Enhancing Student Engagement in Electronic Platforms: E-Gallery Walk

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Abstract- The COVID-19 pandemic was one of the most challenging situations that affected all aspects of humans' life including education and active face to face teaching and learning methods. Engaging learners in the teaching and learning process, teaching faculty members, and employing technologies to enhance teaching and learning requires adapting instructional methods based on diverse situations, especially in crises and force majeure. This study was an attempt to design and implement an electronic gallery-walk (e-gallery-walk) based on Gagne's Nine Events of Instruction. A teacher training e-course was designed, developed, and implemented during COVID-19 era at the Center of Pedagogical Training and Academic Development at Hawler Medical University, Iraq. Moreover, for the purposes of this study different formative assessment tools were designed and implemented. Thirty-eight MSc and PhD graduates from different medical specialties who were university instructors participated in this study and their learning was assessed via the designed assessment tools. This hands-on-experience indicates that a carefully designed and implemented e-gallery walk enhances student-centered activity in an online faculty development program. This approach by improving student engagement results in more meaningful discussion and peer instruction. The e-gallery walk gives teachers and students a valuable experience of using technological advances and digital tools to modify face-to-face activities. These tools ensure successful teaching and learning practice in critical conditions when remote activities are deemed necessary. The study findings indicate that peer and teacher immediate feedback is highly influential on the quality of teaching and learning and a modified e-gallery walk could be a suitable choice to improve the process in virtual settings.

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Introduction

The Ministry of Higher Education in Iraq and the Kurdistan region similar to their global counterparts, has mandated that universities incorporate blended learning approaches, including faculty development programs, in response to the COVID-19 pandemic. Consequently, all pedagogical courses have transitioned to an online mode of delivery. However, incorporating student-centered learning activities, such as gallery walk, has proven to be a challenge in this new paradigm.

The COVID-19 pandemic has resulted in a change in basic assumptions in the education sector, wherein the traditional classroom teaching model has given way to blended and/or online teaching-learning methods (1) and offline pedagogical approaches have been superseded by their online counterparts (2). Most faculty members lacked prior experience in online teaching and students had predominantly been accustomed to traditional face-to-face learning in conventional classrooms (3). To address this issue, the development of online teaching programs for medical teachers is recommended (4),

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enabling them to design and implement technologies that enhance student-centered learning.

Numerous pedagogical methods are available to support active learning among students, including the use of Gallery Walk, which is a team-based learning technique that encourages critical thinking, reflection, and feedback among students, thus improving their work (5). Traditional Gallery Walk involves physical movement within the traditional on-campus classrooms, making it challenging to adapt for online learning environments.

To promote active learning among students in remote settings, it is necessary to modify the gallery walk technique. Therefore, to develop an effective lesson plan, the instructional design model proposed by Gagne (Gagne's nine events of instruction) was utilized (6). In this regard, the present study is an attempt to investigate the design and implementation of an e-gallery-walk to promote teaching and learning in faculty members of Hawler Medical University. The results of this study are intended to be shared with the community of health professions educators for wider dissemination and potential implementation.

Materials and Methods

Setting

A teacher training e-course presented during COVID-19 era at the Center of Pedagogical Training and Academic Development at Hawler Medical University, Iraq.

Study participants

The Code of Ethics to conduct the study was issued by Hawler Medical University. The study participants were 38 MSc and PhD graduates from different medical specialties who attended the e-course to become eligible university instructors. The participants informed consent to participate in the study was secured verbally. Table 1 shows details of the study participants' demographic information.

Table 1. Demographics of the Study Participants

College Graduated from	Sex	Educational Background/ Degree	Affiliation Place of Work
Medicine	**Male**	Board in General Surgery	College of Medicine/ teaching hospital
	Male	Board in Family Medicine	Ministry of Health
	Male	Master's in Public Health	UNICEF
	Male	Board in General Surgery	College of Medicine/ teaching hospital
	Male	PhD	Ministry of Health
	Female	MRCP, Master's in Rheumatology	College of Medicine
	Female	Board in Family Medicine	Health center
	Male	Board in Family Medicine	College of Medicine
	Female	Master's in Pharmacology	College of Medicine
	Female	Board in General Surgery	College of Medicine
	Female	Master's in Medical Physiology	College of Medicine
	Male	MRCS/ Master's in GIT Surgery	College of Medicine
	Male	Board in General Surgery	College of Medicine
	Male	Board in General Surgery	College of Medicine
Dentistry	**Female**	Master's in Oral Pathology	Khanzad Specialized Center
	Female	Master's in Dental X ray	Health Center
	Female	Master's in Pediatric Dentistry	Health Center
	Female	Master's in Preventive Dentistry	College of Dentistry
	Female	Master's in Health Administration	College of Dentistry
	Male	Master's in Prosthodontic Dentistry	Khanzad specialized center
	Female	PhD/ Prosthodontic Dentistry	Health Center
	Male	Master's in Oral Anatomy	Shaqlawa (District) Hospital
	Female	Master's in Oral Medicine	Khanzad specialized center
	Female	Master's in Preventive Dentistry	Health Center
	Female	Master's in Preventive Dentistry	Directorate of Health
	Female	Master's in Esthetic Dentistry	College of Dentistry
Pharmacy	**Female**	Master's in Oral Pharmacology	Ishik (Private) University
	Female	Master's in Pediatric Dentistry	College of Dentistry
	Female	Master's in Pharmaceutical Chemistry	College of Pharmacy
	Female	Master's in Clinical Pharmacy	College of Pharmacy

e-Gallery walk

Cont. table 1.

	Female	Master's in Clinical Pharmacy	Private sector
	Female	Master's in Clinical Pharmacy	Teaching hospital
	Female	Master's in Pharmacology	College of Health sciences
	Female	Master's in Biochemistry	Not employed
Health Sciences	**Male**	Master's in Medical Microbiology	Private sector
	Female	PhD/ Virology	College of Health Sciences
Nursing	**Female**	Master's in psychiatric Nursing	College of Nursing
Other	**Male**	Master's in Engineering	Private sector

The innovative course description

The modified Gallery Walk (e-gallery walk for online implementation) was developed for teaching formative assessment tools, based on Gagne's nine events of instruction:

Gaining attention

In the initial phase of the session, various groups consisting of teachers and students were formed. Each group chose a unique pseudonym that encouraged creativity and engagement among the team members, such as Hope, Challenger, Enamel glow, etc.

1. Developing goals and objectives and informing learners

The intended learning outcomes related to designing and implementing different formative assessment tools were shared with the teacher and students through the Moodle platform. A direct message was sent to the teacher and students, informing them of the expected learning outcomes which were:

At the end of the session, students will be able to:

a. Design various forms of formative assessment.
b. Align formative assessment tools with their specialty background by providing examples.
c. Assess activities of colleagues according to a specific criterion (Peer-Assessment).
d. Use Padlet to share their activities and peer assessment.

2. Stimulating recall

Prior knowledge can be activated by engaging learners in a discussion about their past experiences and understanding of the topic. In a recent session on formative assessment, the instructor encouraged teachers and students to recall their previous knowledge by asking about their opinions on formative assessment and how they would incorporate it into their specialties.

3. Presenting the content

Once the prior knowledge has been activated, the educational content should be presented in small bites to promote better understanding and retention. To achieve this, the instructor assigned tasks to six small groups of teachers and students.

The tasks involved preparation of a 10-slide presentation on two formative assessment tools, one for F2F classroom tool use and the other one for virtual classrooms. A rubric used in this study was adapted from an internet source (*iRubric: Assessment of Online Powerpoint Presentation rubric-P34CCX*) (7) and shared with students to guide them in their slide preparation, it is worth to mention that the same rubric was used for evaluation and grading the assignment (Table 2).

4. Providing learner guidance

This is considered a crucial step in promoting correct performance. In this regard, the rubric provided clear guidance on the appropriate actions required to achieve correct performance in slide preparation. By following the rubric (Table 2), teacher and students were able to prepare effective and informative presentations that highlighted their understanding of the topic.

6. Eliciting performance

The action now turns to teacher-students, eliciting performance allows learners to confirm their understanding of the topic and highlight their knowledge through online group presentation where each group present their F2F and virtual classrooms formative assessment tools.

Poster stage of the e-gallery walk

As a replacement for making posters that are used in traditional gallery-walk, each group prepared the requested material in the form of PowerPoint slides or any other form of presentation outside the digital session.

Each group presented their work in the virtual session. To ensure a comprehensive understanding of the presented materials, a dedicated time limit was reserved for questions and discussions at the end of each group

presentation.

7. Providing feedback

Comprehensive feedback is an essential part of promoting teachers and students successful learning. There must be a possibility for providing individual and immediate feedback for each student where all questions must be answered.

Walk through the e-gallery

Padlet was used as an e-Gallery wall to post each group work. Participants were asked to comment on the activities of all the groups according to the provided rubric, and find their peers' feedback on their own work, maximizing the learning process.

8. **Assessing performance**

To evaluate knowledge acquisition effectively, assessing performance is a necessary step and to overcome the potential for bias in peer feedback, the teacher also provided feedback on every group work using the same rubric on the Padlet. This process allowed for transparent criteria and multiple ways of testing knowledge acquisition.

9. **Enhancing retention**

Learning must continuously improve, increasing student retention. Repetition of learned concepts is an effective method of improving retention; however, students often dislike it. In this session the teacher and students were asked to watch the presentations and video recordings to choose the most appropriate formative assessment tool that matches their specialties. This process aimed to promote continuous learning and enhance retention. Figure 1 shows a sample of students' feedback on their peer's presentation.

This innovative technique not only allowed for an enhanced level of student engagement, but also provided an opportunity for participants to demonstrate their proficiency in a contemporary form of communication.

In this study, a modification was implemented to address the time constraints of video conferencing tools. By utilizing Padlet for students to provide asynchronous feedback on their peers' presentations, a hybrid approach of using both Zoom and Padlet was found to be a noteworthy solution for the challenges of internet connectivity and financial limitations faced by low-resource countries in procuring the Pro version of digital tools. These findings demonstrate the potential of innovative solutions to improve the delivery of educational content in a cost-effective and accessible manner. It ensures active learning of learners and some of its advantages are as follow:

a. It provides a good opportunity for peer, self and teacher assessment.
b. It can be used effectively for formative assessment.
c. It enhances collaborative learning.
d. It is easily applicable for large groups of students (e.g., thirty-eight participants in this study).
e. It gives students a chance to use rubrics for giving feedback.
f. Its Padlet provides an online resource for collected group activities and feedback that any teacher-student can access at anytime and anywhere, this benefit outweighs the traditional gallery walk.
g. It gives students more responsibility for their learning.
h. It provides an experiential learning opportunity that is to their benefit in the e-learning environments.

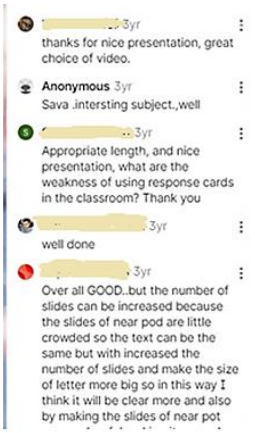

Figure 1. Examples of students' feedback on their peer's presentation

Table 2. Rubric for preparing presentation on formative assessment tools adapted from an internet source "iRubric: Assessment of Online Powerpoint Presentation rubric-P34CCX" (7)

Assessment criteria	Poor 1	Fair 2	Good 3	Excellent 4
Appropriate length	1-4 slides	5-8 slides	9-12 slides	13-15 slides
Knowledge	Demonstrated poor understanding of the material. Left too many questions unanswered.	Demonstrated fair comprehension of the material. Answered some of the expected questions.	Demonstrated a competent understanding of the material. Provided answers for almost all anticipated questions	Demonstrated an exceptional knowledge of the material. Provided a well-researched answer for expected questions.
Design	Poorly developed slides that contained error, and/or lacked information or compacted information (overloaded) per slide	Fairly developed slides that might have an excessive number of images or information or inadequate visuals or information	Well-developed slides that contained messages that demonstrated a balance between images and information with a few exception	Creative use of slides to point messages and showed a balance between images and information
Transitions	None	Little or no transition to guide the audience through the presentation	Used transitions but are not consistent or effective	Transitions are effective throughout the presentation and guide the audience
Work cited	None	Had bibliography which might contain formatting errors	A well-developed bibliography and successful citation of the resources with little or no errors	A complete and accurate bibliography that is useful in directing the audience to the cited resources

Discussion

The COVID-19 pandemic has brought unprecedented challenges to the delivery of faculty development programs in medical education (8). In response to social distancing measures, virtual learning has become the new norm, requiring adaptations in traditional teaching methodologies. In this context, the e-gallery walk technique has emerged as a promising approach to facilitate interactive and engaging digital faculty development programs.

This paper presents a hands-on-experience in conducting an e-gallery walk as a student-centered activity in a proposed faculty development online program. This approach improves student engagement and accountability (5), resulting in more meaningful discussion and peer instruction. The e-gallery walk gives teachers and students a valuable experience of how to use digital tools to modify face-to-face activities. While technology can be introduced in medical education spontaneously, it is recommended that medical teachers carefully design and plan their use of technology to ensure its successful integration into their teaching practice.

Faculty development programs are designed to promote student learning and motivate teachers to become competent educators (9). To improve the quality of teaching, instructional designs must be effective, engaging, and attractive. Faculty must be trained to deliver and assess education that is level-specific, competency-based, standardized, integrated, and easily accessible (10). Gagne's nine events instructional design model, widely used in educational settings, is based on an information-processing model of mental events that occur when adults are exposed to various stimuli (11). Digital approach to medical education enhances student collaboration skills, which are necessary for their future digital practice (12). Instructional design models serve as invaluable sources for matching the right creative process to the right design situation, as well as an effective framework for conducting instructional design research (13).

The e-gallery walk, based on Gagne's model, engages all students in the feedback and reflection process. Learners and teachers collaborate to develop success criteria for a piece of work, and then co-develop strategies for offering constructive peer feedback. In light of the COVID-19 pandemic, there has been a noticeable transition towards the acceptance and utilization of technology in healthcare. This shift holds promising prospects for facilitating the implementation of online faculty development programs and engaging faculty members who work in clinical settings or are geographically separated (14). The primary emphasis in technology-enhanced faculty development is on fostering engagement. However, the achievement of desired faculty learning outcomes through the integration of various technologies necessitates

meticulous planning.

The concept of "just-in-time" (JiT) refers to the active acquisition of information in response to specific needs. During the COVID-19 pandemic, the importance of JiT learning has become even more apparent. However, it is important to acknowledge certain limitations of the e-gallery walk approach. Firstly, the sample size in this study was small, additionally, the study was conducted within a specific educational institution, which may introduce institutional biases and limit the generalizability of the findings. Moreover, the absence of a control group or comparative analysis hinders a clear understanding of the specific impact of the e-gallery walk approach. Recognizing these limitations is crucial for researchers and educators interested in adopting the e-gallery walk approach, and further research is needed to validate and explore its potential in different contexts.

In conclusion, the e-gallery walk technique is a promising approach for facilitating interactive and engaging digital faculty development programs in medical education during the COVID-19 pandemic. This approach enhances participation, encourages collaboration, and provides an opportunity for peer feedback and discussion. As such, it is an innovative solution to the challenges of the current virtual learning environment. Medical educators should consider adopting the e-gallery walk technique as part of their faculty development programs to promote effective teaching and learning during unprecedented times.

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