Helping doctoral students crack the publication code: An evaluation and content analysis of the *Australasian Journal of Educational Technology*

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Getting published in an academic journal is no easy feat, especially for doctoral students and English as a second language speakers, seeking to publish in English. Considering the relatively low acceptance rate for educational technology journals, this article seeks to provide guidance by following the framework of rigour, impact, and prestige (West & Rich, 2012) to evaluate the *Australasian Journal of Educational Technology* (*AJET*), as well as applying computer-assisted content analysis techniques in new and unique ways, in order to understand how *AJET* is furthering scholarship in the field. Findings reveal a strong focus on Asia-Pacific scholarship, with little representation from other continents. However, the editors are seeking to improve this, by providing regular advice in editorials for conducting rigorous research and hints on how to get published. Future research trends are identified, including teacher development, learning environments and cognition, and the role of feedback in student learning. In addition, recommendations to editors and doctoral students are provided.

Introduction

The world of publishing in academia can be a difficult code to crack, with a great variety in understanding across disciplines as to what defines research excellence (Lamont, 2009). Academics are increasingly being pressured to publish in high quality, leading academic journals (McGrail, Rickard, & Jones, 2006), considered to be the most highly valued sign of research productivity and quality (Mulligan, Hall, & Raphael, 2013; Print & Hattie, 1997). However, with half of all manuscripts rejected, either by editors or as part of the peer review process, and with over half of all citations belonging to a mere 1% of publications (Fiala, Mares, & Sestak, 2017), anxiety and concern still abound. For example, in a recent editorial published in the *Australasian Journal of Educational Technology* (*AJET*), Redmond, Henderson, and Heinrich (2017) responded to lamentations on social media about desk rejections, calling for cooler heads and a deeper understanding by authors of the peer review process. Whilst this was written for the benefit of all academics, it was explicitly recognised in the article that so-called "minority groups within academia" (Rodriguez, 2015, p. 1061) are struggling the most; that is, academics from non-English speaking countries, and doctoral students/early career researchers.

Doctoral students across all disciplines are being introduced early to the *publish or perish* mentality (Jackson, 2013; Jones, 2013; Pare, 2010). An increasing number of publication-based dissertations are being completed across Europe, the United Kingdom, and Australia (Lee & Kamler, 2008), with ongoing disagreement among national institutions about the requirements (Badley, 2009; Jackson, 2013). Whilst publishing during doctoral studies has been shown to have a significant and positive impact on future publication and citation count (Horta & Santos, 2016), as well as increased international collaboration, visibility, and preparation for a future academic career (Thomas, West, & Rich, 2016), writing for peer review is a great source of anxiety for doctoral students (Kamler, 2008; Jones, 2013; Mason, 2018; Pare, 2010). A certain amount of guidance on writing for publication in peer reviewed journals and appropriate journals is provided to students via doctoral supervision (Kamler, 2008; Lee & Kamler, 2008; Nagago & Bukovszki, 2016), however students often need to seek further help via study groups, publications, or writing coaches (McGrail et al., 2006). Problems are further exacerbated for students who are required to publish in English as their second language, as is the case for doctoral students in Hungary, who must publish their results in both their native language and in a second language (often English) in order to be awarded their PhD (Nagago & Bukovszki, 2016). This is particularly problematic, as a significant language bias exists in English-speaking peer reviewed journals, whose articles have a better chance of being cited than those written in another language (Franco-López, Sanz-Valero, & Culebras, 2016; Leon-Sarmiento, Leon-S., & Contreras, 2007).

As with many top-ranking journals, publication acceptance rates in the field of educational technology are not high. As of 2014, the *British Journal of Educational Technology* (*BJET*) had an acceptance rate of 9% and *Computers & Education* (*CAE*) 24%, as opposed to 15% for *Higher Education*, and 25% for *Higher Education Research and Development* (University of Wollongong Library, 2014). Likewise, when articles are first submitted to *AJET*, less than 30% are sent on to be peer reviewed (Redmond et al., 2017), and in 2015 the acceptance rate was 15% (Heinrich, Lee, & Henderson, 2017). Conversations within the educational technology field continue to question whether it is better to publish in open access journals (e.g., Anderson, 2018; Panker, 2018), with ranked lists of important open access articles growing in popularity (e.g., National Institute for Digital Learning, 2017). This, combined with the recent *AJET* editorial, prompted the author - who falls into a minority category - to question how a leading educational technology journal such as *AJET* is promoting the growth of scholarship, and whether the rate of international representation amongst authors is growing, given that a recent analysis of 2013-2017 keywords, abstracts, and authorship suggests that it is not (Bond & Buntins, 2018). This study will be of particular interest to doctoral students, early career researchers, and researchers from non-English speaking backgrounds, as it will provide them with an understanding of how *AJET* compares to other leading educational technology journals, in what ways the editorial team have sought to support researchers and further scholarship in the field, and how receptive the journal is to international authors. It also provides an example method of critiquing journals (West & Rich, 2012), recommendations from the literature for conducting rigorous research, and identifies areas of particular future research interest, discovered through a new application of text-mining software.

Investigating research trends in educational technology

The development of the field of educational technology has been of growing interest recently, as uncovering research trends "also reveals emerging technologies and paradigm shifts" (Baydas, Küçük, Yilmaz, Aydemir, & Göktaş, 2015, p. 710), thereby providing guidance to educators on best practice for using technology in the classroom, as well as identifying opportunities for future research direction (Lee, Driscoll, & Nelson, 2004), which is particularly important for early-career researchers. By revealing methodological and research trends, journal content analyses can also assist researchers to identify appropriate journals in which to publish (Baydas, et al., 2015), as opposed to researchers solely referring to citation data (West & Rich, 2012) or an arbitrary codified list of publications (Carr-Chellman, 2006). This study seeks to build on the research foundations, laid by previous educational technology journal content analyses, which have included *BJET* (Latchem, 2006)*, Distance Education* (Zawacki-Richter & Naidu, 2016), *Edutec-E Journal* (Marin, Zawacki-Richter, Perez Garcias, & Salinas, 2017)*, 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* (Martin, Duart, Galvis, & Zawacki-Richter, 2018), as well as comprehensive analyses of multiple educational technology journals across time (e.g., Baydas, et al., 2015; Hsu, Hung, & Ching, 2013; Küçük, Aydemir, Yildirim, Arpacik, & Göktaş, 2013; West & Borup, 2014).

Whilst content analyses provide valuable overviews of the state of the field, they are focused on what has already been researched and published. For example, Baydas et al. (2015) suggested that more studies should focus on ICT-related policies, as did Latchem (2006); more mixed methods studies should be undertaken to enhance the integration of theory and practice, as did Küçük et al. (2013); and that the "methodological tendencies of a journal should be considered carefully during the selection process" (Baydas et al., 2015, p. 723). Whilst this is certainly helpful to early-career researchers, and provides an idea of where research gaps exist, this does not adequately capture future directions for the state of the field, the identification of which is necessary to catapult doctoral students into valuable and cutting-edge work. Such innovative work is more likely to make a significant contribution to the field (Henderson, Heinrich, & Lee, 2016), thereby increasing the chance of publication in a quality peer reviewed journal such as *AJET* (Redmond et al., 2017).

Therefore, this study seeks to answer the research questions:

1. To what extent has *AJET* reflected a focus on Asia-Pacific scholarship from 2013 to 2017?
2. How has *AJET* contributed to furthering scholarship in the field of educational technology?
3. What research topics and issues have been identified by researchers as important for future research, and published in *AJET* from 2013 to 2017?

AJET | ASCILITE

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

AJET was established in 1985 and is published six times a year by the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE), including occasional special issues (Bond & Buntins, 2018). It is indexed in many international indexes, including the Social Science Citation Index (SSCI), having become an online-only, open access journal in 2008, following a merger with the *e-Journal of Instructional Science and Technology and* the *International Journal of Educational Technology* in 2007 (Australasian Journal of Educational Technology [AJET], 2017a). Following this move, editorial policy focused on expanding its reach and raising the profile of non-English speaking researchers, particularly from the Asia-Pacific region (Atkinson & McLoughlin, 2009; Hadlock et al., 2014). Editorials began highlighting topics in 2013, specifically written to assist authors better understand the publication process and thereby potentially strengthen the quality of research (Bennett, Kennedy, & Dalgarno, 2013). This was also the year that *AJET* altered its focus to higher education only research (Dalgarno, Bennett, & Henderson, 2015). This research includes all articles from 2013 to 2017 (*n = 256*) (Table 1), in order to compare data from 2003 to 2012 in the *AJET* analysis by Hadlock et al. (2014), as well as to ascertain the effect that the shift in editorial focus had on authorship and journal impact.

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

AJET in previous bibliographic studies
Research published in *AJET* in 2013-2017 has become more student-centred (Bond & Buntins, 2018), focusing in particular on teacher knowledge and skill development to strengthen teaching and learning, as well as on collaborative learning in online environments, echoing a previous analysis of *AJET* (McDonald & Loke, 2016) and research in the wider educational technology field (e.g., Marin, Duart, Galvis, & Zawacki-Richter, 2018; Zawacki-Richter, et al., 2017; Zawacki-Richter & Latchem, 2018). *AJET* publications during this period used a relatively even mix of inferential, interpretative, and combined methods (Bond & Buntins, 2018), showing less methodological bias than in other educational technology journals (Perez-Sanagustin, et al., 2017; Twining, Heller, Nussbaum, & Tsai, 2017). Whilst the high frequency of the keywords "foreign countries" continued between 2013 and 2017, there was a drop in the percentage of articles that used it, suggesting that there was less international representation in *AJET* authorship, therefore this will be analysed in the current article.

Aside from the analyses by Bond and Buntins (2018), McDonald and Loke (2016) and Hadlock et al. (2014), *AJET* editors also provide yearly bibliometric analyses (e.g., Dalgarno, Heinrich, & Henderson, 2016), which provide submission and review statistics, publication summaries, the most downloaded articles, and citation information. Article submissions continue to grow, which has meant a larger number of rejections at both stages of the review process (Heinrich, Lee, & Henderson, 2017). The Google *h*-index and the 5-year impact factor have both grown in the past 2 years (Bond & Buntins, 2018); however citations alone are not enough to measure a journal's quality (Dalgarno, Kennedy, & Bennett, 2014). Using impact factors to evaluate educational research is problematic due to bias, skewing of metrics, editorial policies, and methodological preferences (Lavie, 2009; Ouimet, Bedard, & Gelineau, 2011; Saxena, Thawani, Chakarbarty, & Gharpure, 2013; Staller, 2017), therefore this research seeks to explore *AJET*'s impact and support of scholars and scholarship beyond metrics alone (West & Rich, 2012).

Method

This study was conducted using both qualitative and quantitative methods, and seeks to build upon the existing body of educational technology journal research, by exploring how computer-assisted content analysis using the text-mining software Leximancer (Zawacki-Richter & Latchem, 2018) can be used to analyse other article and journal components, aside from titles and abstracts. Whilst titles and abstracts are "lexically dense and focus on the core issues presented in articles" (Cretchley, Rooney, & Galois, 2010, p.

319), they are limited in size and often do not go into sufficient detail about future research directions. This research will also compare the results of the 2003 to 2012 analysis of *AJET* (Hadlock et al., 2014) with data from 2013 to 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 international representation.

Whilst it is recognised that this study seeks to answer the research questions through one English-speaking lens, this journal is not only "the premier journal in Australasia which publishes manuscripts related to technology enhanced learning and teaching in post-secondary education settings" (Redmond, et al., 2017, p. i), but also a highly ranked and respected journal internationally (Thomson Reuters, 2017). In 2017, *AJET* published 2 articles that featured in the top 10 educational technology open access articles for the year (National Institute for Digital Learning, 2017).

Authorship analysis

In order to answer research question 1: To what extent has *AJET* reflected a focus on Asia-Pacific scholarship from 2013 to 2017?, all country data for authors were extracted from the Web of Science database and analysed by the software *R*-Package *bibliometrix* (Aria & Cuccurullo, 2017). However, it was realised that the data was incomplete, only showing countries from first authors. Therefore, all articles from 2013 to 2017 were checked manually on the *AJET* website and on the records of Web of Knowledge, extracting the number of authors and articles per country, per year, in order to gauge how widespread the international scope of the journal actually is (Atkinson & McLoughlin, 2009; Hadlock et al., 2014).

Evaluation of rigour, impact, and prestige

Whilst citation analyses are "commonly used to explore the intellectual structure of a given discipline" (Liu & Wang, 2005, p. 308), interpreting educational research quality using impact factors alone is problematic (Lavie, 2009; Ouimet, et al., 2011; Saxena, et al., 2013; Staller, 2017), particularly given the issues in assessing research quality in Australia (e.g., Smith, 2014). Therefore, in order to explore how *AJET* has furthered scholarship in the field (research question two), an analysis of *AJET*'s rigour, impact and prestige was undertaken, following the framework by West & Rich (2012).

Rigour
Journals set the parameters for format, length, style, methodology, and focus, thereby shaping the state of research published in a field (Hardré & Mortensen, 2013). In order to establish a journal's rigour, it is important to consider how high publication standards are, and whether research is judged critically on its merits prior to acceptance (West & Rich, 2012). Therefore, an analysis of *AJET*'s acceptance rate, including time to publication, peer review policy, and the number of reviewers was undertaken.

Impact
In order to evaluate the impact of a journal, it is important to consider its circulation, including availability on the internet, as well as any indication that the journal has had an impact on other scholars in the field (West & Rich, 2012). Therefore, *AJET*'s publication rate and open access policy were reviewed, and a citation and journal metric analysis undertaken (Bond & Buntins, 2018), which helps show how influential the journal has been on other scholars. The citation analysis of *AJET* and other leading educational technology journals (Dalgarno, Kennedy, & Bennett, 2014) was conducted using Thomas Reuters Journal Citation Reports®, the Google Scholar *h-index* and the freeware Publish or Perish (Harzing, 2007), in order to triangulate citation data (West & Rich, 2012).

Prestige
The prestige of a journal can be determined by considering whether other academics thinks the journal is prestigious, whether it is sponsored and supported by a large national or international professional organisation, and whether the editor and editorial board is well-known and respected (West & Rich, 2012). Therefore, the analysis of open access journals by Perkins and Lowenthal (2016) was considered, and a citation analysis was conducted for members of the editorial board.

Computer-assisted content analysis using Leximancer

In order to answer research questions 2: How has *AJET* contributed to furthering scholarship in the field of educational technology?, and 3: What research topics and issues have been identified by researchers as important for future research, and published in *AJET* from 2013 to 2017?, a content analysis was undertaken using the text-mining software Leximancer. The software 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). In order to detect future research areas, as identified by researchers published in *AJET*, all articles from 2013 to 2017 ($n = 256$) were hand searched for appropriate sections containing recommendations. To the author's knowledge, this method has not been used in prior research. In some cases, these sections were labelled Conclusion and Future Direction (e.g., Chai, Ng, Li, Hong, & Koh, 2013), Summary and Recommendations (e.g., Pegrum, Howitt, & Striepe, 2013), or Summary and Outlook (e.g., Thalmann, 2014). In order to gain an understanding of how *AJET* furthers scholarship in the field, all editorials were extracted ($n = 28$), excluding special issues and descriptions of issues. Both data subsets were then uploaded into Leximancer and 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.

Results and discussion

Authorship analysis

Whilst there appeared to be reduced international representation within *AJET* from 2013 to 2017 (Bond & Buntins, 2018), as opposed to 2003 to 2012, an analysis of articles from 2008 to 2012 ($n = 336$) revealed that this was not the case (Table 2), with very Australian-centric authorship until 2011, and Oceanian research representing 50% of articles published in those 5 years. Authors hailed from 37 different countries, and whilst this does confirm the findings of Hadlock, et al. (2014) that *AJET* has an international outlook, the next highest region represented was Asia with 33%, followed by North America with 10%.

An analysis of the geographic representation of 2013 to 2017 articles revealed that authors hailed from 36 different countries (the full table is available from http://www.researchgate.net/Melissa_Bond2). When viewed as percentage of articles per region, Asia-Pacific represent 78% of all articles, with even distribution between the two. There were no authors from South America, and very few from the Middle East or Africa. This echoes the findings of authorship in *CAE* by Perez-Sanagustin, et al. (2017), and is in stark contrast to country representation found in *IRRODL* (Zawacki-Richter et al., 2017), another open access journal, where 64 countries were represented by first authors alone. This was, however, over a period of 15 years (2000-2015), in contrast to the current *AJET* analysis across 5 years. Analysing the authorship of all articles published in 2013 revealed that 28 different countries were represented in *IRRODL* across authors from 71 articles, as opposed to 12 countries in *AJET* across 60 articles. Whilst this number increased to 20 different countries in 2017, and "any journal's significance has a regional component" (Perkins & Lowenthal, 2016, p. 33), this is an indication that more effort could be made to attract authors from a wider variety of cultural contexts, given the importance of context within research (Bennett, Dalgarno, Kennedy, & Henderson, 2014; Perez-Sanagustin et al., 2017).

Table 2
Number of authors per region

Region	2008-2012		2013-2017	
	No. of papers	% of papers	No. of papers	% of papers
Oceania	167	50%	100	39%
Asia	111	33%	99	39%
North America	32	10%	38	15%
Europe	28	8%	31	12%
Middle East	16	5%	11	4%
Africa	10	3%	6	2%
South America	2	1%	0	0%

When the top six represented countries are viewed across time (Figure 1), a more balanced contribution is seen in 2015, where authors from Taiwan were more prolific than Australian authors; a trend seen across a number of educational technology journals (Hsu, Hung, & Ching, 2013). Interestingly, the number of Taiwanese authors have since decreased, to be replaced by a growing number of American authors.
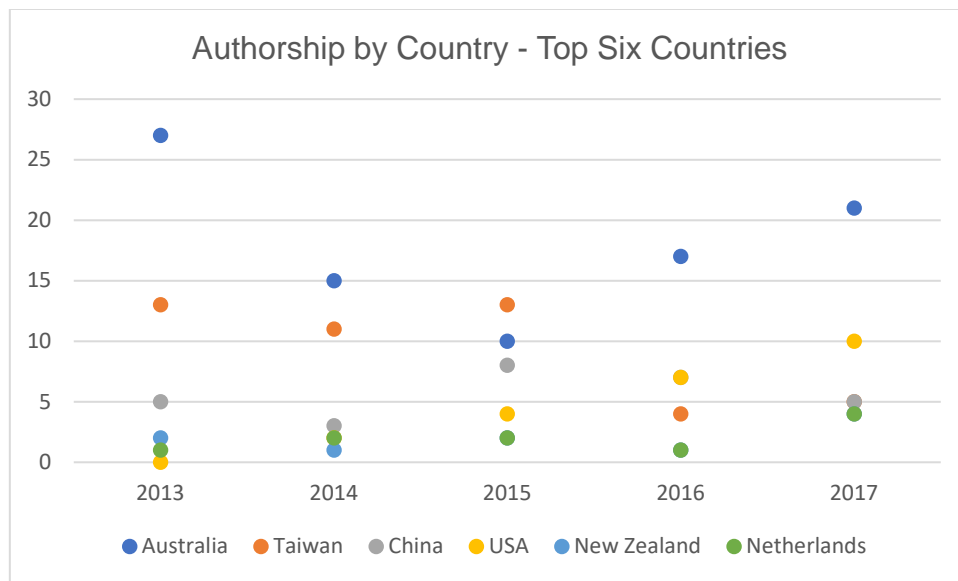
Figure 1. Six most represented countries by authorship, 2013-2017

Evaluation of rigour, impact, and prestige

Rigour
AJET has a two-stage review process, with papers needing to pass editorial review prior to forwarding for double blind peer reviewing (Australasian Journal of Educational Technology [AJET], 2017b). *AJET* reviewers must be research active and engaged within a related field, as well as be experienced with giving and receiving peer reviews. At least two voluntary non-blind editor reviewers and two voluntary blind peer reviewers evaluate an article before it is accepted for publication (Heinrich, Henderson, & Redmond, 2017). In 2015, 67% of articles submitted at the editorial stage, and half of the articles subsequently peer reviewed, were declined, with only 15% of submissions subsequently published (Heinrich, Lee, & Henderson, 2017). This places *AJET* within the average of educational technology journal acceptance rates (University of Wollongong Library, 2014), and adhering to high quality reviewing procedures (De Silva & Vance, 2017), thereby achieving a high level of rigour.

Time to publication
Based on 2016/2017 data provided by *AJET* editors, initial screening of submitted articles is under one month, which is comparable to *BJET* at 2 weeks, although the average time to first review decision and final acceptance is slightly higher than other similar journals (Table 3). Given the rigour of the review process, however, this should not overly dissuade submission to *AJET*.

Table 3
Average time to first review decision and final acceptance

Journal	Time to first decision	Time to final acceptance
AJET*	4 months	7 months
BJET	2 months	6 months
CAE	4 months	5 months
IRRODL*	2-3 months	6 months

* open access

Impact
AJET is published six times per year under an open access policy that does not charge authors or readers, enabling "a greater global exchange of knowledge" (AJET, 2017b), appreciated by educational technology academics (Perkins & Lowenthal, 2016). Open access articles are more likely to be quickly and highly cited (Zawacki-Richter, Anderson, & Tuncay, 2010), which helps grow a researcher's profile. The citation analysis (see Bond & Buntins, 2018) revealed that *AJET*'s 5-year impact factor has remained relatively stable, given

the introduction of new journals with 5-year impact factors (e.g., Learning Media and Technology). *AJET* has a 5-year impact factor of 1.460 and is ranked 151/235 of education and educational research journals. The Google *h*-index has shown growth since 2014, placing it above journals with a higher 5-year impact factor, as the *h*-index also considers citations within publications outside the SSCI (Hirsch, 2005). This is an example of the importance in considering a range of factors when considering where to publish (West & Rich, 2012).

Prestige

AJET is the journal of ASCILITE, which is a globally recognised (ASCILITE, 2014) professional association, and in a survey of 323 international educational technology scholars (Perkins & Lowenthal, 2016), *AJET* was ranked the second most influential open access journal. *AJET* also featured 2 articles in the top 10 list of open access articles in 2017 (National Institute for Digital Learning, 2017).

Hirsch (2005, p. 16571) suggests that a *h*-index over 20, after 20 years of academic activity, would indicate a *successful* scientist, a *h*-index over 40 would indicate an *outstanding* scientist, and a *h*-index over 60 would indicate a truly *unique* individual. *AJET* has two lead editors and 18 editorial board members. Of these, eight are recognised as successful, five as outstanding, and one as unique according to Google Scholar. However, if one uses the *g*-index instead (Egghe, 2006), which gives more weight to highly cited articles and is available through the Publish or Perish software (Harzing, 2007), all except one editorial board member is well and truly above 20. Therefore, *AJET* has an extremely experienced and well-respected board of editors. The evaluation of *AJET* quality via the three factors of rigour, impact, and prestige are shown in Table 4.

Table 4
Evaluation of AJET quality

Rigour	Impact	Prestige
• 15% acceptance rate. • Two stage review process. • Double blind peer reviewed. • Reviewers must be research active and have peer review experience. • Less than 1 month for initial screening of submissions. • Acceptance time lengthy.	• Published 6 times per year. • Open access - no publishing or reading fee. • Ranked in the top 18 educational technology journals. • 151/235 in education and educational research.	• Journal of ASCILITE, globally recognised professional association. • Considered a very influential open access journal internationally. • Highly respected editors and editorial board.

Analysis of future research trends in *AJET* (2013 to 2017)

The content analysis of future research trends in *AJET* (Figure 2) confirms the keyword and abstract analysis by Bond & Buntins (2018) that student learning and teacher development are in focus, rather than technology. The thematic summary reveals that learning has the most direct mentions within the text with 1,197 (100% relative count), followed by students (98%), study (93%), teachers (56%), learners (17%), feedback (12%), content (12%), information (11%) and access (7%). There are five key areas of focus identified for future research: (1) the development of teachers' technology skills and TPACK (teachers-education-development-technology-teaching-need-skills and teachers/pre-service-knowledge-practices/content); (2) the development of quality content (resources-effective-support-activities-learning-environment); (3) student accessibility to learning (access-time-student-learning-mobile), (4) the impact of learning environments on cognition (cognitive-learners-system-participants-social-learning-environment); and (5) the role of feedback (feedback-students-online-communication), which was also found to be prevalent in *CAE* (Zawacki-Richter & Latchem, 2018).
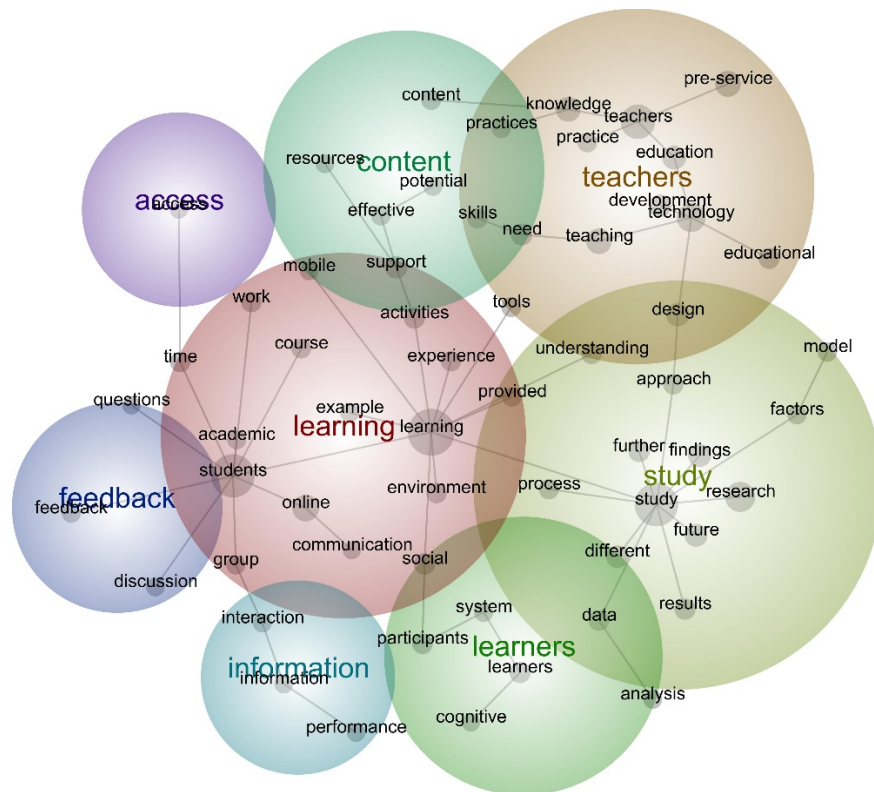
Figure 2. Concept map of future research trends in *AJET* (2013-2017; *n* =256)

The following is a list of areas for future research in the field of educational technology, as suggested by authors published in *AJET* during 2017. These could be possible lines of research for doctoral students, as they reflect gaps in the literature, which could provide more chances of getting their research published.

In-service and pre-service teacher development
- Exploration of teacher education instructor use of technology, in order to gain context of pre-service teacher use (e.g., Batane & Ngwako, 2017).
- Development of computational thinking modules for use in content-specific pre-service teacher courses (e.g., Mouza, Yang, Pan, Ozden, & Pollock, 2017).
- Longitudinal studies that track the development of TPACK across time (e.g., Valtonen, Sointu, Kukkonen, Lambert, & Makitalo-Siegl, 2017).

Development of quality content
- Analyse how reusable learning objects impact on blended learning experiences (e.g., Koh, 2017).
- Use log trace data to investigate how teachers rate the quality or usefulness of resources in online public databases (e.g., Poitras, Doleck, Huang, Li, & Lajoie, 2017).
- Investigate the effects of differentiated learning materials on student outcomes in the flipped learning classroom (e.g., Shih & Tsai, 2017).

Student accessibility to learning
- Mixed method studies that focus on how students perceive learning with educational technology (e.g., Chai, Tan, Deng, & Koh, 2017).
- Student engagement with and preference for multi-purpose or sole-purpose higher education apps (e.g., Pechenkina, 2017).

Learning environments and cognition
- Use of neuro-imaging techniques to measure cognitive load in AR learning environments (e.g., K.-H. Cheng, 2017).
- Investigate how learning management systems can be used to enhance student learning processes and sense of connectedness within cross-institutional studies using mixed methods (e.g., Sadowski, Pediaditis, & Townsend, 2017).

The role of feedback
- Analyse the impact of automatic classification technology providing immediate feedback on student writing (e.g., G. Cheng, 2017).
- Explore the use of student-facing learning analytics and how best to assist students to understand them (e.g., Kitto, Lupton, Davis, & Waters, 2017).

Editorial content analysis

In 2013 (from issue 3 onwards), the editors changed their editorial approach, to one that focuses on a "current issue in educational technology or reflect[s] on aspects of publishing AJET [that they] would like to draw to the attention of … readers" (Bennett, Kennedy, & Dalgarno, 2013, p. i). This places them among an increasing number of journals who are seeking to provide advice to researchers, in order to boost submission quality (e.g., American Journal of Nursing, 2017; Twining et al., 2017). The concept map in Figure 3 depicts the major areas covered within these editorials, which shows that there was a particular concern about the quality of research being sent to *AJET* for potential publication (research-educational-quality-study-educational-quality-issues-educational-quality), as well as challenges in the field (methods-study-educational-challenges-field). In order to help improve the overall quality of publications, *AJET* editors sought to guide researchers and potential authors by outlining important considerations when conducting research, in order to move scholarship forward and "advance the field of educational technology" (Bennett, 2015, p. i). Editorials have particularly stressed the need for authors to place their research within the field, clearly identifying its significance and valuable contribution to the existing body of work (Bennett, Dalgarno, & Kennedy, 2013; Bennett, Kennedy, & Dalgarno, 2013; Henderson et al., 2016).
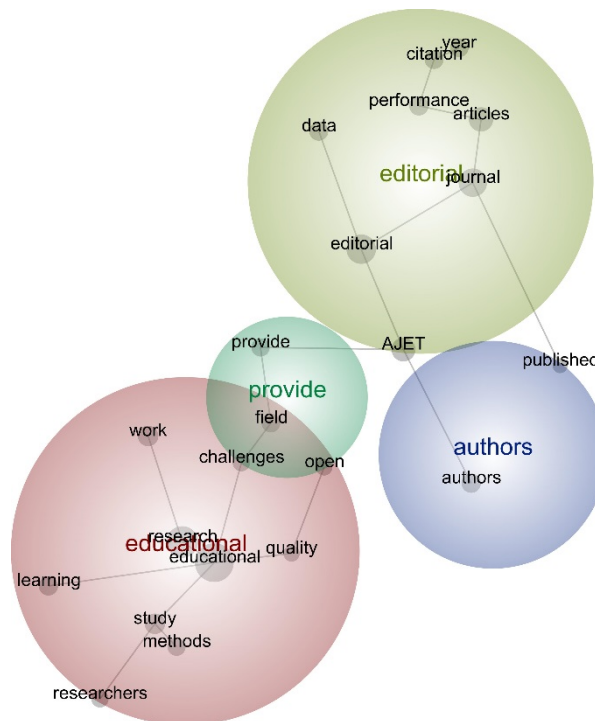

Figure 3. Concept map of AJET Editorials, without Special Issues (Issue 3 2013-2017; *n* =24)

Aside from providing regular bibliometric analyses of *AJET*'s performance (e.g., Dalgarno, Heinrich, & Henderson, 2016; Heinrich, Lee, & Henderson, 2017) (articles, performance, citation), the editors also

provided advice on how Google Scholar Journal Metrics (Dalgarno, Kennedy, & Bennett, 2014) and open access publishing works (Dalgarno, Bennett, & Kennedy, 2014) (open, quality, educational, research). Another way of supporting authors has been the introduction of early release articles; making articles available online that have been accepted for publication, which have been copyedited and typeset but which have not yet been published within an issue (Henderson, Bennett, & Dalgarno, 2015). This, in conjunction with advice for best practice in conducting literature searches (Dalgarno, Bennett, Henderson, & Kennedy, 2014), case studies (Bennett et al., 2014) and mixed methods research (Bennett, Dalgarno, & Henderson, 2015), as well as a call for researchers to maintain a wider appreciation of ethics (Heinrich, Henderson, & Lee, 2016), places *AJET* as a transparent journal, committed to furthering scholarship in the field of educational technology.

Limitations

AJET is one English-speaking lens through which to view the field of educational technology, and what is published in any one journal is subject to editorial, reviewer and funding influences (Goldenberg & Griegl, 1991). However, by using the framework of rigour, impact, and prestige (West & Rich, 2012), the journal was critically analysed by itself and in comparison to other educational technology journals. It is also acknowledged that, whilst Leximancer limits human bias (Krippendorff, 2013), the results must be interpreted through researcher "analytical sensitivity and judgement" (Harwood, Gapp, & Stewart, 2015, p. 1041).

Future research

Future research could include applying the content analysis method employed here to other educational technology journals, in order to gain a more rounded understanding of future directions for the state of the field, as well as to gauge the degree to which research published in such journals contributes to the resolution of significant educational problems. It would also be interesting to investigate how educational technology journals use social media to spread awareness of editorial and article content, and how often doctoral students access editorial advice to inform publishing decisions. Likewise, it would be interesting to analyse the percentage of papers in *AJET* that are authored by doctoral students, those written by various ranks of academics, and those authored by practitioners, which was unfortunately beyond the scope of this paper. It would be profoundly helpful to collate advice given by journals in one article or repository, perhaps by means of a systematic review, to allow easy access to those who need it. Further research is also planned into the international collaboration of educational technology researchers, given the results from the geographic authorship analysis and the authorship analysis by Bond and Buntins (2018).

Recommendations for doctoral students

1. Consider the list of identified trends above if choosing a new area to research.
2. Read journal editorials regularly and stay abreast of trends and research gaps by paying close attention to the Future Research section of articles.
3. Ensure careful choice of keywords when publishing.
4. Citing a number of articles from the journal in which you are publishing can show that you have an awareness of research that is of interest to that journal's readership (Dalgarno, Kennedy, & Bennett, 2014).
5. Undertake rigorous mixed methods research (Bennett, Dalgarno, & Henderson, 2015; Poth, 2018) and carefully consider the context in which you are researching (Bennett et al., 2014; Perez-Sanagustin et al., 2017).
6. Use the journal evaluation framework by West and Rich (2012) and consider a range of data, rather than relying on one metric, when deciding in which journals to publish.

Conclusion

The analysis of articles published in *AJET* from 2013 to 2017 has revealed a number of future research trends, including the development of teacher technology skills, student accessibility to learning and the role of feedback in student learning. These trends were uncovered by using text-mining software Leximancer in a unique way, and it would be interesting to reflect upon these results in five years, to see whether these lines of research were investigated. Whilst *AJET* has been focused on promoting Asia-Pacific researchers in

particular (Atkinson & McLoughlin, 2009; Hadlock et al., 2014), a review of geographic authorship and editorial policy has revealed that authors from other parts of the world are equally considered, but are under-represented. ESL researchers and doctoral students are strongly encouraged to consult the range of publishing advice contained in regular editorials, in order to improve submission quality (Redmond et al., 2017), as well as consult the list of recommendations provided in this article. In order to further scholarship and highlight publishing advice, editors could use Twitter (e.g., @AJET_eds) to tweet editorials, using hashtags relevant to doctoral students (e.g., #phdchat #phdforum #PhD #phdlife #AcWri #edtech). Overall, an exploration according to the rigour, impact and prestige framework (West & Rich, 2012) has revealed that *AJET* is an attractive open access journal in which to publish, which has demonstrated an ongoing commitment to further scholarship in the field of educational technology.

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