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The Impact of Clinical Practice E-portfolio in Radiology Education during COVID-19 Outbreak

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ABSTRACT

Introduction: The Coronavirus pandemic (COVID-19) had affected education and learning delivery worldwide. Education institutes faced compulsory transition to online learning systems and challenged by developing electronic/online simulation sessions.

Objective: The study aimed to assess the student's experiences and challenges of using clinical practice e-portfolio during the COVID-19 outbreak. Fifty-nine students were invited to participate in an online survey.

Methods: Two focus group discussion were conducted to elaborate on experiences and challenges. Descriptive and thematic data analysis was used to analyze the responses.

Results: 78.2% reported that e-portfolios facilitated clinical work organization, 87% stated that e-portfolios improve their professional skills. 21.7% had a vague idea about the importance of using e-portfolios in clinical practice.

Conclusion: Positive feedback about student's engagements with instructors and peers, but technical difficulties were the main challenge. Using e-portfolios improve the student's learning experiences and support the teaching process. E-portfolio were well-accepted with a sign promising potential for future implementation and improvement.

Key Words: Radiography, Education, E-portfolio, COVID-19, Clinical Practice

INTRODUCTION

On March 11, 2020, the World Health Organization (WHO) declared coronavirus (COVID-19) as a worldwide pandemic.^{1,2} Social distancing is considered as a fundamental factor to avert the spread of the infection.³ Nearly all the government and private amenities, including schools and universities, had been closed. Online education has been embraced as an emergency plan to reduce the attendance of students in lecture halls, laboratories and personal contact.⁴ Therefore, online and distance learning should be able to provide evidence that students are equipped with the knowledge and clinical skills required for practice.

Clinical practice translated the student's theoretical knowledge and developed practical skill.⁵ Implementation of clinical practice e-portfolio improves the opportunities to collect the evidence and reflect on their knowledge and practice gained across the academic degree.^{6,7} E-portfolio provides evidence of the student's knowledge, attitude, and skills re-

quested for the transition into a healthcare professional. Utilization of e-portfolio provides evidence for student's ability to integrate learnt knowledge, lifelong sustainable assessment, focused feedback, and evidence of achievement.⁸

This study was conducted at the University of Sharjah, Department of medical diagnostic imaging, to assess the student's experiences and challenges of using clinical practice e-portfolio during the COVID-19 outbreak.

MATERIALS AND METHODS

The study was conducted among the undergraduate radiography students attending the clinical practice courses during the COVID-19 pandemic outbreak (March-June 2020).

The e-portfolio was designed and implemented under the 'Blackboard' learning management system (LMS). The e-portfolio provides student's learning progression, accomplishment, and evidence of what students can do.

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The study was conducted in two phases. Phase (1) an online self-administered survey, derived from a previous study, was distributed through the google form platform. The survey consisted of 20 questions to gather students' experiences and challenges while using the e-portfolio.⁹ The questions used a 5-point scale (1 = strongly disagree to 5 = strongly agree). The survey with introduction and study objectives was introduced at the beginning, and the students must approve their participation.

Phase (2); a focus group discussion (FGD) was conducted in two rounds through Microsoft Teams program. A total of (n=15) students participated in the FGD after the invitation. One group had eight students, and the second group had seven students. The discussions were recorded and transcribed.

Data Analysis

Descriptive statistics were generated after the data was exported from the google form to Microsoft Excel. FGD responses were analyzed and categorized accordingly.

RESULTS

All the students (59) enrolled in the clinical courses were invited to participate in the survey; out of which forty-six responses were received, which made the response rate 77.9%. Table 1 showed students perceptions of e-portfolio. Most of the students, 78.2% stated that e-portfolio facilitated clinical work organization. Similarly, 87% stated that e-portfolios improve their professional skills. Ten students (21.7%) stated that the importance of using e-portfolios in clinical practice was not clear to them.

The students show great interest to continue using the e-portfolio even after the COVID-19 pandemic. Forty students, 87% were ready to continue using the e-portfolios in the upcoming semesters. The majority 88% of the participants stated that using an e-portfolio facilitates collaborative learning; also, 75% stated that using an e-portfolio helped them to set goals and organize their work and tasks scheduling.

Almost 53% of the students used Windows and 47% using the IOS operation system while accessing the e-portfolio. Although most of the students 97.8% access the e-portfolio most of the time using computer devices, they use the Blackboard application to review the announcements, updates, and follow-up the submission schedule. These results showed the compatibility of the e-portfolio with the different operating systems such as Windows, Mac, and Android.

The student's perceptions about e-portfolio are divided into three categories; experiences, ability to support learning, and challenges. Descriptive statistics and Cronbach's alpha values of 0.72, 0.80, and 0.87, respectively, which is higher than the cut-point value of 0.7.

The findings showed a positive correlation between the experiences and the potential usage of the e-portfolio in the future; correlation coefficient of (0.43). Furthermore, the results showed a positive correlation about feedback in the e-portfolios were able to support the learning and education (0.44). The students favourably reported the ability of the e-portfolio to challenge the organization of submission and unfinished tasks, with correlation coefficients of 0.54 and 0.49, respectively.

The result of focus group discussions showed that an e-portfolio facilitates the student's engagement with instructors and peers. Students were able to share their reflections, submit their work and receive timely feedback. Students reported some difficulties, such as technical problems and design layout. Student's responses towards e-portfolio are categorized into three themes (Table 2).

DISCUSSION

The goal of this study was to evaluate the experience and challenges of students using e-portfolios in clinical practice during the outbreak of COVID-19. The aim of implementing an e-portfolio in clinical practice was to improve the achievement of course objectives. The department thought that implementing the e-portfolio during the COVID-19 outbreak would sustain students' learning and assessment. The students got proper training and support before e-portfolio implementation. The e-portfolio was presented with clear guidelines, recorded orientation session and training to ensure understanding and proper usage. The implementation of an e-portfolio in the LMS is cost-effective and environment friendly. The e-portfolios sections facilitate the student's reflection and the instructor's feedback, which is considered an essential element in clinical practice. Assessment of students' works is made in summative and formative format to ensure constructive feedback for improvement.

Descriptive analysis revealed that the e-portfolio helped the students to develop skills to evaluate their commitment towards learning and education. They can evaluate their progress report and plan future tasks. Literature showed that clinical practice e-portfolio contributes to professional development when the student's engagement increases in self/peer assessment and reflection.¹⁰⁻¹² Some studies reported negative feedback about the utilization of the e-portfolio in medical education based on the poor reflection, lack of awareness and difficulty encouraging students to participate in the learning process.¹³⁻¹⁵

The current study results showed that the use of e-portfolio supports students learning during the COVID-19 outbreak. Students appreciated their interaction with the instructor and peers. It is known that interaction with peers improves student learning and achievement.

Similarly, statistics showed appreciations of the feedback as well as the ongoing assessment by the instructors.^{16,17} The students reported technical issues that can be resolved by training and technical support and self-troubleshooting skills. The descriptive analysis showed a significant impact of using e-portfolios on student learning, like the results reported in other studies. The successful implementation of e-portfolio in the undergraduate promotes the acceptability of postgraduate and life-long learning.¹⁸

The main study challenge was that an e-portfolio was implemented during the COVID-19 outbreak for some students for the first time. The training and effective reflection need to observe and monitored to achieve the course objectives. However, a significant relationship between the obstacles and the potential usage of the e-portfolio has an impact on the improvement of the e-portfolio to fulfil the goals of clinical practice even after the outbreak. Moreover, the continuous evaluation of students and instructor experiences is essential for successfully implementing e-portfolio in clinical practice. The undergraduate students should be able to demonstrate professional practice skills supported by evidence-based practice. The e-portfolio use in undergraduate studies can play an essential role in demonstrating learning evidence.

CONCLUSION

This research found that students had a positive experience with the use of e-portfolios in clinical practice courses. Students' learning has been positively associated with the use of e-portfolios in their clinical practice. The departments should consider the student's comments and suggestions to improve e-portfolios' future utilization in learning and assessment.

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Table 1: Student responses about their perception, experience, and utilization of e-portfolio in the clinical practice

Description	SA	Agree	Neutral	Disagree	SDA
Has been fun to do	15.2	21.7	39.1	19.6	4.3
Has made me more interested in my work	10.9	28.3	50	10.9	0
Has taken up too much time	30.4	30.4	19.6	13	6.5
Tells me about what my friends are learning	8.7	15.2	41.3	28.3	6.5
Helps me think more about my own learning	21.7	37	26.1	13	2.2
Makes me take more care with my work	21.7	37	28.3	6.5	6.5
Has helped us to give feedback on each other's work	26.1	26.1	30.4	13	4.3
Forced me to do things on time	32.6	37	21.7	2.2	6.5
Helps me be better organized in my work	17.4	45.7	28.3	8.7	0
Helps me to show people what I am good at	13	26.1	32.6	21.7	6.5
Gives me new ways of presenting my work using technology	17.4	21.7	43.5	13	4.3
Helps me to be creative	8.7	19.6	47.8	21.7	2.2
Helps me to be confident	17.4	26.1	30.4	21.7	4.3
Helps me to plan how to improve	17.4	32.6	32.6	15.2	2.2
Helps me judge whether I have improved over time	10.9	37	41.3	8.7	2.2
Is good for showing my progress to other people	8.7	30.4	45.7	15.2	0
Has helped me understand my work better	15.2	34.8	37	10.9	2.2
Has made me pleased with my progress	10.9	34.8	41.3	13	0
Was easy to do because teachers helped me	21.7	32.6	34.8	6.5	4.3

Table 2: Thematic analysis

Theme	Students feedback and reflection
Usage and advantages	<ul style="list-style-type: none"> - Quick to open in many devices. - The online submission of course work and clinical tasks reduce the number of visits to the university to follow up or for paper submission, especially during the Covid-19 period. - Make the work organized and easy to submit. - I was able to share my clinical experiences, evidence and receive feedback faster than before. - E-portfolio facilitate my engagement with clinical tutors as well as I was able to see how others create and deliver in their work,
Difficulties and issues	<ul style="list-style-type: none"> - It freezes sometimes - I think my peers are not able to provide constructive feedback. - The design made the e-portfolio unattractive; I think improved design can help. - E-Portfolio is a useful submission tool, but it is unclear how it can achieve other objectives such as long-life learning. - I am not particularly eager to share my work with everyone
Future implementation	<ul style="list-style-type: none"> - Technical support is needed. - We need more guidance in the discussion forum. - The design can be better and attractive, and colour are not friendly at all