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RESEARCH ARTICLE

STUDY OF MOBILE LEARNING IN PARAMEDICAL STUDENTS OF BIOCHEMISTRY IN A GOVT. MEDICAL COLLEGE

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ABSTRACT

Background: Mobile learning is a type of Technology of learning with portable hand held electronic devices such as Tablet, computers, net-books and digital readers to provide a myriad of opportunities to support learning and performance both inside and outside the class rooms.
Aim: The study was aimed to assess and evaluate the use of mobile learning technology as an educational tool among the paramedical students of Biochemistry.
Materials and Methods: The study was conducted among 100 paramedical students attending Biochemistry department of Sri Venkateswara Medical College (Govt.), Tirupathi, Andhra Pradesh with a method of 9 point Mobile Learning questionnaire issued to all the students after obtaining consent. Data was collected and analysed by simple statistical methods.
Results: This study showed a Sex distribution ratio of males 48 (48%) and Females 52 (52%). 31(31%) were I yr BPT students, 25(25%) were II yr BSc MLT, 21(21%) were III yr BSc MLT, 17(17%) were Ist yr DMLT and 6 (06%) were In-Service Lab Technicians and Lab Attendant Trainees. 20 (65%) BPT, 10 (40%) II BSc.MLT, 13(62%) III BSc.MLT and 7(41%) I DMLT students were using m-learning, whereas 11(35%) BPT, 15(60%) II BSc.MLT, 08(38%) III BSc.MLT, 10(59%) and I Yr DMLT students were not using m-learning. Among in-service trainees none of them were using m-learning. On the whole 50 (50%) were using smart devices for M-learning as an educational tool. Remaining 50 (50%) could not use due to lack of internet access, lack of technical knowledge and cost of instrument etc.
Conclusion: This study concludes that 50% of the paramedical students used smart devices for learning and their mobile learning capabilities will expand with the introduction of smaller sophisticated and powerful gadgets capable of delivering data anywhere at any time in promoting the access and quality of education.

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INTRODUCTION

Mobile learning is learning across multiple contexts through social and content interactions using personal electronic devices inside or outside the classroom with the learner taking advantage of the learning opportunities offered by the mobile technologies. M-learning became a recognized term in the year 2005 and since, the early definition of M-learning as the use of a palm as a learning device (Clark Quinn, 2000; Soloway *et al.*, 2001), there were deep debates about the definition of M-learning (e.g., Laouris & Eteokleous, 2005; Sharples, Taylor & Vavoula, 2007; Traxler, 2009) (Crompton Helen, 2013).

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Clark Quinn, PhD (2) defined mobile learning (m-Learning) as a e- learning through mobile devices called as information appliances (IAs) e.g. Palms, windows CE machines, Digital cell phone etc. The average mobile device is a small handheld portable computer with the learning moving from an organizational function to an individual necessity (Quinn and Clark, 2000). A search of the extensive and authoritative Encyclopaedia of Informal Learning (www.infed.co.uk, accessed June 2005) showed no reference to mobile learning. E learning, transformed by the internet is now redefined by the mobile technology (McGreal, 2009). Globally by the end of 2011, there were 6 billion mobile devices and in developing countries, majority people access the Internet from their mobile devices (International Telecommunication Union, 2012). Canalys (2012) reported that mobile devices numbers

overtook PCs in 2011. Stevens and Kitchenham (2011) described M learning as a meaningful learning through the wireless handheld devices like cell phone, personal digital assistant, mini-computer, or iPod (Mike Sharples *et al.).* M learning is broadly defined as content designed for access through electronic communication, such as the Internet, intranets, digital versatile discs to provide the learner the ability to assimilate learning anywhere and at any time (Crescente and Lee, 2011). In the 21st century, M-Learning has enormous implications in India, in technical, social and educational systems with the aim of the learning process more flexible, accessible and personalized with acquisition of knowledge and skills and improves access to information so that people can update their knowledge continuously (Singh and Mandeep, 2010). Mobile learning, or M-Learning, is a modern way of learning process through mobile devices, such as handheld and tablet computers, MP3 players, smart phones and mobile phones with an impact on teaching and learning practices. Mobile learning is viewed as an activity allowing productive information, mediated through a compact digital portable device carried by the individual regularly, has reliable connectivity, and fits in a pocket or purse (Guild, 2007). One definition of mobile learning is, any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies (MOBIlearn, 2003). Mobile learning with the use of mobile devices support teaching and learning, allows anyone to access information from anywhere and anytime and so, learners have control, when they want to learn and from which location they want to learn. Mobile technologies have a profound global impact on business, education, and culture and M-learning is quickly becoming a reality that business, government, and education cannot ignore. A major benefit of mobile technology is that it reaches people living in remote locations where there are no schools, teachers, or libraries and delivers instructions to these remote regions without having people leave their geographic areas (Aneesunnisa Begum, 2016).

Mobile learning (ML) can go on anytime and anywhere online or offline with the use of various devices including laptops, mobile phones, tablet computers and audio players especially with advantage of portability and lower cost as compared to books and desktop computers. Mobile applications are now available for various subjects ranging from basic sciences like biochemistry and anatomy to drug information, patient education and bioethics being helpful for medical students for regular studying, and preparing for exams, transparent and objective performance assessment and evaluation of medical students by their teachers, performance in Objective Structured Clinical Examinations (OSCEs) and web-based courses. In addition, mobile learning provides medical students a means to self-directed learning by promoting access to references for medical information such as journals. Mobile devices applications are increasing exponentially over the last decade in nearly all spheres of life including health and medical education (Moses Muia Masika *et al.,* 2015). Mobile technology opens the door for a new kind of learning with the learner's access to information anytime and anywhere and provides a myriad of opportunities to support learning and performance both inside and outside the classroom. Though mobile technology is increasingly being used for classroom learning (Lacina, 2008; Meurant, 2010; Sheppard, 2011), there is still a need to do research on mobile devices use in the learning outside the classroom (Florence Martin and Jeffrey Ertzberger, 2013). The present study was under taken to know the data on use of mobile learning among paramedical students.

Aim

The major objective of the present study was to evaluate the use of mobile learning as an educational tool, find the correlation between mobile learning and academic achievement, provide the learner the ability to assimilate learning anywhere and at anytime and to identify the common application used by the paramedical students in Sri Venkateswara Medical College, Tirupathi, Andhra Pradesh.

MATERIALS AND METHODS

It was an observational study conducted amongst 100 paramedical students attending department of Biochemistry of Sri Venkateswara Medical College (Govt.), Tirupathi, AP, a Government medical institute in India to determine the development of trend of mobile learning in modern education as a learning style using the tool of Mobile Learning Questionnaire. The students were I yr BPT, II and III yr BSc MLT, I yr DMLT and In- Service Laboratory Technicians and Lab Attendant Trainees. A validated, 9 point, structured, open-ended, self-administered, anonymous questionnaire about ownership, use of smart phones etc. was issued to all the above students in their lecture rooms before or after lectures after obtaining informed consent. All the students available in the lecture rooms were given the opportunity to participate. Data on demographics, mobile device ownership and mobile learning technology use etc. were collected. Semi-structured interviews were conducted about current use of mobile devices in medical education. There were no specific exclusion criteria. No repeat interviews were conducted. Data was analysed using simple statistical methods.

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1) Name :
2) Age :
3) Gender : M/F
4) Name of the course :
5) Are you a mobile user yes/no if yes please answer
6) Are you using internet yes/no if yes please answer
7) To learn biochemistry yes/no if yes please answer
8) Time spent on mobile to learn biochemistry
   a: 1 hour/day
   b: weekly once
   c: once in 15 days
   d: once in a month
9) Mobile learning usefulness in learning: yes / no

RESULTS

100 paramedical students attending department of Biochemistry of Sri Venkateswara Medical College (Govt.), Tirupathi, AP were involved in our study. 31(31%) were I yr BPT students, 25(25%) were II yr BSc MLT, 21(21%) were III yr BSc MLT, 17(17%) were I yr DMLT and 6 (06%) were In-Service Lab Technicians and Lab Attendant Trainees.20 (65%) BPT, 10 (40%) II BSc.MLT, 13(62%) III BSc.MLT and 7(41%) I DMLT students were using m-learning, whereas

11(35%) BPT, 15(60%) II BSc.MLT, 08(38%) III BSc.MLT, 10(59%) and I Yr DMLT students were not using m-learning. Among in-service trainees none of them were using M-learning. On the whole 50% were using M-learning as an educational tool and remaining 50 (50%) could not use it.

Table 1. Sex Distribution

S. no	Course	Males	Females
1	I Yr BPT	10	21
2	II yr BSc.MLT	15	10
3	III yr BSc.MLT	11	10
4	I yr DMLT	8	9
5	In-Service	4	2
Total		48	52

Sex distribution showed males 48 (48%) and Females 52 (52%)

Table 2. Use of M-learning

Course	Total No.		Using M-learning		Not using M-learning	
	No.	%	No.	%	No.	%
I Yr BPT	31	31.0	20	65.0	11	35.0
II yr BSc.MLT	25	25.0	10	40.0	15	60.0
III yr BSc.MLT	21	21.0	13	62.0	08	38.0
I yr DMLT	17	17.0	07	41.0	10	59.0
In-Service	06	06.0	00	0.0	06	100
Total	100	100.0	50	50.0	50	50.0

DISCUSSION

The term M-learning stands for mobile learning, which means learning with handheld mobile phones, laptops and any other similar portable devices which are handy. Our education system is under pressure to use innovative methodologies and integrate new information and communication technologies (ICT) in teaching and learning process and with mobile learning, the teaching profession evolves from an emphasis on teacher centered; lecture based instruction to student centred; interactive learning environment (Aneesunnisa Begum, 2016). Mobile phone technology was available in various forms for about four decades now .Smartphones were adopted for mass usage, first in Japan and then in the rest of the world. In the last decade there was an exponential rise in spread and functionality of mobile devices. Globally, there are now over 6.8 billion mobile telephone subscribers. Mobile devices are now in use in medical education, as sources of information and reference, especially in problem-based learning and a continuous self-directed learning (Moses Muia Masika *et al.*, 2015). Mobile technology opens the door for a new kind of learning with the learner's access to information anytime and anywhere providing a myriad of opportunities to support learning and performance both inside and outside the classroom (Florence Martin and Jeffrey Ertzberger, 2013). The use of mobile device is increasing day by day for personal and professional purposes with rapid access to information, instant communication and improved organisation and as an educational tool is gaining recognition, with a number of institutions providing the device to medical students (Monika *et al.*, 2017). Mobile learning through the portable handheld electronic mobile devices such as tablet, computers, net-books and digital readers provide the learner the ability to assimilate learning anywhere and at anytime (Joan, 2013). Mobile technology support learning experiences that are collaborative, accessible and integrated with the world beyond the class room especially in a work place with the use of wide range of modes and devices that are more light weight than PC′s. Mobile learning technology capability will expand with the introduction of smaller more sophisticated and powerful gadgets capable of delivering data in a variety of formats anywhere and at any time. The implications of mobile learning are for reaching with a period of rapid growth in the next few years with evolutionary rather than revolutionary changes. Many use SMS, internet access, social media, e-mail. The main problems were lack of smart devices, lack of internet access screen size, limited memory, and cost of investment, lack of knowledge in accessing or using. This study was aimed at assessing mobile learning technology as an educational tool along with the difficulties of M-learning by 100 paramedical students of Biochemistry department at Sri Venkateswara Medical College (Govt.), Tirupati, AP and the Present paper attempts to highlight the importance of mobile learning for education purposes. Our study showed that 31% were I yr BPT students, 25% were II yr BSc MLT, 21% were III yr BSc MLT, 17% were I yr DMLT and 06% were In-Service Lab Technicians and Lab Attendant Trainees and is compared with the study of Moses Mula Masika *et al.*, (2015), with a Data of 292 respondents showed 62% medical students, 16% nursing students, 13% pharmacy students and 9% dental surgery students.

Our study with a female majority (52.0%) mainly in the age range of 17 -24 years is compared with the studies of Moses Mula Masika *et al.*, (2015), in a data of 292 respondents showing the female (59%) majority with an average age of 24 years and Florence Martin *et al.*, (2013), of 109 undergraduate students, showing female (87%) majority in the 18 –22 years age range. Our study showed that 20 (65%) BPT, 10 (40%) II BSc.MLT, 13(62%) III BSc.MLT and 7(41%) I DMLT students were using m-learning, whereas 11(35%) BPT, 15(60%) II BSc.MLT, 08(38%) III BSc.MLT, 10(59%) and I yr DMLT students were not using m-learning. Among in-service trainees none of them were using m-learning. On the whole 50 (50%) were using smart devices for M-learning as an educational tool and Remaining 50 (50%) could not use due to lack of internet access, lack of technical knowledge and cost of instrument etc. This observations in our study correlate with the studies of Moses Mula Masika *et al.*, (2015), Monika Y. Gavali *et al.*, (2017), Robinson *et al.*, (2013), and Joan, D.R. Robert *et al.*, (2013) as below

In the study of Moses Mula Masika *et al.*, (2015), Data of 292 respondents showed that 88% owned a smart device with nearly all of them using it for learning and 64% used it for medical mobile applications. The main problems were lack of a smart device, lack of technical knowledge in accessing or using applications, sub-optimal internet access, cost of acquiring applications and limited device memory. In the study of Monika Y. Gavali *et al.*, (2017), of 446 medical students, 96% owned a Smartphone with more than 90% students had technological skills to use smartphones and 79.4% felt that smartphones are to be introduced in the course. In the study of Robinson *et al.*, (2013), – in the Data obtained from 361 participants, 59% of students owned a smartphone; 37% of these used the device for their learning. 84% students were positive towards smartphones use as future educational learning tools and 64% thought smartphones were costly to implement and 62% felt such technology was not in the medical school's interest. In the study of Joan, Robert *et al.*, (2013) there was a significant difference between mobile phone users and others in mobile learning as a learning style with significant correlation between mobile learning and academic achievement. Using mobile devices were better than

others in mobile learning as a learning style. Mobile learning and academic achievement had a high correlation in the learning. Our study findings compare with studies from South Korea (2013), Saudi Arabia (2014), United Kingdom (UK) (2012) and the United States (USA) (2016), which showed that most of the medical students own a smart phone. Our study and the above studies showed that most of the students owned smart devices using them as a learning tool in their regular study, revising for exams, taking notes or images and accessing research journals and also as medical mobile applications mainly for laboratory references. The main problems were lack of a smart device, lack of technical knowledge in accessing or using applications, lack of internet access, cost of acquiring applications and limited device memory. A multi centric study involving large number of students is needed, as in our study limited to a small group and only one Govt medical college, 50% of the students using smart devices for learning felt that M -learning devices were useful in gaining knowledge and communication skills.

Conclusion

In our study, 50% of the paramedical students are using m-learning as educational tool and the remaining are not using due to lack of internet access, lack of technical knowledge and cost of instrument. A smartphone is a useful addition to the medical education, if financial barriers are overcome before universal acceptance of the devices. It is worthwhile to study further the impact of smartphones on the academic grades of the students before introducing them in medical education.

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