ORIGINAL ARTICLE

Investigating the effect of using the mobile educational app as appropriate method of study and learning on students' educational achievement

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Background: Students' educational success depends on various factors, one of the most important factor is applying appropriate study methods to achieve this, a mobile educational application called: "Appropriate study and learning practices for students" was designed by the researchers to investigate the effect of using educational mobile application on study habits for students' educational success.

Methods: In this quasi-experimental study, 2 groups consisting of 20 and 21 undergraduate students of Radiology at Ahvaz Jundishapur University of Medical Sciences, in the Southwest of Iran were selected as statistical samples which then they were divided into two groups of intervention group (20 persons) and the control group (21 persons). At the beginning of the first half of the academic year of 2017-2018, this application was given to the intervention group. As the next step, at the end of the second semester of the same academic year, the mean of the students final term score of intervention group (Who used this app) was compared with the control group (which did not use this app). Descriptive and inferential statistics were run via SPSS version 22.

Results: The results of the study showed that this application had a positive impact on students' educational improvement. Accordingly, the mean and standard deviation of the average final score of the students' academic term were 14.65 ± 1.70 for the control group and 16.95 ± 1.36 for the intervention group. These results showed a significant difference between the control group and the intervention group ($P<0.001$). Also, the results of the study showed that gender had no effect on increasing the mean of students' final term score in both groups ($P>0.005$).

Conclusion: Using the educational application of appropriate methods of study and learning had a positive impact on students' academic achievement, since it increased their final scores. Learning the appropriate methods of study and learning for students in the form of a curriculum or holding workshops and, of course, with regard to the popularity of smartphones among students, one benefit of mobile education apps can be students' academic achievement.

Keywords: App, Mobile learning, Study habits, Educational achievement, Students, Iran

دراسة أثر استخدام التطبيقات التعليمية عن طريق المحمول والطرق المناسبة التعليمية على التحصيل الدراسي للطلاب

الخلفية والهدف: يعتمد التحصيل الأكاديمي للطلاب على عدد من العوامل ، ومن أهمها استخدام طرق الدراسة المناسبة. لهذا الغرض ، تم تطوير تطبيق التعليم المحمول تحت عنوان "أساليب الدراسة والتعلم المناسبة للطلاب" من قبل الباحث المعنيين ، وقد تم تصميم هذه الدراسة للتحقق من تأثير استخدام التطبيق التعليمي في المحمول (الموبايل)على عادات الدراسة في التحصيل الدراسي للطلاب.

الطريقة: في هذه الدراسة شبه التجريبية، تم تشكيل مجموعتين من ٢٠ و ٢١ طبيباً من متخصصي الأشعة في جامعة جندي شابور أهواز الطبية في جنوب غرب إيران حيث تم تقسيم العينة إلى مجموعتين مجموعة التدخل (ن = ٢٠) والسيطرة (ن = ٢١) ثم في بداية النصف الأول من العام الدراسي ٢٠١٧-٢٠١٨ ، تم تسليم التطبيق التعليمي لمجموعة التدخل، في المرحلة الثانية وفي نهاية النصف الثاني من العام نفسه ، تمت مقارنة متوسط علامات نهاية الفصل بين مجموعة التدخل (الذين استخدموا التطبيق) و المجموعة الضابطة (الذين لم يستخدموا هذا التطبيق). تم استخدام الإحصاء الوصفي والاستدلالي لتحليل البيانات وتم استخدام الإصدار ٢٢ من SPSS.

النتائج: أظهرت الدراسة أن التطبيق كان له تأثير إيجابي على التحصيل الأكاديمي للطلاب. وفقا لذلك ، فإن المتوسط والانحراف المعياري لدرجة نهاية الفصل للطلاب في المجموعة الضابطة ١/٧٠ ± ١٤/٦٥ وفي مجموعة التدخل ١/٣٦ ± ١٦/٩٥.كان هناك فرق كبير بين مجموعة المراقبة ومجموعة التدخل من الناحية الإحصائية وكان ($P <0.001$). كذلك ، لم يكن لعامل الجنس أي تأثير على الزيادة في متوسط درجة نهاية فصل الطلاب في المجموعتين ($P <0.005$).

الاستنتاج: إن استخدام تطبيق التعليم المتنقل في الأساليب المناسبة للمطالعة والتعلم كان له تأثير إيجابي على التحصيل الأكاديمي للطلاب عن طريق زيادة متوسط درجات نهاية الفصل الدراسي . تعلم الطرق الصحيحة لدراسة الطلاب ودراستها في شكل منهج دراسي أو عقد ورش عمل ، وبالطبع مع الانتباه لشعبية الهواتف الذكية بين الطلاب ، فإن فوائد تطبيقات التعليم المحمول يمكن أن تبسط وتسهل رفع المستوى الأكاديمي للطلاب .

الكلمات المفتاحية: التطبيق ، التعلم عن طريق المحمول ، العادات الدراسية ، التحصيل الأكاديمي ، الطلاب ، إيران

طلباء کی تعلیمی پیشرفت اور مطالعے میں موبائل تعلیمی اپلیکشن کے اثرات کا جائزہ

بیک گراونڈ :طلباء کی کامیابی کا دار ومدار مختلف اسباب پر ہوتا ہے۔ان میں ایک اہم سبب مطالعے کی صحیح روشیں اپنانا ہے۔ اس ہدف کے حصول کے لئے موبائل تعلیمی اپلیکیشن بنایا گیا۔اس اپلیکیشن کا نام طلباً کے مطالعے اور پڑھائی کے مناسب اصول رکھا گیا۔ یہ تحقیق طلباء کے مطالعے کی روشوں اور ان کی تعلیمی پیشرفت پر پڑنے والے اثرات کا جائزہ لینا ہے۔

روش: اس تحقیق میں دو گروپ شریک تھے پہلے گروپ میں بیس اوراکیس طلباء شریک تھے ان طلباء کا تعلق اھواز کی جندی شاپور میڈیکل یونیورسٹی میں ریڈیالوجی ڈپارٹمنٹ سے تھا۔ دوسرے سال کے نصف دوم میں دونوں گروہوں کی کارکردگي کا موازنہ کیا گیا۔ اس میں موازنے سے معلوم ہوا کہ جن طلباء نے موبائل اپلیکیشن سے استفادہ کیا تھا ان کی کارکردگی ان طلباء سے اچھی تھی جنہوں نے موبآئل اپلیکیشن سے استفادہ نہیں کیا تھا۔ڈیٹا کا تجزیہ ایس پی ایس ایس بائیس سے کیا گیا۔

نتیجے: اس تحقیق سے پتہ چلتا ہےکہ موبائل اپلیکیشن نے طلباء کی علمی صلاحیتوں کو بڑھانے میں اہم کردار ادا کیا ہے۔ قابل غوربات یہ ہےکہ جنس کےفیکٹر نے دونوں گروہوں کے نمبروں میں اضافہ کرنے میں کوئي کردار ادا نہیں کیا ہے۔

سفارش :اس تحقیق سے یہ نتیجہ حاصل ہوتا ہے کہ موبائل اپلیکشن سے طلبا کومطالعہ کرنے اور دروس کے سمجھنے میں مدد ملتی ہے۔ طلبا کی علمی صلاحیتوں کو بڑھانے کے لئے نیز مطالعے کے موثر طریقے سکھانے کے لئے نصاب میں ایک یونٹ رکھا جانا چاہیے، چونکہ طلباء اسمارٹ فون کثرت سے استعمال کرتے ہیں لھذا اس سے فائدہ اٹھاکرانہیں موبائل اپلیکیشن کی بھی سہولت دی جانی چاہیے۔

کلیدی الفاظ : موبائل اپلیکشن، موبائل کے ذریعے تعلیم، مطالعے کی روشیں، تعلیمی پیشرفت

بررسی تأثیراستفاده از اپلیکیشن آموزشی موبایل شیوه های مناسب مطالعه و یادگیری در پیشرفت تحصیلی دانشجویان

زمینه و هدف: موفقیت تحصیلی دانشجویان به عوامل مختلفی بستگی دارد که یکی از مهمترین آنها، استفاده از روش های صحیح مطالعه می باشد. لذا برای این منظور یک اپلیکیشن آموزشی موبایل تحت عنوان : "شیوه های مناسب مطالعه و یادگیری دانشجویان" توسط پژوهشگر طراحی شد و این پژوهش به منظور بررسی تاثیراستفاده از اپلیکیشن آموزشی موبایل عادتهای مطالعه در پیشرفت تحصیلی دانشجویان انجام شده است.

روش: در این مطالعه نیمه تجربی، دو کلاس ۲۰ و ۲۱ نفره از دانشجویان مقطع کارشناسی رشته رادیولوژی دانشگاه علوم پزشکی جندی شاپور اهواز در جنوب غربی ایران به عنوان نمونه آماری انتخاب شدند که به دو گروه مداخله (۲۰ نفر) و کنترل (۲۱ نفر) تقسیم شدند و سپس در ابتدای نیمسال اول تحصیلی ۱۳۹۷-۱۳۹۶اپلیکیشن در اختیار گروه مداخله قرار گرفت و در مرحله بعد و در انتهای پایان نیمسال دوم همان سال تحصیلی، میانگین پایان ترم گروه مداخله (که از این اپلیکیشن استفاده کرده بودند) با گروه کنترل (که از این اپلیکیشن استفاده نکرده بودند) مقایسه شد. برای تجزیه و تحلیل داده ها از آمار توصیفی و استنباطی و از ورژن ۲۲ نرم افزار SPSS استفاده شده است.

یافته ها: این پژوهش نشان داد که این اپلیکیشن در پیشرفت تحصیلی دانشجویان تاثیر مثبت داشته است. بر این اساس، میانگین و انحراف معیار نمره پایان ترم تحصیلی دانشجویان در گروه کنترل ۱/۷۰ ± ۱۴/۶۵ و در گروه مداخله ۱/۳۶ ± ۱۶/۹۵ بود. بین نمره گروه کنترل و گروه مداخله تفاوت معنی داری از لحاظ آماری وجود داشت (P<۰/۰۰۱). همچنین عامل جنسیت، تاثیری در افزایش نمره میانگین پایان ترم دانشجویان در هر دو گروه نداشته بود (P > ۰/۰۰۵).

نتیجه گیری: استفاده از اپلیکیشن آموزشی موبایل در مورد شیوه های مناسب مطالعه و یادگیری با افزایش میانگین نمره پایان ترم در پیشرفت تحصیلی دانشجویان تاثیر مثبت داشت. آموزش شیوه های مناسب مطالعه و یادگیری به دانشجویان در قالب یک واحد درسی و یا برگزاری کارگاههای آموزشی و البته با توجه به محبوبیت گوشی های هوشمند در بین دانشجویان، بهره مندی از اپلیکیشن های آموزشی موبایل، می تواند پیشرفت تحصیلی دانشجویان را هموارتر سازد.

واژه های کلیدی: اپلیکیشن، یادگیری با موبایل، عادتهای مطالعه، پیشرفت تحصیلی، دانشجویان، ایران

INTRODUCTION

Students' success depends on a variety of factors, among which, there are the universities, educational equipment and teaching aids, faculty members, appropriate books and, most importantly, proper habits and skills (1). In the educational and research departments of universities, academic progress of students is considered as the most important criterion for determining their academic success, and also the average of their final term score is usually considered as another important criterion (2). Most students often feel their academic failure is due to some factors such as university of education, low intelligence, lack of facilities, etc. But they do not pay attention to learning the habits and proper study skills that can play an effective role in their academic achievement. Accordingly, students with specific talents may also suffer from poor academic skills due to the lack of proper study skills (3). Over the past few years, various studies have been carried out on the status of habits and skills of Iranian medical students, and sometimes these habits were considered to be moderate or inappropriate (3-14). Gilavand also confirmed this result in a study recently has been conducted (1). Other studies have shown that successful students, in contrast to unsuccessful students, are trying to find more effective ways for studying and learning. (12) Today, new communication styles and new spaces are available to make the learning process be effective out of the classroom as well. Students are driven by self-learning using ICT, to make their learning be generally improved (15). One of the communication methods which is popular among the researchers in the field of learning is smartphone learning and apps installed on them (16). It is a type of distant learning that takes place in many situations with social interaction and content via individual electronic devices. These learning tools can move along with learners. In other words, the various capabilities of smartphones reduce the flexibility of learning environment and make it more flexible (17-18). Today's educational systems around the world have a strong need to use ICT to provide students with learning conditions (19). Due to its availability and its ease of use in the process of learning, the importance of using smartphones have become one of the new theoretical and research fields in education (20-21). The effective learning of techniques makes learners find better habits and attitudes, also more motivation and interest, so in this way the effective learning will help them improve their study skills (3). Sometimes students may spend a lot of time studying; they are unaware of knowing the reading skills and understanding what they are reading. Students' benefit from appropriate study habits plays an important role in their educational performance and academic achievement. The researchers of this study, reviewing previous research and knowledge of the status of studying habits of students in Iranian medical universities, has designed a program entitled "Appropriate Methods of Studying Students and Studying Their Habits" in Persian language. Therefore, this study was conducted to investigate the effect of using mobile educational application on study habits in student's academic achievement.

METHODS

In this semi experimental study, 2 groups consisting of 20 and 21 undergraduate radiology students from Ahvaz Jundishapur University of Medical Sciences, in the Southwest of Iran were selected as the statistical sample. They were divided into two groups: the intervention (22 participants) and the control group (21 participants). The increase in the mean score at the end of the students' first semester was considered as the criterion of their academic achievement. This research is in line with the research project No. 960437 of the National Center for Medical Education Research, Ministry of Health and Medical Education, Tehran, Iran. (NASR). The researcher, by reviewing previous research and knowledge of the status of students' study habits of Iran's medical sciences universities, designed a training application entitled "Appropriate study and learning methods for students according to the status of their study habits" in Persian. This application included 9 sections: the introduction, the standard method and standard for measuring students' habits, the study status of study habits among students of Iranian medical universities, the 8-step process of learning without forgetting Harvard University (abstract), the process of 8-step learning without forgetting Harvard University (Descriptive), Time Management Skills and Golden Notes How to study at night test, study health, supplementary recommendations are effective ways to study and learn, and resources. This app is free of charge in Iran and is accessible by the cafe markets as "Iran Epps and Magnet" (A portion of the internal images of this application are displayed). The statistical population of this study included all undergraduate students working in radiology at Jundishapur University of Medical Sciences in Southwest of Iran. The sampling method was based on simple random. To conduct this research, in the beginning of the first semester of the 2017-2018 academic year, the groups consisting of 20 and 21 radiology students divided into two groups of intervention (20 persons) and control (21 persons). The intervention group was asked to use the app for free through Internet cafes market, Iran Epps and Mint. And the control group did not use the app and they normally chose their own study. In order to prevent the students from communicating with each other, the intervention group and the control group were selected from the students of two different academic years. So, the students that were selected as the control group were in the first semester of year 2018, while the intervention group were the students entering the second semester of the year 2017. A series of incentives was also considered for student to encourage them to use the educational content of the application. In the next stage and at the end of the second half of the year, the average score of the intervention group (who used the application) was compared to the control group (who did not use the application). Descriptive statistics (mean and standard deviation) and inferential statistics (independent t-test) were used for data analysis and SPSS version 22 was used.

RESULTS

The study showed that this app had a positive effect on students' academic achievement, and the average scores of the graduated students in the intervention group (considered as their index of academic achievement) have increased. According to Table 1, the mean and standard deviation of the scores at the end of the semester in control group was 14.65 ± 1.7, and the mean and standard deviation of the scores at the end of the semester in the intervention group was 16.95 ± 1.36. There was a significant difference between the control group and the intervention group ($P < 0.001$).

Also, according to Table 2, the gender factor had no effect on increasing the mean score of the students' end-term in both the control and intervention groups ($P > 0.005$).

DISCUSSION

Studying and learning styles are factors that can affect academic achievement of students, hence, it is considered as one of the differences between successful and unsuccessful students in university. Over the past few years, several studies have been done to examine the status of students' study habits in Iran's medical science universities, all of whom have assessed this situation as modest or somewhat "inappropriate" (3 -14). The results of this study are worth examining from 2 perspectives. From the first point of view, the comparison of students using the content of this application, which includes a series of teaching materials and recommendations on the appropriate methods of study and learning, has been used by those students who have the educational content. The mean score of the end of the semester was compared with a clear and significant difference in the benefit of the students who used the app as successful students. From this perspective, our research results are consistent with Aminian and Qomizadeh's (13), Ali Mohammadi et al. (14), Mahmoudzadeh et al (22), Vofouri (23) and Otaghi (24). In Aminian and Qomizadeh research which was conducted at the Yazd University of Medical Sciences in central Iran, it was found that in addition to using more effective methods of study and learning, successful students have better academic habits in comparison to unsuccessful students,. (13). Also, in the research of Ali Mohammadi et al., there was a significant and positive correlation between the scores of academic habits and the academic performance of nursing students in Hamedan University of Medical Sciences (14).

Mahmodzadeh et al.'s work in the relationship between study approaches and academic performance in students of Birjand University of Medical Sciences in northeastern Iran, showed that there was a significant relationship between level approach and academic performance of students (22). Vofouri's research in Tajikistan showed that the training method of concentration and memory, affects the academic achievement and motivation, so leads to students' progress (23). Otaghi in a research study showed that teaching of academic skills affects the academic achievement of students in the emergency medicine department of Ilam University of Medical Sciences (24).

But the results of this study can also be analyzed from a different point of view. This view shows that students are welcome to learn by using the smartphones and apps installed on them. A recent intervention study conducted at the Faculty of Dentistry of Jundishapur University of Medical Sciences in Southwestern Iran among students and researchers in the field of popularity learning Gilavand et al. showed that textbook education improves student awareness by utilizing mobile apps (16). Also, Babazadehkamangar and his colleagues from Babol University of Medical Sciences in northern Iran concluded that lessons learned using smartphone mobile apps are more effective than traditional ones (25). The results of Khazaei

Table 1. Difference in the average scores of the students' final semester in each group

Group	Average	Standard Deviation	Minimum	Maximum	Difference of average	95% confidence interval	P_ value
Control	14.65	1.7	11.84	18.7	2.29	(1.39, 3.287)	<0.001
Intervention	16.95	1.36	14.31	19.37	2.29	(1.308, 3.288)	

Table 2. The difference between the average scores of the students' final semester in each group based on their gender

Group	Gender	Average	Standard Deviation	Minimum	Maximum	P_ value
Control	Woman	14.92	2.14	11.84	18.70	0.503
	Man	14.39	1.19	12.29	15.66	
Intervention	Woman	16.86	1.46	14.31	18.96	0.743
	Man	17.07	1.33	15.23	19.37	

Figure1. Part of the in-app view of the appropriate learning and learning practices

Jalil 's research and Jalil et al. showed that the use of educational along with the effective operation of the students in the operating room of Shahroud University of Medical Sciences, also significantly increased their practical test scores (26). Salmani et al.'s also conducted a study to investigate the effect of using computer-based conceptual design software in the mobile environment on the level of learning of nursing students of Yazd University of Medical Sciences in Yazd. The result of their study showed a significant relationship between computer-based conceptual design software and students' learning improvement (27). The result of Montrieux et al.'s research showed that changing educational styles using smart tablets in educational environments can be considered by educational systems because of its many potential, excitement and variability (28). In a study by German-born Albrecht et al, medical education using smartphones was more attractive to students than traditional ones (29).

This study showed that the application used in this study has had a positive impact on students' educational improvement. Accordingly, using the educational app of appropriate methods of study and learning had a positive impact on the students' academic achievement by increasing their final scores. Nowadays, in setting educational goals and educational processes, new approaches have been developed in order to focus on primary educational goals as reading and writing to more important goals such as creative thinking, problem solving, lifelong learning, information literacy and familiarity with information and communication technology. Therefore, taking advantage of the correct ways of study and learning makes using the technology of the world more enjoyable, smartphones and apps installed on them can be very useful in this regard. In order to achieve this goal, it seems necessary to teach students how to study and learn at the beginning of university entrance in form of a curriculum or, at least, by holding workshops, in this way, the popularity of smartphones among students, can be useful to achieve this goal.

As the limitations of this study, the restricted number of samples and the impossibility of conducting this research among all fields of study at university, it is suggested that more different samples to be used in future studies.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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