A snapshot in time: Themes, tags and international reach – An analysis of the Journal of International Research in Early Childhood Education

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Abstract
A thematic content analysis of the seven issues (35 papers and two editorials) of the International Research in Early Childhood Education (IRECE) journal published by Monash University in Melbourne, Victoria was conducted to explore the themes over its five years of publication. Publications were grouped into defined data chunks by year and Leximancer was used to discover concepts and themes. Five dominant themes emerged: children/s; childhood; learning; parent/s and teacher/s. Pathway analyses were then conducted to more fully understand and describe each theme. Data were used to visually represent the most frequently appearing terms to form a tag cloud, which in turn contributes to the development of a 'folksonomy' for the journal. Finally, mentions of geographic regions were also explored which positively reflected on international focus of the journal.

Introduction
The *International Research in Early Childhood Education* (IRECE) journal (hereafter the Journal) is an electronic, peer-reviewed journal published by Monash University in Victoria, Australia. The Journal synopsis appearing on the website describes it as follows:

> The IRECE journal aims to provide improved research discourse about early childhood education in an international context. The journal is designed to address matters affecting early childhood educational research in a post-colonial and post-developmental world, and in combination with the IRECE academic research conference, will publish scholarship that exposes the field of early childhood education to new questions about the future of communities internationally. In particular, the journal seeks to publish articles about the field of early childhood education and its international contexts, as well as about matters relevant to debate within the field in local and regional contexts. It will also address issues arising from interdisciplinary relationships between early childhood education and other fields, such as post-developmental approaches to psychology, socio-cultural/cultural historical research, cultural-activity research, maternal and child health, migration studies, environmental science and globalisation, refugee studies, international policy studies, feminism and queer studies, space and place, as well as post-structuralist research. Furthermore, IRECE seeks to encourage scholarship and interest from nations around the world, and will consider publishing some material in translation and/or languages other than English (Monash University, 2014).

The Journal utilises a double-blind review process, has no publication fees, and has an editorial board comprising 12 distinguished and emerging scholars from around the world, including: three from Australia; three from the African continent; two from China; two from USA; one each from Sweden and Canada. A consideration of the contextual information on the website reveals that the Journal has a number of values and priorities related to early childhood education, including:

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- exploring new questions, in a range of contexts including international contexts as well as interdisciplinary relationships between early childhood education and other fields;
- scholarship and interest from nations around the world;
- deliberate access for developing regions; and
- the promotion of research that challenges conventional approaches and understandings about the field, using a variety of methodological strategies.

In this study, we set out to conduct a content analysis of the publication to date, with a view to reflect on the success of the Journal in meeting some of these values and reflecting this in a visual 'folksonomy', in the form of a tag cloud.

Method

This analysis of the Journal is based in the inductive research methodology, using a thematic, computer-aided content analysis of the entire publication in order to examine themes, concepts, and their relationships. The generation of a tag cloud and use of Leximancer are employed to provide insights into the contents of the journal. Finally, an analysis of the terms which indicated country affiliations was conducted, to determine the international reach of the journal.

The Journal publications were accessed from the website in July 2014. At this time there were four complete volumes (1-4) and the first issue of Volume 5 had been published. In 2010, there were two issues and in subsequent years one issue per year, with a varying number of articles in each issue. In total, 35 articles and two editorials appear on the website and all have been included in this analysis. The publications have a total of 77 authors, one of whom has three authorships. In order to report trends over time, the data were divided into three periods, as presented in Table 1. This was also of assistance for convenience and efficiency of the analytic process based on the size of the dataset being processed and also allowed the possibility of tracking trends.

Table 1
Data on IRECE articles from 2010 - 2014

Year	Volume	Issue	Editorial	Articles	Period	Articles in period	Word count (after refining)
2010	1	1	1	7	1	13	74, 895
	1	2	1	6			
2011	2	1		6	2	8	54, 297
2012	3	1		2			
2013	4	1		7	3	14	82, 916
2014	5	1		7			
Total			**2**	**35**			**212, 108**

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Leximancer is a concept exploration software tool, created to automatically analyse meaning from bodies of text, through the presence and frequency of words and phrases (Leximancer, 2011). When data are analysed a map is generated of related concepts (co-occurrence of words, implicit and explicit) where the theme is the most conspicuous concept of clustered concepts. Using this computerized statistical method avoids researcher bias, which is a fundamental challenge for researchers.

The text document for analysis that was generated from the 35 published articles and two editorials was uploaded into Leximancer with default settings, as the recommended approach to find initial concepts and themes before adjusting the settings to include word variants, compound concepts (for example *early* AND *childhood*; *children* OR *children's*), adding low semantic-value words to the stoplist (*data, different, important, including, research, use, used, using*), and increasing the boilerplate cut-off, resulting in a map that included the most common themes previously identified. An interpretation of the map serves as an insight into the themes and hence thematic contents of the Journal.

The second stage of this research was the generation of a *tag cloud*, or a visualization of word frequencies. Essentially, the most common terms are presented in a format that allows frequency to be depicted by the size and other features of the font, rather than the typical graphic presentations that occur in frequency tables and charts of varying types. This style of presentation has been widely used in computer graphics as a way of providing a picture of the contents of a resource or website.Tag clouds present common terms in a text by grouping similar terms together and emphasizing frequent terms. According to Salonen (2007), tagging is a relatively new approach where resources are typically "digital information objects, such as webpages, photos, or video clips" (p. 189). Along with representations of the word content of a resource, tag clouds may also feature attributes of the text such as size, font style, or color which represent and classify features, including the frequency of the associated terms (Halvey & Keane, 2007). The visual presentation in a tag cloud of the relationship between actual frequency and font size, style, and color is virtually unlimited, and is part of the uniqueness of each tag cloud, making them both functional and fun.

Tag clouds have commonly occurred as features of websites, enabling readers to scan the relational values presented to determine if the site content is of relevance and interest. This is the aspect of tag clouds of most interest to the investigators in this study. If tag clouds can be used to determine relational values, then tag clouds can also be used as a visual means to present content information, and to appeal to readers who respond best to multi-literacy representations of information. In addition, tag clouds can be used for information retrieval and visualization concurrently, whilst simultaneously serving as a hierarchy. The use of tag clouds derived from any source allows it to be analyzed in terms of content through information retrieval, and visualized to show the relationships between retreived terms, thereby presenting a visual representation of the resource. The use of tag clouds to research the focus and content of historical documents has been utilised in recent times by Pendergast (2010) in a study about connecting with Millenials, as well as…

Finally, the same textual data set is investigated to reveal the identification of specific countries. Through this process, the investigators were able to build a map revealing the most frequently referenced regions in the publications. The following section of the paper further explains the data collection and analysis processes utilised for purposes of this study.

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Data collection and analysis

The steps involved in the analysis of the data are presented below in Figure 1: Data collection and analysis process. As outlined in Figure 1, the 35 articles and two editorials were converted into a Microsoft Office Word document to allow for the removal of headers (including the title of the journal), footers, references and other formatting graphics (rules), figures, tables, author details, acknowledgments, notes). Authors and author affiliations were removed. Captions were removed as the investigators considered this repetitive data. The remaining document was used as the data set for analysis in this research.

At Point A of Figure 1, the relationship between key terms was established. Next, at Point B, concept maps were generated from the data set. At the same time, the frequency of terms was determined by running the clean data set through Nvivo, which was then utilised as indicated at Point C to generate the tag cloud. Finally, the entire data set was utilised to generate a geographic picture, and this included information about authors (Point D).

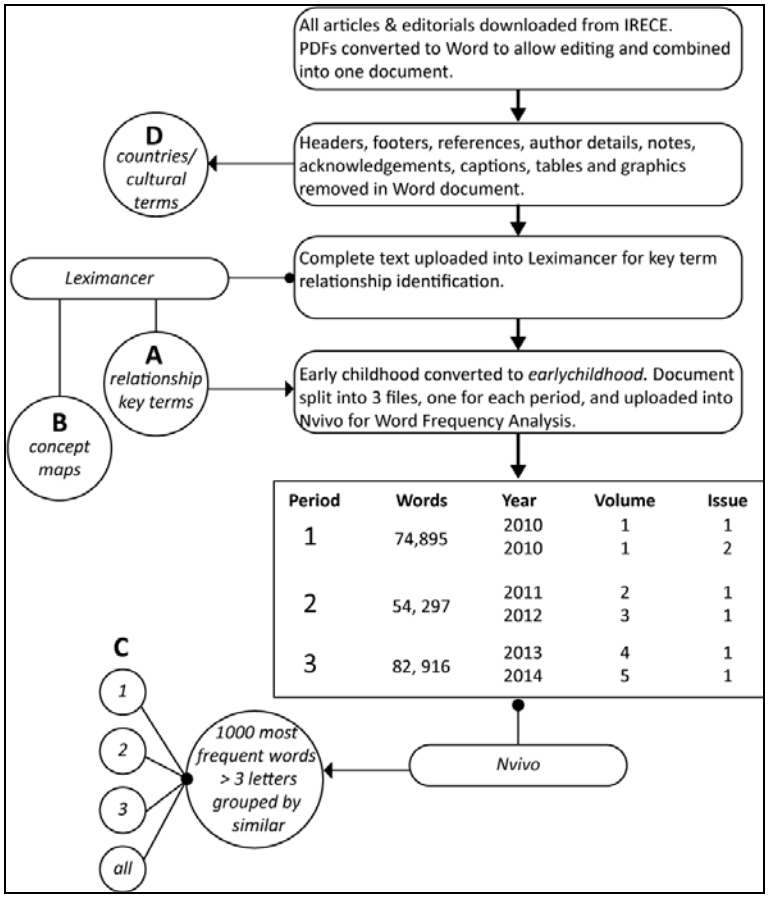

Figure 1 Data collection and analysis process

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Findings and discussion

Concepts and themes

According to Grimbeek, Bryer, Davies & Bartlett (2005), Leximancer concepts are defined as:

> "…frequently used terms around which other terms cluster." For example, in this study Leximancer identified the top term, in this case the compound concept *children OR children's*, and calculated the relevance of other terms to it, by dividing the rate of frequency. In this way a relationship between the lead term *children* or *children's* and other frequently appearing terms can be established. In this analysis, the ten most frequently appearing terms are unsurprising and include: children; teachers; parents; school; learning; childhood; and activities. Given the Journal is focused on research discourse about early childhood education, the appearance of teachers, parents, school and learning is entirely consistent.

The comprehensive data resulting from the Leximancer analysis may also be used to generate a heat map which reflects the relationship between most frequently appearing concepts. For this study, the automatically generated heat map, (see Figure 2) shows the concepts and themes identified across the Journal and their relationships with one another. The most frequent theme identified is the theme *children* (including children's), relating to every other theme on the map.

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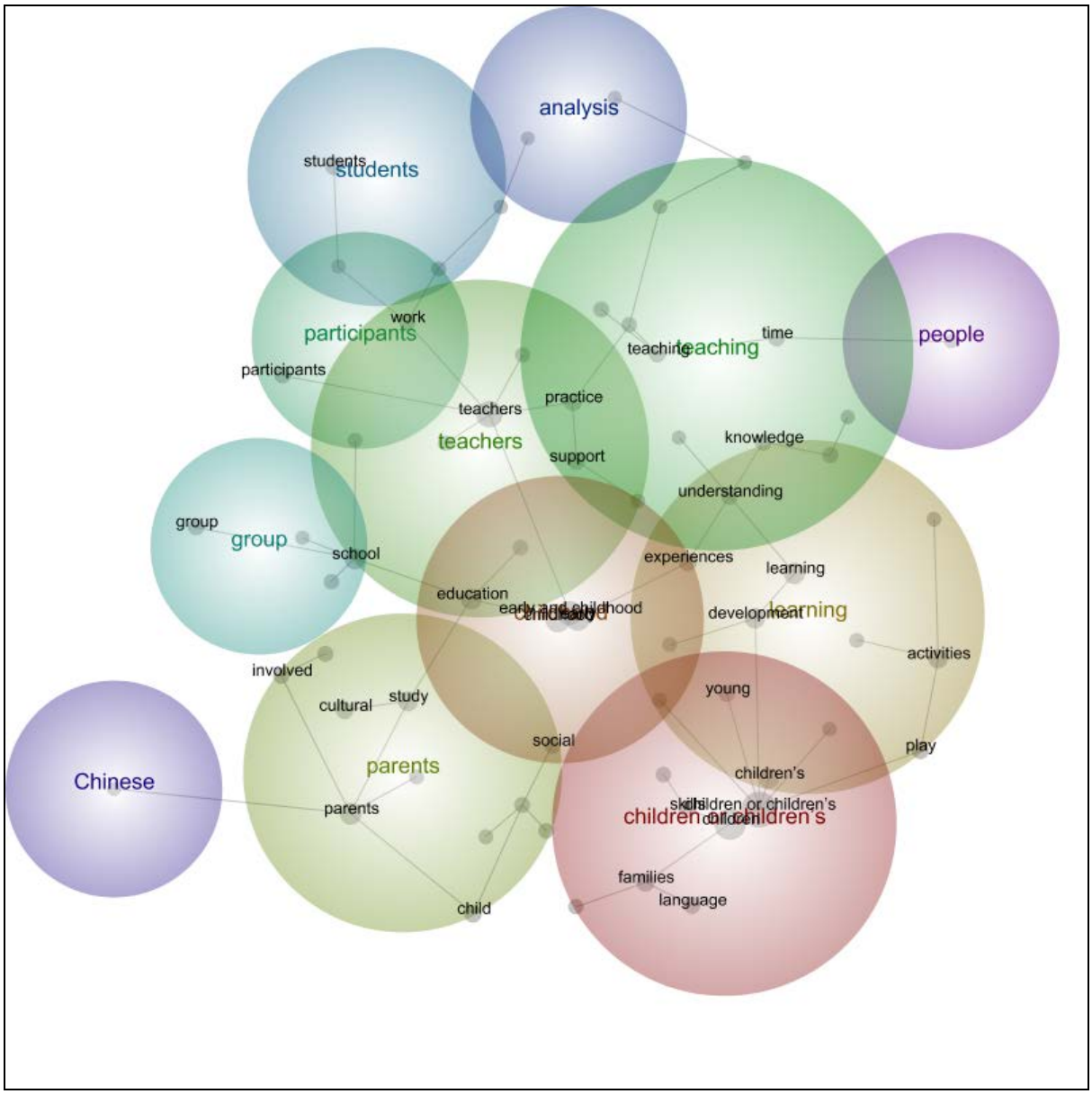

Figure 2 Heat map most frequently appearing concepts in the Journal

The five themes with the highest rates of connectivity (in warm colours on the heat map) were retained for further analysis, including *children (or children's), childhood, learning, parents* and *teachers*. The degree of connectivity and the concepts which were generated from the data to be associated with these themes are now presented in Table 2.

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Table 2 Top five themes showing the degree of connectivity (in per cent)

Themes	Connectivity (in percent)	Concepts
Children (or children's)	100 %	children, families, language, skills,
Childhood	81%	childhood, early childhood, education, social
Learning	66 %	learning, development, activities, experiences, play, understanding, young
Parents	61%	parents, study, child, cultural, involved
Teachers	52 %	teachers, school, practice, support

Given the Journal deals with topics around the education of children, it is not surprising that *children* is the most salient term in this analysis. A description of the associated concepts for each of the dominant themes now follows.

Theme 1 - Children or children's

The most prominent theme emerging from the data analysis focused on the concept of *children* or *children's*. Other concepts that were associated with this theme include: *families, language* and *skills*. When investigating the nature of the relationships of these terms within the theme, the association with family focused on the impact of school affordability for families, and also the relationship between family variables and children's skills and development. With respect to language and skills, the association with the theme of children tended to focus on language and literacy abilities as key identifiers in child development.

Theme 2 - Childhood

The second most prominent theme emerging from the data, and the one with the strongest association to Theme 1, is that of *childhood*. This theme could be considered the main subject of the Journal, especially when the word 'early' was used in association with the theme. It is interesting to note, that the meaning of *social* in this context has two diverse foci: one being the aspect of a child's social competence or socialisation or development, and the other an external impact of social background.

Theme 3 – Learning

This third prominent theme in generated from the data was that of *learning*. Other related concepts revealed the emphasis of the Journal on what learning is (development, understanding), and how it comes about (activities, play). Data revealed that views on learning and approaches to pedagogy are often context-specific throughout the world.

Theme 4 - Teachers

Also a prominent theme generated from the data, the theme of *teachers* reflected the education focus of the Journal. This theme deals with teachers' practice, their need for support and their experience of teaching young children in a range of early childhood settings, both domestic and international in scope.

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Theme 5 – Parents

The last theme included for consideration in this review was related to *parents*. The data analysis revealed this concept was presented in association with the influence of parents in their children's development and the impact that ethnic and cultural identities have in this regard. The significance of the relationship between parents and social groups was also noted.

It is evident from the five core themes generated from the data that all fall squarely into the remit of the Journal as focusing on early childhood education. Furthermore, it is noteworthy at this point to highlight the appearance of 'cultural' as a strongly associated concept in the theme of parents, again a clear objective of the Journal. The following section of the paper provides detailed information on word frequencies and the tag cloud developed as part of this study.

Word frequencies – Tag cloud

In order to generate a tag cloud visually representing the Journal, data were prepared for frequency analysis. Using NVivo 9 (qualitative data analysis software), the text for each period was subject to word frequency analysis. The options were set to the 1,000 most common stemmed words with four letters or more. NVivo (NVivo , 2014) also has a number of text matching options that range from exact word matching to including terms that are generally connected (see Table 3). In this study, the text matching options was set to Level 3 in order to provide a neutral set of returns for text matching and development of the tag cloud.

Table 3 NVivo text match options

Level	Returns	Example (sport)
1	Exact matches only	Sport
2	Exact matches and words with same stem	Sport, sporting
3	Exact matches, words with same stem, synonyms	Sport, sporting, play, fun
4	Exact matches, words with same stem, synonyms, specialisations	Sport, sporting, play, fun, running, basketball
5	Exact matches, words with same stem, synonyms, specialisations, generalisations	Sport, sporting, play, fun, running, basketball, recreation, business

Source: Adapted from Nvivo, 2014

The top ten words in the text of the journal over the five year period from 2010 to 2014 are shown in Table 4. The table includes the rank of the top ten most frequent words, the weighted frequency percentage (this is frequency of the word relative to the total words counted - which is 107,508 comprising the 1,000 most common words) and the similar words included as stem words.

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Table 4 Top ten words in Journal – Frequency

Rank over 5 years	Word	F	Weighted Percentage (%)	Similar Words
1	children	2740	1.88	children, children's
2	teacher	1707	1.17	teacher, teacher', teachers, teachers', teachers'
3	were	1360	0.93	were
4	parents	1177	0.81	parent, parent', parental, parenting, parenting, parents, parents', parents'
5	school	1086	0.75	school, school', schooling, schooling', schools
6	from	959	0.66	from
7	learning	958	0.66	learn, learned, learning, learning', learns
8	education	904	0.62	educate, educated, educating, education, education', educational, educational', educationally, educator, educator', educators, educators'
9	students	872	0.60	student, students, students', students'
10	research	831	0.57	research, researched, researcher, researcher', researchers, researchers', researches, researching

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The most common term across each of the three periods of time (Period 1 = 2010; Period 2 = 2011-12; Period 3 = 2013-14) was *children* but the ranking of other terms shifted over time. *Teacher* was the second most common term overall and in the first two periods, but dropped to 6th position by the third period (see Table 5). The term *parents* ranked fourth overall, only seventh in the first period, but increased in frequency for the following two periods to come in at second. *Education* (and similar words) were in the top ten words overall, and in the second and third period, but ranked only at eleventh in the first period. *Family* became prominent in the third period (rank of 8), ranking at 262 in the first period, and 17th in the second period (21st overall). *Learning* ranked at 30 in the second period, but showed in top six places in the other two periods (7th overall).

Table 5 The top ten most frequent terms in each period

Period	Rank in period	Word	Weighted Percentage (%)	Similar Words
1	1	children	1.84	children, children’
1	2	teacher	1.32	teacher, teacher’, teachers, teachers’
1	3	were	0.94	were
1	4	school	0.90	school, schooling, schooling’, schools
1	5	research	0.67	research, researched, researcher, researcher’, researchers, researchers’, researching
1	6	learning	0.63	learn, learned, learning, learning’
1	7	parents	0.61	parent, parental, parenting, parents, parents’
1	8	from*	0.60	from
1	9	play	0.58	play, play’, played, playful, playing, plays
1	10	child	0.57	child, child’
2	1	children	1.84	children, children’
2	2	teacher	1.44	teacher, teachers, teachers', teachers’
2	3	parents	0.81	parent, parental, parenting, parents, parents', parents’
2	4	early childhood	0.80	earlychildhood
2	5	school	0.76	school, school’, schooling, schools

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2	6	students	0.75	student, students, students', students’
2	7	were	0.71	were
2	8	educators	0.71	educate, educated, educating, education, educational, educator, educators
2	9	science	0.69	science, sciences, sciencing
2	10	from*	0.65	from
3	1	children	1.95	children, children’
3	2	were	1.08	were
3	3	parents	0.98	parent, parent’, parental, parenting, parenting’, parents, parents', parents’
3	4	activity	0.89	activate, activating, active, actively, activities, activities’, activity, activity’
3	5	learning	0.88	learn, learned, learning, learning’, learns
3	6	teacher	0.87	teacher, teacher’, teachers, teachers', teachers’
3	7	from*	0.71	from
3	8	family	0.64	familial, families, families’, family, family’
3	9	research	0.62	research, researched, researcher, researchers, researchers’, researching
3	10	educators	0.62	educating, education, educational, educationally, educator, educators, educators’

* appears in 100 most common words

The Oxford English Dictionaries (Oxford University Press, 2014) provides a list of the 100 most common words used in the English language. Most of these (52) are three letters or less in length, and therefore do not appear in the text frequency analysis. Of the other 48 most common words - only the word ‘from’ appears in this top ten analysis, hence the influence of common words is not significant in this study.

ISSN 1838-0689 online

In order to create a visual representation in the form of a tag cloud, the 100 most common words were first removed from the list of 1,000 terms, and the frequency of the terms used to specify a font size by dividing the count of each by 1/100th of the most frequent term and rounding to the nearest whole number. Thus the most common term *children* has a font size of 100 point, and all other terms' font size are relative to this. The lowest font size used is 8 point, which is for a term that has a frequency of 208. There are 92 terms represented in the Figure 2 tag cloud.

Figure 2 Tag cloud of the most frequent words in the Journal

Despite the popularity of tag clouds and the use of tag clouds as a way of depicting the content of documents (Pendergast, 2010), there have been very few studies evaluating their effectiveness in terms of accuracy of understanding by the viewer of the intended depiction. Halvey and Keane (2007) provide some direction on what makes tag clouds most accurately comprehended, pointing to alphabetization, font size and the position of tags as features that can be used to make tags more effective.

Importantly, the use of tags contributes to the development of a folksonomy, which is the notion of building a form of a hierarchy using the tags emerging from the content being analyzed. Thomas Vander Wal coined the phrase *folksonomy* as a means of categorizing what is appearing on the internet in particular (Pink, 2005). It is called folksonomy to represent its meaning as a people's taxonomy. By identifying the common words used in a text and tagging them in a tag cloud, the development of a hierarchy or folksonomy occurs. In this way, a classification of the contents is possible. This study explores the folksonomy presented by the Journal.

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International profile

The Journal has a clear intention of presenting international research in early childhood education. With this in mind, the data set was searched for appearance of country names, using the United Nations' list of 193 member states. A number of politically ambiguous nations were categorised in this process.

This aspect of the research faced a number of challenges along the way, and hence this insight is based on a number of decisions made as to the inclusion or otherwise of country/region references. During the search, various ethnicities and regions became apparent, and they were also added to the search. Ironically, the difficulty in collating data on ethnicities and regions was addressed in an article from Chan (2011), noting the following:

> [F]or example, using the terms Asian and/or Chinese runs the risk of lumping together diverse ethnic groups and neglecting specific and hyphenated-identities, such as Mainland-Chinese, Hong Kong-Chinese, Taiwanese, Singaporean-Chinese. Unfortunately, most previous research which involved participants of different ethnic groups does not provide participants' specific ethnic originalities, but simply applies a general ethnic category, like 'Asian', to represent participants with diverse ethnicities. This article respects and aligns the way in which ethnic group categories have been previously applied in specific literature when citing research findings (p. 64).

While it is very challenging to quantify the studies presented in the Journal across geographic locations and to include the relative paucity of the effects of this inclusion, the data shows some insight into where the knowledge base is coming from and where the focus of the researchers lie from the analysis. Table 6 reports the frequency of terms relating to culture and country. The term 'western' is the most widely incorporated, being used in 11 of the total published articles, representing almost a third of the total publications. Eight articles refer to 'indigenous' and seven to 'Chinese'.

Table 6 Most common terms relating to culture and country

Member State	**F Entire period**	**Articles in Period 1 2010**	**Articles in Period 2 2011-2012**	**Articles in Period 3 2013-2014**	**Total articles**
Immigrant	249	0	3	3	**6**
Chinese	243	1	2	4	**7**
Indigenous	114	4	1	3	**8**
Western	45	3	3	5	**11**
Hong Kong	44	0	1	2	**3**

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Table 7 presents the frequency of countries mentioned in articles, with a minimum of three mentions in different articles necessary to be reported in this table. This table also shows the change over time of the regions represented in the articles. Australia is the most frequently included, with mention in 20 of the 35 articles. The United Stated has the second most frequent inclusion, with relatively more mentions in Period 3.

Table 7 Countries (or terms) appearing in 3 or more articles for each period

Member State	Articles in Period 1 2010	Articles in Period 2 2011-2012	Articles in Period 3 2013-2014	Total articles
Australia(n)	10	3	7	20
United States of America	4	3	7	14
Western	3	3	5	11
New Zealand	7	2	2	11
European	1	2	6	9
Indigenous	4	1	3	8
Asian	1	2	5	8
Chinese	1	2	4	7
Immigrant	0	3	3	6
African American	1	1	3	5
Caucasian	2	1	2	5
Hispanic	1	2	2	5
Migrant	0	4	1	5
China	1	1	2	4
Maori	2	1	1	4
Mexico	1	1	2	4
Singapore	0	2	2	4
Hong Kong	0	1	2	3

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Member State	Articles in Period 1 2010	Articles in Period 2 2011-2012	Articles in Period 3 2013-2014	Total articles
Aborigine	1	0	2	3
Canada/Canadian	0	1	2	3
Cantonese	1	1	1	3
Germany	1	1	1	3
Mandarin	1	1	1	3
Norway	2	1	0	3
Taiwan	0	2	1	3
Turkey/Turkish	0	1	2	3
United Kingdom	1	1	1	3
Viet Nam	1	1	1	3

This data is presented in summary form in Figure 3, where the colour of the shaded area depicts the number of articles that refer to this nation.

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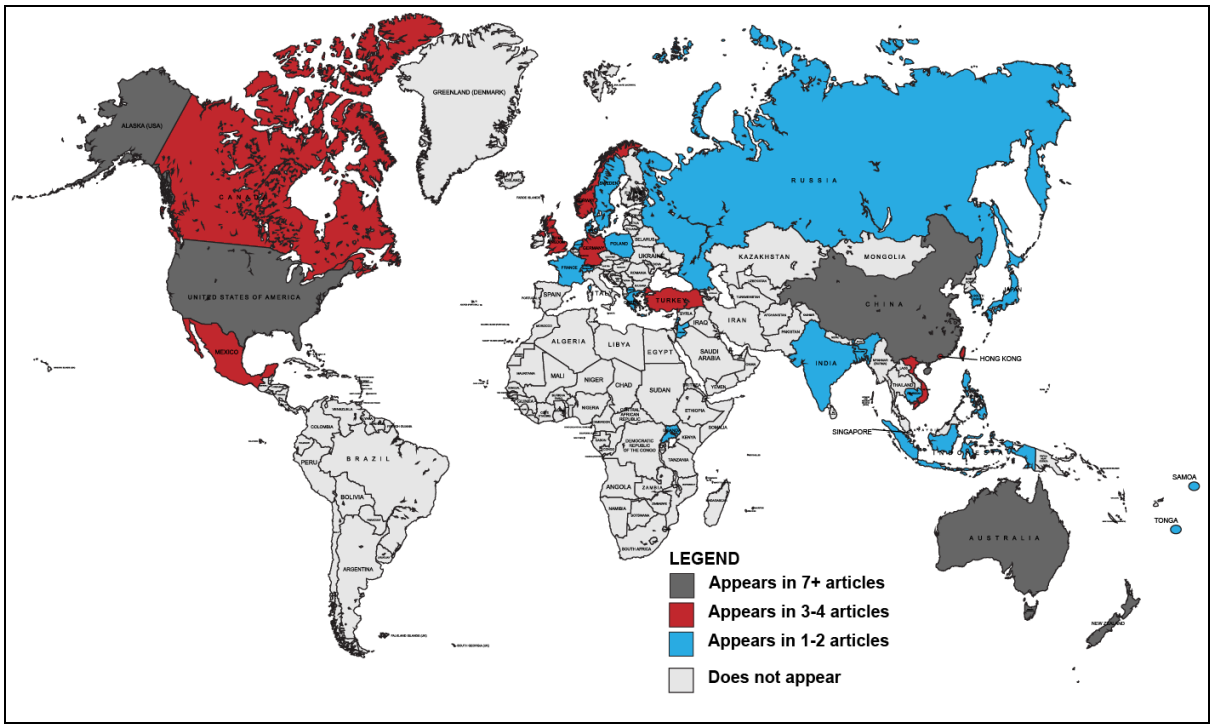

Figure 3 Frequency of articles referring to nations

Summary

This analysis set out to provide a snapshot of the *International Research in Early Childhood Education* journal to date. This was achieved through a thematic content analysis of the seven issues (35 papers and two editorials) of the Journal. Five dominant themes emerged: children/s; childhood; learning; parent/s and teacher/s. A frequency analysis of terms was then conducted to visually represent the most frequently appearing terms to form a collective tag cloud, which in turn contributes to the development of a folksonomy for the Journal. Finally, frequency of geographic regions was also investigated to consider the Journal's international focus.

When reflecting on the aforementioned values and priorities of the Journal, this analysis points to the following features of the Journal. It is the intent of the Journal to include a range of contexts including international contexts and scholarship and interest from nations around the world. It is evident from the geographic analysis that a wide range of contexts are included in the publications. However, there is dominant representation from Australia and the United States, along with other western nations. Some regions are unrepresented, however this is again unsurprising given the relative infancy of the Journal.

The research focus of the journal on education in early childhood is strongly evident in the thematic content analysis, and this is reinforced in the tag cloud which highlights the relational aspects of the terms appearing in the Journal. What is yet to be conducted is an analysis of the researcher methodologies included in each article, especially with regards to the intent that the Journal promote research that challenges conventional approaches and understandings about the field, using a variety of methodological strategies. This is an opening for further research.

ISSN 1838-0689 online

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ISSN 1838-0689 online

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Danielle is an early childhood educator and researcher currently working with both Northeastern University in Boston, Massachusetts (USA) and Griffith University in Australia. Following careers as an early years teacher and researcher in both Australia and North America, Danielle has worked for the Australian Government on strategic initiatives in relation to achieving universal access to quality kindergarten programs for all children. Her research interests are eclectic and include qualitative research methodologies including phenomenology, early childhood art education, health and wellbeing, educational leadership and e-learning in early childhood education. Dr. Twigg was the Chief Investigator for the Evaluation of the Victorian Early Years Learning and Development Framework Coaching Program from 2010-2012 ($197k). Danielle was awarded the Early Career Researcher Award from the Griffith Institute for Educational Research (GIER) in 2010 and her research has been published in several national and international peer-reviewed journals and book articles. Dr. Twigg was awarded an institution-based research grant ($20k) for her research into young children's experiences as global citizens in the Age of Technology from Griffith University [2012-2013]. In 2014, she was presented with the Betty J. Harrah *Manuscript of the Year Award* in Washington, D.C. for her research on off-campus student housing.
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ISSN 1838-0689 online