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Learning Engagement of Adult Females in Remote Physical Fitness Program Through Mobile App Intervention

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Abstract

The use of digital devices such as laptops, personal digital assistants, and mobile phones as learning tools has gained prominence in formal education, generating increased research interest in potential growth areas. According to Jeong and So (2020), there seems to be inadequate empirical evidence from extensive research to support its learning effectiveness in the fitness domain, especially among women who have been underrepresented in economically stressed areas. One of the several explanations for this disparity is the failure to consider women's intersecting cultural identities or potential for social impact. This paper focuses on addressing this issue by conducting a qualitative study. It involves a focus group comprising 15 adult females aged 24 and above. The primary objective is to assess how virtual learning influences the learning perception of adult female learners at a yoga and fitness studio. Interactive self-paced mobile-assisted learning modules were facilitated through the use of mobile phones. An open-ended questionnaire was designed using online resources for primary data collection. The findings were derived by cross-referencing data collected from recordings, interviews,

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and questionnaires. The study revealed that participating in online fitness classes could enhance women's involvement in fitness-related activities.

Keywords: M-learning, Perception, Physical activities, Meditation, Yoga

Introduction

Due to the COVID-19 pandemic, schools shut down, and traditional classes were replaced by online sessions. Home isolation became mandatory, causing a widespread halt in various societal functions, with only grocery stores, medical facilities, and pharmacies remaining operational. In the midst of this crisis, educators reassured students about the effectiveness of virtual learning. The absence of fitness education classes became prevalent, given the impracticality of conducting physical workouts beyond a theory-based curriculum. Despite the interactivity of online lectures, engaging in sports like baseball, basketball, and soccer posed challenges. Questions arose about the feasibility of perfecting skills such as postural correction or modeling in a virtual setting. Similarly, queries were raised about whether swimmers must always practice in water and if basketball shots could only be refined when performed alongside teammates.

Through investigation, the feasibility of incorporating sport into online fitness education courses was revealed. The study anticipated that yoga, focused on enhancing posture, could be effectively utilized in virtual classes to assess the motor skill development of participants. However, numerous challenges were faced in gathering data and recruiting adult female learners from Delaware for the research. Across the globe in India, a yoga and fitness studio was identified, and its online YOGA classes and mobile learning participation were closely observed.

The virtual classroom has the capacity to generate a class performance equivalent to that of traditional face-to-face instruction. Peyman et al. (2018) showed a significant increase in physical activity of women who used educational multimedia and websites and received daily text messages compared to those in the control group. This indicates a positive impact of the media on health promotion as an educational intervention. The introduction of digital media resulted in elevated levels of physical activity, leading to reduced weight and improved Body Mass Index (BMI) within the experimental group. In this research, the use of "WhatsApp" could potentially enhance instructional methods and learning outcomes.

Andrade et al. (2018) examined the risk of infection (specifically influenza and tuberculosis) among individuals engaging in physical exercise at the gym. The analysis involved evaluating carbon dioxide (CO2) concentrations through the Wells-Riley model and investigating the physical attributes of multiple gyms to establish potential correlations with CO2 levels.

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The research was conducted across three distinct gym environments, revealing consistently elevated infection risks for influenza in all scenarios due to the high quantum generation rate associated with CO2 levels. This study indicates that inadequate ventilation in fitness facilities poses a notable concern. High levels of CO2 contribute to compromised air quality, leading to heightened health risks for users, including increased susceptibility to infections like influenza and tuberculosis. The significance of a contagious environment should not be underestimated, especially considering the potential resurgence of pandemic diseases such as COVID-19. Pedro, Barbosa, and Santos (2018) specified that the integration of digital technology into formal education hinges significantly on the capability of instructors to introduce it seamlessly, thus preserving the richness of the classroom environment and ensuring the quality of the inquiry process.

Vlachopoulos (2019) explored how learner–tutor interaction, achieved through educational communication media (conferencing tools, e-mail, discussion forums), can foster a sense of connectedness. To cultivate a closer relationship with online learners, tutors are advised to employ verbal and non-verbal immediacy behaviors, establish a supportive social atmosphere, and deliver timely feedback. Tutor immediacy can be promoted through instructional modes such as instant messaging, emotions, personal profiles, prompt replies, clarification of assignments, timely feedback, and the integration of synchronous activities. As identified by Yu, Kulinna, and Lorenz (2018), instructors and learners can receive modeling and feedback on their mobile devices in realtime through mobile apps, which can be useful in fitness programs. Based on these major literature reviews, it was identified that women from financially stressed areas developed a better perception of mobile learning and electronic learning during the COVID-19 crisis.

Background of the Research Problem

The successful proliferation of M-learning and virtual learning community requires a sustained activity to examine the needs, wants, and preferences of adult female learners in areas of economic distress. Therefore, the seamless integration of online and mobile technology, coupled with interactive design processes, allows theoreticians and practitioners to establish meaningful connections in digital learning. This, in turn, fosters transformative and self-motivational learning experiences within the curriculum. This particularly applies to underrepresented adult female learners engaged in virtual physical fitness training, facilitated by a remotely located trainer or moderator.

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A Justification of the Importance of the Problem

Due to the COVID-19 pandemic outbreak, schools and colleges across all nations had to pivot online on very short notice. In this current time of virtual reality classrooms, learners get fatigued and are quarantined indoors without any physical fitness or exercise. Since the outbreak of the novel coronavirus, more rules and regulations have been implemented by local authorities. The challenging times of a pandemic, disaster, or natural calamity, leading to the suspension of in-person classes, instill profound anxiety and unease among the public. As a result, social interactions are significantly limited during such periods. According to Delaware Emergency Management Agency (DEMA) and Delaware Division of Public Health (DPH), hosting private indoor gatherings or events with more than ten (10) persons presents a substantial risk during the pandemic, potentially leading to a rapid spread of the virus. Female learners in remote areas without access to easy transportation can benefit from the opportunity to maintain physical fitness and mental tranquility at a lower cost through virtual learning. The concept involves transferring traditional in-person fitness classes into a digital environment, which is accessible through portable devices such as iPads or tablets. This allows women to connect with their instructors and participate in online fitness training sessions at scheduled times.

Significance of Research

A valuable way of bridging the gap during unforeseen circumstances is to switch to offering virtual fitness classes supported by a trained instructor.

This provides an opportunity for trainers or instructors to continue supporting female learners in remote areas of economic stress throughout the quarantine period, ensuring consistent participation in online classes. The enriched participation of women learners in virtual fitness training provides a framework for analyzing the usability, intention, and acceptance of new virtual learning frameworks in fitness education. The objectives of this qualitative study are as follows:

1. To enhance better perception of mobile learning and virtual learning among women and improve engagement of adult females in remote physical fitness learning programs through the digital environment.
2. To identify how online yoga, fitness classes, and M-learning can enrich engagement opportunities for adult female learners from marginalized categories in economically distressed area.

Al Emran and Shaalan (2014) demonstrate that M-learning facilitates knowledge sharing among students and educators while interacting with each other. Chatel and Falk (2017) confirm that through convenient information acquisition and sharing, mobile computing not only facilitates traditional

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lecture-style teaching but also promotes innovative teaching methods, such as geography education, through the SMARTGEO application. Ralston et al. (2019) demonstrated the feasibility of conducting student engagement and exploratory learning beyond the traditional classroom setting by incorporating remote field activities. Recent reviews have focused on inquiry-based learning supported by mobile technology. Zydney and Warner (2016) identified typical designs with mobile apps (technology-based scaffolding, location-aware functionality, and digital knowledge sharing and construction) but also suggested some recommendations for better alignment of the learning theories and the measured outcomes. M-learning (Mobile Learning) researchers attempt to maximize the utilities of mobile technologies for complementing the virtual classes in all streams of education, including physical exercise classes, while maintaining the learning mission.

This literature review determined that basic scientific knowledge or conceptual understanding were the main outcomes measured in the studies, and efforts from scholars was needed to assess high-level cognitive outcomes like problem-solving. Another analysis of the effects of mobile technology on inquiry-based learning by Sung, Chang, and Liu (2016) focused on the shortcomings linked to the duration of interventions, the methods of measurement of higher-level skills, and the weak orchestrations of mobile activities in generic learning activities. This supports the idea that learning outcomes cannot be solely attributed to a student's activity.

Future research should incorporate emerging technologies and formulate additional approaches to enhance student-teacher collaboration through the utilization of mobile apps. Researchers need to make more explicit connections between the instructional principles and the design features of their mobile learning environment to better integrate theory with practice.In addition, this review noted that more substantial alignment is needed between the underlying theories and measured outcomes.

According to Shi, Luo, and He (2017), Mobile Assisted Language Learning can occur using ‘WeChat’ Instant Messaging. Therefore, this research concept was significantly influenced by this finding. Pimmer et al. (2014) emphasized how nurses and midwives in remote South Africa used mobile technology through inaccessible and resource-poor areas in informal learning contexts. Xue, Zhang, and Luo (2017) investigated the impact of mobile learning on students’ academic performance and learning attitude. The results revealed that mobile learning could produce identical learning results to traditional classroom instruction. Nevertheless, students had a mixed attitude towards different aspects of mobile learning. The result of the survey indicates that offering mobile learning could be a method for improving the retention of students by enhancing teaching/learning effectiveness.

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Research Design

During live cast sessions, a trainer or volunteer participates in the exercises in front of the camera. This allows online participants to follow the fitness exercises and to understand the instructor well via the headset and visual mode. Fifteen adult female learners, comprising the sample population for this study, were informed on-site that the class would take the form of a live webinar. In addition, live chats were used to help learners with technical problems.

The self-paced mobile-assisted learning modules, which include narration, animation, and assessment questions, provided five educational benefits: versatility, personalized learning, ease of access, interactivity, and affordability. Four mobile app modules were developed using fitness instruction materials, which required 10 to 15 minutes for completion by learners. The instructional activities were facilitated through mobile phones, thus enabling interactive education via 'Whatsapp' mobile app in remote focus groups locations.

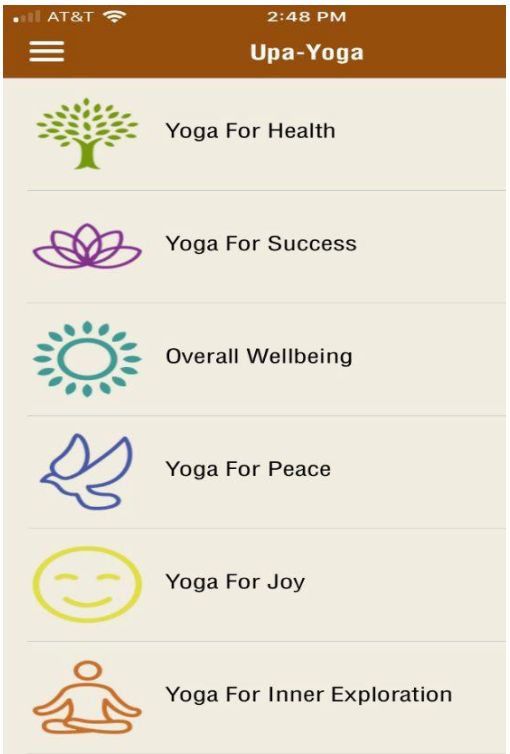

Figure 1. Mobile Assisted Learning Module

Figure 2. Embedded Video in Mobile App

Participants utilized a yoga mat, a laptop equipped with a webcam, an audio recorder, and a high-speed internet connection. Each individual was responsible for positioning their video camera to enable the facilitator to

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observe them as if they were in the same physical space. Furthermore, participants were instructed to mute their microphones while following the provided instructions.

Relevance to Organizational Leadership

This research, focused on student readiness, lays the rationale for accepting online and mobile technologies in virtual physical fitness training by educators, leaders, and fitness solution providers. The study employed a participative leadership style for this action research. The findings can serve as a reference point for future researchers, mobile developers, educators, practitioners, and policymakers for subsequent research endeavors. These findings proffer valuable contribution to the field of virtual digital learning and offer insights that can guide the design and development of yoga and fitness training interventions in a digital environment.

Data Collection

An open-ended questionnaire was designed using online resources for primary data collection. A total of 5 open-ended questions were distributed to the fifteen focus group participants through a survey website link in the 'Whatsapp' fitness group, which were returned for further evaluation. Information regarding the participants' age, medical condition, lifestyle, occupation, intention or purpose for attending the program, other sport skill or outdoor activities, and duration of association with yoga and fitness were obtained from the instructor's record book as a secondary data source. During online sessions, observations were conducted through individual structured interviews to gather relevant information. The consent for participation and usage of information in the research were obtained through the online platform. As an invited advisor and observer for the online fitness program by the Yoga and Fitness Studio, no additional permission was required to gather secondary data about the participants.

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Figure 3. Participant Interview

Figure 4. Online Meeting With the Adult Learners

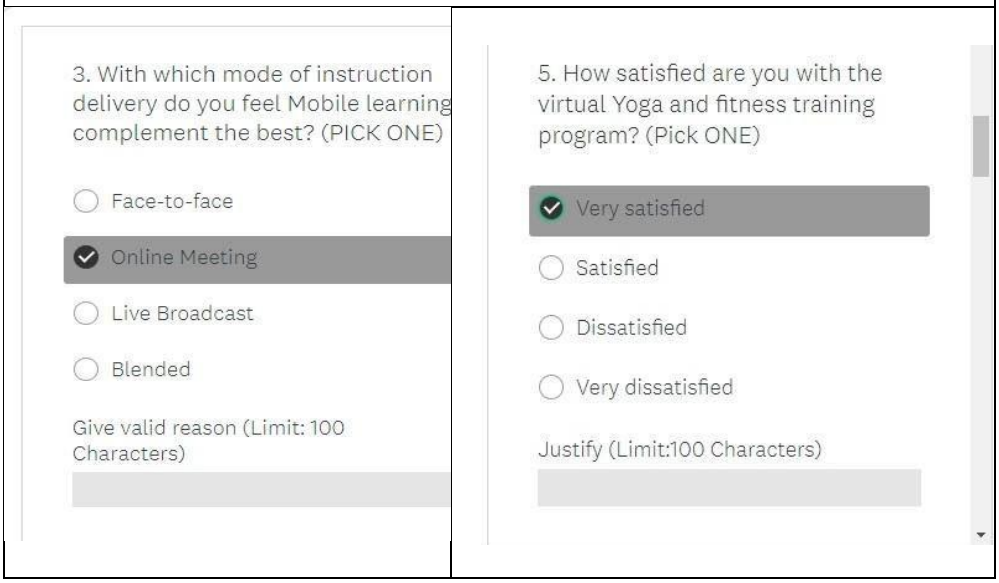

Figure 5. Sample Data Collected Through the Mobi-Site Link Circulated in 'WhatsApp' Fitness Group

Result Analysis and Discussion

Table 1 displays the questionnaire, while Figure 6 presents the results. The reasons for participants' choices, captured through five open-ended questions, are stated as follows:

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Table 1. *Open-Ended Questionnaire on Learner's Participation in Mobile and Online Fitness Training*

Questions	**Response Categories**				
	A	**B**	**C**	**D**	**E**
What is your main reason for joining the virtual yoga and fitness class?	Improve body, strength, and flexibility	Increase Well Being	Weight Management	Relaxation and Stress Relief	Career or Profession
What is your purpose of preference for switching to Online and M-Learning classes?	COVID-19	Distance & Time	Family Restrictions	Transportation Problem	More Economic
With which mode of instruction delivery do you feel mobile learning complement the best?	Face-to-face	Online Meeting	Webinar	Digital Medium	Blended
Did you face technical issues during the online class or virtual meeting?	Always	Usually	Sometime	Rarely	Never
How satisfied are you with the virtual yoga and fitness training program?	Very Satisfied	Satisfied	OK	Dissatisfied	Very Dissatisfied

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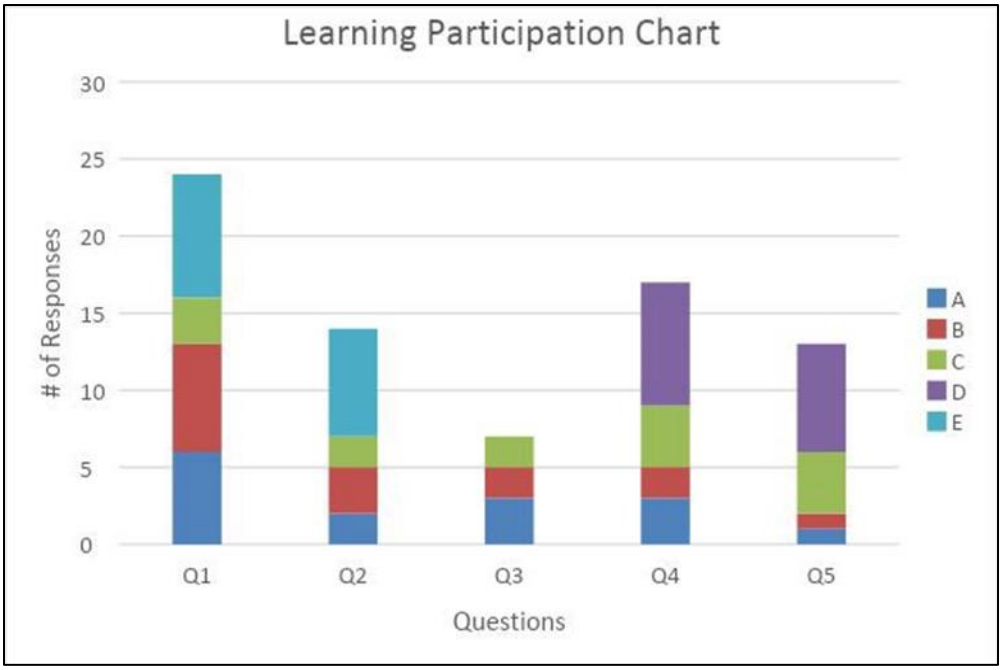

Figure 6. Results of the Questionnaire on Learner's Participation

During the structured interview and participant observation, participants were collectively asked to evaluate and suggest online and mobile-assisted learning improvements for their fitness training class. The subsequent group responses, recorded as fieldnotes to identify shared patterns, include the following:

1. The pace of the online meeting through Microsoft Team, Google Hangout, and Skype, coupled with micro-learning through mobile learning apps, was just right.
2. After attending this program, I feel online and mobile learning curricula for physical fitness classes should replace traditional face-to-face classes as it saves my time, money, and travel effort.
3. The interactive self-paced mobile learning app and daily themes posted on Facebook, Instagram, and other social media accounts motivated me for the forthcoming online workout session.
4. I attended the program the first time, and it changed my notion. Yoga and physical fitness had nothing to do with a person's spiritual or religious views.
5. The class live video chat and mobile conference with the instructor and other participants through the 'Whatsapp' group were helpful.
6. It is most likely that 'Online' instruction mode for the Yoga and Fitness Program can replace the traditional mode of face-to-face instruction post-COVID-19 as it makes life easy.

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7. Despite not having a Smart TV, I could view the live cast by connecting my laptop to the TV using just an HDMI cable. I feel comfortable practicing the yoga exercises online without having to leave my baby to any creche.
8. It is said, "New and better digital technologies are being suppressed by people whose businesses would be challenged by them." This Yoga and Fitness Studio proved it wrong.
9. Being an IT professional, I have had an extremely sedentary lifestyle for the last five years. However, the online and mobile yoga and fitness course improved my body strength and flexibility in just two weeks.
10. The online yoga and fitness program was relaxing and brought ultimate stress relief during COVID-19. As a doctor, I strongly recommend that all other doctors prescribe it.

Table 2. The Triangulation Matrix Depicts Below How Data Was Collected For Qualitative Analysis

Parameters	Data Source		
	Questionnaire	**Interview**	**Observation**
Improvement in learner's perception		✓	✓
Improvement in participation	✓	✓	✓
Technical effectiveness in collaboration	✓	✓	
Improvement in ease of learning	✓	✓	✓
Enhanced portability		✓	✓

The study focused on participants with good physical health and without any medical conditions that could hinder their involvement in the online yoga and fitness program, due to time constraints. It was assumed that participants in the focus group consulted with a physician before engaging in yoga classes, fitness programs, or workshops led by a trained instructor. Many reported health issues such as obesity, thyroid problems, high blood pressure, colitis, knee joint, or back problems. The selection of participants for this study was constrained by budget and time considerations. Furthermore, the validity of the results relies on the responses provided by the participants.

Research Summary

The conducted research successfully achieved its objective by demonstrating that online fitness classes could enhance women's involvement in fitness activities. The study revealed that incorporating mobile learning (M-learning) further contributed to increasing the participation of adult females in online yoga and fitness classes. The required resources for this initiative included a three-week time frame, engagement with the fitness studio, and the

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participation of fifteen adult females. However, further comprehensive research is required to explore the impact of technology in the classroom, with a particular focus on understanding how virtual classes enhance the role of teachers as media orchestrators and learning facilitators. In addition, the scope of this study could be expanded in the future to assess and compare the health benefits and improvements associated with various modes of instruction delivery for fitness training.

COVID-19 caused a significant pedagogical change in the instruction design of the fitness curriculum, which resulted in female learners accessing digital devices in place of traditional face-to-face fitness sessions. In the end, further research is required to explore how instructors can implement online exercises for women from various underprivileged communities.

Conflict of Interest: The authors reported no conflict of interest.

Data Availability: All of the data are included in the content of the paper.

Funding Statement: The authors did not obtain any funding for this research.

Declaration for Human Participants

The research conducted has been approved by the Delaware State University Institutional Review Board, and the principles of the Helsinki Declaration were followed.

References:

1. Al-Emran, M., Elsherif, H. M., & Shaalan, K. (2016). Investigating Attitudes Towards the Use of Mobile Learning in Higher Education. Computers in Human Behavior, 56, 93-102, http://dx.doi.org/10.1016/j.chb.2015.11.033
2. Andrade, A., Dominski, F. H., Pereira, M. L., De Liz, C. M., & Buonanno, G. (2018). Infection risk in gyms during physical exercise. Environmental science and pollution research international, 25(20), 19675–19686. https://doi.org/10.1007/s11356-018-1822-8
3. Chatel, A. & Falk, G. C. (2017). SMARTGEO- Mobile Learning in Geography Education. European Journal of Geography, ISSN 1792-1341, (8)2, 153-165.
4. Demir, K. & Akpinar, E. (2018). The effect of mobile learning applications on students' academic achievement and attitudes toward mobile learning. Malaysian Online Journal of Educational Technology – MOJET, 6(2), http://dx.doi.org/10.17220/mojet.2018.04.004

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

5. Fahad, N. & Al-Fahad (2009). Student's Attitudes and Perceptions towards the effectiveness of Mobile Learning in King Saud University, Saudi Arabia. The
6. Turkish Online Journal of Educational Technology, ISSN: 1303-6521, (6)4, 2, http://www.tojet.net/articles/v8i2/8210.pdf
7. Jeong, H. C. & So, W. Y. (2020). Difficulties of Online Physical Education Classes in Middle and High School and an Efficient Operation Plan to Address Them. Int. J. Environ. Res. Public Health 17, 7279.
8. Jin, X., Zhang, X., & Luo, H. (2017). Effects of mobile learning on academic performance and learning attitude in a college classroom. Proceedings of the 4th International Conference on Advanced Education and Management (ICAEM 2017) (pp. 307–311)
9. Mobile-Assisted Language Learning Using WeChat Instant Messaging. International Journal of Emerging Technologies In Learning, 12(2), 16-26, doi:10.3991/ijet.v12i02.6681
10. Pedro, L.F.M.G., Barbosa, C.M.M.D., & Santos, C.M.D. (2018). A critical review of mobile learning integration in formal educational contexts. International Journal of Education Technology in Higher Education, 15, 10, https://doi.org/10.1186/s41239-018-0091-4
11. Peyman, N., Rezai-Rad, M., & Tehrani, H. et al. (2018). Digital Media-based Health Intervention on the promotion of Women's physical activity: a quasi-experimental study. BMC Public Health 18, 134, https://doi.org/10.1186/s12889-018-5025-5
12. Pimmer, C., Brysiewicz, P., Linxen, S., Walters, F., Chipps, J. A., & Urs, G. (2014). Informal mobile learning in nurse education and practice in remote areas. A case study from rural South Africa. Nurse Education Today. 34(11), 1398-1404, https://doi.org/10.1016/j.nedt.2014.03.013
13. Ralston, A., Hernandez, G., Dyck, M., MacKenzie, M., & Quideau, S. (2019). Mobile learning and student engagement in remote field activities. First Monday. 24(11), https://doi.org/10.5210/fm.v24i11.9999
14. Schuler, C., Winters, N., & West, M. (2012). The future of mobile learning: Implications for policymakers and planners. Paris: UNESCO.
15. Shi, Z., Luo, G., & He, L. (2017). Mobile-Assisted Language Learning Using WeChat Instant Messaging. International Journal of Emerging Technologies in Learning (iJET), 12(02), pp. 16–26. https://doi.org/10.3991/ijet.v12i02.6681
16. Sung, Y., Chang, K., & Liu, T. (2016). The effects of integrating mobile devices with teaching and learning on students' learning

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

performance: A meta-analysis and research synthesis. Computers & Education, 94, 252–275. https://doi.org/10.1016/j.compedu.2015.11.008

17. Vlachopoulos, D. & Makri, A. (2019). Online communication and interaction in the distance higher education: A framework study of good practice. Int Rev Educ 65, 605–632 https://doi-org.desu.idm.oclc.org/10.1007/s11159-019-09792-3
18. Xie, J., Basham, J. D., Marino, M.T., & Rice, M. F. (2017). Reviewing Research on Mobile Learning in K–12 Educational Settings: Implications for Students with Disabilities. Journal of Special Education Technology, 33(1), https://doi.org/10.1177%2F0162643417732292
19. Yu, H., Kulinna, P., & Lorenz, K. (2018). An Integration of Mobile Applications into Physical Education Programs.Strategies.31.10.1080/08924562.2018.1442275.
20. Zydney, J. M. & Zachary, W. (2016). Mobile apps for science learning: Review of research. Computers & Education, 94, 1-17, https://doi.org/10.1016/j.compedu.2015.11.001