

DEVELOPING DIGITAL SKILLS TO SOLVE INFORMATION PROBLEMS THROUGH A MOOC

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Abstract

The study reported here is part of a macro study, which seeks to identify digital competences developed by students and teachers participating in the program MiCompu.Mx in the states of Tabasco, Colima and Sonora in Mexico. This paper presents the experience of a currently ongoing implementation of a Massive Online Open Course (MOOC) addressed to teachers and principals that aims to develop digital skills to solve information problems. The objective of the study is to identify the impact of MOOC in developing the following digital skills: search and select information, organize and process information, to communicate what they have learned and projects planning. For this part of the project a pre-questionnaire and post-questionnaire was implemented to measure the digital skills before and after the MOOC. Results show how the MOOC has benefited the participants in the development of the digital skills to solve information problems. Both horizontally (within the same skill) and vertically (from the basic to the more complex skill), each one of the skills had a significant change in the perception of the participants of their level of competency in each one of the skills studied.

Keywords: MOOC, Digital Skills, MiCompu.Mx

1 INTRODUCTION

The Secretary of Basic Education of Mexico (SEB) and the National Digital Evaluation Commission (CEDN) developed during the years 2013 and 2014 a national program called MiCompu.Mx which in its first stage included the states of Colima, Sonora and Tabasco. It is part of the series of programs implemented to increase the digital inclusion, equity and quality.

The program MiCompu.MX seeks the use of the personal computer to improve the study conditions of children, the improvement of teaching strategies, the strengthening of teachers academic groups, changes in school management and reduction of the digital and social gaps between families and communities (SEP, 2015). The initial pilot program in three states involved the delivery of 240,000 PCs to students in fifth and sixth grade of different school organizations.

Given the importance of documenting research through the experiences of implementing these innovative educational initiatives, this study sought, among other things, to develop digital skills in teachers and principals. This article presents the results of the implementation of a MOOC for teachers and principals, intended to develop information search and selection, organization and processing of the information, the communication of what they have learned and planning projects. The aim of the study is to identify the most developed digital skills through the MOOC.

2 THEORETICAL FRAMEWORK

2.1 MOOC

A Massive Online Open Course (MOOC) can be defined as: "... an open free course, composed mainly of Open Educational Resources (OER) and designed to be completed through a platform or personal learning environment installed on the Internet, by anyone, autonomously, without need for a teacher or support tutor on the other side of the connection" (Marauri , 2014 , p . 40). These courses are identified by some of the following features: it has a start and an end date, resemblance a class without the classroom, has evaluation mechanisms, has no admission criteria and allow the participation of large amount of students (Castaño and Cabero, 2013).

The use of MOOC in teaching regular environments is increasing rapidly. Marauri (2014) calls out the attention to this matter identifying some aspects that is making this possible: the possibility of reaching new audiences and the improvement of the reputation of the institutions by presenting themselves as innovative sources of knowledge. Other aspect is that the MOOC allows the continuance of learning throughout life in a very specialized manner by having new learning experiences for free. For teachers it has helped them to promote their teaching and publications, causing the attraction of new students to regular courses.

Some of the possibilities and strengths given to a MOOC as an educational tool to develop different skills are the redefinition of the role of the teacher, the demand for specialized training, the promotion of new teaching methods and innovative educational practices, the internationalization of universities and academics, flexibility and adaptability of the academic offerings and the expansion and diversification of learning throughout life (Cabejo, 2015)

2.2 Digital Skills

Digital skills are defined as the way of using information and communication systems with digital technologies in an ethical manner (Garcia Valcarcel & Arras, 2011). More specifically, it includes different areas that complements into the competency of using information to resolve problems: search and select information, organize and process information, communicate what they have learned and projects planning.

UNESCO has established some parameters and criteria in its ICT Competency Standards for Teachers (ECD-ICT) for planning training programs for teachers that will prepare them in the use of ICT. There are three different approaches proposed for the training of teachers: 1) basic understanding of ICT; 2) deepening of knowledge and 3) knowledge management. This proposal looks to develop the ICT skills of teachers by going from the simple use and daily management to the implementation and evaluation of projects (UNESCO as cited by Rangel Baca, 2015). Including a dimension of communicative type, is considered important in order for the teacher to develop an environment in which learning activities are more complex and can develop a collaboratively conducted project-based that can go beyond the classroom.

3 METHODOLOGY

For this part of the study, a pre-questionnaire and post-questionnaire were applied to the participants of the MOOC called Development of Digital Skills. This MOOC was available to all teachers and principals that participated in the macro study in the three states where the program MiCompu.Mx was implemented. The questionnaire was divided in three parts: demographical information, digital skills self-assessment and use of Open Educational Resources self-assessment.

A total of 863 participants were enrolled initially in the MOOC and answered the pre-questionnaire. At the end of the course, a total of 210 participants answered the questionnaire and completed the course. Descriptive statistics was used to analyse the data obtained from the questionnaires.

4 RESULTS

The results are presented according to the self-assessment completed by the participants in the digital skills section of the questionnaire in the Table 1.

Table 1. Comparison of level of digital skills before and after the MOOC

Skill	Questionnaire	Level of skill (in %)				
		None	Basic	Average	Advanced	Expert
Search information in the web	Pre	0	19	40	34	7
	Post	0	7	30	50	13
Select information in the web based on objectives	Pre	1	20	40	35	4
	Post	0	7	29	53	11
Organize information from a web search	Pre	2	23	43	29	3
	Post	0	6	27	54	13
Process information as a result of the search, selection and organization in the web	Pre	2	23	46	25	3
	Post	0	6	31	51	12
Communicate what was learned through educational technology (applications, software)	Pre	6	29	44	19	2
	Post	0	7	31	50	12

Planning projects mediated by educational technology (applications, software)	Pre	15	34	38	11	2
	Post	0	1	46	33	20

5 ANALYSIS AND CONCLUSIONS

The descriptive analysis of the results shows at first sight how the MOOC has benefited the participants in the development of the digital skills to solve information problems. Both horizontally (within the same skill) and vertically (from the basic to the more complex skill), each one of the skills had a significant change in the perception of the participants of their level of competency in each one of the skills studied.

Within each skill

The first skill, *Search information in the web*, went from 40% of the participants to self-evaluate themselves with an Average level before the MOOC to a 50% of the participants who indicated that they have an Advanced level of competency in this skill after the MOOC. The Expert level went up by 6% of participants assessing their skills in that level after the MOOC.

The selection of information in the web based on objectives, Organization of information from a web search, Process information as a result of the search, selection and organization in the web and Communicate what was learned through educational technology (applications, software) are skills that were also self - evaluated by the participants as mostly Average before the MOOC and Advanced after the MOOC. In these skills, the Expert level self-assessed by participants went up by 7, 10, 9 and 10% respectively.

The last and most complex skill, *Planning projects mediated by educational technology (applications, software)*, was the only skill that maintained higher percentages of competency declared by participants as Average.

Another interesting result is having 19-49% of participants declaring None or Basic level of skills before the MOOC and have only 7% of participants declaring themselves as having only a Basic level of digital competencies after the MOOC.

From the simplest to the most complex skill

Taking a look to the results vertically, before the MOOC, from the simplest one to the most complex one, the percentage of participants declaring themselves with No skills increased as the complexity of the skill also increased. From having 0% of participants with a self-assessment of none in the basic skill of *Search for information in the web* to having 15% of them declaring the same level when it comes to *Planning projects mediated by educational technology*. Same pattern is found in the Basic level that goes from 19% of participants in the first skill to 34% of participants in the sixth skill.

The next three levels: Average, Advanced and Expert decreased the percentage of self-assessed participants in these levels going from 40%-38%, 34%-11% and 7%-2%, respectively; all this before the MOOC.

After the MOOC, no participants declared themselves within the None level in the six skills. And the more complex skill *Planning projects mediated by educational technology*, had the most increase of participants than went from having None of Basic level to having Average, Advanced and Expert with a 48% of participants moving from the first to the second group of levels.

In conclusion

A MOOC can be a useful resource to develop different skills in teachers, such as the digital skills worked through the MOOC presented in this study. The participants have self-evaluated their development of digital skills by increasing their competency level up to 48%. The skills that was most developed by the participants was the *Select information in the web based on objectives* by having 13% of the participants going from Average level before the MOOC to an Advanced level after the MOOC. Although this is the second basic skill in the range of six of them, is important to declare that the MOOC had a duration of one month, and more time might be needed in order to give the opportunity to master all skills at a higher level.

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