An analysis of the *Australasian Journal of Educational Technology* 2013-2017

Melissa Bond
University of Oldenburg, Germany

Katja Buntins
University of Duisburg-Essen, Germany

The *Australasian Journal of Educational Technology* (*AJET*) changed its editorial policy in 2013, to focus on higher education research and on improving journal submissions. This study analyses all articles (*n* = 256) in *AJET* from 2013-2017 to determine if there has been any change in research topics, methodologies, citations, and authorship since this editorial change, and compares findings to the analysis by Hadlock et al. (2014). The present analysis revealed that the percentage of combined methods research has doubled, although the top 10 most cited articles continue to be predominantly interpretative and inferential. Research has become more student-centred and focused particularly on online collaborative learning environments, and teacher skill and knowledge development, although research gaps exist in mobile learning and gamification. The results also highlight a lack of international collaboration amongst authors, and this is an area for future research.

Introduction

In an era of increasing numbers of predatory journals and high publishing fees to authors and readers (Bacevic & Muellerleile, 2017), open access journals are an excellent option in which to publish (Anderson, 2013). Despite concerns by some educational technology academics over publishing in open access journals, research has shown that they do not adversely impact citations or perceptions of prestige (Davis, 2011; Zawacki-Richter, Anderson, & Tuncay, 2010). The *Australasian Journal of Educational Technology* (*AJET*) is a highly respected open access journal (Perkins & Lowenthal, 2016), which charges no fees to authors or readers. In 2014, Hadlock et al. conducted an analysis of *AJET* articles published between 2003 and 2012 in order to understand the impact that the journal had made on the educational technology field. However, in 2013 *AJET* changed its focus to higher education only research (Dalgarno, Bennett, & Henderson, 2015a), as well as shifting its editorial focus (Bennett, Kennedy, & Dalgarno, 2013) towards highlighting topics specifically written to assist authors better understand the publication process and thereby potentially strengthen the quality of research. This research seeks to understand what impact these changes have had on the focus, scope and reach of the journal, by analysing all articles from 2013-2017 (Table 1), in order to compare data from the analysis by Hadlock et al. (2014). This article will be of particular interest to researchers who are considering where they should publish their work, especially given the increasing conversations about open access publishing (e.g., Anderson, 2018; National Institute for Digital Learning, 2017; Panker, 2018).

Investigating research trends in educational technology

Having an in-depth understanding of any field requires an examination of research from a variety of perspectives (Carr-Chellman, 2006). The development of the educational technology field has been of growing interest, in order to identify "emerging technologies and paradigm shifts" (Baydas, Küçük, Yilmaz, Aydemir, & Göktaş, 2015, p. 710), as well future research directions (e.g., Halverson, Graham, Spring & Drysdale, 2012). A number of bibliometric and content analyses of leading educational technology journals have been conducted in the past 5 years, including open access journals *International Review of Research in Open and Distributed Learning* (*IRRODL*) (Zawacki-Richter, Alturki, & Aldraiweesh, 2017), and the *International Journal of Educational Technology in Higher Education* (*IJETHE*) (Marin, Duart, Galvis, & Zawacki-Richter, 2018). There have also been a number of comprehensive analyses of multiple educational technology journals (e.g., Baydas et al., 2015; Halverson et al., 2012; Hsu et al., 2012; Küçük, Aydemir, Yildirim, Arpacik, & Göktaş, 2013; West & Borup, 2014), which seek to contrast and compare a range of data including trends in research topics, methodologies and methods, and citations across time.

In their analysis of the *British Journal of Educational Technology* (*BJET*) and *Educational Technology Research & Development* (*ETRD*) from 2002-2014, Baydas et al. (2015) found that learning approach, learning environments and online learning were the most frequent research topics. These were also found in the analyses of *Computers & Education* (*CAE*) (Zawacki-Richter & Latchem, 2018), *Distance Education* (Zawacki-Richter & Naidu, 2016) and the *IJETHE* (Marin et al., 2018). Whilst learning environments were also found to be a focus in the comprehensive analysis by Hsu et al. (2012), in addition emphasis was placed on teachers, with the pedagogical use of technology and the effectiveness of instructional design the most frequent research topic. Baydas et al. (2015) reported more quantitative research than any other methodology (39.5%). This was also found in Turkish research (Küçük et al., 2013) and in a study of ICT research in K-12, published in *CAE* (Perez-Sanagustin et al., 2017), which had 50% of studies using a quantitative methodology. However, in their analysis of 10 educational technology journals from 2001-2010, West & Borup (2014) found that theoretical research was by far the most represented methodology. To this end, it would be interesting to contrast these results with the articles published in *AJET*, in order to see whether more Australasian-centred research (Atkinson & McLoughlin, 2009) in the field of educational technology has a methodological bias.

The sample: *Australasian Journal of Educational Technology* (*AJET*)

AJET was established in 1985 by the Australian Society for Educational Technology (ASET), under the title *Australian Journal of Educational Technology* (Australasian Journal of Educational Technology [AJET], 2017a). *AJET* is published six times a year by the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) and its lead editors since 2012 have included Sue Bennett, Barney Dalgarno, Gregor Kennedy, Michael Henderson, Eva Heinrich, and Chwee Beng Lee (AJET, 2017a). It is indexed in many Australian and international indexes, including the Social Science Citation Index (SSCI), with a current 5-year impact factor of 1.460 and ranked 151 out of 235 journals in the field of education and educational research in the InCites™ Journal Citation Reports® (JCR) of Web of Science™ (Thomson Reuters, 2017).

AJET became an open access, online only journal in 2008, after merging with the *International Journal of Educational Technology* and the *e-Journal of Instructional Science and Technology* in 2007. The move towards open access reflected the desire of editors that the journal be "founded on truly open values" (Bennett, 2015, p. i), which "aims to promote research and scholarship on the integration of technology in tertiary education, promote effective practice, and inform policy" (Australasian Journal of Educational Technology [AJET], 2017b). With this move, *AJET* also sought to expand its reach and has widened its scope, seeking to become a journal that is internationally focused, aiming to champion the voice of non-English speaking researchers in the Asia-Pacific region in particular (Atkinson & McLoughlin, 2009; Hadlock et al., 2014).

Table 1
Annual numbers of issues and articles in AJET (2013-2017)

Year	Issues	Articles	Year	Issues	Articles
2013	6	60	2016	6	45
2014	6	48	2017	6	57
2015	6	46			
Total					256

Special Issues
A number of special issues have been published in *AJET* (Table 2) since 2010. These are included in the sample, although the editors acknowledged that *AJET* was a "relatively late entrant into special issues" (Atkinson & McLoughlin, 2011, p. iii). Special issues enable publications to devote a substantial number of pages to specific themes that are considered particularly pertinent to this "rapidly moving field" (Girvin, Hennessy, Mavrikis, Price, & Winters, 2017, p. 5) and reflective of current research trends (Zawacki-Richter & Naidu, 2016). For example, one of the 2017 special issues (TPCK/TPACK Research and Development: Past, Present, And Future Directions) reflects a strong trend in research across educational technology journals in the past 5 years in particular, in order to understand the level of ICT knowledge and

skills of pre-service and practising teachers, and best prepare students to engage with twenty-first century tools (e.g., Hofer & Grandgenett, 2012; Tournaki & Lyublinskaya, 2014). However, this was the first themed journal to focus on this topic in one special issue (Harris, Phillipy, Koehler, & Rosenberg, 2017), which helps position *AJET* as a cutting-edge journal in the field of educational technology.

Table 2
Special Issues in AJET (2010-2017)

Year	Volume	Issue	Topic
2017	33	6	Mobile Augmented and Virtual Reality
2017	33	3	TPCK/TPACK Research and Development: Past, Present, And Future Directions
2016	32	6	Brain, Mind and Educational Technology
2015	31	5	Educational Design Research
2012	28	6	Building the ICT capacity of the next generation of teachers in Asia
2012	28	3	Virtual worlds in tertiary education: An Australasian perspective
2011	27	8	ICT for accessible, effective and efficient higher education: Experiences of Southeast Asia
2011	27	5	Assessing students' Web 2.0 activities in higher education
2010	26	8	Learning technology and organisations: Transformational impact?
2010	26	1	Interactive whiteboards: An Australasian perspective

AJET in previous bibliographic studies
AJET has previously been the subject of a bibliographic analysis by Hadlock et al. (2014). Their analysis of 470 articles from 2003-2012 included identifying the most frequently used keywords and key phrases, ascertaining which research methodologies were most popular, determining which were the most cited articles by year, as well as the number of authors published per year. The five most frequent subject keywords identified in the analysis were: foreign countries, educational technology, electronic learning, teaching methods, and computer assisted instruction. These reflected the growing "international focus of the journal" (Hadlock et al., 2014, p. iv). They were also similar to the *AJET* corpus analysis findings of McDonald and Loke (2016), which analysed articles from 1991-2014, and found that the top 10 most frequent words included: students, learning, technology, online, teachers, and teaching.

The six most frequently mentioned phrases in Hadlock et al. (2014) were: e-learning, higher education, case study, pre-service, online learning, and learning environment. Their analysis also revealed a trend towards collaboration, with a reduction in the percentage of single-authored articles across time. Given the growing need for cross-institutional and international collaboration (Guri-Rosenblit, 2014), it would be interesting to see whether the number of multiple-authored articles continued to grow after 2012, as predicted by Hadlock et al. (2014).

The analysis by Hadlock et al. (2014), also revealed that interpretative studies were the most published (32% of articles), reflecting a trend in increased qualitative research within distance education journals (Zawacki-Richter, Baecker, & Vogt, 2009). However, given that *CAE* - a highly influential educational technology journal (Perez-Sanagustin et al., 2017) - has recently identified a lack of qualitative research being published within their pages, and in those of other journals (Küçük et al., 2013; Twining, Heller, Nussbaum, & Tsai, 2017), it would be timely to analyse whether the number of qualitative studies published in *AJET* has continued to grow since 2012, and whether the keywords have changed.

The *AJET* editorial team also provide yearly bibliometric analyses of the journal (e.g., Dalgarno, Heinrich, & Henderson, 2016), covering publication summaries, the most downloaded articles, submission and review statistics, and citation information. The most recent data (Heinrich, Henderson, & Redmond, 2018) shows that article submissions have grown, as have the *AJET* JCR 2 and 5-year impact factors. The number of total citations in the JCR SSCI also rose significantly in 2016. In order to ascertain a more concrete understanding of how *AJET* compares to other leading educational technology journals, it would be interesting to compare citation data between those that *AJET* editors have identified as leading (Dalgarno, Kennedy, & Bennett, 2014).

Therefore, this research seeks to answer the following questions:

1. How have article keywords, research methodologies, authorship and the most cited articles in *AJET* changed over time?
2. How do *AJET* journal metrics compare to other educational technology journals?

Method

This study analysed all articles published in *AJET* from 2013-2017 (*n* = 256), excluding editorials and book reviews, and used the methodology employed by Hadlock et al. (2014). It then compared the results of the 2003-2012 analysis of *AJET* (Hadlock et al., 2014) with data from 2013-2017, in order to ascertain whether changes to the approach of editorials in 2013 (Bennett, Kennedy, & Dalgarno, 2013) have resulted in any substantial changes of topic, methodology or authorship patterns.

Keyword and abstract analysis

In order to answer research question 1: How have article keywords, research methodologies, authorship and the most cited articles in *AJET* changed over time?, a keyword analysis of *AJET* articles (*n* = 256) published between 2013 and 2017 was conducted using the ERIC database, as used by Hadlock et al. (2014) in their analysis. Unfortunately, not all *AJET* articles were indexed there and the decision was therefore made to export full citation data from the Web of Science for the remaining articles (*n* = 36), and to manually add the keyword meta data, as listed on the *AJET* website (https://ajet.org.au/index.php/AJET/issue/archive). The records were then coded in EPPI Reviewer software (http://eppi.ioe.ac.uk/eppireviewer4/), where keywords were combined into categories following those used by Hadlock et al. (2014). The top 20 combined keywords were then identified.

The article abstracts were also analysed, as per Hadlock et al. (2014), by using the online tool WriteWords (http://www.writewords.org.uk/phrase_count.asp). All abstracts were submitted to the tool, which searched for the most frequent two-word combinations. Combinations such as "of the" or "show that" were excluded. The phrases were then sorted as per the keyword analysis and all keywords/two-word combinations were then compared to those identified from the 2004-2012 analysis.

Computer-assisted content analysis
According to Nunez-Mir, Iannone, Pijanowski, Kong, and Fei (2016), automated or computer-assisted content analysis is superior to word clouds or simple word-frequency counts, such as WriteWords, as the software accounts for linguistic and semantic complexities. In order to confirm the results of this keyword and abstract analysis, all article titles and abstracts (*n* = 256) were uploaded into text-mining software Leximancer. The software automatically identified significant concepts and themes, producing concept maps that show frequency and connectedness (Smith & Humphreys, 2006), which were then analysed by the author. Leximancer reduces time and cost, as well as limiting human bias (Krippendorff, 2013), and is considered to be an appropriate method by which to map out a research domain (Fisk, Cherney, & Hornsey, 2012). Other journal analyses using Leximancer include *Distance Education* (Zawacki-Richter & Naidu, 2016), and the *IJETHE* (Marin et al., 2018).

Analysis of article types and methodologies

In order to ascertain whether the number of qualitative research published in *AJET* has increased since the analysis by Hadlock et al. (2014) and particularly since changes to editorial content was made in 2013 (Bennett, Kennedy, & Dalgarno, 2013), an analysis of articles published from 2013-2017 was conducted. Each article was coded following the method by Hadlock et al. (2014, p. iii) by methodology or type as follows:

- Descriptive - research primarily relies on survey and questionnaire data collection methods where the statistics are analysed and reported descriptively.
- Inferential/quantitative - articles employ experimental, quasi-experimental, or correlational types of methodologies that test hypotheses or validate instruments.

- Interpretative/qualitative - studies focus on interpreting data to develop theory and often include interviews and case studies.
- Content analysis - articles reduce data into specific pre-determined categories that are reported descriptively.
- Combined methods - studies are faithful to the requirements of at least two previously mentioned methods.
- Theoretical - articles are not data-based and include models, instructional approaches, and literature reviews.

Where uncertainty over methodology existed, two research associates in the field of educational research were consulted and agreement was reached.

Authorship analysis

In order to determine whether the trend towards collaboratively authored articles continued after 2012, all author data were extracted from the Web of Science database and analysed by the software *R*-Package *bibliometrix* (Aria & Cuccurullo, 2017). This enabled an analysis of whether articles were single or multi-authored, as well as who the most prolific authors were. In order to identify author affiliation, articles were hand-searched and the data then input into the software package SPSS.

Citation analysis

In order to analyse how the most cited articles in *AJET* have changed over time, a Google Scholar search was conducted by year of publication in the software Publish or Perish (Harzing, 2007). The search was conducted in March 2018 therefore the data are reflective of citation counts at that time.

Journal metric analysis

A citation analysis of *AJET* and other leading educational technology journals (Dalgarno et al., 2014), was conducted using Thomas Reuters Journal Citation Reports® and the Google Scholar *h-index*, in order to answer research question 2: How do *AJET* journal metrics compare to other educational technology journals?. Whilst it is recognised that there is "no universally accepted system of journal ranking" (Milesi, Brown, Hawkley, Dropkin, & Schneider, 2014, p. 367), the journal impact factor published by Thomas Reuters Journal Citation Reports® (JCR) is one of the most popular indicators of journal quality (Dalgarno, Bennett, & Henderson, 2015b; Perkins & Lowenthal, 2016) and "sets the standard for providing easily accessible data (from 1972) on a journal, paper and/or author" (Fiala, Mares, & Sestak, 2017, p. 698). The Google *h*-index is used to measure productivity, by taking into account the number of publications and the number of citations per publication (Fiala et al., 2017). These two metrics were chosen, rather than more recent and immediate metrics, such as Altmetrics, as they have been regularly used by *AJET* editors to provide bibliometric data (e.g., Heinrich et al., 2018). However, Altmetrics are acknowledged as providing added value (Markusova, Bogorov, & Libkind, 2018) and is an area that warrants further investigation for *AJET*.

Whilst citation analyses are "commonly used to explore the intellectual structure of a given discipline" (Liu & Wang, 2005, p. 308), it is important that no one journal metric alone is used to assess a journal's quality (Dalgarno et al., 2014). Interpreting educational research quality by using impact factors has been identified as particularly problematic, due to a range of factors including skewing of metrics, editorial policy, the small number of journals indexed in the ISI (Lavie, 2009; Saxena, Thawani, Chakrabarty, & Gharpure, 2013; Staller, 2017; West & Rich, 2012), and author epistemological or methodological preferences (Ouimet, Bedard, & Gelineau, 2011). Therefore, the results of this analysis should be viewed as one measure of *AJET*'s quality. In order to triangulate this data, and to give a more rounded understanding of *AJET*'s structure and editorial influence, the framework of rigour, impact and prestige (West & Rich, 2012) is used in a forthcoming article (Bond, 2018).

Results and discussion

Keyword and abstract analysis

The results of the keyword and abstract analysis highlighted the shift in focus within *AJET* towards higher education-only focused research (Dalgarno et al., 2015a). The keywords "higher education" (Table 4) yielded the most number of hits and was the most frequent phrase in article abstracts (Table 5). The continued high frequency of the keywords "foreign countries" within articles echoes the analysis by Hadlock et al. (2014), and shows a sustained focus on publishing international research. There was, however, a slight drop in the percentage of articles, indicating that there has potentially been less international representation in *AJET* in the past 4 years, which will be explored in a forthcoming article (Bond, 2018), as it is beyond the scope of this paper.

One major shift in focus during the past five years has been the focus in articles on "computer/technology uses in education" and "student learning" (Table 4), which echoes the findings by McDonald and Loke (2016) in their corpus analysis of *AJET,* and which has also occurred in the wider field of educational technology. Marin et al. (2018) analysed 221 articles from the *IJETHE* between 2010-2017 and found that research had moved from focusing on technology and tools, to focusing more on how they could be used to foster student learning and competencies, so too Zawacki-Richter and Latchem (2018) in their analysis of *CAE*. Zawacki-Richter et al. (2017) also found that the emphasis in research has become more student-centred, with learner characteristics the second most frequent research area in *IRRODL* between 2011 and 2015.

Table 4
Comparison of subject keywords in articles

ERIC subject keywords	Percentage of articles that contain keyword	
	2013-2017	2004-2012
Total number of articles	256	438
Higher education	71%	15%
Foreign countries	70%	83%
Educational technology	62%	59%
Computer/technology uses in education	45%	18%
Questionnaires	44%	16%
Student learning	42%	-
College/undergraduate students	35%	16%
Student attitudes	34%	24%
Teaching methods	34%	27%
Interviews	23%	18%
Online courses	21%	-
Statistical analysis	21%	-
Computer mediated communication	19%	17%
Pre-service teachers	17%	-
Technology integration	17%	24%
Learning environment	16%	-
K-12	15%	-
Qualitative research	15%	-
Electronic learning	14%	27%
Instructional effectiveness	13%	19%

Keywords that were not present in the 2014 analysis include "online courses" and "learning environment", which reflects an international trend towards understanding how to create effective and collaborative online learning experiences (Marin et al., 2018; Zawacki-Richter et al., 2017; Zawacki-Richter & Naidu, 2016), and which also reflects the findings of McDonald and Loke (2016). The appearance of the keyword "pre-service teachers" in the top 20 also reflected the results of the abstract analysis (Table 5), with "pre-service" and "content knowledge" the second and third most frequent combination. Whilst an entire issue was devoted to TPACK in *AJET* (Harris et al., 2017), thereby increasing the instance of the keyword and phrase occurring, this also reflects a growing international research trend (e.g., Marin et al., 2018; Rosenberg &

Koehler, 2015). "Mobile learning" was also a new key phrase in the abstract analysis, which is not surprising given the rise of mobile learning internationally (Crompton, Burke, & Gregory, 2017; Crompton, Burke, Gregory, & Gräbe, 2016; Krull & Duart, 2017). However, "mobile learning" was listed explicitly as a keyword in only 4% of articles, with "handheld devices" accounting for 7% of articles; a trend also found in *CAE* (Zawacki-Richter & Latchem, 2018). Another keyword that was surprisingly under-represented in articles was "gamification", present in only 5% of articles. Given the importance of mobile learning and gamification internationally (Dicheva, Dichev, Agre, & Angelova, 2015), this represents an opportunity for *AJET* to commission special issues, in order to address this research gap.

As in the analysis by Hadlock et al. (2014), the keyword frequency supported the methodology analysis, showing that the interpretative method is most common. "Interviews", "qualitative research", and "questionnaires" were in the top 20 words, with the number of studies using questionnaires (44%) having risen dramatically. Although "case studies" was no longer in the top 20, it was still mentioned 31 times (12%). The appearance of "statistical analysis" (21%) and "qualitative research" (15%) in the top 20 keywords was also reflected in the methodology analysis, with double the number of studies using combined methods.

Table 5
Comparison of key phrases in article abstracts

Phrase	Times listed 2013-2017	Times listed 2004-2012
Higher education	58	83
Pre-service	56	57
Content knowledge (TPACK)	39	-
e-Learning	37	102
Mobile learning	35	-

Computer-assisted content analysis

The concept map in Figure 1 depicts the major topics covered in articles (*n* = 256), published in *AJET* across 5 years (2013-2017). The thematic summary reveals that "learning" has the most direct mentions with 464 (100% relative count), followed by "teachers" (46%), "knowledge" (26%), "system" (15%), "support" (12%), and "different" (11%). These results confirm the keyword and abstract analysis, indicating that research during this time focused on student learning in online environments (see: online, students, learning, environment) as well as to support teachers in using educational technology in their teaching (see: teachers, development, practice and teachers, technology, teaching, skills). The concept map also highlights the use of the TPACK framework to assist in this process (see: teachers, framework, content, knowledge, pedagogical). Interestingly, the word "mobile" did not feature on the ranked concept list, which could be due to the linguistic sensitivity that text-mining software allows (Roberts, 2000), and helps to explain the small number of articles with "mobile learning" in their keywords. This should serve as a warning to use simple word-frequency counts to explain research trends with caution.

Analysis of article types and methodologies

The results of the article analysis revealed that there has been a substantial change in the methodological approach of research published in *AJET* since 2013 (Table 6). Whilst interpretative research is still the most represented methodology alongside quantitative research, as opposed to other educational technology journals (e.g., Küçük et al. 2013; Perez-Sanagustin et al., 2017), there has been no growth in the amount of qualitative research published in *AJET*, having dropped 1%. There has also been a substantial reduction in the number of descriptive and theoretical articles published. One of the reasons for this could be due to editorial opinion that "the field is swamped by descriptive studies" (Henderson, Heinrich, & Lee, 2016, p. i) and that it often prevents generalisation, which limits understanding of how the educational technology or practice can be applied in other contexts.
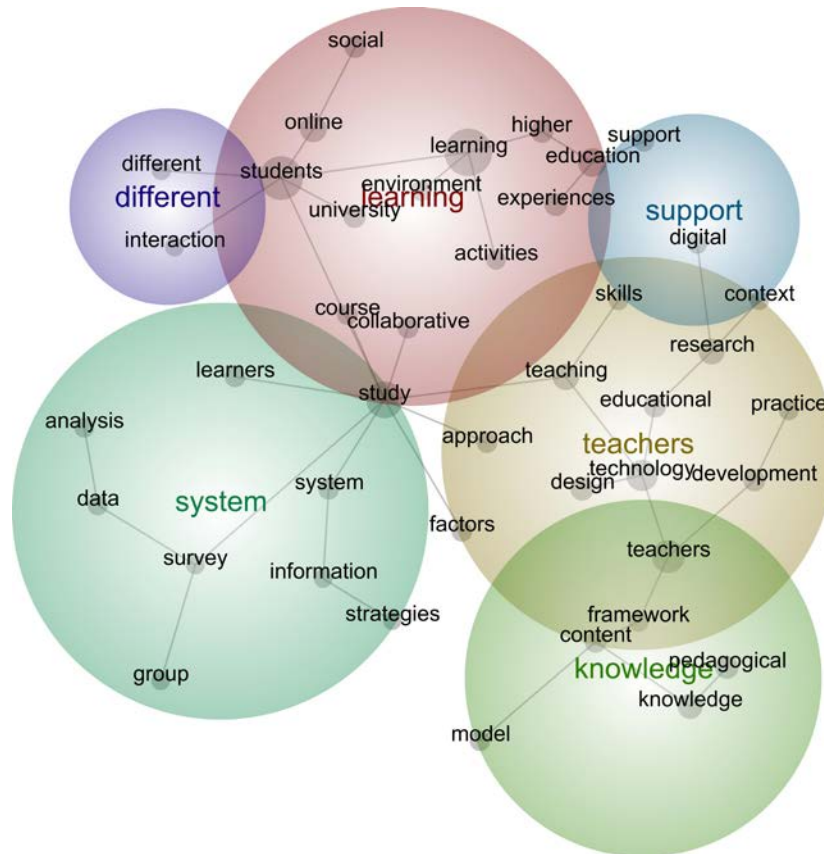
Figure 1. Concept map of AJET titles and abstracts, 2013-2017 (*n* = 256)

There has been extensive growth in the number of studies published that use combined methods, with double the percentage of articles published in the past 5 years than in the previous 10. This contrasts sharply to research published in *BJET* and *ETRD* (Baydas et al., 2015), where it represented 9% of methodological approaches on average in 2013 and 2014. It should be noted, however, that only 7% of articles list "mixed methods research" in their keywords, which might indicate that authors do not feel confident to label their article as truly mixed.

Mixed methods research draws on the strength of both qualitative and quantitative methods in order to answer complex problems (Johnson & Onweuegbuzie, 2004; Mertens, 2015), and has been described as a method whose "time has come … to guide work within the field of educational technology" (Poth, 2018, p. 4). Indeed, Bennett, Dalgarno, and Henderson (2015) focused on mixed methods within their editorial in Issue 3, stressing that authors need to sequence methods clearly and create a coherent story. The trend of articles (Table 7) shows that numbers (and therefore quality) had reduced, with only 8 published in 2015, however this number increased to 14 in 2017. By providing methodological guidance, *AJET* editors are improving researcher understanding and therefore submission quality.

Table 6
Comparison of total research methodologies used by number and percentage

Year	Descriptive	Inferential/ quantitative	Interpretative/ qualitative	Theoretical	Content analysis	Combined methods	Total
2013-2017	14 (5%)	79 (31%)	79 (31%)	17 (7%)	6 (2%)	61 (24%)	256
2003-2012	37 (8%)	136 (29%)	149 (32%)	78 (17%)	15 (3%)	55 (12%)	470

Table 7
Articles by method and year

Year	Descriptive	Inferential/ quantitative	Interpretative/ qualitative	Theoretical	Content analysis	Combined methods	Total
2013	3 (5%)	17 (28%)	21 (35%)	3 (5%)	0 (0%)	16 (27%)	60
2014	3 (6%)	17 (36%)	13 (27%)	2 (4%)	1 (2%)	12 (25%)	48
2015	1 (2%)	16 (35%)	19 (42%)	1 (2%)	1 (2%)	8 (17%)	46
2016	3 (7%)	11 (24.5%)	10 (22%)	8 (18%)	2 (4%)	11 (24.5%)	45
2017	4 (7%)	18 (32%)	16 (28%)	3 (5%)	2 (4%)	14 (24%)	57
Total	14 (5%)	79 (31%)	79 (31%)	17 (7%)	6 (2%)	61 (24%)	256

Citation analysis

The most cited articles in *AJET* by year of publication (Table 8) reflect the mixed methodological scope of the journal, with two interpretative, two theoretical and one inferential. They also reflect the keyword and abstract analysis, which highlighted: higher education, student learning, mobile learning, and pre-service teachers. These topics also strongly featured in the most cited articles published across 2013-2017 (Table 9). It is interesting to note that the article by Beckers, Dolmans, and van Merriënboer (2016) reflects a recent trend in educational technology towards conducting systematic reviews (e.g., Clark, Tanner-Smith, & Killingsworth, 2016; Crompton et al., 2017; Joksimovic et al., 2017).

Table 8
Most cited articles by publication year, as listed in Google Scholar

Year	Citations	Authors	Paper
2013	189	Pegrum, Oakley, and Faulkner	Schools going mobile: A study of the adoption of mobile handheld technologies in Western Australian independent schools
2014	66	Alammary, Sheard, and Carbone	Blended learning in higher education: Three different design approaches
2015	30	Henderson and Phillips	Video-based feedback on student assessment: Scarily personal
2016	13	Beckers, Dolmans, and van Merriënboer	e-Portfolios enhancing students' self-directed learning: A systematic review of influencing factors
2017	10	Chai, Tan, Deng, and Koh	Examining pre-service teachers' design capacities for web-based twenty-first century new culture of learning

Table 9
Most cited articles published in AJET 2013-2017, as listed in Google Scholar

Citations	Year	Authors	Paper
189	2013	Pegrum, Oakley, and Faulkner	Schools going mobile: A study of the adoption of mobile handheld technologies in Western Australian independent schools
88	2013	Pegrum, Howitt, and Striepe	Learning to take the tablet: How pre-service teachers use iPads to facilitate learning
69	2013	Jimoyiannis, Tsiotakis, Roussinos, and Siorenta	Preparing teachers to integrate Web 2.0 in school practice: Toward a framework for Pedagogy 2.0
66	2014	Alammary, Sheard, and Carbone	Blended learning in higher education: Three different design approaches
63	2013	Mac Callum and Jeffrey	The influence of students' ICT skills and their adoption of mobile learning
54	2013	Jang and Tsai	Exploring the TPACK of Taiwanese secondary school science teachers using a new contextualized TPACK model
47	2013	Gedik, Kiraz, and Ozden	Design of a blended learning environment: Considerations and implementation issues
=	2013	Chai, Ng, Li, Hong, and Koh	Validating and modelling technological pedagogical content knowledge framework among Asian preservice teachers

40	2013	Atkinson and Lim	Improving assessment processes in Higher Education: Student and teacher perceptions of the effectiveness of a rubric embedded in a LMS
37	2013	Tondeur, Kershaw, Vanderlinde, and van Braak	Getting inside the black box of technology integration in education: Teachers' stimulated recall of classroom observations
32	2014	Rambe	Converged social media: Identity management and engagement on Facebook Mobile and blogs
=	2014	Escobar-Rogriguez, Carvajal-Trujillo, and Monge-Lozano	Factors that influence the perceived advantages and relevance of Facebook as a learning tool: An extension of the UTAUT
=	2013	Koh	A rubric for assessing teachers' lesson activities with respect to TPACK for meaningful learning with ICT

Authorship analysis

Of the articles published between 2013-2017, 50 were published by a single author, with only two articles published by the same author. Some 31.8% were published by two authors, 25.3% by three authors, 12.8% by four authors and 10.5% by five or more authors. Contrary to the findings by Hadlock et al. (2014), there was no ongoing trend towards more authors per article during these 5 years (Table 10), with the percentage of articles with three or more authors remaining relatively stable.

Table 10
Authorship per year

Year	Authors									Total articles	% more than three authors	% single authors
	1	2	3	4	5	6	7	8	9			
2013	10	20	16	7	6	0	0	0	1	60	50%	17%
2014	9	15	12	7	5	0	0	0	0	48	50%	18%
2015	13	14	12	6	1	0	0	0	0	46	41%	28%
2016	9	12	14	4	3	0	0	2	1	45	53%	20%
2017	9	20	11	9	5	2	1	0	0	57	49%	16%
Total	50	81	65	33	20	2	1	2	2	256	49%	19%
Percent	20%	32%	25%	13%	8%	0.8%	0.4%	0.8%	0.8%			

In this analysis, the 256 articles were written by 621 authors, which were spread relatively equally across the 5 years (see Table 11). Joyce Koh (Singapore), Chin-Chung Tsai (Taiwan) and Joke Voogt (Netherlands) were the most prolific authors, having co-authored six papers each. Interestingly, Joyce Koh had four papers published in 2013, Joke Voogt co-authored four in 2017, and Chin-Chung Tsai also published six times during 2003-2012, with five of them during 2012 (Hadlock et al., 2014). Of the articles that had more than one author, 101 came from one institution, 70 from two institutions, 22 from three institutions, a further 11 from four or more institutions, and 2 more had no affiliation. Only 39 of these collaborations were international, which warrants further investigation in future research.

Table 11
Number of authors per year

	2013	2014	2015	2016	2017	Total
Number of articles published	60	48	46	45	57	256
Number of authors	160	127	101	131	152	

Journal metrics analysis

The Thomas Reuters Journal Citation Reports® (JCR) and the Google Scholar *h*-index are two of the most popular indicators of journal quality for authors and researchers (Dalgarno et al., 2015b). Despite a small dip in 2014, *AJET*'s 5-year impact factor has remained relatively stable (Table 12), which places it towards the bottom of the 18 leading educational technology journals (Table 13), as recognised by *AJET* editors

(Dalgarno et al., 2014). Interestingly, the *h*-index (Table 14), which considers both the quality and quantity of articles (Hirsch, 2005), places *AJET* above journals with a higher 5-year impact factor, such as *Language Learning & Technology* (2016 *h*-index = 29). This indicates that it is necessary to consult more than one citation metric when considering journal quality (West & Rich, 2012), which is further explored in an upcoming article (Bond, 2018).

Table 12
Thomson Reuters JCR SSCI 5-yeari impact factor

Year	Impact factor
2012	1.540
2013	1.198
2014	1.006
2015	1.171
2016	1.460

Table 13
Journal citation report 5-year impact factors for leading educational technology journals

Journal	2012	2016
Internet and Higher Education	N/A	5.130
Computers & Education	3.305	5.047
Language Learning & Technology	2.205	3.306
Computer Assisted Language Learning	N/A	2.902
ReCALL	N/A	2.851
International Journal of Computer-Supported Collaborative Learning	2.904	2.808
IEEE Transactions on Learning Technologies	0.893	2.620
British Journal of Educational Technology	1.888	2.532
Journal of Computer Assisted Learning	2.095	2.415
International Review of Research in Open and Distributed Learning*	N/A	2.139
Interactive Learning Environments	1.491	2.138
Distance Education	N/A	2.056
Educational Technology & Society*	1.505	2.034
Learning Media and Technology	N/A	2.000
Journal of Computing in Higher Education	N/A	1.895
Educational Technology Research and Development	1.522	1.652
Australasian Journal of Educational Technology*	**1.540**	**1.460**
Journal of Educational Computing Research	N/A	1.179

* Open Access journal

Table 14
Comparison of Google Scholar h-5 index for educational technology journals, 2014-2016

Journal	*h*5-index 2014	*h*5-index 2016
Computers & Education	81	94
British Journal of Educational Technology	44	53
Educational Technology & Society*	39	49
Internet and Higher Education	35	46
International Review of Research in Open and Distributed Learning*	34	41
Journal of Computer Assisted Learning	38	37
Educational Technology Research and Development	33	34
Australasian Journal of Educational Technology*	**30**	**32**
International Journal of Computer-Supported Collaborative Learning	25	26
IEEE Transactions on Learning Technologies	27	24

* Open Access journal

Limitations and future research

Researchers interested in conducting journal content analyses should consider using a computer-assisted program such as Leximancer, rather than relying on human analysis alone, in order to eliminate human error or bias (Nunez-Mir et al., 2016). Whilst great care was taken in the extraction, analysis and interpretation of data, the human factor remains. The results of the abstract analysis using Leximancer revealed a more sensitive linguistic analysis than by using a word-frequency count method, as WriteWords only focused on two-word combinations, rather than looking at the semantic meaning of the text within two-sentence blocks, as in Leximancer (Smith & Humphreys, 2006).

An analysis of what has caused the change in Impact Factor over time would be useful for authors and editors alike, however this is beyond the scope of the current paper. This article has also only focused on two journal metrics, for comparative purposes, however this should not be considered as the only measure of a journal's quality (West & Rich, 2012), and therefore other measures will be further explored in a forthcoming article (Bond, 2018).

Another prime area of interest that has arisen from this research has been the international collaboration of researchers within the field of educational technology. The authorship analysis revealed a strong tendency for authors to collaborate within their own countries, which is against the international trend towards openness and cross-border collaboration (e.g., Guri-Rosenblit, 2014); therefore, further exploration of this will also be the focus of future research.

Conclusion and recommendations

The analysis of articles published in *AJET* in 2013-2017 has confirmed a growing trend that educational technology research has become more student-centred (Marin et al., 2018; Zawacki-Richter & Latchem, 2018) since the Hadlock et al. (2014) analysis, and that there has been a rise in the number of studies researching online learning environments, and teacher knowledge and skill development. This reflects the journal shift towards higher education-only research, due in part to the widespread use of learning management systems by universities (Beer, Clark, & Jones, 2010). Despite the change in focus and scope of *AJET,* an even number of quantitative and qualitative studies continue to be published. However, the percentage of combined methods research has doubled in the past five years, which will likely continue to grow, as long as high quality mixed methods research skills are employed (Bennett et al. 2015; Poth, 2018).

AJET is an open access journal, with a strengthening presence, and no particular methodological bias, thereby making it an attractive journal in which to publish. Opportunities exist for both authors and editors to broaden research in the areas of mobile learning and gamification, and the editors are encouraged to engage with Altmetrics as added value to authors, rather than rely on traditional citation metrics alone. Whilst cross-institutional research is continuing to occur, the hope is that this analysis will help to start a conversation about how *AJET* can further foster international collaboration, whilst continuing to champion Australasian-centred research.

References

Anderson, T. (2013, March 8). Open access scholarly publications as OER. The International Review of Research in Open and Distributed Learning, *14*(2), 81–95. http://dx.doi.org/10.19173/irrodl.v14i2.1531

Anderson, T. (2018). More on distance education journal rankings [Blog post]. Retrieved from https://virtualcanuck.ca/2018/03/08/more-on-distance-education-journal-rankings/

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An *R*-tool for comprehensive science mapping analysis. *Journal of Informetrics, 11*(4), 959-997. https://doi.org/10.1016/j.joi.2017.08.007

Atkinson, R., & McLoughlin, C. (2009). Announcing AJET's new editorial board. *Australasian Journal of Educational Technology, 25*(2), iii-vi. Retrieved from https://ajet.org.au/index.php/AJET/article/view/1145/394

Atkinson, R., & McLoughlin, C. (2011). Editorial: Volume 27 Issue 2. *Australasian Journal of Educational Technology, 27*(2), iii-ix. Retrieved from https://ajet.org.au/index.php/AJET/article/view/963/237

Australasian Journal of Educational Technology [AJET]. (2017a). *Journal history*. Retrieved from https://ajet.org.au/index.php/AJET/about/history

Australasian Journal of Educational Technology [AJET]. (2017b). *Editorial policies*. Retrieved from https://ajet.org.au/index.php/AJET/about/editorialPolicies#focusAndScope

Bacevic, J., & Muellerleile, C. (2017). The moral economy of open access. *European Journal of Social Theory, 21*(2), 169-188. https://doi.org/10.1177/1368431017717368

Baydas, O., Küçük, S., Yilmaz, R., Aydemir, M., & Göktaş, Y. (2015). Educational technology research trends from 2002 to 2014. *Scientometrics, 105*(1), 709-725. https://doi.org/10.1007/s11192-015-1693-4

Beckers, J., Dolmans, D., & Merriënboer, J. (2016). e-Portfolios enhancing students' self-directed learning: A systematic review of influencing factors. *Australasian Journal of Educational Technology, 32*(2), 32-46. https://doi.org/10.14742/ajet.2528

Beer, C., Clark, K., & Jones, D. (2010). Indicators of engagement. In C. H. Steel, M. J. Keppell, P. Gerbic, & S. Housego (Eds.), *Curriculum, technology & transformation for an unknown future. Proceedings ascilite, Sydney* (pp.75-86). http://ascilite.org/conferences/sydney10/procs/Beer-full.pdf

Bennett, S. (2015). Editorial: Volume 31 Issue 6. *Australasian Journal of Educational Technology, 31*(6), i-ii. Retrieved from https://ajet.org.au/index.php/AJET/article/view/2947/1332

Bennett, S., Dalgarno, B., & Henderson, M. (2015). Editorial: Volume 31 Issue 3. *Australasian Journal of Educational Technology, 31*(3), i-ii. https://doi.org/10.14742/ajet.2804

Bennett, S., Kennedy, G., & Dalgarno, B. (2013). Editorial: Volume 29 Issue 3. *Australasian Journal of Educational Technology, 29*(3), i-ii. https://doi.org/10.14742/ajet.993

Bond, M. (2018). Helping doctoral students crack the publication code: An evaluation and content analysis of the *Australasian Journal of Educational Technology*. *Australasian Journal of Educational Technology, 34*(5), 167-181. https://doi.org/10.14742/ajet.4363

Burke Johnson, R., & Onweuegbuzie, A. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26. https://doi.org/10.3102%2F0013189X033007014

Carr-Chellman, A. (2006). Where do educational technologists really publish? An examination of successful emerging scholars' publication outlets. *British Journal of Educational Technology, 37*(1), 5-15. https://doi.org/10.1111/j.1467-8535.2005.00522.x

Clark, D., Tanner-Smith, E., & Killingsworth, S. (2016). Digital games, design, and learning: A systematic review and meta-analysis. *Review of Educational Research, 86*(1), 79-122. https://doi.org/10.3102/0034654315582065

Crompton, H., Burke, D., & Gregory, K. (2017). The use of mobile learning in PK-12 education: A systematic review. *Computers & Education, 110*, 51-63. https://doi.org/10.1016/j.compedu.2017.03.013

Crompton, H., Burke, D., Gregory, K., & Gräbe, C. (2016). The use of mobile learning in science: A systematic review. *Journal of Science Education and Technology, 25*(2), 149-160. https://doi.org/10.1007/s10956-015-9597-x

Dalgarno, B., Bennett, S., & Henderson, M. (2015a). Editorial: Volume 31 Issue 2. *Australasian Journal of Educational Technology, 31*(2), i-iii. https://doi.org/10.14742/ajet.2690

Dalgarno, B., Bennett, S., & Henderson, M. (2015b). Editorial: Volume 31 Issue 4. *Australasian Journal of Educational Technology, 31*(4), i-iii. https://doi.org/10.14742/ajet.2888

Dalgarno, B., Heinrich, E., & Henderson, M. (2016). Editorial: Volume 32 Issue 1. *Australasian Journal of Educational Technology, 32*(1), i-iv. https://doi.org/10.14742/ajet.3095

Dalgarno, B., Kennedy, G., & Bennett, S. (2014). Editorial: Volume 30 Issue 3. *Australasian Journal of Educational Technology, 30*(3), i-iv. https://doi.org/10.14742/ajet.2029

Davis, P. M. (2011). Open access, readership, citations: A randomized controlled trial of scientific journal publishing. *The FASEB Journal, 25*(7), 2029-2134. http://doi.org/b35.

Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in education: A systematic mapping study. *Journal of Educational Technology & Society*, *18*(3), 75-88. Retrieved from https://www.researchgate.net/publication/270273830_Gamification_in_Education_A_Systematic_Mapping_Study

Fiala, J., Mares, J., & Sestak, J. (2017). Reflections on how to evaluate the professional value of scientific papers and their corresponding citations. *Scientometrics, 112*(1), 697-709. https://doi.org/10.1007/s11192-017-2334-x

Fisk, K., Cherney, A., & Hornsey, S. A. (2012). Using computer-aided content analysis to map a research domain: A case study of institutional legitimacy in postconflict East Timor. *SAGE Open, 2*(4), 1-15. https://doi.org/10.1177/2158244012467788

Girvin, C., Hennessy, S., Mavrikis, M., Price, S., & Winters, N. (2017). BJET Editorial November 2016. *British Journal of Educational Technology, 48*(1), 3-6. https://doi.org/10.1111/bjet.12542

Guri-Rosenblit, S. (2014). Distance education systems and institutions in the online era: An identity crisis. In O. Zawacki-Richter, & T. Anderson (Eds.), *Online distance education: Towards a research agenda* (pp. 109-130). Edmonton: Athabasca University. https://doi.org/10.15215/aupress/9781927356623.01

Hadlock, C., Clegg, J., Hickman, G., Huyett, S., Hensen, H., & West, R. (2014). An analysis of the Austalasian Journal of Educational Technology 2003-2012. *Australasian Journal of Educational Technology, 30*(4), ii-ix. https://doi.org/10.14742/ajet.2126

Halverson, L., Graham, C., Spring, K., & Drysdale, J. (2012). An analysis of high impact scholarship and publication trends in blended learning. *Distance Education, 33(*3), 381-413. https://doi.org/10.1080/01587919.2012.723166

Harris, J., Phillips, M., Koehler, M., & Rosenberg, J. (2017). TPCK/TPACK research and development: Past, present, and future directions. *Australasian Journal of Educational Technology, 33*(3), i-viii. https://doi.org/10.14742/ajet.3907

Harzing, A. (2007). *Publish or perish*. Retrieved from http://www.harzing.com/pop.htm

Heinrich, E., Henderson, M., & Redmond, P. (2018). Editorial: Volume 34 Issue 1. *Australasian Journal of Educational Technology, 34*(1), i-iv. https://doi.org/10.14742/ajet.4386

Henderson, M., Heinrich, E., & Lee, C. (2016). Editorial: Volume 32 Issue 4. An argument for research significance. *Australasian Journal of Educational Technology, 32*(4), i-iii. https://doi.org/10.14742/ajet.3434

Hirsch, J. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences of the United States of America, 102*(46), 16569-16572. Retrieved from www.pnas.org/cgi/doi/10.1073/pnas.0507655102

Hofer, M., & Grandgenett, N. (2012). TPACK development in teacher education: A longitudinal study of preservice teachers in a secondary M.A.Ed. program. *Journal of Research on Technology in Education, 45*(1), 83-106. Retrieved from https://files.eric.ed.gov/fulltext/EJ991840.pdf

Hsu, Y.-C., Ho, H. N. J., Tsai, C.-C., Hwang, G.-J., Chu, H.-C., Wang, C.-Y., & Chen, N.-S. (2012). Research trends in technology-based learning from 2000 to 2009: A content analysis of publications in selected journals. *Educational Technology & Society*, *15*(2), 354–370. Retrieved from https://www.researchgate.net/publication/280689068_Research_Trends_in_Technology-based_Learning_from_2000_to_2009_a_content_analysis_of_publications_in_selected_journals

Joksimovic, S., Poquet, O., Kovanovic, V., Dowell, N., Mills, C., Gasevic, D., ... Brooks, C. (2017). How do we model learning at scale? A systematic review of research on MOOCs. *Review of Educational Research, 88*(1), 1-65. https://doi.org/10.3102/0034654317740335

Krippendorff, K. (2013). *Content analysis: An introduction to its methodology* (3rd ed.). Thousand Oaks, CA: SAGE Publications.

Krull, G. & Duart, J. (2017). Research trends in mobile learning in higher education: A systematic review of articles (2011-2015). *International Review of Research in Open and Distributed Learning, 18*(7), 1-23. http://www.irrodl.org/index.php/irrodl/article/view/2893

Küçük, S., Aydemir, M., Yildirim, G., Arpacik, O., & Göktaş, Y. (2013). Educational technology research trends in Turkey from 1990 to 2011. *Computers & Education, 68*, 42-50. https://doi.org/10.1016/j.compedu.2013.04.016

Lavie, P. (2009). The race for the impact factor. *Journal of Sleep Research, 18*(3), 283-284. https://doi.org/10.1111/j.1365-2869.2009.00778.x

Liu, Z., & Wang, C. (2005). Mapping interdisciplinarity in demography: A journal network analysis. *Journal of Information Science, 31*(4), 308-316. https://doi.org/10.1177/0165551505054176

Marin, V., Duart, J., Galvis, A., & Zawacki-Richter, O. (2018). Thematic analysis of the International Journal of Educational Technology in Higher Education (ETHE) between 2004 and 2017. *International Journal of Educational Technology in Higher Education, 15*(8), 1-7. https://doi.org/10.1186/s41239-018-0089-y

Markusova, V., Bogorov, V. & Libkind, A. (2018). Usage metrics vs classical metrics: Analysis of Russia's research output. *Scientometrics, 114*(2), 593-603. https://doi.org/10.1007/s11192-017-2597-2

McDonald, J., & Loke, S.-W. (2016). Discursive constructions of teacher in an educational technology journal. *Australasian Journal of Educational Technology, 32*(5), 77-93. https://doi.org/10.14742/ajet.2787

Mertens, D. (2015). Mixed methods and wicked problems. *Journal of Mixed Methods Research, 9*(1), 3-6. https://doi.org/10.1177/1558689814562944

Milesi, C., Brown, K., Hawkley, L., Dropkin, E., & Schneider, B. (2014). Charting the impact of federal spending for education reserch: A bibliometric approach. *Educational Researcher, 43*(7), 361-370. https://doi.org/10.3102/0013189X14554002

National Institute for Digital Learning (2017, December 20). The top 10 for 2017: Full list of articles and additional reflections [Blog post]. Retrieved from https://nidl.blog/2017/12/20/the-top-10-articles-for-2017-the-full-list-and-additional-reflections/

Nunez-Mir, G., Iannone, B., Pijanowski, B., Kong, N., & Fei, S. (2016). Automated content analysis: addressing the big literature challenge in ecology and evolution. *Methods in Ecology and Evolution, 7*(11), 1262–1272. https://doi.org/10.1111/2041-210X.12602

Ouimet, M., Bedard, P.-O., & Gelineau, F. (2011). Are the h-index and some of its alternatives discriminatory of epistemological beliefs and methodological preferences of faculty members? The case of social scientists in Quebec. *Scientometrics, 88*(1), 91-106. https://doi.org/10.1007/s11192-011-0364-3

Panker, S. (2018. March 10). EdTech research – Where to publish, how to share (Part 1): Journal overview [Blog post]. Retrieved from http://blog.aace.org/review/edtech-research-publish-share-part-1-journal-overview/

Perez-Sanagustin, M., Nussbaum, M., Hilliger, I., Alario-Hoyos, C., Heller, R., Twining, P., & Tsai, C. (2017). Research on ICT in K-12 schools - A review of experimental and survey-based studies in computers & education 2011 to 2015. *Computers & Education, 104*, A1-A15. https://doi.org/10.1016/j.compedu.2016.09.006

Perkins, R., & Lowenthal, P. (2016). Open access journals in educational technology: Results of a survey of experienced users. *Australasian Journal of Educational Technology, 32*(3), 18-37. https://doi.org/10.14742/ajet.2578

Poth, C. (2018). The contributions of mixed insights to advancing technology-enhanced formative assessments within higher education learning environments: an illustrative example. *International Journal of Educational Technology in Higher Education, 15*(9), 1-19. https://doi.org/10.1186/s41239-018-0090-5

Roberts, C. (2000). A conceptual framework for quantitative text analysis. *Quality & Quantity, 34*(3), 259–274. https://doi.org/10.1023/A:1004780007748

Rosenberg, J., & Koehler, M. (2015). Context and technological pedagogical content knowledge (TPACK): A systematic review. *Journal of Research on Technology in Education, 47*(3), 186-210. https://doi.org/10.1080/15391523.2015.1052663

Saxena, A., Thawani, V., Chakrabarty, M., & Gharpure, K. (2013). Scientific evaluation of the scholarly publications. *Journal of Pharmacology & Pharmacotherapeutics, 4*(2), 125-129. https://doi.org/10.4103/0976-500X.110894

Smith, A., & Humphreys, M. (2006). Evaluation of unsupervised semantic mapping of natural language with Leximancer concept mapping. *Behavior Research Methods, 38*(2), 262-279. https://doi.org/10.3758/BF03192778

Staller, K. (2017). Accountability metrics, politics, and qualitative inquiry: Demystifying bibliometrics. *Qualitative Social Work, 16*(4), 437-445. https://doi.org/10.1177/1473325017713881

Thomson Reuters. (2017). InCitesTM Journal Citation Reports® of Web of ScienceTM. Retrieved from https://jcr.incites.thomsonreuters.com/JCRJournalHomeAction.action

Tournaki, N., & Lyublinskaya, I. (2014). Preparing special education teachers for teaching mathematics and science with technology by integrating TPACK framework into the curriculum: A study of teachers' perceptions. *Journal of Technology and Teacher Education, 22*(2), 243-259. Retrieved from https://www.researchgate.net/publication/261725369_Preparing_Special_Education_Teachers_for_Teaching_Mathematics_and_Science_with_Technology_by_Integrating_the_TPACK_Framework_into_the_Curriculum_A_Study_of_Teachers%27_Surveys_and_Lesson_Plans

Twining, P., Heller, R., Nussbaum, M., & Tsai, C.-C. (2017). Some guidance on conducting and reporting qualitative studies. *Computers & Education, 106*, A1-A9. https://doi.org/10.1016/j.compedu.2016.12.002

West, R., & Borup, J. (2014). An analysis of a decade of research in 10 instructional design and technology journals. *British Journal of Educational Technology, 45*(4), 545-556. https://doi.org/10.1111/bjet.12081

West, R., & Rich, P. (2012). Rigor, impact and prestige: A proposed framework for evaluating scholarly publications. *Innovative Higher Education, 37*(5), 359-371. https://doi.org/10.1007/s10755-012-9214-3

Zawacki-Richter, O., Alturki, U., & Aldraiweesh, A. (2017). Review and content analysis of the international review of research in open and distance/distributed learning (2000-2015). *International Review of Research in Open and Distributed Learning, 18*(2), 1-21. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/2806/4090

Zawacki-Richter, O., Anderson, T., & Tuncay, N. (2010). The growing impact of open access distance education journals – a bibliometric analysis. *Journal of Distance Education, 24*(3). Retrieved from http://www.jofde.ca/index.php/jde/article/view/661/1170

Zawacki-Richter, O., Baecker, E., & Vogt, S. (2009). Review of distance education research (2000 to 2008): Analysis of research areas, methods, and authorship patterns. *International Review of Research in Open and Distance Learning, 10*(6), 21-50. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/741/1433

Zawacki-Richter, O., & Latchem, C. (2018). Exploring four decades of research in Computers & Education. *Computers & Education, 122*, 136-152. https://doi.org/10.1016/j.compedu.2018.04.001

Zawacki-Richter, O., & Naidu, S. (2016). Mapping research trends from 35 years of publications in Distance Education. *Distance Education, 37*(3), 245-269. https://doi.org/10.1080/01587919.2016.1185079

Corresponding author: Melissa Bond, melissa.bond@uni-oldenburg.de