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A Profile Outline of Higher Education E-Tutoring Programs for the Digital-Native Student – Literature Review

Iulia A. Copaci[a]*, Alina S. Rusu[b]

[a]Faculty of Psychology and Sciences of Education, Babes-Bolyai University, Cluj-Napoca, Romania
[b]Doctoral School Education, Reflection, Development, Babes-Bolyai University, Cluj-Napoca, Romania

Abstract

In today's digital literacy society, education is facing challenges that emphasize the need to reconsider the traditional paper-pencil methods of instruction. Thus, e-tutoring programs have the potential to enhance students' academic achievement through counselling and learning-supporting activities. The present paper examines the results of the literature research (i.e. systematic review) related to e-tutoring in higher education, aiming to outline a profile for the higher education e-tutoring programs. Also, we aim to identify the Service-Learning related features of the e-tutoring programs found in the literature. The purpose of this study is to aid instructors designing friendly and more effective e-tutoring programs, well-suited for the digital-native student.

Keywords: e-tutoring programs, digital native students, academic performance.

1. Introduction

Traditionally, education was designed and conceptualized as a face-to-face instructional process aiming to support and develop students' personality and native potential to their fullest. This educational ideal (i.e. the main goal of a country's educational system) still supports the same core beliefs today, but the means and channels of

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* Corresponding author.
E-mail address: copaci.iulia@gmail.com

designing the instructional process had to continuously adapt to the social and technological changes, so that they can meet today's digital natives expectancies.

According to Prensky (2001), today's students have different thinking patterns and process information differently by virtue of their "native-speaking" ability of the digital language of computers, internet and video games. Moreover, today's digital natives interact (communicate, share, exchange), create, meet, coordinate, evaluate, learn, search, analyse, report, socialize and evolve differently (Prensky, 2004), due to a lifetime of exposure to new means of technology. The nucleus variable imposing changes in every major field of today's society, especially in education, is the reigning of the Web 2.0 era. First described by Berners-Lee (2005), the concept refers to "a collaborative medium, a place for all to meet, read and write". The Web 2.0 brings forward new tools and practices for the digital tech and it appears to have a great potential for the transformation of education (Crook, 2012). Web 2.0 is driven by user-generated content for a more efficient and time-saving information exchange. Moreover, the new web is also focusing on the user's experience (UX) through user-centred design and other user interaction practices, so that the online experience becomes pleasant, entertaining, incentive and productive for users, especially students.

According to Crook (2012), Web 2.0 is "…also about communication practices and distinctive human activities made possible by this infrastructure". Thus, such online environments would be great assets to education because they can offer digital-natives and lifelong learners extra career support in the form of e-learning software and e-tutoring tools.

2. E-tutoring

It is generally acknowledged that academic tutoring is a support and counselling system designed for students, aiming to facilitate their integration in universities by offering guidance when choosing the best social, cultural and educational options, but also to motivate and develop students' skills and improve their academic performance (Babes-Bolyai University, http://www.ubbcluj.ro/). The fundament of academic tutoring is the master-student relationship, where the tutor is a partner and a participant, which enhances students' scientific and personal development (Tapper & Palfreyman, 2000 apud Krajewska & Kowalczuk-Waledziak, 2014). As a form of education per se, tutoring focuses on the personalization of instruction and learning processes by varying interaction methods, becoming and instructional-learning-event (Bourdeau & Grandbastien, 2012). Most of the higher education institutions indicate the following advantages that the tutoring programs might offer to the students: (1) helping students become aware of their optimal academic development trajectory, (2) helping students develop a sense of self-management and responsibility in terms of personal and professional development, (3) letting students know that they are not alone in the education process, they can benefit from support, (4) improving students' experience at the university, (5) helping clarify students' professional options and goals for further development and (6) at the institutional level, facilitating the development and implementation of strategies and activities that have a positive impact on students' experience (for further details, see http://www.ubbcluj.ro/).

The term e-tutoring has extended the framework of traditional tutoring, so that its purpose could be achieved in the virtual environments as well. Thus, e-tutoring refers to individualized support from a tutor to a single or a small group of tutees that uses the Internet as its medium of communication (Flowers, 2007; Johnson & Bratt, 2009 apud Corrigan, 2012). The online tutor refers to any person undertaking a role to support and enable students to learn online effectively (Higginson, 2000 apud Kumar & Jayaraman, 2012) and it implies a broad spectrum of functions: the setting and administration of learning-environments as well as technical and social support (Kerres & Thomas, 2000 apud Adamus et al., 2009). There are numerous studies demonstrating the effectiveness of traditional and online tutoring as a valid form of intervention ((Biesinger & Crippen, 2008; Fuchs, Fuchs et al., 2008; Fuchs, Seethaler et al., 2008; Means, Toyama, Murphy, Bakia, & Jones, 2009; Merriman & Codding, 2008; Song, 2005 apud Corrigan, 2012), but, in order to design an optimal e-tutoring program, one should first review the existing programs and identify the specific elements related to the efficiency of these programs at all the potential levels regarding their implementation (i.e. technological support, categories of tutees and tutors, outcomes of the e-tutoring etc.).

3. Method

In order to accurately analyse the relevant literature in the field of e-tutoring, the chosen method for this paper was systematic review. Systematic review is a process that follows an exact algorithm for identifying, evaluating and interpreting research materials to answer a number of research questions; the purpose of the systematic review is to summarize the research by conducting a synthesis, in a systematic procedure on three stages, on research resources (Judi & Sahari, 2013 apud Kitchenham & Charters, 2007).

In the first planning stage of this paper, we conducted an analysis to identify the need of such a review, develop a review protocol and outline the research questions, as the systemic review process suggests (Judi & Sahari, 2013). As we already presented the rationale in the introduction of this paper, there is a need of improving the special e-learning support for the digital-natives through e-tutoring in pursuance of their new expectations from today's educational system. Thus, the investigation of recent literature and major advances in the field is needed. The research questions involve major key points in the e-tutoring related research, so that major trends could be identified: (1) Which are the aims of recent research? (2) Which types of instruction are mostly used in e-tutoring? (3) What are the most common e-tutoring categories and types? (4) What is the length of the e-tutoring program? (5) What types of computer technology are most common in e-tutoring programs? (6) Which research designs and data analysis models yield the best results in e-tutoring? And (7) What challenges does e-tutoring bring?

In the second phase, we established a research protocol to examine the relevant literature on e-tutoring, as the authors suggest (Judi, & Sahari, 2013 apud Kitchenham & Charters, 2007). The search engine used was ANELiS (http://www.anelis.ro/), a program developed by the Da that offers Romanian university students free mobile access to a wide range of scientific databases, such as: ScienceDirect, Springer Link, Wiley Blackwell, ProQuest Central, OVID LWW High Impact Collection, Oxford University Press, Emerald Group Publishing, American Institude of Physics, Taylor and Francis, EBSCO Academic Search Complete, EBSCO Business Source Complete, SAGE, Thomson ISI and SCOPUS. The protocol applied the following searching keywords: "E-tutoring/ Online tutoring" and "Higher education" and the search included all disciplines available, and as for content, all journal articles, books & e-books, conferences, dissertations and trade publishing articles. The search was filtered so that the result would yield the full text of the paper. The eligibility criteria were: (1) research papers published between 2010-2015 and written in English, (2) research papers had to address students enrolled in higher education (18+ years) and (3) research papers had to discuss the solely topic of e-tutoring in higher education. Papers were excluded from this review if the eligibility criteria were not met or if the subject focused solely on other fields, such as distance learning, e-learning or other virtual environments.

4. Results and Discussions

The initial ANELiS search protocol yielded an initial number of 38 papers that was reduced to 15 papers discussing the field of e-tutoring. Using the exclusion criteria, 7 papers were rejected from the further analysis, that lead to a total of 8 valid papers focusing on e-tutoring in higher education and published between 2010-2015 (as shown in Table 1).

Table 1. Papers reviewed

Paper	Number
Total fulfill inclusion criteria	15
Total fulfill exclusion criteria	7
Total valid	8

4.1. Research question 1: Which are the aims of recent research in the field of e-tutoring?

Recent research focuses mainly on improving in-depth retention or interactive learning (Poor & Brown, 2013; Lin & Yahg, 2013; Arco-Tirado et al., 2011; Peacock et al., 2012), developing future job-related skills (Doukakis et al., 2013; Herzog & Katzlinger, 2011 ; Rusu, Copaci & Soos, 2015), but also assess the quality of interaction

between tutor and tutees (Hodges et al. 2014). While some studies focus more on the development psychological variables in students, such as cognitive and metacognitive learning strategies, social skills, self-efficacy, happiness and civic attitudes (Arco-Tirado et al., 2011; Rusu, Copaci & Soos, 2015), others focus towards enhancing students' procedural knowledge and skills (Herzog & Katzlinger, 2011; Doukakis er al. 2013). The various directions of research in the e-tutoring field brings forward the adaptability and the potential of such support programs in higher education, whether they are designed for learning enhancement or preparing students for future jobs. The complete list of research aims is presented in Table 2.

Table 2. Identified aims of research in the field of e-tutoring

Aim
Confront learners with real-life situations through virtual simulation
Help students understand and manage course theory
Increase learning success
Prepare educators for their new role as e-tutors (i.e. facilitators, technologists, administrators, advisors and researchers)
Develop students' motivation and writing skills
Asses the quality of interaction between e-tutors and tutees
Asses students' perceived helpfulness of the program
Improve course material retention
Examine the way web-based programs support interactive learning
Increase and evaluate tutees' civic actions, self-efficacy and subjective happiness post-e-tutoring

4.2.Research question 2: Which types of instruction are mostly used in e-tutoring programs?

Based on the Service-Learning categorization proposed by Waldner et al. (2012), we divided the e-tutoring programs into two categories: *classical e-tutoring* that imposes on-line and at least two face-to-face meetings with the tutees, and extreme, *ex-tutoring* that only requires on-line interaction. The literature analysis shows that all studies adopted the classical e-tutoring, instruction involving at least two face-to-face meetings, as presented in Table 3. Thus, it would be interesting to investigate the effects of such exclusive ex-tutoring programs on various variables in the future since there is no recent research in the field.

Table 3. Types of instruction in the e-tutoring programs presented in the reviewed literature

Item	Number
E-tutoring (classical form)	8
Ex-tutoring	-

4.3. Research question 3: What are the most common e-tutoring categories and types?

The majority of the e-tutoring programs fall into the structured category as shown in Table 4, as it is easier to quantify and allows an increased variable control. Also, all tutoring programs were offered to students as a supplementary university course or support module and not as a substitute instance, since it would have interfered with the course curricula.

Table 4. E-tutoring categories identified in the reviewed literature

Item	Number
Structured	6
Unstructured	2
Supplementary course	7
Substitute course	-
Not mentioned	1

Table 5 summarizes the types of e-tutoring regarding the impersonation of tutor and tutees. The selected research predominantly utilized a teacher in the e-tutor role, with two studies that selected peer e-tutors to prevent academic failure or dropouts and investigate the benefits of peer-to-peer interaction (Arco-Tirado et al., 2011) and increase students' motivation and writing skills (Lin & Yahg, 2013). In both cases of peer-e-tutoring the intervention was statistically significant, as student-e-tutors managed to increase tutees' GPA, performance rate, success, learning strategies, social skills (Arco-Tirado et al., 2011) and develop positive attitudes towards the program, at both levels (i.e. e-tutors and e-tutees) (Lin & Yahg, 2013). These findings reinforce the premise that e-tutoring, peer-to-peer, Service-Learning programs are powerful curricular tools that upgrade multiple variables associated with academic learning.

Moreover, Table 6 presents the predominant e-tutors category, where more than half of the studies chose to conduct pre-e-tutoring-trainings for their tutors. On this matter, Lin & Yahg (2013) point out the importance of e-tutor-training, arguing that effective training is a critical issue, especially in the development of language skills and research.

Table 5. E-tutoring types identified in the reviewed literature

Item	Number
Peer-to-peer	2
Teacher-student	5
Mixed	1

Table 6. E-tutors category identified in the reviewed literature

Item	Number
Trained tutors	5
Untrained tutors	2
Mixed	1

4.4. Research question 4: What is the length of the e-tutoring programs?

Through this research question, we intended to investigate whether the length of the e-tutoring program influenced its efficiency, since Cohen and Kulik (1982) concluded, in a meta-analysis, that face-to-face tutoring programs were more effective when the length was reduced to four weeks or less. The analysis shows inconclusive results, since both short-term and long-term e-tutoring programs report statistically significant improvements in the measured variables.

Table 7. Length of the tutoring programs described in the reviewed literature

Item	Number
One academic year	2
One semester or more	2
Less than 4 weeks	3
Between 4 weeks and 1 semester	1

4.5. Research question 5: What types of computer technology are most common in e-tutoring programs?

There is a variety of software researchers used as vehicle for the program implementation, as presented in Table 8. The most common environments were educational platforms: existent and adapted to the purpose of the study such as Blackboard Collaborate (Doukakis et al., 2013), Online Synchronous Learning Environments (Peacock et al., 2012) and designed especially for the e-tutoring program, such as PedTut (Rusu, Copaci & Soos 2015).

Table 8. Types of computer technology used in e-tutoring programs described in the reviewed literature

Item	Number
Simulation game	1
Educational platform	3
Google cloud/ Google.doc	1
E-mail	2
Texting, & Chat	1
Telephone	1
University existent website	1
Programs with audio-video plugins (e.g. Adobe Connect, Skype)	1

4.6. Research question 6: Which research designs and data analysis models yield the best results of the e-tutoring programs?

Table 9 presents the research design of the analysed papers, whereas Table 10 lists the data analysis methods. Half of the papers utilized a solely qualitative research design that used methods such as individual interviews and students' feedback content analysis (Doukakis et al., 2013) or group interviews, content analysis, class observation, discourse and content logs analysis (Lin & Yahg, 2013), content examination of e-tutoring exit surveys (Poor & Brown, 2013) or analysis of video diaries (Peacock et al., 2012). On the other hand, the other half of the papers is characterized by mainly quantitative approaches for their increased external and ecological validity and combines them with qualitative, content analysis or interviews as to gain a more specific insight into the issues studied. The most common quantitative methods were pre-test and post-test comparisons with experimental and control groups (Rusu, Copaci & Soos, 2015; Hodges et al., 2014; Arco-Tirado et al., 2011), also doubled by content analysis.

Table 9. Research designs used to investigate the efficiency of e-tutoring programs in the reviewed literature

Item	Number
Qualitative	4
Quantitative	-
Mixed	4

Table 10. Frequency of data analysis methods in the reviewed literature describing the e-tutoring programs

Item	Number
Interviews (non-structured & semi-structured)	7
E-tutoring overall content analysis	4
Online tutees' feedback content analysis	4
Pre-test & post-test comparisons	3
Focus groups	1
Observation	1
Cluster analysis	1
Analysis of reflection logs	1
Analysis of video diaries	1

4.7. Research question 7: What challenges do e-tutoring programs bring?

Apart from the multiple benefits of e-tutoring on learning processes, cognitive and meta-cognitive skills, social, personal and academic development, online communication also has its challenges that need to be taken into consideration for further design optimization of e-tutoring programs. Less than half of the papers chose to report their challenges (Rusu, Copaci & Soos, 2015; Doukakis et al., 2013; Lin & Yahg, 2013), as mentioned in Table 11. Issues were related to the instability of some platforms, lack of self-confidence regarding the digital literacy skills, cautious attitudes (Rusu, Copaci & Soos, 2015; Doukakis et al., 2013;)). Students might have also perceived the supplementary e-tutoring course as extra academic work, resulting in low levels of participation (Rusu, Copaci & Soos, 2015).

Table 11. Challenges of e-tutoring programs reported in the reviewed literature

Issue
Educators being cautious and concerned regarding the e-tutoring program
Accidental lag occurring during online writing
Instability of the platform
Periodical missing data
Learner-anxiety induced by video calling, perceived as invasion of private space
Low levels of student participation
Inequality of communication with large groups of tutees

5. Conclusions

The current paper used a systematic review protocol to analyse the latest research on the e-tutoring programs (i.e. 8 studies from 2010-2015 met the inclusion criteria). The results indicate the latter aims of research, most common types of instruction, categories and types of e-tutoring, various lengths of such programs, types of computer technology mostly used, the best research designs and data analysis methods and challenges arisen during the research. The investigated literature reveals an on-going preference for trained-e-tutors programs since 5 out of 8 programs assigned their e-tutoring content to previously trained e-tutors. Another highlight of this review is the predilection to use teachers as tutors, as 5 out of 8 programs were teacher-student e-tutoring programs, whereas only 3 programs chose the peer-to-peer e-tutoring wireframe. The findings from this study may serve as a premise for combining Service-Learning with such e-tutoring programs, considering that peer-to-peer instruction is under-represented in the field literature and holds great potential for increasing GPA, performance rate, success, learning strategies and social skills of tutees (Arco-Tirado et al., 2011). Moreover, the educational platform appears to be the preferred form for delivering e-tutoring programs, so greater attention should be given to developing such platforms on the grounds that they are accessible, user-friendly, user-centred designed, with multiple opportunities for data accessibility and analysis, thus being suitable for the digital-native student.

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