

Literature review of the most cited articles in selected 5 educational technology journals during 2013 to 2017 – Identifying the champions

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Abstract

The aim of the current review study was to examine the characteristics of the most cited articles, derived from five selected journals in the field of educational technology between 2013 to 2017. The research method of this study was the review of the most cited published articles. Total forty one (n=41) articles were reviewed first and later only seven most cited articles were selected for the further analysis. The results indicate that the most cited published article from the five selected per journal and the years between 2013 to 2017 was entitled “The gamifying learning experiences” (Citation count = 801 times). The results further highlight that three articles were derived from the journal of Computer and Education. The results also show that the five most cited articles were published in 2013 and other two articles were published in 2014 and 2015. A mixed methods approach, review of the empirical articles and quantitative approach were used as research methods in the most cited five selected journals. The results confirm that the journal of Computer and Education was found the most dominating in the field of educational technology research in all years. The results also show that the year 2013 was the most dominating years for the published articles reviewed in this study. The primary implication of findings will be beneficial for the novice researchers, Master Degree students and academicians to know the current issues of the educational technology and its future improvement. The limitation of this study is the issue of generalization because of the limited number of reviewed most cited published articles in the current study.

Keyword: *Characteristics, educational technology, most cited articles, computer and education.*

1. Introduction

Reviewing published most cited articles is one of the primary tasks for the novice researchers. The reviewer of this research study will be named as the current researcher in the following texts. The research findings of the reviewed articles can be not only recognized in the academic community but also be beneficial for applying tenure, promotion, grants and scholar awards by the publications to advance their professional careers. Similarly, education researchers often view the publications of research findings in academic journals as a significant work for their professional development (Tsai & Lydia Wen, 2005). More importantly, reviewing most cited published educational technology journals help the novice researchers to understand the required field in greater depth. Educators can be supported by the systematic analysis of the most cited published articles in academic journals to discover the current status and future trends of educational technology research (Lee, Wu & Tsai, 2009). Various methods have been used to review different empirical published most cited articles. Reviewing journal articles is also regarded a key effort to find the most debatable and emergent issue of educational technology research in

the current educational context. Review of journal articles is also connected for selecting a new research topic for further investigation.

In the current study, the aim of the analysis was to identify the most cited articles in educational technology between 2013 to 2017. The five selected journals were entitled “British Journal of Educational Technology (BJET), the Journal of Computer and Education (JCE), the Journal of Computer Assisted Learning (JCAL), the Journal of IEEE Transactions on Learning Technologies (IEEE TLT) and the Journal of Educational Technology Research and Development (JETRD). The method of reviewing the most cited published articles was content analysis method where selected most cited published articles were compared and summarized on the basis of the citation counts, published years, titles of the published articles and existing theories. The current era of education is connected with worldwide educational systems which demands for the holistic research in the educational technology to support the learners and teachers (Pathek & Chaudhay, 2012). Many changes have been globally taken place in the political, economic and demographical sectors which also demand the systematic research on the emergence of educational technologies in teaching and learning activities. Furthermore, the research on educational technology has covered, for example, the issues of social media, serious games, and adaptive software to improve the outcomes of education. Similarly, the emerging practices on openness and user modelling have to be focused in future research because global education has demanded the innovations and new practices in digital learning contexts which have been facing complexities and unavailable technological resources in teaching and learning activities (Pathek & Chaudhay, 2012). The roles of educational technology have been increasing day by day in the educational sector for the improvement of the students’ achievements and educational quality. So, the review of most cited published articles is emerging to focus on the current demands of educational technology and its integration in educational institutions (Aksnes, 2003; Tondeur, van Braak, Siddiq & Scherer, 2016). The outcomes of education will be fruitful for all nations if computer and Technological tools are integrated in their educational system. More importantly, this is the era of Information and Communication Technology (ICT) where all official and none-official works, private and public activities have been made so convenient. So, current educational leaders and practitioners have to at least understand the importance of ICT for effective and efficient teaching and learning activities (Onifade, 2011; Picatoste, Pérez-Ortiz & Ruesga-Benito, 2018).

1.1 Importance of technology in classroom teaching and learning activities

The current era of education is more likely emerging to connect with educational technology research because teacher educators are still struggling with how to create positive, interactive, open learning environment in educational institutions. Creating a powerful learning experiences is one step ahead to transform teachers’ efforts into classroom practice (Putnam & Borko, 2000). The roles of technology in education has been emerged since two decades ago to now because the use of education technology can identify the demands of students, enriches teachers how to apply technology in instructions and tracking the their performance (Onifade, 2011). Additionally, educational technology can enhance students’ performance, keep students engage effectively in learning activities, improve students’ performance and make student response to adapt the new learning environment (Spector, 2017). Van Thiel (2018) States that “Technology integration in schools involves implementation of computers for effective and efficient use in meaningful curriculum-driven ways that enhance student learning by allowing for flexibility, creativity and collaboration, while making real-world connections” (p.2). Educational technology is

important for teaching and learning activities because it integrates computer and teaching activities. It also enhances teachers' teaching skills and makes them easy to manage their classroom (Onifade, 2011). The use of technology in classroom teaching can support teachers for effective and efficient use of curriculum contents which can increase student achievements. The use of technology also enhances teachers' beliefs for external commands and opportunities and permits them to access for resources (Christensen et al., 2018). "Technology in education is an integral part of effective teaching and learning. It is crucial to prepare learning leaders who can guide and support innovative and effective technology enhanced learning in the classroom" (Christensen et al., 2018, p.458). Educational technology also supports students and teachers to be more innovatives to improve their performance, & how to get good results effectively and efficiently (Alexander, 2018).

Gupta (2015) states that; "The field of education has been affected by the penetrating influence of information and communication technology. Undoubtedly, ICT has impacted on the quality and quantity of teaching, learning, and research in traditional and distance education institutions" (p.316). It is noted that current educational systems and teaching and learning practices have been positively influenced for delivering actual chances for individualized instruction in classroom teaching by the educational technology through its dynamic, interactive, and engaging contents (Cuny, 2011). It also enhances the capability of accelerating, inspiring, and deepening skills; motivating and engaging students in teaching and learning activities. Technology is also useful tool to teachers for helping to relate school experiences to work practices; creating economic viability for tomorrow's workforces; underwriting to fundamental changes in school; strengthening teaching and providing opportunities for connection between the school and the society (Onifade, 2011).

1.2 Research Problems and Questions

The current chapter has focused on the main research questions of the current study where one main research question and 3 sub-questions were designed to facilitate the analysis section. The primary research questions are rooted in the differences of citation counts; published years of journal and the differences of the contents. The firstly, forty-one highly cited articles were selected & secondly, only seven articles were selected. The next issue of the research question is deeply rooted in the variations of per five selection journals and the published papers based on their characteristics. The primary research question is related to identifying and analyzing the most cited of the five selected journals in the field of educational technology during the year 2013 to 2017. The primary research question has been divided into three sub-questions.

1. What are the characteristics/differences between the most cited published articles per five selected journals?
2. What are the characteristics differences between the most cited published articles per year among the five selected journals between 2013 to 2017?
3. What are the differences between the most cited published articles per five selected journals and per year among the seven selected journals between 2013 to 2017?

At first, the most cited five journal articles were derived from Publish and Perish Tool. The first journal BJET was the main source of academic journal articles for researchers and academicians in the arena of digital educational and training technology throughout the universe. The publications of BJET are deeply

rooted in theoretical outlooks, methodological developments and high quality observed studies that signify whether and how applications of educational systems, tools, and resources guide to developments in both formal and informal education at all sectors (Dalby & Swan, 2018). The second journal was JCE that is helpful to increase knowledge and understanding of different ways by using computer technologies in teaching and learning activities. More importantly, the journal of JCE was also the main source of educational technology research. Additionally, it primarily focuses on digital technology in order to enhance educational practices through the publication of high quality research materials which eventually increases the level of the theory and practice of education. It is significantly noted that JCE has highly demanded articles because it has revolutionarily increased the importance of research on Computer and Education all over the world (Robins, 2015).

The third journal was JCAL which is connected for using of computers to support the education of people, to describe the application of computers and also includes the instructions for computer-based learning activities. Moreover, the meaning of JCAL is defined as an interactive instructional technique where a computer can remarkably present the instructional materials for teaching and learning activities (Arteaga Sánchez, Cortijo & Javed, 2014; De Witte, Haelermans & Rogge, 2014).

The fourth journal was IEEE TLT which is connected for using technology in teaching and learning activities to improve the outcomes of education. In more details, learning technologies have been deeply rooted in computer-based learning method which is supported by the application of technology for the improvement of teaching methods (Buckley & Doyle, 2017). Furthermore, computer-based learning is directly linked in using the multimedia materials and also using of different networks and communication systems to assist learning activities (Innovation in Technologies for Educational Computing, 2016). The words equality, future, mobile, motivation, social, updates, assessments, global, and convenience have been used for the importance of learning technologies in educational sectors. The fifth journal was the JETRD. The meaning of educational technology research and development is understood by a single scholarly journal focusing entirely on research and development in educational technology. The next origin of education technology has been anticipated among working professionals, for example, technology coordinators, instructional designers, school library media specialists, training directors, and technology teachers (Januszewski, 2001).

2. Research Method

The purpose of the current study is to compare and contrast the seven most cited published articles among the forty-one highly cited articles per five selected journals and per year among the five selected journals (See in Appendix 1). The current research method has mainly focused on the topics of per five selected journals and per year among the five selected journals of the forty-one published papers between 2013 to 2017 in the current study. The main research method is embedded in the content analysis of the seven most cited published papers. The seven most cited articles among 41 articles are presented in pie-chart mentioning their citation counts, published year of the articles and the percentage of each article in the given pie-chart. Furthermore, forty-one articles are also mentioned in the Table 1 to make analysis section clear. Chapter two introduces the research design of the current study where the content analysis focuses on analyzing the data. It also explores the methods of data analysis and key contents for the further analysis.

The research design also focuses on different issues of data analysis. Chapter three introduces the results of the current study and further identifies and analyzes the key characteristics of the highly cited articles

based on per five selected journals and per year among the five selected journals. The results section further explores the details analysis of 7 highly cited articles based on the publication years, citation counts and the percentage covered by each article in each Pie-chart. The fourth part of the current dissertation introduces the summary and conclusion of the whole part of this study which also compares, contrasts and synthesizes the key findings of the results section. The purpose of the current research design was to analyze the most cited seven articles per five selected journals and per year among the five selected journals between 2013 to 2017. The contents for the analysis are years of publication and citation counts of the most cited seven published articles among forty one published papers. First of all, five journals entitled the CE, CAL, BJET, IEEE TLT and JETRD were selected. The number of citation counts might be more in the forthcoming day, but the current researcher does not consider the citation counts after 20th May 2018. In the current study, the research topics of each published article have been embedded in different subjects and different areas of the educational and technology research (see in the Appendix 1 and 2). Twenty-five most cited published papers were derived from per five selected journals. Similarly, another twenty-five most cited published papers per year among five selected journals between 2013 to 2017 were selected. The selected articles mentioned in the Table 1 and 2 are embedded in the total citation counts of each published article, published years and the name of five selected journals. There are five rows and five columns in the Table 1 and 2 where forty-one published articles are mentioned as well. Only the fortyone published articles are mentioned in the Table 1 and 2.

3. Results

3.1 Analysis of Seven the Most Cited Articles among Forty one highly Cited articles

The seven the most cited articles among the forty-one the most cited published articles according to per five selected journals and per year five selected journals were selected for the further analysis but other most cited articles were excluded in the analysis. The analysis has mainly focused on the citation counts, published years and the five selected journals among forty one most cited published articles.

Detailed analysis of the seven most cited published articles per journal and per year

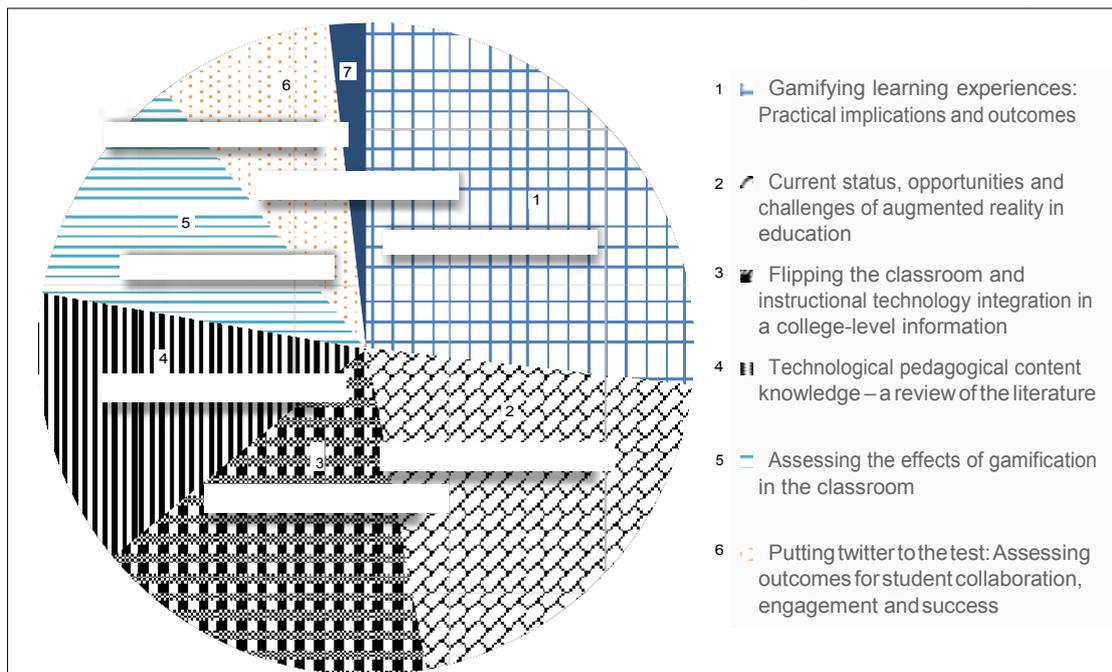


Figure 1. Seven most cited published articles among five selected journals

The Pie Chart in the Figure 1 has presented the number of citation counts, percentage covered by each article and title of each most cited article. The first most cited article was derived from JCE which was “Gamifying learning experience: Practical implications and outcomes” published in 2013 cited 801 times (27%). The second most cited published article was derived from JCE which was entitled “Current status, opportunities and challenges of augmented reality in education” published in 2013 cited by 606 times (20%). The third most cited article was derived from JETRD which was “Flipping the classroom and instructional technology integration in a college-level information system spreadsheet course” published in 2013 cited by 506 times and has covered 17%. (Davies, Dean & Ball, 2013). The fourth most cited article was derived from JCAL which was “Technological pedagogical content knowledge (TPACK)” and published in 2013, published in 2015 cited by 410 times (14%). The fifth most cited article was derived from JCE which was “Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance” published in 2014 which was cited 352 times (12%).

The sixth most cited article was derived from BJET which was “Putting twitter to the test: Assessing outcomes for student collaboration, engagement and success” published in 2013 which was cited 259 times (8%) (Junco, Elavsky & Heiberger, 2013). The seventh most cited article was entitled “Delving into Participants’ Profiles and Use of Social Tools in MOOCs” which was derived from IEEE TLT, published in 2013 cited 54 times (2%). The research theme of the seven most cited articles was the massive open online courses and educational technology. The article had cover the participants’ profiles on MOOCs, social tools on MOOCs and digital education of the future. Here, the observations of the current researcher also conclude that JCE has been seen as demonizing journal according to per selected journals and per year among the five selected journals. It was also noted that different types of research methods were used in the most cited seven articles, for example, a mixed methods design, review method, longitudinal survey method, the cross sectional survey method, qualitative interview method, and quantitative method. The results further indicate that a reviewed method was used in many of the reviewed articles and research objects mentioned in the most cited articles had given the same message that ICT has to be interconnected in teaching and learning activities in our classroom for the quality education. Meanwhile reviewed method was the first and the mixed method was seemed the next second dominating research approach among the seven most cited published articles. In all seven most cited articles, different research approaches, for example, quantitative method, a mixed methods research, review method and the qualitative research method. Similarly, different research instruments were used in the seven most cited articles, for example, the survey questionnaire, the qualitative interview question and focus group discussion. There were many similarities and contrasts among the seven most cited articles, for example, the research method and research instrument and key words used in the articles (Creswell, 2017).

The review of seven most cited articles according to per five selected journals and per year among the five selected journals between 2013 to 2017 has highlighted the key results in the field of educational technology research. The current study has supported the empirical studies of Abramovich, Schunn and Higashi (2013) because the study of Abramovich et al. (2013) had also concluded that the articles published in the former years had greater number of citation counts than articles published in the later

years as the current study concluded. The current study has also identified that the current trends in education technology is highly connected with the computer and education in teaching activities because most of the published most cited published articles were derived from the journal of Computer and Education (n=21). The result importantly conclude that the key words used in different articles were varied in seven published articles, but the mostly repeated keywords from seven published articles were identified as learning, technology, collaboration, game, mobile and education. Furthermore, the current study signifies that the trends of current educational technology research has focused on computer and education technology research. Finally, the current study also confirmed that most of the repeated published articles were also derived from the JCE (Sun & Shen, 2014).

The current researcher had faced many difficulties during this study, for example, finding the most cited articles because there was variation in the citation counts among different online sources. Some online sites showed greater number of citation counts and some online resources showed lesser number of citation counts. The next limitation of the current study is the analysis of the limited number of most cited articles because the current study had reviewed only seven most cited articles. So, the findings cannot be generalized for the larger sample size in the similar context. The next limitation of the this study was the limited analysis of characteristics of the only seven most cited articles because the current study has analyzed articles based on per year among the five selected journals and per five selected journals. The current researcher has also realized that the findings would be more valid and reliable if the greater number of the most cited articles had been selected and added in the analysis section. Again, it was further noticed that reviewing most cited articles can give more depth knowledge to select future research topics and also helpful to know the current trends of educational technology research. The most crucial findings for the current researcher was embedded in knowing the emerging issues of educational technology to integrate in teaching and learning activities for improving the quality of education and students' performance (Margaryan, Bianco & Littlejohn, 2015). It is obvious that the educational technology research of JCE is emerging in educational institutions so the researchers have to focus on reviewing the most cited articles on the journal of JCE.

Recommendations

The future research has also to focus on reviewing the most cited articles of longitudinal studies which would give more citation counts and reflect more advanced knowledge of educational technology for the novice researchers. This study recommends that the future researchers need to focus on reviewing the greater number of the most cited journals of CE separately to foreground the specific knowledge of educational technology to enhance educational quality by which an innovative and contemporary knowledge of educational technology and computer education can be generated for future generation. If the future research focuses on reviewing the most cited articles of per selected five journals, it would be more beneficial for practitioners, school leaders and the different levels teachers to gain more knowledge how to intergrade computer technology into classroom teaching. More importantly, the future research needs to focus on reviewing the articles of the former years which would give more citation counts and deep knowledge for conducting the future primary research. This study also recommends that the future research also has to select the most cited published articles of per five selected journals and needs

to review them separately so that it can help the future researchers to know the special issues of each journal and to conduct primary research on different issues, for example, BJET, CE, JCAL, IEEE TLT, JETRD. It is also recommended that the future research has to focus on different characteristics (for example, strengths and weakness, contents, abstracts, citation counts, published years). Finally, in order to generalize the results obtained in this study, similar analysis of the most cited articles per five journals and per year among the five selected journals should be made on reviewing most cited published articles between 2013 to 2017.

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Appendix 1

Table 1. Five most cited articles per journal based on Journal (Using Publish and Perish Tool)

British Journal of Educational Technology	Computer and Education	Journal of Computer Assisted Learning	IEEE transactions on learning technologies	Journal of educational technology research and development
1. Putting twitter to the test: Assessing outcomes for student collaboration, engagement and success-259 times (2013)	1. Gamifying learning experiences: Practical implications and outcomes-801 times (2013).	1. Technological pedagogical content knowledge - A review of the literature 410 times (2013).	1. Developing into participants' profiles and use of social tools in MOOCs 54 times (2014)	1. Flipping the classroom and instructional technology integration in a college-level information system spreadsheet course-506 times (2013).
2. Mapping learning and game mechanics for serious games analysis-211 times (2015)	2. Current status, opportunities and challenges of augmented reality in education 606 times (2013).	2. Is it a tool suitable for learning? A critical review of the literature on Facebook as a technology-enhanced learning environment 263 times (2013).	2. Metafora: A web-based platform for learning to learn together in science and mathematics 52 times (2013)	2. Are badges useful in education? It depends upon the type of badge and expertise of learner-239 times (2013).
3. Critical success factors for transforming pedagogy with mobile Web 2.0 154 times (2015)	3. Assessing the effects of gamification in the classroom: -352 times (2015)	3. Challenges to learning and schooling in the digital networked world of the 21st century 191 times (2013)	3. Providing collaborative support to virtual and remote laboratories 47 times (2013)	3. Instructor experiences with a social networking site in a higher education setting: expectations, frustrations, appropriation, and compartmentalization 97 times (2013).

4. Ethical and privacy principles for learning analytics-121 times (2014)	4. Here and now mobile learning: An experimental study on the use of mobile technology-329 times (2013).	4. A mixed methods assessment of students' flow experiences during a mobile augmented reality science game-126 times (2013).	4. GreedEx: A visualization tool for experimentation and discovery learning of greedy algorithms 39 times (2013)	4. Enhancing socially shared regulation in collaborative learning groups: designing for CSCL regulation tools-89 times (2015).
5. The research and evaluation of serious games: Toward a comprehensive methodology-119 times (2014)	5. Instructional quality of Massive Open Online Courses (MOOCs) 300 times (2015)	5. Blending student technology experiences in formal and informal learning 108 times (2013)	5. Facilitating social collaboration in mobile cloud-based learning: A teamwork as a service (TaaS) approach 25 times (2014)	5. Improving learning achievements, motivations and problem-solving skills through a peer assessment-based game development approach 78 times (2014).

Table 2. Five highly cited articles per journal based on published year 2013-2017 (Using Publish and Perish Tool).

2013	2014	2015	2016	2017
1. Gamifying learning experiences: Practical implications and outcomes, 801 times Computers & Education	1. Effectiveness of virtual reality-based instruction on students' learning outcomes in K-12 and higher education: A meta-analysis 273 times Computers & Education	1. Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance 352 times Computers & Education	1. The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis 167 times Computers & Education	1. Self-regulated learning strategies predict learner behavior and goal attainment in Massive Open Online Courses 45 times Computers & Education
2. Current status, opportunities and challenges of augmented reality in education, 606 times Computers & Education	2. It's not about seat time: Blending, flipping, and efficiency in active learning classrooms 252 times Computers & Education	2. Instructional quality of Massive Open Online Courses (MOOCs) 300 times Computers & Education	2. An update to the systematic literature review of empirical evidence of the impacts and outcomes of computer games and serious games 148 times Computers & Education	2. Some guidance on conducting and reporting qualitative studies 28 times Computers & Education
3. Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course, 506 times Educational Technology Research and Development	3. Students' perceptions of Facebook for academic purposes 231 times Computers and Education	3. Mapping learning and game mechanics for serious games analysis-211 times British Journal of Educational Technology	3. Mobile apps for science learning: Review of research 80 times Computers & Education	3. Perceiving learning at a glance: A systematic literature review of learning dashboard research 25 times IEEE Transactions on Learning Technologies

<p>4. Technological pedagogical content knowledge - A review of the literature 410 times Journal of Computer Assisted Learning</p>	<p>4. Is FLIP enough? Or should we use the FLIPPED model instead? 203 times Computers and Education</p>	<p>4. Understanding the MOOCs continuance: The role of openness and reputation 156 times Computers & Education</p>	<p>4. Virtual laboratories for education in science, technology, and engineering: A review 77 times Computers & Education</p>	<p>4. Individualising gamification: An investigation of the impact of learning styles and personality traits on the efficacy of gamification using a prediction market 15 times Computers & Education</p>
<p>5. Here and now mobile learning: An experimental study on the use of mobile technology 329 times Computers & Education</p>	<p>5. Experimenting with electromagnetism using augmented reality: Impact on flow student experience and educational effectiveness 159 times Computers and Education</p>	<p>5. Critical success factors for transforming pedagogy with mobile Web 2.0 154 times British Journal of Educational Technology</p>	<p>5. Facebook and the others. Potentials and obstacles of Social Media for teaching in higher education 74 times Computers & Education</p>	<p>5. Studies of student engagement in gamified online discussions 10 times Computers & Education</p>