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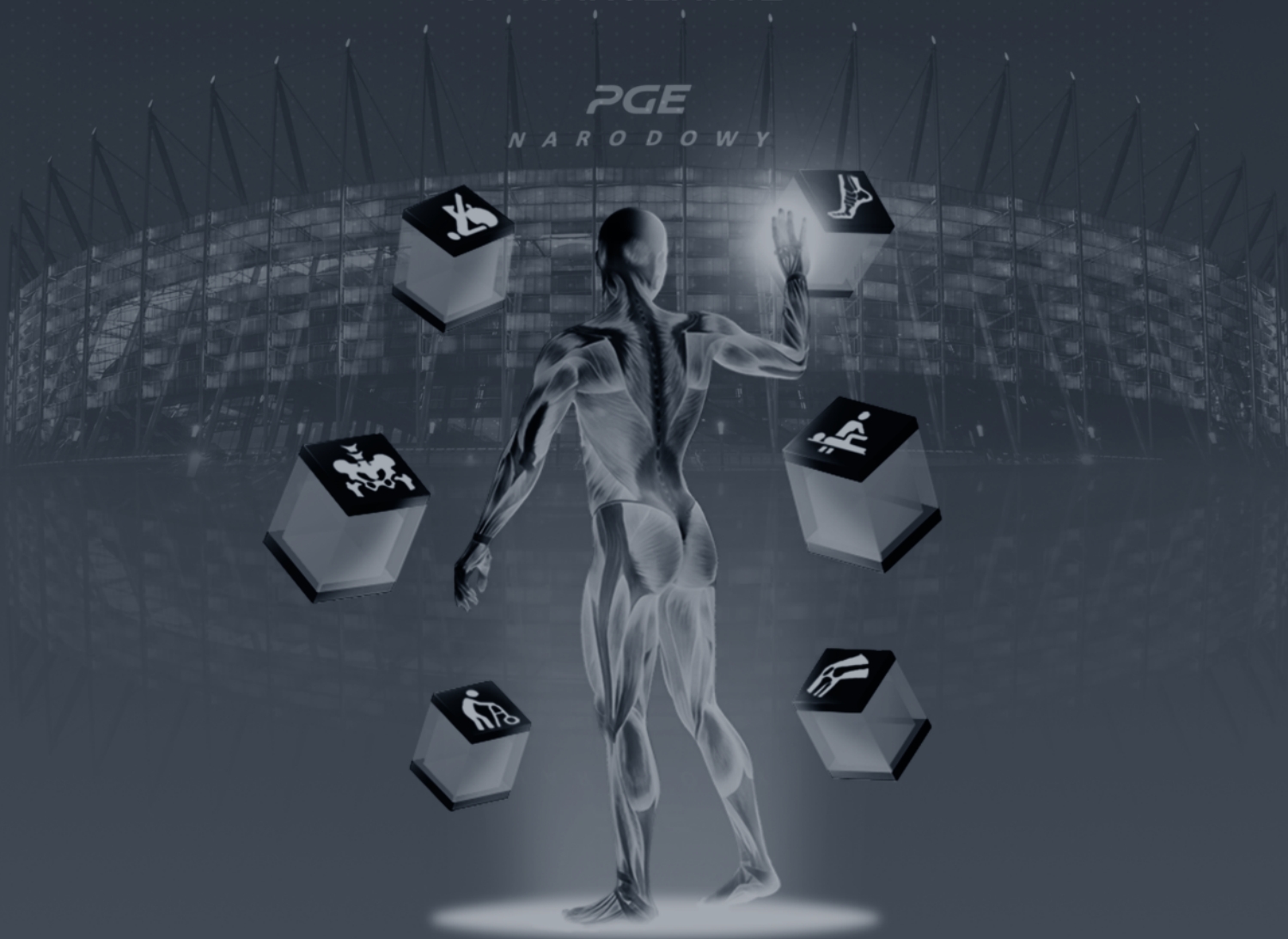
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The effectiveness of a case based online video assignment in improving practical performance of physiotherapy students – a quasi experimental study

Skuteczność przydzielania zadań wideo online bazujących na studium przypadku w poprawie praktycznych wyników studentów fizjoterapii – badanie quasi-eksperymentalne

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Abstract

Aim. In this technologically advancing world, online teaching has become omnipresent in all fields. However, teaching online is still a challenge in allied health professional courses where hands-on skills are the core component of the curriculum. Hence, the aim of this paper was to assess the effectiveness of a case based combined online video and written assignment in improving the practical performance and satisfaction of the cardiorespiratory physiotherapy course students.

Material and Methods. At INTI International University (INTIUI), we provided a case scenario to the cardiorespiratory physiotherapy course students as an assignment. First, the students need to submit their written answers in the Blackboard (BB) Learning Management System. They also need to record a video of the patient assessment procedure for the given case scenario and upload it in the BB. The student's practical performance before the online assignment in the coursework Objective Structured Clinical Examination (OSCE) and after the assignment in the Final OSCE was assessed to find the difference.

Results. The paired t-test showed a significant difference between coursework ($M = 66.47$, $SD = 7.04$) and final OSCE ($M = 77.49$, $SD = 10.11$) performance; $t(13) = -3.48$, $p = 0.004$, which indicates that the students' performance in the final OSCE was significantly better than coursework OSCE. The students' perception about the course and their engagement in the BB was better.

Conclusions. The case-based video and written assignment is a successful strategy to improve the practical performance of the students in a physiotherapy course where practical skills are imperative.

Key words:

blended learning, video assignment, online assignment, practical performance, physiotherapy

Streszczenie

Cel. W tym zaawansowanym technologicznie świecie nauczanie online stało się wszechobecne we wszystkich dziedzinach. Jednak nauczanie online pozostaje wyzwaniem na kursach dla pracowników służby zdrowia, gdzie umiejętności praktyczne są podstawowym elementem programu nauczania. W związku z tym celem niniejszego artykułu była ocena skuteczności zadania wideo online i pracy pisemnej na podstawie badania przypadku w poprawie praktycznych wyników i satysfakcji studentów kursu fizjoterapii krążeniowo-oddechowej.

Materiał i metody. Na INTI International University (INTIUI) udostępniliśmy studentom kursu fizjoterapii krążeniowo-oddechowej w ramach zadania scenariusz przypadku. Najpierw uczniowie muszą przesłać swoje pisemne odpowiedzi w systemie zarządzania edukacją Blackboard (BB). Muszą również nagrać film z procedury oceny pacjenta dla danego scenariusza przypadku i przesłać go do BB. W celu znalezienia różnicy oceniano praktyczne wyniki studenta przed zadaniem online w ramach zajęć Objective Structured Clinical Examination (OBWE - Obiektywne ustrukturyzowane badanie kliniczne) i po zajęciach końcowych OBWE.

Wyniki. Sparowany test t wykazał istotną różnicę między wynikami z zajęć OBWE ($M = 66,47$, $SD = 7,04$) a końcowymi wynikami zajęć OBWE ($M = 77,49$, $SD = 10,11$); $t(13) = -3,48$, $p = 0,004$, co oznacza, że wyniki uczniów w ramach zajęć końcowych OBWE były znacznie lepsze niż na początkowych zajęciach OBWE. Odbiór kursu przez studentów i ich zaangażowanie na platformie BB było lepsze.

Wnioski. Wideo dotyczące oceny przypadku i praca pisemna to skuteczna strategia poprawy praktycznych wyników uczniów na kierunku fizjoterapia, na którym niezbędne są umiejętności praktyczne.

Słowa kluczowe:

nauczanie mieszane, zadanie wideo, zadanie online, wyniki praktyczne, fizjoterapia

Introduction

In this technologically advancing world, online teaching has become ubiquitous in all fields. Medical education is no exception for that [1]. The arrival of Digital Natives or Gen Z has challenged the Medical schools to modify their traditional teaching methods to move towards digital transformation [2]. As a solution Online or e-learning has shown to be as effective as offline learning in undergraduate medical education in improving the knowledge and skills [3, 4].

However, teaching online also has challenges in allied health professional courses like physiotherapy where hands-on skills are the core component of the curriculum [5,6]. The barriers like time limitation, difficulties with internet connection, meager technical skills to use online sources, insufficient facilities, lack of management support, preference for paper-based materials, insufficient interactive materials and negative attitudes of all involved may hinder the learning experience of online teaching [6, 7].

Blended learning (BL) is one of the e learning methods which combines face to face and online instruction modalities [8]. BL tools like websites and discussion boards have shown many positive effects on physiotherapy students teaching and learning [7]. In addition, Physiotherapy students preferred BL for chronic disease management as per a qualitative study report from Australia [9]. A Blended mode learning like flipped classroom showed better student performance than conventional teaching methods [10]. Students self video of a skill, peer comparison and reflection has shown to improve their practical performance than traditional teaching methods [11].

Therefore, BL is a way to bring online teaching in allied health courses like physiotherapy without compromising practical skill training as there is an opportunity for face to face interaction [10, 12]. Furthermore, some of the barriers for e learning like time limitation can be managed effectively by BL approach. However, the role of BL in teaching practical and clinical skills of physiotherapy courses is not explored thoroughly in the Malaysian context in the literature [3, 13]. Therefore, this research was planned to explore the effects of BL method to improve the practical performance of physiotherapy students.

Aim

The aim of this study was to assess the effectiveness of combined video and online written assignment in improving the practical performance and satisfaction of the cardiorespiratory physiotherapy course students.

Material and methods

Study Design

This study was a quasi experimental study with one group pretest-posttest design.

Participants

The participants were all the third year, semester 5 Physiotherapy course students of the Jan 2017 cohort (n = 15) taking cardiorespiratory physiotherapy course at INTI International University (INTIUI), Malaysia. All the stu-

dents were informed about this innovative teaching method and consent was obtained. The research has been approved by the INTIUI research ethics committee.

Procedure

At INTIUI Cardiorespiratory Physiotherapy course was delivered by the BL approach. Blackboard (BB) is the Learning Management System (LMS) used by INTIUI. As a part of BL, the students get online activities regularly like discussion and submitting self recorded video along with face to face contact hours, which are part of their teaching and learning activity of the curriculum.

In this study, the intervention was a case based online video and written assignment. The students learned general physiotherapy assessment for cardiorespiratory conditions in the face to face hour before the intervention was given. The student's practical performance before the online assignment (pretest) was assessed by the coursework practical examination, Objective Structured Clinical Examination (OSCE) using standard checklist. Followed by that, instead of teaching assessment for clinical conditions face to face, a case scenario was given to the students as an assignment. As a first part of the assignment the students need to choose the correct physiotherapy assessment method based on evidence based guidelines with rationale for the given case scenario and submit their soft copy of the written (typed) answers in the Turnitin page (Plagiarism checker) of the assignment in the BB. As a second part of the assignment, they also need to record a video of the physiotherapy assessment procedure for the given case scenario with a model and upload it to the Kaltura media of the BB assignment. Each student need to pair with another student and perform a role play as patient and therapist. This role play was recorded as a video and was submitted in the BB Kaltura page. Rubrics were used to evaluate the written assignment and video separately. The students were also given opportunity to perform a peer assessment of their classmates' work using a standard rubric. The combined video, online assignment and peer evaluation marks were used to provide feedback to the students. After the assignment, the performance in the final practical examination (OSCE) was assessed using a standard checklist as post test. The examiners for the coursework OSCE and final OSCE were the same and they were blinded about the intervention used. Since the students learned partly face to face followed by online and assessed face to face in the OSCE, this study followed BL approach.

Statistical analysis

The scores of coursework OSCE and the final OSCE were tabulated in the IBM SPSS statistics version 19. The paired t-test was used to find the difference between pretest and posttest performance of the student. A p-value of less than 0.05 was considered statistically significant. Besides, each cohort of students was given a 7 item survey about their perception of the course at the end of each semester. The overall perception score recorded in Jul 2016 and Jan 2017 was also compared. Along with that BB analytics, which showed the students' participation in the course was also analyzed.

Results of the research

A total of 15 students were recruited in the study. However, one student discontinued the course for personal reason before the pretest. Hence, only 14 students (7 male and 7 female) participated in the study. The paired t-test showed a significant difference between coursework (M = 66.47, SD = 7.04) and final practical examination (M = 77.49, SD = 10.11) performance; $t(13) = -3.48$, $p = 0.004$, which indicates that the students' performance in the final OSCE was significant

tly better than coursework OSCE (Table 1). The students' perception about the course was recorded using 7 items survey. The perception score of the Jan 2017 session was better for practical component (item 7) and overall average score than the Jul 2016 session (Figure 1). The BB analytics showed a higher accesses average, submission average, interactions average and minute average when compared to department average (Figure 2). Overall case based video assignment improved students practical performance and their perception about the subject improved.

Table 1. Paired t test values

		Paired Differences							
		Mean	SD	St. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	CW_OSCE - FINAL_OSCE	−11.02	11.85	3.17	−17.86	−4.18	−3.48	13	0.004

LEGEND :

Item1 - I was able to achieve most of the learning outcomes of the subject.

Item2 - I find the syllabus stated in the course structure informative.

Item3 - I find the number of topics in the syllabus were sufficient (or adequate).

Item4 - I find the text book(s), and references for the subject are up-to-date.

Item5 - I find the percentage of evaluation of Coursework components, and the Final Examination is reasonable.

Item6 - I find the percentage of various Coursework components (tests, midterm, assignments, quizzes, case studies, laboratory, work, etc) fair.

Item7 - I find the experiments/practical/exercise for this subject are related to the syllabus.

SUBJECT CODE	NO.OF STUDENT	TOTAL PRESENT	SEC	ITEM1	ITEM2	ITEM3	ITEM4	ITEM5	ITEM6	ITEM7	SUBJECT AVG
SESSION				JAN2017							
PTH4221	15	13	1NY1	4.31	4.46	4.46	4.46	4.38	4.31	4.46	4.41
SESSION				JUL2016							
PTH4221	18	16	7NY	4.38	4.44	4.38	4.44	3.56	3.50	4.44	4.16

Figure 1. Student's perception of the subject

Learn Course At A Glance

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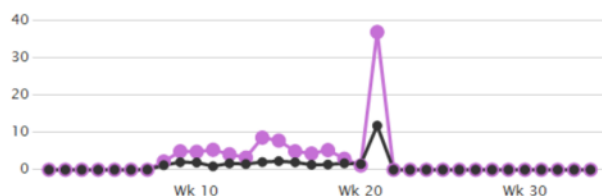
Instructor:	Thirumalaya Balaraman –
Course ID:	MY11.PTH4221.1NY1.JAN2017.IIU
Term:	JAN2017
Status:	Unavailable
Instruction Method:	Blended
Students Enrolled:	15
College:	IIU
Department:	HEALTH SCIENCE

ITEM COUNT (SAME INSTRUCTION METHOD)			
ITEM	COURSE ITEMS		% DIFFERENCE
	TOTAL	AVAILABLE	
Non-SIS Mapped Course	0	0	0.0
% OF ITEMS ACCESSED (SAME INSTRUCTION METHOD)			
ITEM	COURSE		% DIFFERENCE
Non-SIS Mapped Course	0 (NaN%)	0 (NaN%)	
ACTIVITY (SAME INSTRUCTION METHOD)			
ITEM	COURSE AVG		% DIFFERENCE
Accesses	97	33.5	
Minutes	1,557	454.1	
Interactions	804	276.7	
Submissions	16	5.9	

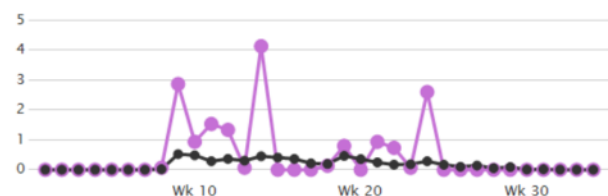
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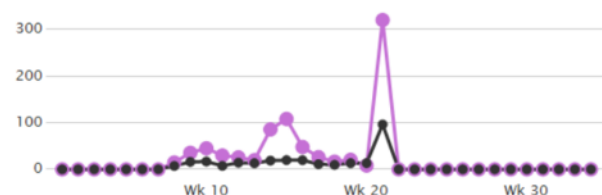
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Submissions Average vs Department Average



Interactions Average vs Department Average



Minutes Average vs Department Average

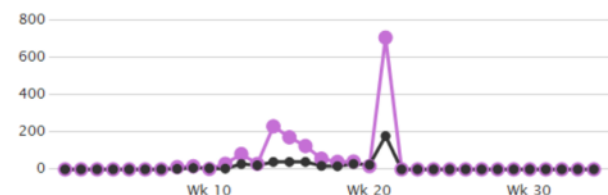


Figure 2. BB Analytics of Jan 2017 session

Discussion

This study was aimed to identify whether BL approach of case based combined online video and written assignment helps the students to learn the practical skills better. The result of the study suggests that video assignment is helping to improve the practical performance of students. The assignment given in this study included Evidence based practice component, clinical reasoning and practical skill. The written part of the assignment encouraged the students to find out evidence based assessment for the given case and all the students supported their assessment with higher order evidences and Clinical Practice Guidelines's. Also the students need to reason out why they need to use a particular assessment method which encouraged clinical reasoning. Also the video part helped the student to perform the assessment techniques appro-

priately and also peer assessment helped them to identify their own mistakes. Therefore online case based video assignment can improve the practical skills of the students very effectively. It is also supported by previous studies which claimed that student self-video of performance, multimedia video clips in combination with individual exercises and feedback from peers and teachers might have a positive impact on students practical skills learning than traditional methods alone [11, 14].

The students' performance in the final OSCE was better than coursework OSCE. It could be due to better preparation for the examination from the experience of a video based activity as reported by previous study from United Kingdom [15]. However, student generated video's for learning has pro's and con's as all the students are not well versed in digital media produc-

tion [16]. This can be avoided by group work which was followed in this study.

The students' perception about the subject was better in the Jan 2017 compared to previous Jan 2016 session in which no video based activities were used. Also the student engagement was better than the department average of all courses since the students actively participated in the activity. Hence it is clear that a case based video assignment can be very useful for learning practical skills among physiotherapy students.

Limitation: A limitation of this study is only one group of students used due to feasibility and small number of students. Also the better performance in the Final OSCE could be due to more practice time compared to coursework OSCE. Further research with randomized control study design using a control group and randomization to increase the validity of the study could provide more solid evidence for the video based assignments.

Applications

Case based video assignments can be effectively utilized to teach practical skills for physiotherapy students. Also the students

can improve their performance by watching the video assignment and it can be used to teach the future students.

Conclusion

The case-based combined online video and written assignment is a successful strategy to improve the practical performance of the students in a physiotherapy course where practical skills are imperative. The video assignment provides opportunity for the students to revisit the performance in BB as many times as they want to further improve their skills. Further to that the videos can be used as a teaching material for future students with proper consent from the students.

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