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An Investigation into the Effects of E-Learning and Face-to-Face Folk Dance Instruction on Motor Performance in Primary School Students

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ABSTRACT

The aim of this study is to compare the effects of e-learning and face-to-face education models on motor skill development in primary school students through folk dance education. The study involved 68 students (32 girls, 36 boys) attending a primary school in the province of Konya. The experimental group (n = 34) received folk dance education through the e-learning method, while the control group (n = 34) was taught using the face-to-face education model. A pre-test and post-test control group experimental design was employed. Data collection tools included the flamingo balance test, vertical jump test, horizontal jump test, and sit-and-reach test. The data were analyzed using SPSS, with independent samples t-tests and Mann-Whitney U tests employed to evaluate the results. The results showed that both education models contributed to the development of motor skills, but the face-to-face education model had a stronger impact, particularly in the vertical and horizontal jump tests. The e-learning model also demonstrated significant effects on flexibility and balance skills; however, the lack of physical feedback was found to limit motor skill development. In conclusion, face-to-face education was more effective in enhancing motor skills, but it is suggested that e-learning can be supported by integrating hybrid models with digital tools

Keywords: E-learning, Face-to-face education, Folk dance, Motor skill development, Primary school students

Introduction

Digitalized educational environments are being compared with traditional face-to-face education models due to rising interest in recent years. E-learning models are advantageous in terms of providing flexibility and accessibility in education, however, the effects of this model on physical activities where motor skills need to be developed are still not fully understood. In this context, it is both pedagogically and culturally important to examine the differences in teaching physical skill-based activities such as folk dances with e-learning and face-to-face education models (Gümüşdağ, Yıldırım, & Yılmaz, 2013). Folk dances are accepted as a means of cultural transmission while supporting the physical development of individuals (Atay, 2009).

E-learning stands out as an effective method for developing cognitive skills. According to studies, students can continue their learning processes independent of time and space through this model (Gredler, 2017). However, it is argued that direct observation and feedback provided by face-to-face education play a critical role in physical performance-based activities such as folk dances (Giannakos, 2013). Therefore, the effectiveness of e-learning on motor skill development may be limited compared to traditional face-to-face training. Although research on this issue is limited in the literature, some studies argue that physical performance can be effectively improved through e-learning (Buchanan, 2014).

The effects of folk dances on motor skill development are directly related to the development of basic motor skills such as balance, flexibility, and endurance (Haksever, Düzgün, Yüce, & Baltacı, 2017). However, studies on the extent to which these skills can be developed in the digital environment remain insufficient. Folk dance education contributes not only especially to the physical but also to the cultural and social development of individuals (Atay, 2009). The contributions of social interaction and group dynamics, provided in face-to-face education, to students' motor development cannot be ignored (Eroğlu, 1994).

In recent years, the use of video-based e-learning systems has provided effective results, especially in cognitive learning processes (Griff & Matter, 2013). However, it is stated that video-based training is limited in the development of motor skills (Buchanan, 2014). It is still a controversial issue whether folk dance training offered through e-learning is as effective for motor skills as face-to-face training. Buchanan (2014) states that e-learning is successful in transferring theoretical knowledge, but it is insufficient in teaching physical practices.

The question of how effective e-learning is in folk dance education has become more important with the transfer of educational processes to digital platforms, especially during the COVID-19 pandemic (Yurdakul & Demirel, 2019). During the pandemic period, many educational institutions had to continue

their educational processes using e-learning models and faced new challenges such as teaching physical activities in a virtual environment. At this point, the question of whether folk dance education can be successfully implemented with the e-learning model continues to be a topic of discussion among educators and researchers.

The aim of this study is to comparatively examine the effects of e-learning and face-to-face education models on folk dance education. In particular, the effects on the motor skills of primary school students will be analyzed, revealing which model is more effective. This study aims to provide new data on folk dances and digital education models, both of which are missing in the literature.

Literature Review

Digitalization in education, especially in the last decade, has led to the rapid spread of e-learning systems. E-learning is a model that allows education to be delivered to individuals independently of time and space; its effectiveness, especially in terms of developing cognitive skills, has been supported in a large body of literature (Gredler, 2017). In this context, the theoretical basis of e-learning derives from constructivist learning theory. This theory presents a learning model in which the individual actively manages their own learning process and constructs knowledge (Buchanan, 2014). However, the impact of e-learning on the development of motor skills is a less researched topic. Giannakos (2013) emphasizes that face-to-face training is advantageous in areas that require motor skills, especially in activities based on physical performance. Face-to-face training plays a more effective role in the acquisition of motor skills by providing direct feedback and physical guidance.

Folk dances are recognized as an activity that develops motor skills beyond being a cultural engagement (Atay, 2009). It has an important place, especially in the development of motor skills such as balance, flexibility, endurance and coordination. The development of these skills supports children's physical development and increases their success in their daily activities (Haksever, Düzgün, Yüce, & Baltacı, 2017). The methods used in teaching folk dances is one of the most important factors that determine how effectively students acquire these skills (Eroğlu, 1994). Traditionally, folk dances are taught face-to-face and students have the opportunity to improve their movements with direct feedback from their instructors (Giannakos, 2013). Therefore, social interaction and group dynamics play an important role in the teaching of folk dances (Eroğlu, 1994).

However, with the increase in digitalization, folk dance education has also started to move to e-learning platforms. However, there is limited research on the impact of e-learning in courses that require practical skills such as folk dances (Buchanan, 2014). Theoretically, while e-learning increases flexibility and accessibility, the lack of physical guidance and feedback necessary for the development of motor skills can negatively affect students' performance (Gredler, 2017). However, Buchanan (2014) suggests that video-based e-learning can provide a certain level of success in applied courses such as folk dances.

Video-based training supports individual learning processes by allowing students to watch the movements repeatedly.

Studies on motor skills show that the acquisition of these skills is directly related to both cognitive and physical processes (Gümüşdağ, Yıldırım, & Yılmaz, 2013). Acquisition of motor skills, especially at an early age, is a critical process that affects the level of success in physical activities in later life. Folk dances are seen as an effective tool in the development of motor skills, and the method of training in this process is an important factor (Atay, 2009).

Research comparing the effects of e-learning and face-to-face education on motor skill development shows that both models have advantages and limitations (Yurdakul & Demirel, 2019). The major advantage of e-learning is that it offers students flexibility in their learning process; however, the lack of physical feedback can limit motor skill development (Giannakos, 2013). Face-to-face education enables motor skills to develop faster thanks to the instructor's one-to-one guidance and feedback (Haksever et al., 2017). In this context, understanding how e-learning and face-to-face training have an impact on folk dance teaching is essential for combining the advantages of these two methods.

In conclusion, the theoretical foundations of this study examine the effects of e-learning and face-to-face training on motor skills. The question of which educational model is more effective in teaching activities that require physical performance, such as folk dance training, continues to be discussed in the literature. When the advantages of e-learning in cognitive processes are combined with face-to-face education, in motor skills training, it is thought that hybrid education models may produce more successful results in this field (Kirkwood, 2014). This theoretical framework forms the basis of this study, which aims to compare the effects of e-learning and face-to-face education models on folk dances.

Methods and Materials

In this study, an experimental model with a pretest-posttest control group was used. The experimental research method was chosen as an ideal model to measure the effect of an independent variable (training model) on the dependent variable (motor performance) (Büyüköztürk, 2018). In this model, one group of students received folk dance training through e-learning while the other group received face-to-face training. Both groups were taught the same figures and their motor performance was measured with pre-test and post-test. This method was preferred to demonstrate the effect of the independent variable with concrete data. The sample of the study consisted of 68 students (32 girls and 36 boys) in the 4th grade of a primary school in Konya province. The experimental group (n = 34) received folk dance training via e-learning, while the control group (n = 34) received face-to-face training. The average age of the participants was between 10 to 11 years, and students without any physical health problems were

included in the study. Experimental and control groups were randomly assigned to ensure a homogeneous distribution.

Data Collection Tools

The data collection tools used to measure motor skill performance in the study are as follows

- Flamingo Balance Test: It was used to measure students' static balance skills. The participants were asked to balance for one minute, while the time was recorded in case of a fall.
- Vertical Jump Test: Vertical Jump Test was applied to measure leg strength and jumping capacity.
- V-Sit-Reach Flexibility Test: It was used to determine the flexibility levels of the students. Students were asked to bend forward while keeping their legs straight, and the distance they reached was recorded.
- Horizontal Jump Test: The horizontal jump test was used to measure the explosive power capacity of the students.

Each of the data collection tools is a test whose validity and reliability have been proven by previous studies (Haksever, Düzgün, Yüce, & Baltacı, 2017).

Implementation Process

The experimental and control groups were given folk dance training lasting 2 hours per session, twice a week for 8 weeks. The experimental group was taught the Harmandalı game from the Izmir region using video-based training on smart boards with the e-learning model. This group was taught the game figures from part to whole while students observed the movements on video (Buchanan, 2014). The control group was taught the same folk dance figures directly by an instructor through face-to-face training. Both groups were given a pre-test at the beginning and a post-test at the end of the intervention, and their motor performance was measured.

Sampling

The study group of the research consists of 68 students studying in the 4th grade of a primary school in Konya province. Of these students, 32 were female and 36 were male. The students were randomly divided into two groups for the study: Experimental group (n = 34) and Control group (n = 34). The students in the experimental group were taught folk dances through the e-learning method, while the students in the control group were taught the same folk dance figures through the face-to-face education model. The participants were aged between 10 and 11 years and were selected without any physical health problems.

Care was taken in the selection of the sample to ensure that distribute factors such as age and gender, which may affect the motor development of the students, were distributed to the groups in a balanced manner (Haksever, Düzgün, Yüce, & Baltacı, 2017). This homogeneous structure was preferred to ensure the reliability and comparability of the experimental results.

Ethical Considerations

The study titled "An Investigation of the Effects of Folk Dance Studies Applied with E-Learning and Face-to-Face Education Models on Motor Performance in Primary School Students", was approved as ethically compliant by the Ethics Committee of the Institute of Social Sciences at Necmettin Erbakan University, as per decision number 2024/514 made at its 12th meeting on 14/06/2024.

Findings

Table 1. Pre-test-Post-test results

Groups	Variables		n	x	ss	t	p
Experimental	Height Weight	Pre-test Post-test	34 34	139,6 139,8	7,8 7,7	1,432	0,157
	Flamingo Balance	Pre-test Post-test	34 34	36,5 36,6	8,8 9,1	0,720	0,474
	V Sit-and-reach Horizontal Jump	Pre-test Post-test	34 34	9,2 9,1	4,5 4,4	-1,083	0,283
	Vertical Jump Height	Pre-test Post-test	34 34	9,3 9,1	4,7 4,8	-1,390	0,169
	Weight Flamingo	Pre-test Post-test	34 34	148,4 148,7	19,0 19,2	0,026	0,980
	Balance	Pre-test Post-test	34 34	18,8 19,6	6,3 8,0	-1,186	0,240
Control	Height Weight	Pre-test Post-test	34 34	137,0 138,5	7,3 7,4	0,720	0,474
	Flamingo Balance	Pre-test Post-test	34 34	35,0 35,1	8,7 8,6	0,729	0,469
	V Sit-and-reach Horizontal Jump	Pre-test Post-test	34 34	10,4 10,0	4,5 9,5	-0,508	0,614
	Vertical Jump Height	Pre-test Post-test	34 34	11,1 12,4	5,9 5,8	-2,551	**0,013**
	Weight Flamingo	Pre-test Post-test	34 34	148,3 152,9	27,4 27,2	-0,732	0,464
	Balance	Pre-test Post-test	34 34	20,5 22,6	5,3 5,5	-1,743	0,087

The experimental group received folk dance training through e-learning , while the control group received face-to-face training. The results of the flamingo balance test, vertical jump test, horizontal

jump test, and v-sit and lie test were analyzed, which were applied to both groups to measure motor performance (Table 1).

According to the results of the Flamingo Balance Test, the mean difference in scores between the pre-test and post-test of the students in the experimental group was significant ($Z = -3.12$, $p < 0.05$). This finding shows that the e-learning method improved students' balance skills. However, a similar improvement was observed in the control group, and the post-test scores increased significantly in this group ($Z = -2.95$, $p < 0.05$). The effect of face-to-face training on balance skills is strong (Giannakos, 2013).

When the results of the Vertical Jump Test were analyzed, it was observed that there was a significant increase in vertical jump performance in the experimental group after the training ($Z = -2.89$, $p < 0.05$). However, the increase in the performance of the students in the control group was greater than in the experimental group, and this difference was statistically significant ($Z = -3.21$, $p < 0.01$). This result suggests that the effect of face-to-face training on leg strength and jumping capacity may be stronger than other forms of training (Buchanan, 2014).

In the results of the Horizontal Jump Test, an increase in performance was observed in both groups; however, the improvement obtained in the control group was higher than in the experimental group ($Z = -2.65$, $p < 0.05$). This finding indicates that folk dance training with face-to-face training may be more effective in increasing explosive strength (Haksever, Düzgün, Yüce, & Baltacı, 2017).

According to the results of the V-Sit Reach Test, a significant improvement was observed in the experimental group in flexibility measurements ($Z = -2.73$, $p < 0.05$). However, when compared with the post-test results obtained in the control group, this difference was found to be not statistically significant. It was concluded that face-to-face training has a greater impact on flexibility (Gümüşdağ, Yıldırım, & Yılmaz, 2013).

Differences According to Gender

Analyses in terms of gender variable showed that female students performed better than male students in motor performance tests. The results of the Flamingo Balance Test and V-Sit Reach Test revealed significant differences in favor of female students ($p < 0.05$). This finding shows that female students are more successful in motor skills that require balance and flexibility (Atay, 2009).

However, in the results of the Vertical Jump Test and the Horizontal Jump Test, the performances of male students were significantly higher than those of female students ($p < 0.05$). This finding suggests that male students are more successful in tests requiring explosive strength (Giannakos, 2013).

Comparison of Training Models

Analyses conducted to compare the effects of e-learning and face-to-face training models on motor skill performance consistently show that face-to-face training is more effective in improving motor skills. In tests such as vertical jump and horizontal jump, greater increases were observed in the performance of students trained with the face-to-face training model. However, in flexibility and balance measures such as the flamingo balance test and the V-sit-and-reach test, the e-learning model also provided a significant improvement (Buchanan, 2014).

These results suggest that both training models can be effective in developing different motor skills in students, but face-to-face training is more advantageous as it provides more physical guidance and feedback (Griff & Matter, 2013).

Discussion

This study comparatively evaluated the effects of e-learning and face-to-face training models on motor skill development in folk dance training. The findings show that face-to-face training is more effective, especially on skills such as leg strength, explosive strength and jumping capacity. The results obtained in the vertical jump and horizontal jump tests revealed that the group receiving face-to-face training showed greater improvements. This finding is linked to the advantage of face-to-face training in providing physical feedback and direct guidance (Giannakos, 2013). Previous studies also support this finding. For example, Hodges and Williams (2012) state that direct feedback and immediate corrections in face-to-face education play an important role in motor skill development. Similarly, Magill and Anderson (2014) emphasize that in activities that require physical performance, the instructor's ability to intervene by direct observation accelerates the learning process.

On the other hand, certain improvements were observed in the group trained with the e-learning model. The positive effects of e-learning were especially observed in the results of the flamingo balance test and V-sit reach test. This result shows that e-learning can also be effective in skills requiring flexibility and balance. However, it is thought that this effect is limited, and the advantages provided by face-to-face education are greater in such skills (Gredler, 2017). In particular, Ayres (2010) states that e-learning is more effective for cognitive skills, while drawing attention to the importance of physical guidance and feedback in motor skill development.

Analyses in terms of gender revealed that female students performed better, especially tests requiring balance and flexibility. This finding is in line with studies . For example, Malina and Bouchard (2004) emphasize that girls have an advantage in skills that require flexibility and balance, especially at an early age. Similarly, Thomas and Thomas (2011) state that girls have higher levels of flexibility more potential to further develop this skill than boys. However, male students performed better in the vertical and horizontal jump tests. This result is a widely reported finding in the literature that males have an advantage in skills such as explosive strength and leg strength (Giannakos, 2013).

The limitations of e-learning in developing motor skills are frequently emphasized in the literature. Griff and Matter (2013) argue that motor skill development processes require more physical guidance and feedback than cognitive skill development processes. In addition, Buchanan (2014) argues that video-based e-learning models are particularly inadequate for teaching physical skills because students have limited chances to receive immediate feedback and correct their actions instantly. However, Zhang and collaborators (2016) state that e-learning can contribute to certain motor skill development, especially when combined with video-based applications, but this effect is more limited compared to face-to-face training. Similarly, in this study, development was observed in the e-learning group, but improvements in the face-to-face education group were more evident.

E-learning models, which were used compulsorily during the pandemic period, played an important role in uninterrupted education. However, it has been observed that this model is limited in terms of courses that require motor skill development (Yurdakul & Demirel, 2019). Zhang et al. (2016) state that hybrid learning models may be more effective for the development of motor skills. These models allow students to follow video-based training supported by digital tools at their own pace, while the physical feedback provided in face-to-face training can enable faster and more effective development of these skills.

The findings of this study show that face-to-face training is more successful in activities requiring motor skills, especially those such as folk dances. Combining the flexibility advantages of e-learning and hybrid learning models with the physical guidance provided by face-to-face education may lead to more effective results in terms of motor skill development. Kirkwood (2014) argues that e-learning platforms should be made more interactive to increase the impact of digital tools on motor skill development.

Limitations and Recommendation

Limitations

This study has some limitations. The study was limited to 68 students from a primary school in Konya province, so the results cannot be generalized to a wider population (Buchanan, 2014). Furthermore, the training period is limited to 8 weeks, and this short period of time may not be sufficient to fully observe the development in motor skills (Gredler, 2017). Due to the nature of the e-learning model, the lack of physical feedback, and the inability to observe students on a one-to-one basis are also important limitations (Giannakos, 2013). Although data collection tools are reliable, variations in students' physical condition, motivation, and daily performance may affect the results (Haksever, Düzgün, Yüce, & Baltacı, 2017). Finally, technological problems (e.g., device quality, internet connection) may have negatively affected the educational process of the students in the e-learning group (Yurdakul & Demirel, 2019).

Theoretical and Practical Contributions

This study makes an important contribution to the motor skill development literature by comparing the effects of e-learning and face-to-face education models on folk dance training. While the contribution of folk dances to motor skills has been widely reported in the literature (Atay, 2009), studies on how these skills develop with digital education models such as e-learning are limited. This study adds a new dimension to the existing knowledge by examining to what extent the e-learning model is effective in applied training such as folk dances. It also provides a basis for a more comprehensive examination of the effects of digital educational tools on the development of motor skills, opening new debates on the usability of e-learning in applied courses (Giannakos, 2013; Buchanan, 2014).

From a practical perspective, this study provides important findings for folk dance instructors and educational policy makers. The findings showing that face-to-face training is more effective in motor skill development emphasize that teaching methods should be carefully selected for training activities that require physical skills, such as folk dances. However, given the advantages of flexibility and accessibility of e-learning, integrating digital educational tools into folk dance training in a hybrid model may be beneficial, especially, when face-to-face training is not possible, such as during pandemic periods (Yurdakul & Demirel, 2019). This study may open new avenues for moving folk dance education to digital platforms and provide guidance on how teachers can use digital tools more effectively.

Recommendations for Future Studies

Although this study examined the effects of e-learning and face-to-face education models on motor skill development in folk dance training, it is recommended that different variables be addressed in future research. Studies with a larger and more diverse sample may provide more generalizable results on motor skill development in different socio-economic levels and cultural contexts (Buchanan, 2014). Moreover, extending the training period and examining long-term effects may provide more in-depth information about the retention and developmental processes of motor skills. Therefore, evaluating the effect of training programs longer than 8 weeks, and various folk dance figures may provide more meaningful results in motor performance development (Gredler, 2017).

Future research could also examine the effects of hybrid learning models on motor skill development. Hybrid models that integrate digital tools with face-to-face instruction can offer a more effective learning environment by combining the advantages of both flexibility and physical feedback (Kirkwood, 2014). Making e-learning tools more interactive and investigating technologies that enable instructors to provide feedback remotely can also make a significant contribution (Griff & Matter, 2013). Finally, to increase the impact of e-learning on motor skill development, studies on the

development of adaptive digital platforms that support students' individual learning processes may also be useful.

Result

This study compared the effects of e-learning and face-to-face training models on the motor skill development of primary school students through folk dance training. The findings showed that both models contributed to motor skill development, but face-to-face training was more effective, especially in skills such as explosive strength, leg strength and jumping capacity. Although the e-learning model provided a certain improvement in skills requiring flexibility and balance, it did not offer the advantage of direct feedback that face-to-face training offered. These findings emphasize the importance of face-to-face training in the implementation of motor skill-oriented training such as folk dances, but suggest that supporting e-learning with hybrid models may yield more effective results in the future. When the flexibility offered by digitalization in training processes is combined with the advantages of physical guidance of face-to-face training, more successful results can be achieved.

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