Influence of teacher on student motivation: Opportunities to increase motivational factors during mobile learning

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Abstract

Amid the COVID-19 lockdown many countries have replaced traditional learning with remote or mobile one. It was noted that students' motivation has become much less with the transition to distance learning. This study analyzes how motivational processes influence mobile learning quality and aimed to analyze the factors boosted the motivation of students to learn in modern conditions of isolation and identify the major demotivating factors affecting the quality of mobile learning. Motivation is considered a key factor in improving students' involvement in distance learning. The author surveyed 200 students and 46 teachers of The University of Jordan and Jordan University of Science and Technology regarding the factors that influenced their motivation in terms of mobile learning. The results revealed that 178 out of 200 participants agreed that intrinsic motivation impacted their interest in mobile learning. Some 78% of the students approved of mobile learning, while the remaining 22% believe it is necessary to return to the traditional face-to-face education format. The importance of feedback and communication with teachers and its impact on the process of mobile learning is considered. The role of built-in mechanisms in information systems and the positive role of gamification is equally important. Plug-ins compatible with the convenient WordPress system, i.e. applications that help organize the educational process were examined in the scientific work. The specific recommendations for raising the motivation of students in the learning process, which can be used by relevant institutions worldwide presented.

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1 Introduction

The modern development of information technologies entails changes in all spheres of human life, including in obtaining new knowledge and skills by a person (Hasan et al., 2021). Researchers are actively considering the option to completely replace the traditional format of the educational process with mobile learning because new digital technologies have emerged and educational platforms have been created that are aimed at providing high-quality knowledge (Pekrun et al., 2017).

Today, the transition to mobile learning is a widespread and promising phenomenon caused by the introduction of lockdown in many countries globally. This type of education involves lectures and seminars, as well as passing various intermediate certifications, exams, and tests online thanks to modern information technologies (Hasan et al., 2021; Hsu et al., 2019). Such an innovative form of arranging the educational process is widely covered and discussed in the media and is being studied by scientists to identify factors that can influence the quality of education (Özhan & Kocadere, 2020). Parties in the educational process are teachers and students, while significant factors for quality learning are programs, methods, and format of learning, as well as the personal and professional qualities of mobile education participants (De Barba et al., 2016). The high priority among the factors presented above is motivation, an incentive that encourages a person to act. Motivation can improve the learning process and raise its quality since it is it that increases student involvement, and stimulates attendance at classes and doing homework (Gulati, 2020).

The abrupt change in the traditional format of education has led to difficulties in motivating students to acquire new knowledge (Costa et al., 2018). Since motivation contributes to higher involvement in the educational process, and demotivation results in negative learning outcomes – low attendance and poor academic performance – it is necessary to investigate and study which factors most strongly impact the growth in student motivation (Lazowski & Hulleman, 2016). It is also worth paying attention to the role of a teacher as one of the key figures in the educational process since it is the educator who organizes the lesson, applies the relevant methods, and provides feedback to students (Dinçer & Yeşilyurt, 2017). Knowledge of motivational factors leads to the development of ways that can increase the level of student engagement in the learning, help institutions make informed decisions about the course and organizational structure, and hold professional development seminars for teachers (Gupta & Khan, 2021).

The relevance of this subject stems from the fact that in almost all countries of the world students have switched to mobile learning over the rapid spread of COVID-19. Educational institutions faced such problems as students' non-attendance of online classes, their absences, failure to complete homework, and unwillingness to work in class (Li & Tsai, 2017). The reason behind this is either a complete lack of motivation or its very low level. So, it is required to develop methods that will help boost motivation and the quality of learning so that students are interested in acquiring new knowledge and skills in conditions of distancing (Ryan & Deci, 2020).

The practical significance of the article is confirmed, first, by the relevance of mobile learning in the modern world. Many countries are seeing the benefits of distance learning by gradually adopting innovative technologies (Harati et al., 2021).

But for mobile learning to be of high quality, it is necessary to consider such an important factor as motivation, which significantly impacts students' involvement and interest in acquiring knowledge, that is motivational factors increase such interests and their skills in the context of mobile education (Allen & Seaman, 2017). The present paper will develop specific recommendations that are expected to be useful to educational institutions, as they reveal the meaning and importance of motivational factors and contribute to enhancing students' involvement in the study process.

2 Literature review

2.1 Motivation in mobile learning

Researchers and educators have long been interested in student motivation since it is closely related to the achievement of desired outcomes. Thus, certain researchers define motivation as students' willingness to participate in adaptive mobile learning viewing it as an integral part of the latter (Harati et al., 2021). Lack of motivation affects the gaining of knowledge and skills by students, even if they have the most outstanding abilities. Motivation is the first condition for completing a learning task and the driving force behind the educational mobile process (Lazowski & Hulleman, 2016).

Mobile education has become a widespread phenomenon since the mid-1990s because it brings many benefits, including greater access to educational activities and learning opportunities. Yet, it also gives concerns about the skills of students and teachers (Çebi & Güyer, 2020; Jang et al., 2015). Online learning can be described as a form of mobile learning made possible by technological devices used by isolated learners in their settings away from the main source of education (Dinçer & Yeşilyurt, 2017). Motivation in online courses has attracted attention in recent years (Özhan & Kocadere, 2020; Richardson et al., 2015). In particular, one of the scientists describes motivation in online learning as a complex phenomenon, which is mainly influenced by individual characteristics and a specific context (Richardson et al., 2015).

Certain scholars suggest the concept of close relations between motivation and interest. The task of motivation is to keep students engaged regardless of the learning context, i.e. traditional or e-learning, which is a challenging task given the many distractions in the new century. Learner motivation, acquired through the training process or initially emerging with the learner in the educational environment, plays a vital role (Allen & Seaman, 2017). One of the researchers defines motivation as the process that initiates, directs, and maintains goal-directed behavior (Hux et al., 2018).

Motivation is also worth studying in mobile learning because students tend to be less involved. They experience lower motivation when missing or not participating in classes (Özhan & Kocadere, 2020). Some researchers point out that the ease of use of mobile devices and the sense of belonging that arise during online learning directly affect learning satisfaction, which in turn increases attachment to the learning site. This attachment is a predictor of continued use and the possibility of customer retention (Ooi et al., 2018). The concept of perceived behavioral control in the study by Zhou (2016) is cited as an important factor that determined the willingness to use

MOOC by Chinese students. Autonomous motivation played a decisive role in all constructs used by researchers, while controlled motivation was a prerequisite only for influencing subjective norms of behavior. Thus, recent research emphasizes the importance of factors of intrinsic and autonomous motivation, as well as attachment to convenient and high-quality learning tools that provide the possibility of social engagement.

Certain researchers suggest that students need support tailored to their needs to reduce their anxiety and insecurities. Course materials and assignments have also been questioned regarding motivation (Nakamura, 2017; Pekrun et al., 2017). Thus, it is important to offer students meaningful assignments and provide a basis for communication between teachers and students (Chen et al., 2021; Pekrun et al., 2017). Some other research confirms the decisive role of the quality of the training course and the integrated regulation of the learning process, spurring motivation and providing student retention. These two factors turn out to be decisive for to overcome the dropout rate (Bai et al., 2022). In the context of COVID-19, which has pushed the rapid development of online education, the process of securitization is very important as the basis for a rapid transformation to distance learning (Murphy, 2020). Securitization as a health-oriented process, if properly implemented, should increase motivation for online learning, which is confirmed by data from other studies (Bai et al., 2022; Ooi et al., 2018).

Motivation is described as the "engine" of learning (Dobbs et al., 2017). It can influence the effectiveness of learning and the desire to continue attending classes and doing homework. It also impacts the quality of work done and the level of achievements (Hartnett, 2016; Sezer, 2016).

Distance learning allows students to motivate themselves and overcome obstacles with less help and support from peers and teachers, as there is always a sense of isolation (Chiu, 2021). In a situation where students are allowed to self-motivate themselves and promote their learning, there is an obvious need to understand what factors influence motivation in distance learning. Such an incentive has been identified as a critical factor for online education. However, it has been neglected in this regard. Motivation is vital in all areas of life, be it professional work or university studies (Gupta & Khan, 2021).

2.2 Main types of motivation

Intrinsic motivation is defined as performing an activity for its inherent satisfaction, rather than for the sake of any particular consequences (Peck et al., 2018). Intrinsic motivation is often the result of a challenge, interest, or pleasure a person gets from an activity (Li & Tsai, 2017). It is associated with the desire to learn and gain new knowledge, experience inspiration with pleasure from studying interesting educational materials, and complete complex tasks (Ryan & Deci, 2020). What is more, intrinsic motivation is influenced by interest, ambition, inspiration, awareness, competence, and physical and psychological conditions (Lazowski & Hulleman, 2016).

In contrast, extrinsic motivation is the performance of an activity to achieve a particular outcome (Peck et al., 2018). Such motivation is associated with the desire to receive a reward or avoid punishment and a bad situation, and to receive a benefit

after the completion of learning. Noteworthy, learning conditions, social status, family status, and supportive opportunities influence extrinsic motivation (Ryan & Deci, 2020).

Yet, amotivation means the absence of both intrinsic and extrinsic motivation, that is when students show reluctance or lack of motivation to learn. They have low self-efficacy and feel incapable because learning will not lead to the desired outcome, and completing tasks has no value as well (Ucar & Kumtepe, 2020).

2.3　Teacher's role in boosting motivation

Scientists note that teachers play an important role in increasing student involvement in the educational process, as they must provide learners with high-quality and timely feedback, as well as the necessary help and support (Harati et al., 2021). Instructors in the classroom can use multimedia systems, divide video conference participants into separate session rooms for deeper discussion and analysis, share their phone screens to present class material, and download presentations (Kurt & Yildirim, 2018).

It is also worth noting that teachers should provide students with both positive and negative feedback. Positive feedback involves the encouragement of learners and satisfactory grades, while negative one implies justified remarks to students and poor grades. However, negative feedback should be less, as it can considerably reduce the motivation to achieve results (Ryan & Deci, 2020). Providing positive feedback to students is desirable after they have successfully passed the test or the assignment to maintain their desire to continue learning (Lazowski & Hulleman, 2016). Depending on the type of feedback, an information technology system must first determine the goal as to whether the feedback contributes to an increase in the overall effectiveness of learning or solving a particular task (Salmela-Aro et al., 2019).

2.4　The role of rewards and gamification in increasing motivation

The key to improving motivation is rewards, which manifest themselves in the form of praise and rewards (Ezen-Can & Boyer, 2015). However, this situation is not unambiguous since there are different conflicting points of view. So, training should be conducted not for the sake of receiving rewards, but for obtaining quality knowledge (Gaur et al., 2020; Schiffrin & Liss, 2017).

Moreover, researchers analyzed whether gamification could improve motivation. It is related to the concept of game learning but is not identical to it. Whereas gamification refers to the use of game design elements outside of a game context, game-based learning refers to the use of real games to acquire skills or knowledge. In this type of learning, the skills that are tested in the game match the learning task (Smiderle et al., 2019), such as in a game where medical students or staff perform surgical procedures in a simulated environment (McDonald et al., 2018).

Although gamification for learning and game-based learning are different concepts, researchers share the idea that game elements can make learning more fun. Academic interest in the effective use of game design elements started at least 30 years ago when the attractiveness of computer games began to be explored to make the user interface more interesting and enjoyable (Treiblmaier & Putz, 2020). Edu-

cators show great interest in the use of games in the classroom, perceiving them as innovative, and demonstrating a desire to understand best practices in the implementation of games and gamified education (Dichev & Dicheva, 2017).

Despite academic interest in understanding and utilizing the attractive features of games, academia has been slow to respond to the surge of gamification projects in business and on the Internet (Jia et al., 2016). Initial support for gamification effectiveness came mainly from enterprises, where the idea that tasks could be made more efficient and fun by wrapping them in game design elements quickly gained traction (Mekler et al., 2017). Thus, gamification can indeed have a huge positive impact on engagement and performance in various fields of activity.

2.5 Setting goals

This research aimed to study and analyze students' and teachers` opinions about mobile learning, the advantages and disadvantages of distance education, and identify the role of motivational processes. The paper also considered the key internal and external factors influencing academic motivation since the transition to distance learning amid isolation showed the relative value of these factors, paying special attention to them. Even though in the period of isolation, students studied at the same educational institution with the same program, disciplines, teachers, and classmates, their learning environment and the way of communication, both among themselves and with other peers, have changed significantly. Thus, the objectives of the study are: to identify factors that, according to students, influence their motivation for learning; reveal features of changes in students' academic motivation amid isolation; identify the advantages and disadvantages inherent in mobile learning based on students` and teachers` opinions; determine the role of the teacher and built-in mechanisms in boosting student motivation; determine opportunities to improve academic performance through motivation; identify what positive factors can impact the maintenance of a decent level of motivation for effective and quality education. The fulfillment of these tasks contributes to the development of students' motivation and their effective acquisition of knowledge and skills in the context of mobile learning.

3 Materials and methods

A target sample was used in the study since only students and teachers of The University of Jordan and Jordan University of Science and Technology could take part in it. So, a letter was e-mailed to all university students and teachers with an offer to take part in an interview, to which those who wished had to respond within 24 h. Then a sample of 200 students and 46 teachers was formed. The small number of students and teachers who agreed to be individually interviewed is explained by the presence of both technological problems (lack of the Internet, inappropriate gadgets, poor connection) and psychological characteristics.

Respondents were informed of the anonymous nature of the data collected and their voluntary participation in the survey without monetary or other rewards. The written information obtained has no names of the respondents, while all answers are

coded. Participants were identified as a Participant (P) followed by a number (1, 2, 3…) to identify the person, which means that Participant 1 will be referred to as P1, and so on.

The data was collected using a method of an individual in-depth interview with semi-structured questions. In particular, five questions for the interview (see Annex 1) focused on motivating students to study online during the pandemic period. Given physical distancing during the pandemic, individual interviews, which took from 15 to 30 min, were conducted remotely using WhatsApp video or voice calls, as well as via Google Meet.

The interview questions were developed and adapted based on the theory of motivation in learning, namely the self-determination theory developed by Ryan and Deci (2020). Semi-structured (open-ended) questions in individual interviews were designed to allow respondents to answer in their own words. Unlike structured questions, they do not require a checkmark in a pre-designed list of options aimed to collect statistical data. The interview was supposed to reveal the point of view of 200 participants as regards students' motivation to study online during the pandemic. Teachers who were participants in the experiment and conducted classes with students, after completing the experimental study, expressed their opinions about the advantages and disadvantages of mobile learning.

The interview results were recorded in Google Forms. The procedure for analyzing the data collected during the examination consists of the following major steps:

1) Segmentation of the main topics;
2) Elaboration of response category templates closely related to the objectives of the research;
3) Each category is assigned a series of codes to designate different aspects of the research questions;
4) Every answer is endowed with a code;
5) Presentation of final data.

In addition, a table was created in Microsoft Office, which briefly displays the findings of the study, i.e. motivational factors that most strongly influence the quality and effectiveness of mobile learning. Yet, all participants gave oral and written consent to participate in the experiment.

4 Results

This interview revealed internal, external, and demotivating factors that impact students of The University of Jordan and Jordan University of Science and Technology. The findings are examined and classified in keeping with said factors.

4.1 Intrinsic motivational factors

Some 178 out of 200 students agreed that intrinsic motivation influenced their interest in mobile learning.

4.1.1 The desire to learn and gain new knowledge is a key motivational factor

Participant 3 (P3) stressed that his motivation was to continue studies even at a distance, expressing his point of view as follows:

"My motivation for mobile learning is the desire to constantly learn and develop. I think even though we are now facing the challenges of the pandemic, resulting in no opportunity to study traditionally, as before … this cannot be an excuse to stop studying. I'm sure one can get a quality education in any conditions, as long as there is a willingness and desire to learn" (P3).

In addition, 156 out of 200 interview students said they favor mobile learning since they realize the importance of constantly updating their knowledge and skills. P8 expressed her opinion in such a way:

"I embrace mobile learning because of self-awareness and self-control. Despite the current difficult situation, this should not interfere with learning and gaining knowledge. It may not be as effective as the traditional form of education, but it's a challenge for us. So, I don't want to miss the opportunity to get knowledge."

4.1.2 Interest in using digital platforms

P11 and P18 mentioned in individual interviews that the new approach to learning (using digital platforms) has always motivated them to attend classes. Furthermore, P178 and P90, with the support of P16, explained this as follows:

"… Certain lecturers use Google Meet, Zoom, and Teams to explain the lesson. These are very interesting platforms that, due to their innovative features, completely replace traditional learning. For example, they said they enjoyed the most using innovative features such as Raise Hand to answer and Clapping Hands" (P178).

"Mobile learning has developed my tech-savvy … it motivates me to learn how to use some apps that I've never used before. I discovered Microsoft Teams and Office, a multifunctional app where you can do everything you need to study" (P90).

"… Distance learning helps improve my digital experience" (P16).

4.1.3 Self-regulation

Self-regulation turned out to be one of the decisive internal factors influencing students' motivation because mobile learning required participants to develop new learning habits, which was a challenge for them.

"Over online learning, most students can act in an undisciplined manner. A comfortable environment is more relaxing. So, not everyone wants to attend an online class at home" (P10).

"Sitting in front of a computer or phone screen at home takes a lot of self-discipline. During remote learning, I faced distractions such as parents, TV, and pets. As for me, the home environment is not conducive to learning at all" (P78).

4.2 Extrinsic motivational factors

The interview also showed that external motivational factors also influenced the motivation of students. Extrinsic motivational factors include teachers, classmates, and built-in mechanisms.

4.2.1 Teachers

Interview participants said teachers have both positive and negative external impacts on student motivation. They noted that their motivation to learn was highly dependent on teacher-related factors, which in turn led to lower or higher extrinsic motivation. Key factors in motivating students are educators' teaching methods and those of conducting a lesson, as well as feedback and interaction with the teacher. In this regard, P123 pointed out that not all teachers give feedback, often being insufficient, which reduces motivation to attend classes. Meanwhile, P98 said in an individual interview:

"I check the schedule of the teacher giving the class and decide whether to attend it or not because the methods teachers use vary a lot."

Interaction with the teacher was also reported to be limited compared to face-to-face instruction, as students were unable to communicate with them in the way that is typically found in face-to-face learning.

"In face-to-face teaching, students can easily ask their questions in the classroom or during breaks. As a result, they learn what they did not understand. Unlike studying in the classroom, distance education does not provide such an opportunity over time constraints and short breaks" (P45).

Moreover, P56 mentioned he was shy about texting teachers. The participant said that even if he had questions that needed to be clarified with the teacher, he did not want to send emails, believing this might interfere with the teacher.

The survey of teachers who conducted classes with students in the context of the experiment made it possible to determine the advantages and disadvantages of mobile learning. The advantages of mobile learning are the speed of implementation of the educational process and delivery of information to students; ease of use; accessibility (a mobile phone is required for training in this format); quick and constant access to educational materials at any time; the possibility of interaction both with one student and with the group as a whole; use of various mobile applications for organizing training sessions and communication (Viber, Skype, WhatsApp, etc.); the possibility to diversify the educational process due to multimedia tools, mobile applications, etc.; activating students' interest and increasing their motivation to study. Disadvantages of mobile learning are determined by the fact that students are more often distracted by using a mobile device as entertainment - social networks, communication with peers, games, etc.; small screen sizes limit the type and amount of information that can be displayed; not all software can be implemented and used effectively in a mobile phone.

4.2.2 Classmates

Study participants also reported a significant impact of their classmates on personal motivation. So, they all need support from their peers, especially those with whom they study and spend time.

"A large number of students at the videoconference motivates me a lot. I want to express my thoughts and show the quality of my knowledge" (P4).

In turn, P66 stressed that the presence of peers in the classroom contributes to improved motivation, as they "exchange ideas, knowledge, and skills."

In addition, P143 said: "We indeed like to communicate with each other and have intellectual conversations. This broadens our horizons and makes the educational process more interesting."

At the same time, P165 noted: "Having a small number of peers in a virtual classroom makes students nervous, reducing their motivation to attend classes. Group work can greatly boost motivation."

4.2.3 Built-in mechanisms

Built-in mechanisms influenced student motivation as well. All participants confirmed that such mechanisms only had a positive effect on motivation, making the learning both exciting and effective.

In this context, P7 said: "The Google Document Embedder plug-in helps me easily create and showcase my presentations in PowerPoint. I can speak at video conferences and present my knowledge and skills, which is more interesting than just listening to lectures."

There are two more opinions below:

"Motivation depends on feedback between teachers and students. The Contact Form by Contact ME plug-in facilitates this. Thanks to this plug-in, I can find out the phone/e-mail of teachers and ask my question" (P9).

"WP Quiz allows participating in surveys and voting, which also impacts my motivation. It helps me feel important in the learning process" (P55).

The interview showed that WordPress, being compatible with plug-ins, is an ideal option to improve the efficiency of the educational process, which significantly increases the students' motivation in a mobile learning environment.

4.3 Demotivating factors

4.3.1 Organizational problems

Organizational issues are a factor that undermines the motivation of students. The groups were organized in a way as to unite strong and weak students in terms of knowledge. As a result, more simplified tasks were given. Thus, the content of the lesson was considered less valuable.

"When you know something and the other student doesn't, listening to the teacher's explanation becomes a waste of time for you. Even if I listen to teachers' explanations just to revisit the topic, I still get bored and lose motivation" (P142).

"Students in the same group have different levels of knowledge, and this greatly affects our motivation" (P167).

Participants also reacted negatively to voluntary attendance. Interview data showed that students tend to skip classes if they are not required.

"Mostly I don't want to attend because it's not necessary" (P56).

Certain participants (P90, P56, P77, P25, P45, and P134) also mentioned they avoided classes due to a lack of normal access to the Internet.

For instance, P45 in an individual interview said: "For me, mobile learning is a kind of boring activity… voice delay… unstable picture… bad signals…. But I prefer to join it rather than be absent from the class so that I don't make up the time at the end of the semester."

4.3.2 Situational problems

The problem with online learning is the presence of a huge number of distractions such as "noise," "siblings," "pets," and "parents." Students say they "need a quiet environment" to focus on their lessons (P8).

"I'm always nervous when I attend classes at home because my parents usually forget that I have a class. So, I'm afraid that something inappropriate will happen" (P1).

However, certain participants noted that environmental conditions provided them with significant support in technological distance learning. In particular, they mentioned a comfortable learning environment, proper educational institutions, and parental support.

"I like to study at home. I feel very relaxed. Besides, I save time and money considering getting to the university and then back home" (P95).

"My parents and younger brother support my mobile learning. The simplest example is they will turn down the volume of the TV or even turn it off when I have an online class" (P74).

According to the interview data obtained, the participants are strongly influenced by their extrinsic motivation. Table 1 is designed to illustrate such findings.

4.3.3 Practical recommendations

Thus, teachers need to follow the recommendations to step up student motivation:

1) Help students achieve their mobile learning goals via rewards to become self-motivated and independent. Teachers should provide frequent, timely, and

Table 1 Students' motivation for online learning

Motivation	Motivational factors
Intrinsic	Internal desire to learn and gain new knowledge, enjoyment of digital platforms, and self-regulation.
Extrinsic	Teachers, classmates, and built-in mechanisms.
Demotivation	Problems with external sources, i.e. electricity and Internet connection reduce students' faith and ability.

positive feedback on student performance. This will help keep learners' beliefs about what result they can achieve. Also, do not set unrealistic expectations from students or give them difficult tasks to complete. All assignments must comply with the curriculum, which will help keep them motivated.

2) Allow students to participate in curriculum development and express their opinions on what will be covered in the class, while still retaining enough theory and practice to achieve the goals of mobile learning. Due to this, students will feel their importance, which will improve their motivation to attend classes. During the lesson, it is also necessary to ask learners' opinions about the content, talk, and discuss interesting topics. Students should be able to share their opinions and complaints about the structure of the lesson.

3) Provide students with quality and timely feedback. The conducted research revealed the importance of student-teacher interaction. Amidst mobile learning, there is no opportunity to ask a teacher a question of interest in the classroom or during a break, which makes the study process challenging and problematic. However, educators can arrange individual or group consultations via online conferences to discuss issues that students have. Thus, online meetings with the teacher will help both solve the problem of the student and provide the required support.

4) Implement game methods and technologies. Gamification can play a major role in boosting students' motivation to learn. Their answers showed that they have a positive attitude towards the introduction of game methods. Learning gamification leads to the belief that it will engage students in a productive education process by incorporating game technology into it. However, the development of successful gamification apps in education that can support planned behavior change is still more of a guessing practice than a science.

5) Create a flexible educational system, involving teachers and students to apply different digital platforms, and not focus on one. So, teachers can use Zoom, Google Meat, and Teams. The alternation of types of classes will also positively impact learners' motivation. For instance, one lesson can be devoted to lecture material, the second to the discussion of theory, and the third to practice. Multimedia systems can be used in the classroom, too.

6) Develop mechanisms to provide mental health support, as well as career counseling and training via electronic meeting platforms.

7) Conduct online training in groups. Research has shown that students feel motivated when there are more people in a class. They can unite to achieve common goals, discuss topics of interest, cheer, and support each other. This is especially vital in isolation, as there is a need for communication.

8) It is also important to introduce clinical simulation training into online education. Clinical skills sessions may be conducted online in response to COVID-19. In particular, the practice of training with the help of standardized patients is engaged. This advice is useful for medical schools since practice in training as a health worker is an integral part of education. Modern technology allows conducting experiments online.

5 Discussion

It is necessary to consider studies that have been conducted in foreign countries to deeper analyze motivational factors in mobile learning. Thus, researchers from China and the United States performed a general large-scale study from March to April 2021 to identify motivational factors in mobile learning (Gulati, 2020; Ucar & Kumtepe, 2020). The study employed a causal-comparative method. A total of 373 students of various specialties took part in the survey, while 266 participants were undergraduate students. Noteworthy, there were 163 students from West Virginia University and 210 from Fudan University in Shanghai, of whom approximately 40.4% of respondents are male, 59.6% female, 14% married, 84.9% single, and 1.1% divorced. International students, graduate students, and online learners with an Internet-only experience were excluded from the sample for a more effective comparison. A questionnaire that contained six types of motivation was offered to participants who had to identify the factor that most strongly impacts their motivation to acquire new knowledge and skills (Table 2).

The researchers found that factors such as interest in mobile learning and the relevance of the course hold the first place in boosting American students' motivation. These were followed by support, self-regulation, inner emotions, and student control. For Chinese students, the highest motivation was interest in the course, followed by

Table 2 The most strongly influencing factor on the motivation to acquire new knowledge and skills

Motivational factors	Value	Country	Participants	Value per country
Relevance of the course	4.02 (0.63)	USA China	108 158	4.20 (0.61) 3.90 (0.61)
Interest in the course	4.03 (0.59)	USA China	108 158	4.09 (0.53) 4.00 (0.62)
Inner emotions	3.56 (0.70)	USA China	108 158	3.56 (0.70) 3.56 (0.70)
Support	3.86 (0.62)	USA China	108 158	3.99 (0.60) 3.77 (0.61)
Self-regulation	3.73 (0.63)	USA China	108 158	3.87 (0.61) 3.63 (0.63)
Student control	3.71 (0.76)	USA China	108 158	3.64 (0.84) 3.76 (0.69)
General motivation	3.82 (0.47)	USA China	108 158	3.89 (0.44) 3.77 (0.48)

course relevance, support, student control, self-regulation, and then inner emotions (Gulati, 2020; Ucar & Kumtepe, 2020).

Comparing the present study and that of scientists from China and the United States, it can be concluded that students from Jordanian, American, and Chinese universities are influenced by such key motivational factors as self-regulation, an internal desire to learn and acquire new knowledge, interest to mobile learning, student control, and support. However, the research by scientists from the United States and China failed to reveal the role of the teacher and classmates in boosting student motivation, whereas the current research confirmed their key role in improving such motivation. So, the teacher needs to actively interact with students and provide them with high-quality and timely feedback so that they could show greater interest in mobile learning. Moreover, the said research did not reveal the role of built-in mechanisms. However, the present study demonstrated they are essential in increasing motivation. Students like to use digital platforms and plug-ins that make mobile learning more fun and attractive. The features provided by such platforms as Zoom, Google meet, and Teams give the feeling that students are present and learning in the classroom, rather than via technological means.

British scientists also conducted a study to identify the priority of internal and external motivational factors. They found that people who are intrinsically motivated are more likely to engage in challenging activities and enjoy learning by applying a deep learning approach and showing increased performance, persistence, and creativity (Peck et al., 2018).

Furthermore, researchers also examined the intrinsic motivation of psychology and engineering students when performing computer tasks. They revealed that high intrinsic motivation is not necessarily indicative of higher levels of achievement. Instead, it was associated with a profound learning of a discipline (Ryan & Deci, 2020). A study on intrinsic and extrinsic motivation has shown that intrinsically motivated students are in the spotlight and actively involved in the educational process (Xu et al., 2020). It is also worth noting that in many studies researchers focus predominantly on intrinsic motivation (De Barba et al., 2016; Pekrun et al., 2017; Yantraprakorn et al., 2018).

Comparing the mentioned studies with the present one, it can be concluded that both internal and external motivations play a huge role in students' involvement in mobile learning. Thus, it was found that such external factors as classmates, teachers, and built-in mechanisms have a considerable impact on the quality of education and students' interest in gaining knowledge and skills. The current research proves that one must take into account both intrinsic and extrinsic motivation rather than focus on intrinsic motivation factors only to ensure that students receive a quality education.

The training of students in medical and technical schools deserves special attention. Research shows that they rated mobile learning positively since the majority reported an improvement in knowledge. In particular, they highlighted the ease of access to courses and the benefits of saving money and energy (McDonald et al., 2018). Moreover, they noted an improvement in their psychosocial health linked with reduced stress and fatigue and an increase in free time (Knipfer et al., 2019). Mobile

learning has also made it possible to focus on learning. These factors greatly influenced the motivation of students (Rainbow & Dorji, 2020).

In addition, medical students stated that online classes are much more interactive, while educators are more accessible than in lecture halls. They also have an opportunity to view the recorded lesson and improve their knowledge (Rainbow & Dorji, 2020).

Although the majority of students approve of mobile learning, certain students still have a negative attitude towards it. In a survey held in Nepal, students stated that poor internet connectivity or lack of suitable gadgets takes away their motivation to learn (Nepal et al., 2020). The same observation was made in the study of 488 first- to third-year medical and dental students (Al-Azzam et al., 2020). The low engagement in these countries may be related to the quality of teacher training in interactive pedagogy and digital technologies.

6 Conclusion

The research used the survey of The University of Jordan and Jordan University of Science and Technology students. Among the major advantages of mobile learning that influence students' motivation, they point out a comfortable and relaxing learning environment, saving money and time, and health safety. Only 22% believe it is necessary to return to the face-to-face education format. Among the significant shortcomings that reduce the motivation to gain knowledge, students name the need for live communication with classmates and teachers, the difficulty of spending a long time in front of gadget screens, the presence of distractions such as pets, parents, noise, and technical failures. The results of the teachers' survey show that the disadvantages of mobile learning are determined by the fact that students are more often distracted by using a mobile device as entertainment - social networks, communication with peers, games, etc.; small screen sizes limit the type and amount of information that can be displayed; not all software can be implemented and used effectively in a mobile phone.

The research showed that 89% of the students surveyed agreed that their learning was greatly influenced by intrinsic motivation factors (self-regulation, the desire to learn and gain knowledge, and interest in using digital educational platforms). The remaining 11% believe they were influenced solely by extrinsic motivation factors (teachers, classmates, built-in mechanisms). Students shared their opinion about teachers' priority role in boosting students' motivation for learning.

Teachers in the educational process use digital platforms such as Zoom, which offer features that allow students to feel comfortable while learning. Students are also interested in plug-ins such as Google Document Embedder, Contact Form by Contact ME, and WP Quiz being compatible with the convenient WordPress system. Gamification facilitates growth in students' motivation. Game technologies and methods are not only able to make the educational process interesting and useful, but also improve learners' creative abilities, which is essential during the post-mobile learning period. The present findings can serve as recommendations for use by educational institu-

tions in many countries to promote student motivation and improve the quality of education during mobile learning.

6.1 Research limitations and future study directions

The study is limited to a sample from one region, whose representatives may have behavioral and motivational characteristics due to ethnic, religious and social factors. Therefore, the results obtained should be extrapolated to other samples with caution. The use of the semi-structured interview tool also creates some opportunities for incomplete or inaccurate evaluation and determination of participants' opinions during coding; this risk is statistically minimal, but it should be mentioned. Also, the assessment collected by the study is based on subjective opinion, and not on objective assessment data.

Further directions of research should lie in the field of differentiated study of the influence of individual external factors, such as the use of certain technologies or mobile learning methods and the influence of teachers themselves on student motivation. Separation of factors provides an opportunity to improve the quality of the impact and increase the involvement and retention of students.

Annex 1

Questionnaire

Questions:
1. What do you think is motivates you to use mobile learning?
2. Is the teacher's role so significant in boosting the motivation of students?
3. What educational platforms/built-in mechanisms do teachers use to conduct classes?
4. What factors demotivate you the most, and why?
5. Is it possible for medical students to get a quality education in terms of mobile learning?

Conflict of interest The author declare that there are no conflicts of interest related to this article.

Data Availability Data will be available on request.

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