

Higher Education Students Perspective on Education Management Information Systems: An Initial Success Model Proposal

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ABSTRACT

As higher education evolves into a multifaceted and complex activity, the incorporation of education management information systems (EMIS) that allows for the production of relevant, organized and structured information, becomes a necessity for both institutions and students. Despite the recognition of this requirement, existing literature does not focus on how EMIS might trigger students' success. With this in mind, an initial proposal of a multi-perspective EMIS success model is presented and a validation on the possible existence of linear correlations between the model contexts is described. Moderate correlations have been detected between the majority of the model contexts and a very strong correlation has been detected between students' satisfaction and the arise of net benefits associated with the use of EMIS.

KEYWORDS

EMIS Success Model, EMIS, Higher Education, IS Success

INTRODUCTION

From a conceptual perspective one can easily perceive that education is one of the most relevant triggers towards individual success and social integration (Millán, Congregado, Román, van Praag, & van Stel, 2014). As the educational process becomes increasingly complex and available information and data grows at a fair rhythm, both students and education institutions need to incorporate information systems focused on allowing improved and feasible manner to manage and use existing data and, by consequence, stimulating performance and particularly success (Brabazon, 2016).

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In the current digital Era, information-based decision making has become one of the most relevant priorities for those who plan and implement information systems (Branco, Martins, Gonçalves, Bessa, & Costa, 2015; Gonçalves, Martins, & Rocha, 2016). In parallel, and as argued by Dabbagh and Kitsantas (2012), having access to structured and relevant information and knowledge has also become a necessity for both students and education institutions managers.

From a conceptual perspective, Education Management Information System (EMIS) are information systems designed to produce, manage and disseminate educational data and information, and are typically deployed on education institutions as an integrant part of their information technologies structure (Hua & Herstein, 2003; Wako, 2003). This type of information system allows for a dual perspective on its use, a first when being used by those managing the education institutions (thus allowing to achieved the necessary information to make strategic decisions) and a second when EMIS are being used by students to not only manage their education path but also to collect the information necessary to make decisions on their learning activities (Deng & Tavares, 2013) (hence, triggering their learning success (Holsapple & Lee-Post, 2006)).

Despite the prospect advantages on using EMIS, existing literature is yet limited when providing indication on the determinants that must be taken in consideration when deploying the referred systems and when promoting their use as a tool aimed at addressing both students and education managers necessities (and by inherence, triggering their success). In order to shed some light to this research topic and reaching a formal solution to the detected flaws, the presented research used Balaban, Mu, and Divjak (2013) e-Portfolio systems success model as the basis for an empirical study aimed at perceiving student perceptions on the impact EMIS might have in their personal learning success.

Hence, the main contribute of this paper is to provide for an initial analysis, drawn from the data collected from a minor sample of students from only one university, to the determinants which might impact EMIS success. In order to reach this goal an initial empirical validation has been performed and the achieved results have been analysed at the light of Pearson Correlation technique.

In what concerns the present manuscript organization, it starts by presenting a brief introduction to the research project and is followed by a focused theoretical analysis to existing literature on the educational use of information systems and technologies. The third section presents in a descriptive manner a conceptual model proposal for mimicking EMIS impact on students learning success and overall educational performance. This is followed by a straightforward description on the empirical study performed to reach an initial validation of the referred model. The manuscript is finalized by a conclusions sections where various acknowledgements are described and some limitations, and future work to address them, are highlighted.

Information Systems and Technologies Applied to Education

Most students in class today, in higher education, are millennials, born after 1982 and before the year 2000. A characteristic that helps define millennials is their proximity to technology and how they, very different to the baby boomers before them, are used to being, from a very young age, connected to the Internet 24 hours a day and 7 days a week, using various devices and digital tools to stay connected to the world, their friends and their network. In order for higher education to reach out to millennials the use of such digital forms of communication is essential (M. Au-Yong-Oliveira, Gonçalves, Martins, & Branco, 2017).

When analyzing today's perspective on the use of technology by students, they can even access the results of their application to a given university via online platforms, and they may register for different course options and receive other important information all online. Such forms of communication are more flexible and may be accessed at the time of day most convenient to students, who no longer will have to wait in line and queue up for certain important information (Stuttgart, 2016). In the case of international students, this is even truer (UCAS, 2016). Indeed, with an aging population in most European countries, capturing students from abroad is now important and possible via online pathways, and students may access important information, such as videos and degree and university

classifications online, without having to contact the university directly to make their decision about where they want to pursue their studies.

Being able to navigate online digital platforms is thus an important part of studying in higher education in the 21st century. The quality of Internet connections has improved immensely in recent years and in particular since access, in the mid '90s, via 56Kb modems, as baby boomers may recall. Internet access is now fast, and widespread, across university campuses, with free Wi-Fi expanding into new realms entirely – to the extent that at present free Wi-Fi access is an ambition of municipal leadership for entire city centers, and not just being limited to small, closed areas. Most classrooms in higher education will indeed be equipped with limitless Internet access before, during and after class – opening up new possibilities for teachers and lecturers who may now access Google and YouTube.com for real-time searches and videos to support class material even further (Arkorful & Abaidoo, 2015).

E-learning tools and platforms - such as Moodle - are also essential to the learning process. Students may be contacted via online forums, which are a possibility of Moodle, with important messages and challenges being communicated by the lecturer to all of the course students at the same time; while students may also submit their course work, and be informed of their results, via the Moodle platform (Greenhow, Robelia, & Hughes, 2009).

For students who work, and who cannot come to class regularly, e-learning platforms are especially important. Such platforms grant access to class material, and if this material is ordered by lecture date, for example, it may be a means to follow lectures from a distance. Indeed, some higher education institutions, for example in the UK, are now video-recording lectures and placing them online just in case a student was not able to attend a lecture, for whatever reason, and to maximize the opportunity for learning to occur. E-learning tools such as Moodle are called Course Management Systems (CMS) and despite their usefulness they are not intended to be a substitute for teachers (Cole & Foster, 2008). E-learning tools help poor performers in particular given that they allow to implement more dynamic and innovative teaching and learning mechanisms and initiatives to the point of stimulating student willingness to work harder and take more responsibility with their learning process (Kemp & Grieve, 2014; Masino & Niño-Zarazúa, 2016).

Specific digital and online tools such as Padlet.com are intended for collaboration purposes, in class and after class. They are ideal for registering ideas during a brainstorming session and it does help for students to see their ideas projected during, and after, class discussions, thus fostering their creativity and motivation to contribute further.

In the era of online social networks such as Facebook, Instagram and Snapchat it is more difficult to involve students in class (M. Au-Yong-Oliveira, 2016; Deng & Tavares, 2013), as they may soon “switch off”, especially as there is now Internet everywhere.

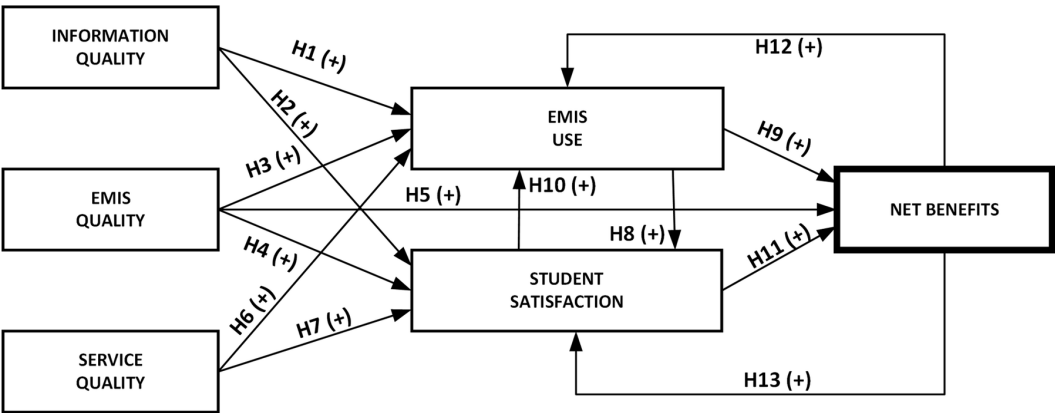
Finally, e-books, blogs, and videos may be co-created with students as technology has opened up new possibilities for higher education and learning in particular, across boundaries. Indeed, it is hard to keep up with all of the tools which now exist in the digital world though benefits from being up-to-date may help work be completed faster and better, in times of accelerated change (Guy, 2012).

EMIS Success Model Proposal

The proposed EMIS success model (Figure 1), despite being drawn from Balaban et al. (2013) model, it has its theoretical basis on Delone and McLean (2003) information systems success model. From a conceptual perspective, the proposed artefact provides for a multi-dimensional characterization on how the various determinants surrounding the deployment and consequent use of EMIS might trigger students' net benefits.

Considering the presented theoretical background and the proposed goal, the following research hypothesis has been designed:

Figure 1. Proposed education management information systems success model



Does the use of EMIS contribute positively to the success of the management of the academic career of the students of higher education?

Information Quality Context

Despite the existence of several measurements for the quality of an IS outputted information (Petter, DeLone, & McLean, 2008), its relevance, accuracy, importance, and ability to be easily understood and used, are those indicators who tend to be accepted as the most interesting to be used as metrics for measuring the Information quality of a given information system (Balaban et al., 2013).

As the main element of an EMIS, the available Information, and particularly its quality, tends to have a direct impact on the IS use and the user satisfaction (Bastida & Huan, 2014). According to Al-Debei (2014) education information systems tend to have improve relevancy not only to students use of the available features but alto to the levels of satisfaction towards those same systems from part of the students. Hence:

H1: Improved information quality will have a positive impact on students use of EMIS.

H2: Improved EMIS information quality will have a positive impact on students' satisfaction.

EMIS Quality Context

As argued by Middleton et al. (2013), the existence of technical and functional features and specifications that, at the same time, are aligned with the users information requirements, are well implemented and present good levels of robustness, provide for a significant argument towards its acceptance and consequent adoption by users. Hence, when addressing the initially highlighted problem, we reached the assumption that the education management information system quality context might be one of the most interesting ones to be studied given that is represents the ability for an EMIS to validate its capacities for things such as data processing efficiency, accessible and easy to use interfaces, response times and reliability (Kendall, Dandapani, & Cicchinelli, 2016).

Considering the existing assumptions on an IS quality direct relation with a perception on its ease of use (Cheung & Vogel, 2013; Walji et al., 2014) and its fulfilment of all predefined functional and non-function requirements (Delone & McLean, 2003; Petter, DeLone, & McLean, 2013), within the scope of this research we have considered EMIS quality as a dual nature context composed by both the systems usability and its functionality.

With the above in mind we believe that EMIS considered to be of the highest quality will be better suited for being used by students, hence the following hypothesis:

H3: Increased levels of quality associated with EMIS will have a positive impact on the system use.

H4: Increased levels of quality associated with EMIS will have a positive impact on the students' satisfaction.

H5: Increased levels of quality associated with EMIS will have a positive impact on the arise of net benefits.

Service Quality Context

Existing literature argues that in order for an information system to be fully accepted and used, hence helping users to improve their own performance and efficiency, it must ensure that its availability is not only constant but that its performance has very relevant levels (Oliveira, Faria, Thomas, & Popovič, 2014). As a conceptual concept, service quality – associated with information systems and technologies, has already been proven to be of relevancy towards not only users satisfaction but also their willingness to continue using the inherent systems (Orel & Kara, 2014).

From an education related systems perspective, and in line with the arguments presents by both Balaban et al. (2013) and Yousapronpaiboon (2014), one can characterize the service quality as the existence of synchronous and asynchronous online help features, the existence of (tech-support and user) manuals, the existence of a helpdesk service and the existence of ease to interpret online information repositories on how to use the systems. Hence, when assuming the study of the service quality context associated with education management information systems, the following hypothesis were drawn:

H6: Increased levels of EMIS service quality will have a positive impact on the system use.

H7: Increased levels of EMIS service quality will have a positive impact on the students' satisfaction.

EMIS Use Context

According to Maillet, Mathieu, and Sicotte (2015) the continuous use of a given information system tends to trigger the user satisfaction. This relation has also been studied by Tam and Oliveira (2017), according to whom user satisfaction is clearly enhanced when he uses high quality information systems.

From another perspective, various authors also acknowledge that using a given IS tends to be very relevant to the arise of net benefits such as an increase in the users' individual success and performance (Bossen, Jensen, & Udsen, 2013; Tam & Oliveira, 2016).

With the above in mind the following hypothesis has been drawn:

H8: The students use of EMIS has a positive effect on their satisfaction.

H9: The students use of EMIS has a positive effect on the arise of net benefits.

Students Satisfaction Context

On their research, Park and Kim (2014) highlight the direct relation between user satisfaction towards a given information technology and the user intention to use it. This same relation is demonstrated by Kim, Kim, and Wachter (2013) to whom when a user is satisfied with the overall system he tends to develop strong intentions to use it. A complementary perspective is delivered by Baraka, Baraka, and El-Gamily (2013) that argue the existence of a direct relation between user satisfaction and the arise of net benefits that can be translated into individual success. Thus, we propose that:

H10: Increased levels of students' satisfaction towards EMIS will have a positive impact on their use of the system.

H11: Increased levels of students' satisfaction towards EMIS will have a positive impact on the arise of net benefits.

Students Net Benefits Context

From Baraka et al. (2013) perspective, the net benefits concept can be characterized by a success measure that reflects the impact that an IS has on an individual or an organization or society.

When analysing the existing literature on IS success, one can easily detect the existing perception that net benefits tend to trigger systems continuous usage and user satisfaction (Bossen et al., 2013; Holsapple & Lee-Post, 2006). Hence:

H12: EMIS net benefits have a positive impact on EMIS use.

H13: EMIS net benefits have a positive impact on students' satisfaction.

RESULTS ANALYSIS

In order to perform an initial validation on the proposed conceptual model, an empirical study, in the form of a survey aimed at university level students, has been performed. The referred survey is part of a research project aimed at understanding the current state of the EMIS at university level, as well as reaching conclusions on the actions that should be executed to make these information systems truly important for academic management. With this initial study we were able to collect 186 complete answers from one Portuguese university students, who make daily use of EMIS in their academic activities.

Data Analysis

Considering the need to reach an initial validation to the proposed model and with this infer on the possible usage of its contexts to, in a near future, serve as the basis for an extensive empirical study on the impact EMIS might have on higher education students, and following Shmool et al. (2014) arguments on the assessment of dependencies between determinants, a set of correlations have been calculated in order to validate if the proposed variables presented a level of correlation sufficient for it to be considered a valid argument in favor of further advances in more complex data collection activities. As the presented research hypothesis tend to demonstrate a possible existence of positive linear relationships between the proposed model contexts, we decided to follow Hauke and Kossowski (2011) indication towards using Pearson's correlation to test for the existence of that type of relation (Table 1).

Table 1. Pearson correlations between the proposed conceptual model variables

	EMIS USE	Student Satisfaction	Net Benefits
<i>EMIS USE</i>	-	0.474	0.486
<i>Student Satisfaction</i>	0.613	-	0.798
<i>Service Quality</i>	0.541	0.654	-
<i>Information Quality</i>	0.528	0.669	-
<i>EMIS Quality</i>	0.492	0.539	-

From the achieved correlations between the proposed conceptual model variables, one can state the existent of linear correlation between all the accessed pairs and that, in all cases, this statement is significant even at the 1% level as the calculated p-values are less than 0.01 (Dahiru, 2008).

CONCLUSION

As higher education institutions and courses become increasingly multifaceted and the inherent sets of available information and data become significantly bigger and complex, the incorporation on EMIS that allow for the production of organized and structured information and the formalization of education related activities and processes, one should understand what impact are these systems having on students and whether they are already aligned with existing requirements or if changes must be enforced.

Despite throughout the existing literature one can identify the existence of various research projects focused on studying education management information systems, to our knowledge there is no research directed at understanding how EMIS impacts the performance and success of higher education students.

With the current research we aimed at presenting an initial validation of an EMIS success conceptual model, theoretically drawn from Delone and McLean (2003) IS success model and Balaban et al. (2013) e-Portfolio success model, that from our perspective would allow for a more complex characterization of the impact the referred systems might have on students.

The performed initial and simplistic statistical analysis, typical of early stages of a research project, to the possibility of existing positive linear correlations between the proposed conceptual model variables, allowed to understand that most of existing relations are relatively strong, thus allowing to prospect positive results on a future empirical validation of the referred model with increased sample numbers.

Another interesting achieved conclusion was the fact that the linear relation between students' satisfaction and the arise of individual net benefits is extremely strong, hence assuming the theoretical assumptions argued by Delone and McLean (2003) research.

From our perspective the presented research holds an innovative artefact composed by multiple dimensions and directed at studying if EMIS do really trigger higher education students' success and by consequence the systematization of higher education institutions information related processes and activities.

Limitations and Future Work

Despite the proposed model conceptual and theoretical support and the performed initial empirical validation on the existence of linear correlations that may lead to positive results in future research, for the proposed conceptual model to be considered an overall portrait of the inherent research topic, not only do we need to perform more complex empirical studies and using highly valid statistical methods and techniques, such as partial least squares path modeling (PLS) method to structural equation modeling (Oliveira et al., 2014; Tam & Oliveira, 2017).

Thus, by analyzing all the highlighted arguments and issues on the present research, we have to consider it a valid and relevant first approach for addressing an important and up-to-date issue.

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