

Production of Dissertations and Theses on Mobile Learning in Brazilian Postgraduate Courses

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Abstract—This article aims to map and analyze the scientific productions about mobile learning, found in theses and dissertations registered in the Coordination for the Improvement of Higher Education Personnel (CAPES). The present research is characterized as a quantitative, retrospective and documentary study. It was used as a criterion, to present in any part of the abstract or text, the descriptor mobile learning, and to be published between 2014 and 2017. The results found allowed to visualize the academic production of theses and dissertations on the mobile learning in Brazil in recent years.

Keywords—Mapping, Academic Production, Mobile learning.

I. INTRODUCTION

In the last decade we see that mobile devices are spreading at a speed never before seen, about 95% of the world's population is living in an area covered by a mobile cellular network (ITU, 2016). The number of cell phones has grown exponentially, with most adults having even more than one mobile device (Statística, 2016).

For Bairral, Assis e Silva (2015) digital technology is part of the daily life of young people, in the most varied models of mobile devices, highlighting the need and possibilities of diffusion of this theme. Pimmer, Mateescu and Grohbiel (2016: 492) also report that even after more than 20 years of research on mobile learning, there is still relatively little systematic knowledge available on the subject.

Mobile learning enables numerous improvements in student education environments, allowing the use of mobile devices as an educational tool for learning anytime, anywhere, making them more convenient for students. Along with day-to-day activities, students can at any time study and share their doubts about the subjects studied with their colleagues and teachers. Thus increasing your study times and possibly contributing to

better grades during the exams. Mobile learning encourages collaborative learning by allowing students in different locations to be in contact with their peers to discuss and learn the topics being taught, forming an excellent learning support environment (MURSHIDI, 2017).

In this perspective, this article aims to map and analyze the scientific productions on mobile learning, found in theses and dissertations registered in the Coordination of Improvement of Higher Education Personnel (CAPES). The realization of this mapping is justified in order to consolidate a field of knowledge that is in an advanced constructive process. It was decided not to deepen in conceptual and methodological questions of mobile learning in the conception of the authors of the works investigated.

In this work, we present, besides this introduction, considerations about the relevance of the study of mobile learning. The method and procedures of the research are described below. Afterwards, the main results of the analyzes carried out and discussions of the general panorama about the publications are presented, finally, the final considerations of the study emerge.

II. CONSIDERATIONS ON THE RELEVANCE OF THE REVIEW OF MOBILE LEARNING

Mobile learning is defined by Crompton (2013, p. 4) as "[...] learning in multiple contexts, through social and content interactions, using personal electronic devices [...]". There are some studies that have proposed to verify the state of the art in relation to mobile learning in Brazil, such as:

Almeida and Araújo (2013) in the article entitled "The use of mobile devices in the educational context: analysis of national theses and dissertations", analyzed the state of the art of the use of mobile devices in formal education in Brazil from 2003 to 2012. The results pointed to the need to investigate this field of research with precision. The

analysis of the focus of the research on the use of mobile devices in teaching allowed to identify that a large part is focused on Higher Education, requiring, therefore, initiatives that also contemplate the other levels of education. Also, the results pointed out the need to encourage the learning process outside the traditional classroom, since the use of these resources is still restricted to the physical space of a classroom. There was a need for more research that analyzes the role of the teacher as mediator in this process.

Carvalho, Galvanin and Santos (2018), in the article "Mobile learning in Brazil: a mapping of theses and dissertations", mapped Brazilian theses and dissertations on mobile learning in the areas of education and / or education, published after 2013 to November 2016. The analysis carried out data related to: distribution of work per year, degree, regions, institutions, area of concentration, research line and study topic.

These studies provided a valuable synthesis of research on mobile learning. A review is added to these studies, including an updated synthesis of the general characteristics of the empirical studies, through the mapping and analysis of the scientific productions on mobile learning found in theses and dissertations registered in CAPES between 2014 and 2017. Being unique, to be (academic masters, master's and doctoral), programs (education, teaching and letters, among others) and teachers (orientation and participation in the area's).

III. METHODOLOGY

This research is characterized as a quantitative, retrospective and documentary study, presenting a mapping of dissertations and theses available in the catalog of theses and dissertations of CAPES ([http://catalogodeteses.capes.gov.br/catalogo-teses/#! /](http://catalogodeteses.capes.gov.br/catalogo-teses/#!/)), which presented in any part of the abstract or text, the mobile learning descriptor, carried out between 2014 and 2017.

The CAPES Portal was used as the highest body in the evaluation of stricto sensu postgraduate studies in Brazil. This research tool brought together the dissertations and theses defended from 1987, and this information was provided by the postgraduate programs to CAPES, being these responsible for the veracity of the data. Another reason for choosing this tool was the practicality, allowing the realization of filters. As a limitation of the study, it highlights the breadth of this mapping, which did not seek to deepen the conceptual and methodological questions of mobile learning in the conception of the authors of the investigated works.

Thus, a systematized search was carried out in the thesis and dissertations database of CAPES, using as inclusion criteria: theses and / or doctoral dissertations, academic

masters and professional masters that presented at least one of the descriptors the term mobile learning and be registered in the CAPES database from 2014 to 2017. Then, the researches found were evaluated to ensure that they met the stipulated inclusion criteria.

With the accomplishment of the electronic search in the site of the CAPES returned 22943 studies, being 4494 of these of doctorate, 12042 of dissertations of academic masters and 6387 of dissertations of professional masters. CAPES's own page filters were used to carry out analyzes in the database. However, since there were countless other papers that presented the established term, they were filtered in a new cut of 292 papers with a specific focus on education and / or teaching, for a more in-depth analysis of the lines of research studied and experiences in Brazilian graduate programs. Next, we present the results obtained by means of the survey of the theses and dissertations that present the term mobile learning in the stipulated period.

IV. RESULTS AND DISCUSSIONS

In the search carried out in the thesis and dissertations database of CAPES, 22943 studies were classified as descriptive, in any part of the abstract, of the terminology mobile learning. According to table 1, there was a predominance of the production of works in which mobile learning was cited in the academic masters of the three categories of programs analyzed (academic masters, master's degrees and doctorates), confirming the work of Carvalho, Galvanin and Santos (2018). also highlighted a considerable difference in the amount of master's and doctoral work, attributing this to the possibility of being due to the greater amount of programs existing in the Brazilian territory of master's degree than doctorate.

Table.1. Frequency of theses and dissertations recorded between 2014 and 2017.

Types of courses	Absolute value	Percentage (%)
Academic Masters	12042	52,5 %
Doctorate degree	4494	19,6 %
Professional Master's Degree	6387	27,9 %
Year	Absolute value	Percentage (%)
2017	6373	27,8 %
2016	6098	26,6 %
2015	5667	24,7 %
2014	4805	20,9 %

Table 2 identifies the main areas of knowledge developed by post-graduate studies, in which mobile learning was cited, with the education area registering the most jobs, followed by science and mathematics education. Confirming the work of Carvalho, Galvanin and Santos

(2018) who also pointed out these areas as the ones with the greatest amount of work, and according to the same authors this indicates the interest in developing methodologies and knowing new techniques to improve such areas.

Table.2. Frequency of the area of knowledge of theses and dissertations recorded between 2014 and 2017.

Knowledge area	Absolute value	Percentage (%)
Education	5033	21,9 %
Teaching science and mathematics	3008	13,1 %
Teaching	1371	5,98 %
Letters	1128	4,92 %
Mathematics	924	4,03 %

When analyzing separately the programs of academic masters, professional master's and doctorate, Table 3 shows a significant growth in the productions of theses and dissertations in which were cited mobile learning in both academic and professional masters as in doctorates, Para Almeida and Araújo (2013, p. 30) to "[...] progressive decrease in the cost of mobile devices, increased number of brands and models of tablets in the market, incentive to government projects to use tablets in elementary and middle school [...]] "Are some of the reasons for the growing number of mobile learning surveys.

Table.3. Frequency of theses and dissertations recorded between 2014 and 2017, separated by course.

Year	Academic Masters	%	Professional Master's Degree	%	Doctorate degree	%
2017	3152	13,7 %	1898	8,2 %	1323	5,7 %
2016	3106	13,5 %	1839	8,0 %	1153	5,0 %
2015	3008	13,1 %	1577	6,8 %	1082	4,7 %
2014	2784	12,1 %	1081	4,7 %	940	4,0 %

In relation to the production in the three types of course, it is noticed that the academic masters are the most productive, possibly seen the largest number of courses in this modality. But it is possible to perceive in all three types a growth in the quantity of productions, in which mobile learning was mentioned.

Table 4. Frequency of the main institutions of theses and dissertations recorded between 2014 and 2017.

Institution	Absolute value	Percentage (%)
University of Sao Paulo	954	4,16 %

Federal University of Rio Grande do Sul	660	2,88 %
University of Brasilia Pontifical Catholic	620	2,70 %
University of São Paulo	589	2,57 %
Federal University of Minas Gerais	512	2,23 %

As for educational institutions, both public (federal and state) and private, it has contributed to the development of research in which mobile learning has been cited in recent years. With emphasis on the University of São Paulo, which is the educational institutions that produced the most work in this condition in recent years, as presented in Table 4.

Table 5. Frequency of major theses and dissertations programs between 2014 and 2017.

Name of Programs	Absolute value	Percentage (%)
Education	3882	16,9 %
Mathematics in National Network	907	3,95 %
Letters	768	3,35 %
Administration	530	2,31 %
Mathematics Education	422	1,84 %

The program that stands out most is education, as shown in Table 5, which is justified considering the objective of the current National Basic Education Plan that aims to train professionals for Basic Education through professional qualification through the stricto sensu Postgraduates in the area of Education (BRAZIL, 2011). In addition to this, the "digital natives" according to Prensky (2016) are the current public of the schools, seek to research emerging issues of this new reality of society, and are eager for technological tools that support the learning process.

Table 6. Principal teachers on the subject between 2014 and 2017.

Advisors' Name	Absolute value
Jose Claudio Del Pino	32
Fernando Luiz Affonso Fonseca	18
Júlio Gomes Almeida	17
Jose Aires de Castro Filho	16
Alex Sandro Gomes	14

Table 6 presents the most prominent teacher in the orientation of research in which mobile learning was cited, which was the teacher Jose Claudio Del Pino. As for participation in newsstands, the professor with the largest participation in newsstands was Professor Fernando Luiz Affonso Fonseca, as shown in Table 7.

Table 7. Main professors in the stands on the subject between 2014 and 2017.

Name of Teachers	Absolute value
Fernando Luiz Affonso Fonseca	50
Cristina Massot Madeira Coelho	39
Saddo Ag Almouloud	39
Vera Lucia Messias	39
Fialho Capellini	39
Ana Maria Iorio Dias	34

Tables 8 and 9 show respectively the main guiding teachers separated by type of course and the main participating bank teachers by type of course. Aiming this way, the main professional references involved with researches in which mobile learning was cited in recent years.

Table 8. Principal teachers between 2014 and 2017, separately by type of course.

Academic Masters	Absolute value	Professional Master's Degree	Absolute value	Doctorate degree	Absolute value
Julio Gomes Almeida	14	Adriano Salmar Nogueira E Taveira	13	Jose Claudio Del Pino	16

Table 9. Main teachers in the cages between 2014 and 2017, separately by type of course.

Academic Masters	Absolute value	Professional Master's Degree	Absolute value	Doctorate degree	Absolute value
Fernando Luiz Affonso Fonseca	32	Cleide Carneiro e Eliane Scheid Gazire	15	Roger Miarka	15

The analyzes also showed that the experiences currently carried out in works focused specifically on education and / or teaching, on the theme of mobile learning, cover aspects such as: verifying the use of mobile devices and creating applications for teaching and learning. Borba et al. (2016) states that studies on this subject cover the potential of devices for teaching and learning, the use of devices by pupils and teacher training.

In order to complement the information regarding the areas of concentration and lines of research studied, we synthesized what is being researched and which are the most significant experiences being developed with mobile learning in works with a specific focus on education and / or teaching. Literacy, the training of tutors and teachers, and the learning of contents from diverse areas such as mathematics, physics, chemistry, biology, history, English, letters and Portuguese, were investigated. learning and strategies of use of mobile devices and applications in the process of teaching and learning. Evidencing that the mobile learning theme is essentially multidisciplinary, challenging graduate programs to involve numerous areas of knowledge.

Finally, this analysis of theses and dissertations became important, as it provided an overview of the production involving the theme of mobile learning in Brazil in recent years.

V. FINAL CONSIDERATIONS

Research on academic production in the area of mobile learning provides professionals and researchers of education and areas for purposes an update of how is the development of research in this field in a general context. Thus, in performing a mapping on mobile learning, we identified the growth in the number of jobs in which mobile learning was cited in both academic master's, professional master's and doctoral studies.

In spite of the limitation, due to the amplitude of this mapping, which did not aim to deepen the conceptual and methodological questions of mobile learning in the conception of the authors of the works investigated, this study allows a synthesis on the researches developed in the postgraduate courses, allowing the discussion between teachers, students and institutions on mobile learning in Brazilian universities, through an overview of the research situation in which mobile learning was mentioned at the national level.

The present study confirmed that the scientific researches involving mobile learning presented significant growth in both academic and professional masters as well as in doctorates, identified the main areas of knowledge developed by the postgraduate studies, in which mobile learning was cited, presented the main institutions which has contributed to the development of these researches in recent years, the programs that stand out most in these researches and the main professional references involved with works in which mobile learning have been cited in recent years.

The results allowed to visualize the academic production of theses and dissertations on the theme of mobile learning, we have established a quantitative panorama of academic publications in recent years. Further deepening

in the areas of concentration, lines of research studied and important experiences that are being developed with mobile learning in works with specific focus on education and / or teaching. Needing additional studies to delve into scientific productions in this topic, considering that there is much to be explored in this area of research, from its potentialities and limitations to its reflections in society.

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