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A systematic review of the literature on e-tutoring in higher education

ABSTRACT

Il contributo si propone di descrivere il metodo utilizzato per condurre una revisione sistematica della letteratura scientifica durante il primo anno del Dottorato in Scienze della Persona e dell'Educazione (XXVI ciclo, Università Cattolica del Sacro Cuore), in materia di didattica esercitativa. Il metodo trova il suo fondamento negli studi di Kitchenham e Bacca, che partono da una definizione dello stato dell'arte attuale coadiuvato dalla ricerca di revisioni sistematiche legate al tema chiave, arrivano allo sviluppo del protocollo di ricerca, quindi alla definizione dei criteri di inclusione ed esclusione degli articoli da rivedere. In corrispondenza della ricerca degli articoli, grazie a una stringa di ricerca definita da utilizzare nei database e nei motori di ricerca, è stata definita una maschera di estrazione dati, utile per riassumere i dati di ogni articolo e avere una panoramica dell'esistente.

La seconda fase del metodo ha previsto la conduzione della revisione: una volta identificato il processo di revisione, si è proceduto alla valutazione della qualità degli studi e all'effettiva estrazione dei dati.

Il paper si propone di creare un futuro report della revisione sistematica condotta, che possa essere la conclusione del primo anno di ricerca riguardante l'argomento di studio prescelto

Parole chiave: didattica esercitativa, e-tutoring, didattica, revisione sistematica della letteratura, higher education.

ABSTRACT

The paper aims to describe the method used to conduct a systematic review of the scientific literature during the first year of the PhD in Sciences of the Person and Education (cycle XXXVI, Catholic University of the Sacred Heart), on the subject of practical teaching in e-tutoring. The method is based on the studies of Kitchenham and Bacca, initiated from a definition of the current state of the art assisted by the search for systematic reviews related to the key topic, arrive to the development of the research protocol, and successively define the inclusion and exclusion criteria of the articles to be reviewed. In correspondence with the search of the articles, thanks to a defined search string to be used in databases and search engines, a data extraction form has been defined, useful to summarise the data of each article and to attain a general overview of the existent.

The second phase of the method involved the implementation of the review: once the review process had been identified, the evaluation of the quality of the studies and the actual extraction of the data were carried out.

The paper aims to create a future report of the implemented systematic review, that could become the conclusion of the first year of research concerning the chosen study topic.

Keywords: practical teaching, e-tutoring, systematic literary review, higher education.

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Context of research

The research of my PhD programme aims to study the role of the e-tutor in online teaching in the Higher Education sector, and to contribute to the definition of an implementation framework and active methodologies for interactive teaching, aimed at the improvement of the exercise activities carried out by of the student in the course of study.

The question underlying the research is “How can e-tutoring, by using tools such as synchronous e-tivities and gamification, act as a mediator to improve Higher Education online teaching in its interactive components?”

In order to identify and refine research questions in a PhD course of study, and to justify the research itself, I considered it important to conduct an initial systematic review of the scientific literature on the topic of interest.

Considering the e-tutor as a figure with psycho-pedagogical skills, an expert in training mediation and online moderation, who acts as a link between teaching, students and administrative components, the research questions the methodologies of the currently existing online tutor, and is interested in studying different approaches that could expand its functions in the university environment.

Starting from a mapping of e-tutoring models in the Higher Education sector, ensuing from an accurate analysis of the existent, the research aims to offer a proposal for the improvement of the interactive component designed for the students' course of study.

Methodology

I used the systematic review method of the literature by Kitchenham, later adapted by Bacca, which divides the process into three main phases: planning, conducting the review, and reporting the review.

Kitchenham (2004) argues that systematic reviews aim to present a fair evaluation of a research topic by using a trustworthy, rigorous, and auditable methodology.

In accordance with the author's claims, taken as a reference, the advantage of systematic reviews of literature is that they provide information on the effects of some phenomena in a wide range of empirical settings and methods. If the studies give consistent results, systematic reviews provide evidence that the phenomena is robust and transferrable. A second advantage, in the case of quantitative studies, is that it is possible to combine data using meta-analytic techniques. This increases the likelihood of detecting real effects that smaller individual studies cannot identify.

The objectives of the systematic literary review are aimed at:

- justifying the research question;
- reviewing and structuring the research question;
- offering a systematic view of the scientific literature produced, concerning specific research questions, which is essential for directing the following research path.

These objectives were chosen both as reference points to follow, and to outline the structure of the research.

First, it was necessary to understand if the research was plausible, hence it was essential to justify the search request based on the studies already carried out: this was achieved by analysing the articles found through the chosen search strings.

Thanks to the definition of the objectives, it was then possible to revise and better structure the research question, as well as offer a systematic and consistent view of the scientific literature already present in relevant journals, with respect to the chosen topic.

Researched Question

Granting that every research is based on a problem, it is necessary to define a specific research process, which is always formulated by a question; in my case, the underlying research question is: “How can e-tutoring, by using tools such as synchronous e-tivities and gamification, act as a mediator to improve Higher Education online teaching in its interactive components?”

The research objectives derive from the research question, and the research process is chosen and defined on the basis of the identified objectives.

The research, in this case, originated from the need to understand if there were similar, or at least correlated, researches that might already have answered the research question or some of the identified objectives.

Current state of the art of the research topic and related systematic reviews

To begin the systematic review of the literature, it was important to start from the knowledge of the current state of the art of the chosen topic. It was also important to understand if other systematic reviews of the literature on the same topic had already been conducted.

The related researches on the topic that were found in the early stages of the research concerned the role of the e-tutor in the students' study process and moments of practice; they touched the themes of gamification and e-tivity processes created ad hoc to support the student only marginally, but proved to be equally important to understand the dynamics already implemented by other institutions.

Development of the research protocol: inclusion and exclusion criteria.

In developing the systematic review of scientific literature, it is necessary to establish a review protocol, which specifies the methods that will be used to undertake a specific systematic review. Why is a review protocol needed? Several authors¹ justify the need for a default protocol because it can reduce any possible bias of the researcher. In fact, without a protocol, it is conceivable that the selection of articles or studies or the analysis itself are guided by the expectations of the researcher or by his / her previous knowledge.

Kitchenham himself makes it clear that

the components of a protocol include all the elements of the review plus some additional planning information:

- *Background. The rationale for the survey.*
- *The research questions that the review is intended to answer.*
- *The strategy that will be used to search for primary studies including search terms and resources to be searched, resources include databases, specific journals, and conference proceedings. An initial scoping study can help determine an appropriate strategy.*
- *Study selection criteria and procedures. Study selection criteria determine criteria for including in, or excluding a study from, the systematic review. It is usually helpful to pilot the selection criteria on a subset of primary studies. The protocol should describe how the criteria will be applied, e.g. how many assessors will evaluate each prospective primary study, and how disagreements among assessors will be resolved.*
- *Study quality assessment checklists and procedures. The researchers should develop quality checklists to assess the individual studies. The purpose of the quality assessment will guide the development of checklists.*
- *Data extraction strategy. This should define how the information required from each primary study would be obtained. If the data require manipulation or assumptions and inferences to be made, the protocol should specify an appropriate validation process.*
- *Synthesis of the extracted data. This should define the synthesis strategy. This should clarify whether or not a formal meta-analysis is intended, and if so, what techniques will be used.*
- *Project timetable. This should define the review plan.²*

¹ Among the Authors, Bacca & Kitchenham (2004), Tranfield (2003), Hutton (2015).

² Kitchenham, B. (2004). *Procedures for performing systematic reviews*. Keele, UK, Keele University, 33 (2004), 1-26.

To make the search precise and valid, it was necessary to choose the inclusion and exclusion criteria of the articles found. The criteria chosen for the SLR are summarised in the chart below:

Inclusion Criteria	Exclusion Criteria
The papers are published from the year 2000 onwards AND	The papers are published before 2000 OR
The author has a HI greater than or equal to 30 AND	The author has a HI inferior to 30 OR
The papers are published in a peer reviewed conference or Journal with an IF equal to or greater than 3.	The papers are not published in a peer reviewed conference or Journal with an IF equal to or greater than 3.

Figure 1, inclusion and exclusion criteria used in the systematic review of the literature.

For research purposes, it is necessary to define the criteria (used unequivocally) to select journals in relation to our objectives, the research questions asked, and the selection process.

The researcher generally defines general inclusion and exclusion criteria and specific inclusion and exclusion criteria, outlining magazine selection parameters.

Study selection criteria are intended to identify those studies that provide direct evidence related to the research question. To reduce the likelihood of errors, the selection criteria were decided during the protocol definition and were based on the research question.

In selecting the inclusion and exclusion criteria, some aspects were taken into account, which are summarised below:

- exclusions based on the language of the study were avoided, even though most of the articles were in English;
- we avoided considering articles dating back to years before 2000, since the topic taken into consideration had a turning point with the articles published by Salmon in those years;

- unpublished papers in a peer reviewed conference or in a Journal with an IF inferior to 3, were avoided.

Development of the research protocol: preparation of the data extraction form

A data extraction form was prepared, an Excel spreadsheet useful for the organisation of the obtained results. In addition to the spreadsheet, a document was drawn up for the management of the bibliography.

The results given by the research process of scientific articles were classified and coded thanks to tags in Zotero, a platform that allowed the organisation of the results and facilitated their analysis, by specifying the items of the article such as author, year and identification based on the research question.

The goal of this phase was to design a data extraction module to accurately record the information obtained by reading the studies and the articles found. To reduce the possibility of errors, the data extraction module was defined and then perfected once the study protocol was finalised.

It was decided to establish a data extraction form, useful to gather all the information necessary to understand the fundamental elements of the studies. The completed data extraction form was relatively simple when considering the number of articles to be reviewed, and this allowed a basic clarity that complemented every phase of the review, maintaining the necessary order and accuracy throughout the entire research.

Conducting the review

Identification of the review

Once the procedures were defined and the systematic review procedure of the reference literature was in place, the review began.

The semantic structure of searches is performed following the principles of structured search; the logical gates AND, OR, NOT, among others, help the filtering to be efficient. The logical gate AND is used to unify search levels and OR for sequence of synonyms.

In particular, the search strings, one more general and the other more specific, were:

- “online tutoring” OR “e-tutoring” AND “higher education”;
- “online tutoring” OR “virtual tutoring” NEAR “higher education”.

The research of the papers was conducted on Google Scholar, ResearchGate, ScienceDaily, Summon, Academia, ResearchGate, WoS and Scopus.

Study quality assessment

It is generally considered important to assess the “quality” of primary papers. These considerations are sustained by the inclusion and exclusion criteria, adding aspects of quality represented in the relevance of the study, quality of the bibliographic sources, relevance and academic prestige of the authors, and the impact factor of the journal in which it was published, amongst others.

Data extraction

It was important to design data extraction forms in order to accurately record the information researchers obtain from the primary studies, which included the following data: name of review, date of data extraction, title, authors, journal, publication detail, and a space for additional notes.

It was also important that, in the keywords section, the documents were recorded as belonging to the literature review, specifying the research question to which they belonged.

Each article was categorised taking into account the items chosen for filing, and the added space for supplementary notes proved to be essential to keep track of some important considerations while conducting the research as, for example, when it became crucial to compare two articles or to find differences between articles by the same author.

SLR report

By applying the method described and with the search strings, 473 papers were found. Once downloaded, they all were saved in Zotero.

Following the chosen inclusion and exclusion criteria, the scientific articles deemed relevant for the research path are 82. Each paper that was found was labelled, downloaded and saved in the repository previously created for this purpose.

Two scientific articles were also identified and studied in two other reviews of the scientific literature of the subject chosen as research topic, namely the teaching practice in e-tutoring.

The reporting phase allowed me to carry out an in-depth analysis of the 82 papers found, to organise them by macro-themes and to find connections between them.

The first part concerned the reading of the articles, essential to understand what was the theme at the basis of each article; in this first reading, what was always taken into consideration was the search string thanks to which that article was found in the search engines.

Subsequently, the article was associated with a general theme; the topics identified were e-tutoring, gamification and practice learning.

It ensued that an article contained two or three interconnected themes: in this

case, it was important to understand in what way that article included all its themes. A second phase led me to create connections between those articles that could encompass more specific topics than only the general ones or, moreover, for citing a theory or an author in two or more articles.

This not only allowed me to identify which theories and which authors were the most cited amongst the articles found, but also allowed me to gain an overview of the studies from which each article originated. I therefore was able to develop some important basic themes and study new theories concerning the subject chosen as the research topic.

Finally, I designed a conceptual map of the articles divided by macro-themes: beginning from the three main themes (e-tutoring, gamification and practice learning), each article found its place on the map.

This allowed me to literally see the connections between the concepts and to have a complete view of the basis from which to start my research.

Conclusions

The process of systematic literature review on the research topic proved to be a valuable way to learn about both the research topic, and the relevant authors who had previously studied it, as well as being an exceptional starting point for future research. The existing systematic reviews of the literature on the subject also made it possible to develop the research methods used in other similar studies, and their approach to the subject in question.

In conclusion, the objectives of the systematic literature review can be defined as achieved, since the initial research question has been justified while concurrently building a systematic view of the concerning scientific literature produced, indispensable for directing the subsequent research path, which will consist in conducting a meta-synthesis of the results achieved.

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