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The impact of blended and traditional instruction in students' performance

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Abstract

Blended learning environment is a hybrid of classroom and online learning that includes some of the convenience of online courses without the complete loss of face-to-face advantages. The purpose of this study was to investigate the impact of traditional and blended instruction, in students' performance in a Physical Education in Early Childhood course. The course was designed and developed to meet the learning needs of students and the course's objectives. The t test analysis on independent samples, revealed statistically significant differences in students' performance. Based on the findings, blended instruction appears as an alternative teaching practice that should be embraced by teachers, in order to assist students to improve their performance.

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1. Introduction

In recent years, with the continuously development of Information and Communication Technology (ICT), blended instruction emerges as probably the most prominent instruction method in education, especially in Higher Education. The pedagogy of a blended learning environment is "based on the assumption that there are inherent benefits in face-to-face interaction as well as the understanding that there are advantages to using on-line methods" [1]. Blended learning is a mix of the traditional face-to-face and the on-line learning so that instruction occurs both in the classroom and on-line. It is essential to point out that the on-line component becomes a natural extension of the traditional classroom learning [2]. It has been acknowledged that blended instruction, is an emerging trend and it is trying to give students the advantages of each method [3], [4].

The traditional environment in which Face To Face instruction takes place, no matter how intensively technology is used, has some major restrictions. Some of these restrictions are the limited one-to-one teacher-student interaction, the delayed feedback that is given to the students and the limitations in visual aids and materials that the instructor can use in the class session [5]. Perhaps one of the best reasons to develop blended courses is that they provide a viable option for students who seek the flexibility of distance only courses but also wish to have some personal contact with faculty and other students in classroom settings. Blended learning goes beyond barriers of time, location, and culture and has created many enhanced opportunities for learners and instructors. In other words, blended learning endeavors to purposefully and seamlessly integrate online and traditional learning in order to create a distinct, new approach with its own merits [6], [7]. Therefore, blended learning represents a new educational paradigm [8].

Additionally, by providing students with more control over their learning, blended learning can help foster critical thinking [9]. It has been suggested that such an environment promotes student-centered learning and encourages greater interaction between students [10], [11], [12]. Furthermore, it has been reported that students who participate in blended learning environments exhibit the same or better learning outcomes compared to traditional teaching [13], [14].

More specific, Delialioğlu and Yildirim [15], investigated the effectiveness of the hybrid instruction in regard to students' achievement, knowledge retention, attitudes towards the subject, and course satisfaction in comparison to traditional classroom instruction. They reported no significant difference between the blended course and the traditional course in students' achievement, as well as in knowledge retention, satisfaction, and attitude. Also Riffell & Sibley [16], attempted to evaluate the effectiveness of the online portion of a hybrid course in an introductory environmental biology course for non-science majors and found that the hybrid course format was better or equivalent to the traditional course in regard to students' performance on a post-course assessment test. However, the implementation of blended instruction in professional photography, religious studies and computer science, has produced conflicting results [17], [18], [19], [20].

Despite the cautious, but yet quite positive feedback, researchers and educators still worry that the blended course option may not be the answer to distance education problems. Students' confusion about the blend of online and traditional delivery methods, increased student workload in blended sections, and weak online components are all the concerns being raised [21]. Moreover research in Physical Education higher education has been limited so far. In this study, a blended model of instruction was designed and developed to deliver content of "Physical Education in Early Childhood" course by technological means. The purpose of this study was to investigate the effectiveness of the blended course in terms of students' performance, in comparison to traditional instruction. The research question that guided this study was: Is there a significant mean difference between experimental (exposed to blended course) and control (exposed to traditional instruction) groups in performance at the end of the experiment?

2. Methods

2.1 Design of the study

In this study a test and a control group experimental design was used. A blended course covering Physical Education in Early Childhood was developed. The independent variable of the study was the treatment (blended course - traditional face-to-face course); the dependent variable was student's performance after the completion of the course.

2.2 Participants

Study participants consisted of 53 undergraduate students enrolled in the "Physical Education in Early Childhood" course in the Department of Physical Education and Sport Science at the Democritus University of Thrace. Twenty five of the participants were male and twenty eight were female. The participants ranged in age from 18 to 22 years old ($M = 20.09$, $SD = .79$). There were 29 students in the control group and 24 students in the experimental group. The convenience sample of participants was entered into the study through their voluntary participation. Prior to group assignments, participants were orientated to the purpose of the study, the experimental group to which they belonged, the method by which it would be taught and obligations for participation in the experiment.

2.3 The blended course

For the purpose of this study the "Physical Education in Early Childhood" course was redesigned and developed in a blended course format (part online, part face-to-face) according to Kerres's and De Witt's [22] 3C-model of didactical components in a blended learning arrangement. This model includes three components that need to be taken into account a) a content component that makes learning material available to the learner b) a communication component that offers interpersonal exchange between learners or learners and tutors and c) constructive component that facilitates and guides individual to actively operate on learning tasks (or assignments) with different degrees of

complexity (from multiple-choice to projects or problem based learning). In designing the blended course, formal and informal data gathered from the students who had already taken the course, were examined. Then the instructors specified the desired outcomes of the course in terms of goals and objectives. At the end, the content, the practice items and the assessment instruments were determined based on the course basic goal and objectives.

The online component was delivered using the asynchronous course management system (e-Class). E-Class included course description, course schedule, documents (course content), announcements, forums, links and student papers. The course duration was 12 weeks, and the students met for a 90-minute lecture with the instructor 2 times, at the beginning and at the end of the semester. The course commenced with a 90-minute Face to Face lecture where the learners had the opportunity to meet each other and the instructor. In this F2F introductory session students were presented with the learning objectives of the course. The blended learning course required self-paced learning time since the course content was online, resulting in a major reduction in classroom lecture time. Students were expected to log onto the course individually from home, work or a University computing cluster, whichever was most convenient, and read that week's course material, download resources (such as lecture transcripts and journal papers), and follow instructions to complete tasks. Assignments emphasized practical application and authentic tasks all complemented with textbook readings. The blended course was structured to include bi-weekly online assignments focused on active-learning exercises. Weekly quizzes and self-evaluation questions were given online. Students could communicate and interact with the instructor and with each other by e-mail or over forums. Students were expected to post their comments regularly in an asynchronous online forum and to comment on and generate ideas with other students while the instructor coordinated the procedure. Topics of discussions were related with the concepts introduced in the course's modules. All contributions were graded. Students' evaluation was based on their performance to the two weekly assignments and to an exam paper at the end of the semester and also to their participation in a weekly discussion concerning the thematic area of the week.

To evaluate the effectiveness of the web-based component of the blended course, the course was taught simultaneously with a traditional course in which passive lectures were used to cover material in the online assignments. Both courses received the same active-learning activities.

3. Results

To investigate the effectiveness of the blended course in terms of students' performance, in comparison to traditional instruction, a t test analysis for independent samples was conducted. Homogeneity of variance was verified by the Levene's test [23]. The results showed that there were significant differences between students who attended the traditional course and those who attended the blended method instruction ($t_{(51)} = 2.66, p > .05$), with students who attended the course with blended instruction to show higher performance as shown in Table 1. Based on the findings, it can be concluded that there was significant mean difference between the experimental (blended course) and the control (traditional instruction) groups in performance.

Table 1. Means and standard deviations of students' performance

	Instruction method	N	M	S.D.
Performance	Traditional	29	6,34	,81
	Blended	24	7.08	1,14

4. Conclusion

This research represents an initial attempt to measure student performance between blended and traditional course formats. Findings emanating from the study indicated that students who attended blended instruction had higher performance scores than those who attended traditional instruction. The survey results are in agreement with Gomez & Igado, [24], who also argued that Web-based education and especially the blended learning environments have the potential to strengthen the core of teaching and learning, to provide the student higher learning but also have an impact in areas of daily living. This finding provides a persuasive argument to blended learning supporters that effective learning can also take place in a nontraditional or a blended learning environment. This finding is also consistent with other studies in the literature which indicated that student performance in blended courses was equivalent [15] or slightly superior to traditional courses [25, 26, 27]. The approach of blended learning is an

approach currently gaining more and more territory and recognition and thus appears as an alternative teaching practice that can be applied directly to assist students to improve their performance. Overall, the findings reinforce the view that a blended learning environment promotes student-centered learning by empowering students to take more responsibility for their learning and to increase the involvement and participation necessary for that learning.

Results purporting higher learning performance by the students might be affected by the more active classroom teaching approach utilized in the blended format. A blended course model may actually lend itself to more active learning due to students becoming more responsible for learning content on their own time, while classroom time is spent with application of newly acquired knowledge. This environment demands a more thorough investigation.

In the literature, there are a limited number of research studies that examine students' performances in Physical Education settings. Consequently, the current study revealed valuable insights that could help and guide other instructors and designers in adopting and developing blended courses. In order to be able to make more generalizations there is a need for further research studies in this area, at different students' levels, and with different design and development models. Based on these findings, it can be concluded that there are strongly supported evidence in favor of blended learning as an integral part of instructional design in higher education and specifically to Physical Education in Early Childhood course.

Future research should explore alternative designs aiming at higher levels of performance. The explosion of blended learning in supporting learning has made it extremely significant to investigate the determinants crucial that would enable students to use the blended model and therefore enhance their performances. Comprehending the essentials of what is the ideal mix for a successful blended course can provide great management insights into developing effective strategies that will allow universities to create new opportunities for their students and instructors.

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