visual aid in teaching and learning. The usage of E poster in the teaching process is important, especially when the use of visual means of education becomes an integral part of the cognitive activity of learners today. The educators must adhere to the guidelines outlined in the E poster by reading the instructions, believe in the instructions and follow the instructions as its technology based (Lentz, 2017). E Posters have the advantage of being displayed before, during, and after the conference, which is often a good way to facilitate professional communication. (Christenberry & Latham, 2013). Furthermore, some software may allow for a creative e poster design, but it requires a high level of technical skill (Haar Romenij & Barentsz 2003) which our present generation of technologically savvy students would revel in working on.

#### 2.3.1. Adobe Spark

Granlund and Malmi (2002) argue that the usage of this e software is common in educational institutions when structuring e posters. Software such as Adobe Spark Post could produce significant benefits for the learners in terms of increased transaction processing efficiency, more accessible information of a higher quality and greater support for adhoc reporting.

#### 2.3.2. WebTC

WebRTC, with its peer-to peer communication link, is considered as an ideal solution for customer care, allowing direct access to the contact center. The key point with WebRTC is that any website can evolve into a control and delivery point for real-time communications, and that the website manages the experience that a user receives through HTML use. WebRTC is a major unique communication process among millions of operating websites (Leylah Fernandez, 2013).

#### 2.3.3. Adobe Illustrator

Adobe Illustrator is a vector-based software that can be scaled and printed at any size and resolution while maintaining full detail and clarity. Based on some of its benefits, Adobe Illustrator is recommended as software for creating interactive learning media (Ariesto Hadi Sutopo, 2003).

When using any software, plenty of time should be allowed for the design and creation of the e poster.Collaboration is key for learners to consult one another and seek technical assistance from either within or outside the classroom. Interestingly, research findings reveal that game-based learning suits learners of the new generation (Rankin & Edwards, 2017; Watson & Yang, 2016). Especially so when the interaction is in an authentic context in addition to the collaboration among peers which is a key component of social constructivism. 3D virtual reality has been recognized as a potential technology capable of providing learners with authentic contexts and immersive experience for them to carry out collaborative tasks (Lan, Kan, Sung, & Chang, 2016).

# 3. METHODOLOGY

## 3.1. Approach

### 3.1.1. The progressive e-poster

The e-poster modifies a traditional mode of communication of research in theoretical subjects. It is distinct from the traditional scientific poster in purpose, format, and assessment practice. The traditional poster follows a linear format similar to the linear model as per Figure 1, whereby sections are presented sequentially: 'Aim, Background & Significance, Hypothesis, Materials & Methods, Results, Discussion, and Conclusions.'

In the e-poster, students work with their group members (10 members per team) to collectively reflect on their approach; develop their notions of what constitutes resources and references that are reliable, and relevant to each stage of the group project. They would also continually develop and revise their conceptual maps, identify areas of uncertainty or concern, and discuss possible ways to address these issues. The 'progressive' format of this e-poster underlines the iterative model of inquiry as per Figure 2.

For this research, two submissions took place; one in week 9 and the other in week 12. Each poster progressively maps the team's reflective process. Each team received an identical web e-poster template (with user and password login) created to assess the elements described above. Teamwork was facilitated through an online learning application, a discussion group, and a collective agreement was reached before the poster was submitted electronically.

### 3.1.2. Research Model

In total, two different models were used in this research to get impactful results and outcomes. Firstly, the traditional model was used to teach the method that followed a linear approach. This model is illustrated as Figure 1. This conceptually traditional linear approach, which leads toward a singular endpoint, reinforces the perception amongst students that the 'outcomes and conclusions' are the most important elements of the research process. This belief is perpetuated through the undergraduate curriculum. However, an impactful research should also involve continuous reflection, analysis, and communication. Thus, this evaluative process contributes to ongoing development in the teaching and learning process as a whole.

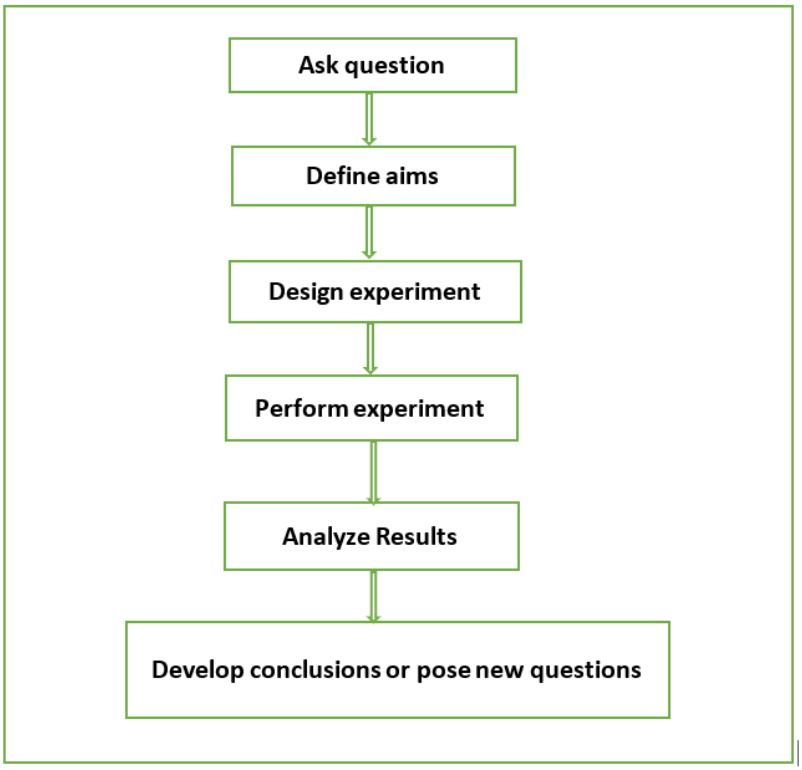


**Fig. 1.** Traditional Linear Model

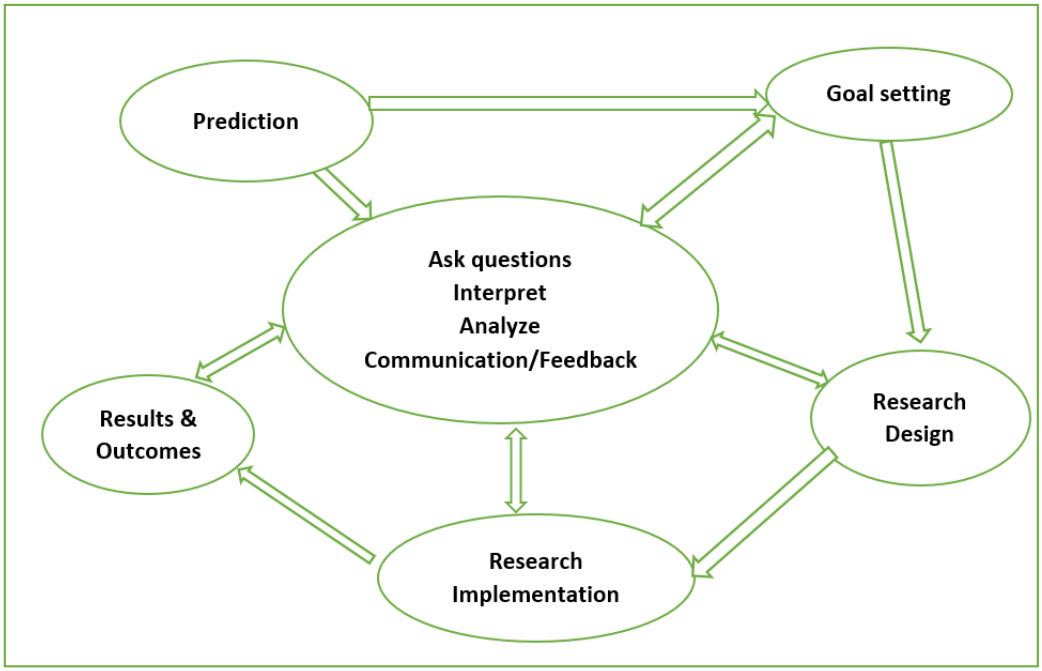


**Fig. 2.** New model to develop a reflective, iterative approach to the teaching and learning for theoretical framework

Figure 2 shows a new model invented to develop an iterative approach to engage students in an inquiry process that is more impactful. This model represents a more authentic process with regard to the learning and teaching of theoretical inquiry and also assessment. It represents an ongoing iterative process involving both thought and action,

similar to an ongoing conversation (Yinger 1990) between present action, past experience and intentions for the future. This process can operate in different time frames and in different spheres. The model as it is presently conceived has five components: prediction, goal setting, research design, results and outcome, and research implementation. All of these five components are linked to basic research skills such as asking questions, interpreting, analyzing, and communicating feedback. The model is heuristic, explanatory rather than predictive.

One of the important components of this model is goal setting which will lead to collaboration and communication with stakeholders which includes instructor, students and colleagues. Learning activities regarding the production of meaningful information are closely related to reflection that deals with recalling students' initial knowledge and simulating them to arrive at the interrelation of teaching materials to surrounding phenomena. According to Arends (2012), activities to teach students about interpreting the teaching materials used can be facilitated through orientation activities. In reflection-oriented teaching, students and teachers are trained to assess themselves using self-checklists, self-reflection journals, as well as peer-reviewed checklists (Ratminingsih, Artini, & Patmadewi, 2017). The teachers' role in reflection-based learning is emphasized in demonstrating both regular capability and authentic reflection in teaching (Sellars, 2012). The reflective approach plays a role in verifying activities and attitudes aimed at increasing these aspects for further learning (Conley et al., 2010)

### 3.1.3. Research Design and Sampling

The study took the form of a Likert scale adopting the quantitative method. A total of 450 university students were selected randomly to participate in this research. They were then divided into groups and tested for the progressive e-poster assessment. The goal of this assessment is to enhance the students to have deep learning and promotion of metacognitive awareness of inquiry linked to the learning process. The progressive e-poster is a group assessment project that maps students' learning on the process of collaborative inquiry.

The study took place in a private university from August 2020 until November 2020. The researcher determined the participants via purposive sampling. The sample is taken on the basis of students' judgement of their typicality of the particular characteristics being sought (Cohen et.al, 2007).

This test was conducted for one whole semester which is about 4 months in order to get an impactful result. Additionally, this test was conducted to know the improvement of students' ability in knowledge transfer for theoretical subjects via the e-poster presentation. The scores were then processed using descriptive statistics, according to mean, standard deviation, maximum, and minimum. The results of the tests were recorded to observe the implications in learning process for the theoretical subjects after the application of e-poster.

The primary goal of this research was to strengthen student engagement through contextual relevance in a process of inquiry that mirrors professional practice and align the pedagogy of the discipline to the practice of the discipline.

## 4. FINDINGS AND DISCUSSION

The e-poster assessed student engagement in the process of inquiry, and reflection throughout the course. For the instructor, this assessment approach progressively mapped group learning of the theoretical, conceptual, and collaborative processes. The goal was to strengthen student engagement through contextual relevance in a process of inquiry that mirrors professional practice and align the pedagogy of the discipline to the practice of the discipline. The iterative model of inquiry and learning promoted through the e-poster is relevant not only to undergraduate and postgraduate courses but serves as a mentorship model for research supervisors.

Changes in the introduction of the progressive e-poster were marked by the transformation of the groups into collaborative learning communities. In comparison to the previous two years, the quality of discussions in web was indicative of higher levels of thinking, integration of theory and practice, and a culture of peer learning and teaching. It was revealed that this was one of the strongest elements of evidence demonstrating the evolution of students' intrinsic motivation with this assessment. The natural integration of theory and concept with practical application into the context of the research project can be witnessed in the e-posters.

Additionally, peer learning and teaching, as well as mentorship within the e-poster discussions, were also apparent. The e-poster functioned as an assessable component that structured the step-by-step processes of transfer and application, to make them 'visible' to the learner. As the groups' assessments evolved into learning communities, the discussions in web revealed the students' own metacognitive realization of the utilization of the e-poster assessment for their learning process.

The outcomes from the e-poster are indicative of students' conceptual development regarding the iterative process of authentic inquiry. A few groups took the initiative to create their own original concept maps to document the evolution of their conceptual schema. Such documentation, dissemination, and integration of feedback into the continued self-reflection and critique at the group level are indicators of good learning and scholarship.

The challenge of developing and revising their own research approach created an engaging level of motivation for students. As an extension of this learner-centered approach, the e-poster provided an opportunity for creative teamwork aligned to the learning experience. Student responses to a Likert scale survey (Table 1) indicate that the e-poster primarily encouraged students to work collaboratively and to learn from their peers. As a formative assessment approach, the students also recognized the e-poster as a learning tool.

Another goal of this research is to foster students' metacognitive awareness; i.e., thinking about their learning. The responses from the survey indicate that this desired outcome was not entirely achieved. Our interpretation is that the focus on group collaboration may have neglected the importance of individual introspection. Additionally, students did not believe that the e-poster facilitated their problem-solving skills. We had initially assumed the e-poster would strengthen the connections of the lectures and tutorials and this proved to be through from the mean score of 3.07.

**Table 1.** Table 1: Results of the Likert scale survey

| **Survey Question (Likert Scale: 4 = strongly agree; 3 = agree; 2 = disagree; 1 = strongly disagree)** | **Mean** | **SD** | **Min.** | **Max.** |
|---|---|---|---|---|
| The e-poster project enabled me to understand the concepts and definition beyond those which were discussed in lectures. | 3.12 | 0.60 | 2 | 4 |
| The e-poster project challenged me to apply my conceptual understanding in the theoretical subjects. | 3.12 | 0.51 | 2 | 4 |
| The e-poster project facilitated the connection between lectures and tutorials | 3.07 | 0.53 | 2 | 4 |
| The e-poster project encouraged me to investigate topics that were outside of those covered in lectures, and tutorials. | 3.23 | 0.60 | 2 | 4 |
| The e-poster project helped me to work in a group environment. | 3.31 | 0.59 | 2 | 4 |
| The e-poster project helped me to enlighten my problem-solving skills. | 2.84 | 0.62 | 1 | 4 |
| The e-poster project helped me to understand the process of effective communication. | 3.04 | 0.49 | 2 | 4 |
| The e-poster project prompted me to think about my learning. | 2.94 | 0.66 | 1 | 4 |
| The e-poster project enabled me to learn from my peers. | 3.29 | 0.60 | 2 | 4 |
| The e-poster is a useful learning tool in the learning process. | 3.26 | 0.56 | 1 | 4 |

From the table above, it could be seen that most of the respondents feel that the utilization of e-poster had totally helped them to work in a group environment. This might be because of the communication occurrence among the group member in order to complete the given task effectively. Thus, to achieve it, definitely it requires patience and tolerance. Hence, the assessments on e-poster is one of the weapons that gives opportunity to the students to prove themselves.

On the other hand, the respondents felt that the assessments on e-poster did not really help in enlightening their problem solving skills. It might be because not all students did get the chance to be a group leader and they were not given a chance to solve a problem. In short, it might be since they did not get the chance to expose their leadership, thus they not did not gained much on problem solving skills. All in all, from the results and outcomes, it could be proved that the utilization of e-poster in the students' assessment was really beneficial in their learning process.

## 5. CONCLUSION AND RECOMMENDATIONS

This article has presented the results of an exploration of the utilization of E-poster in teaching and learning. E posters are used at various levels of learning to gain new knowledge and improve skills at the stage of learners' educational achievement verification and correction. This contributes to the intensification of work for both teachers and students. These advancements are changing the ways how E posters are displayed, presented, and retained by the audience. The ultimate goal of E poster usage in teaching

and learning shows information retention, rapid dissemination of knowledge and active multi- collaboration that spurs and harnesses the talent of collaborators.

In the recommendation, focus group sessions with respondents would be an option to obtain further in- feedback from students to investigate how to facilitate the higher order thinking skills of problem solving and the interconnections of reflection at individual and group level. E- Posters have the ability to demonstrate reflection in learning and are an excellent demonstration of experiential learning and assessing authentically. According to current evidence, users' should not use the e poster to achieve knowledge transfer only– rather, an integrated approach with supplemental material are required to achieve changes in users' knowledge, attitude, and behavior. As a result, empirical studies are required to establish an evidence base to inform how e posters should be developed and implemented to achieve successful knowledge transfer.

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