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Who is Listening to us from Geography Education? Is Anyone Out There?

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Abstract

This is the last of three studies designed to assess the interchange between the geography education community, the larger geography field, and other disciplines. Our previous studies have examined citation patterns between geography education journals and quantified whether a paradigm shift was occurring from a focus on strategies and methods towards understanding the learning and teaching process. Further, we wanted to know "who are we listening to?" The answer is that while we were listening to ourselves (geography education), our scholars were incorporating knowledge, ideas, and perspectives from the larger geography community and importantly from academicians and professionals trained in pedagogy and education theories. This study asks the question, "who is listening to us?" Our results indicate that education scholars are actually reading our publications. There were distinct lines of communication between those from geography education and the disciplines of education that permeate journals, books, conference proceedings, theses and dissertations, and other outlets (i.e. reports, blogs, wikis).

Keywords

Citations, Geography Education, Journal of Geography In Higher Education

When those aligned with geography education produce published materials, what disciplines are citing us? Are we merely hearing echoes of ourselves within geography education (Lui & Wang, 2005; Solomon, Carley & Porter, 2016)? In other words, "[I]s

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the circulation of knowledge through academic journals largely confined within separate disciplinary containers?" (Johnston, 2003, p. 135)? The phenomenon of "talking to ourselves" is not exclusive to geography education, but common in mathematics, physics, history, and other academic fields. The cross-fertilization with those outside one's expertise adds perspective. And if there are those outside geography education reading our articles, from what fields are they from, and what are we producing that is of interest?

This is the third in a series of bibliometric studies in the geographic field of geography education (Albert & Cassidy, 2017; Albert, Gerrish, & Adu-Prah, 2017). The first study tracked articles from 2009-2011 published in ten established geography education journals and followed their citations exchanges through 2015. A directed graph depicting ripple (10-39), wave (40-59), and splash (60 or greater) (Foster et al., 2007) citation interactions found the *Journal of Geography in Higher Education* (*JGHE*) to operate as a "breeder" for the *Journal of Geography* (*JoG)* by sending almost twice the citations it receives. The majority of the remaining journals (*Geography, Geographical Education, International Research in Geographical and Environmental Education, Journal of Geography, Research in Geographical Education,* and *Teaching Geography*) were interacting at the ripple level (10-39 citations). Two of these, the *Journal of Geography* and *Geography*, were acting as "distributors," sending citations to three geography education journals each. *Research in Geographic Education* and *Geographical Education* were ripple-level spur journals, only receiving but not sending citations during the study frame (Albert, Gerrish, & Adu-Prah, 2017).

The second study analyzed the references appearing in *JGHE* (2010) to determine which journals and disciplines we were reading (Albert & Cassidy, 2017). Our results found that 61% of *JGHE*'s weighted citations were coming from four journals: one in geography education (*Journal of Geography in Higher Education*), two in geography (*Progress in Human Geography* and *The Professional Geographer*), and one in nongeography (*Science Education*) for 23%, 23%, and 15%, respectively. While geography education scholars have engaged pedagogic theory and fostered connections with other disciplines including education, more materials supporting an understanding and assessment of learning and thinking about spatial awareness, knowledge and skills have been forthcoming (Albert & Cassidy, 2017; Albert, Gerrish, & Adu-Prah, 2017). For example, of the 30 most-cited articles in geography education 2009-2011, nine of 30 (30%) were in the learning and thinking category, including the number one and three of first four most cited articles. A further 33% of the citations from the *JGHE* in 2010 were from education journals (excluding geography education), with *Science Education* accounting for 15% of the weighted citations. Of seventeen leading journals contributing to the *JGHE* (2010), 25%, 27%, and 48% of the weighted citations were from geography education, geography, and nongeography journals, respectively; most from geography education were self-cites from the *JGHE*. The other two categories, geography and nongeography, were pulling citations from Scimago's (2007-2016) first quartile journals as opposed to second quartile journals from geography education journals. It appears that geography education scholars have reached outside this inner circle to the larger

geography and nongeography research communities, and further were canvassing top-ranked journals to support their research endeavors.

These studies illustrate that progress towards the promotion of learning and thinking research is moving forward. Such studies incorporate educational theories and assessment approaches that integrate empirical, quantitative, and/or qualitative methodologies (Bednarz, 2000, p. 136). When Bednarz proposed this focus, only 10% of the articles published in the *Journal of Geography* (1988-1997) were on learning and thinking, with a majority 55% on teaching methods and strategies. However, just four years after the millennium, there was an emerging optimism over the horizon, as "[N]ow, for the first time, because of geography education's progress and growth, the field has the capacity to educate a critical mass of geographers" (Bednarz & Bednarz, 2004, p. 24). Consequently, as geographers embed more learning and thinking constructs within their studies, it is useful to see if connections are being maintained and fostered outside the geography education community.

Background

Citations have been used to determine time-space dynamics of an author (i.e., Hägerstrand) (Persson & Ellegård, 2012); confer "classic" status on article (Wrigley & Matthews, 1986); compare citation patterns of human versus physical geographers (Johnston, 2003); gauge the influence of a subfield, for example, economic geography (Bodman, 2010); visualize the network relations among a set of journals (Gatrell & Smith, 1984; Liu, 2007; Zawacki-Richter & Anderson, 2011); examine the status of programs (Turner & Meyer, 1985) and departments (Coomes et al., 2013); and even analyze the impact of American Association of Geographers presidential addresses (Brunn, 2018).

Notwithstanding these citation applications, caution is advised in using citation counts alone for decisions concerning tenure, promotion, merit, market adjustment, or honorary designation such as "regents' professor." Nor should citations be the sole basis for designating the best author, article, or journal of the year. This is because it is possible to broaden citation footprints by posting, linking, and otherwise promoting one's scholarship on academic sharing sites (ResearchGate, Academica.edu), social media (Twitter, Facebook, LinkedIn), and blogs, wikis, and op-eds (Alderman, 2017).

The Cynical Geographers Collective (2011) advises extreme caution when using citations for career advancement because of known biases. For example, citation inflation occurs through self-cites, overzealous citation of one's dissertation advisor (or perhaps even on his or her insistence), publishing in open or at least online access journals (Lawrence, 2001), focusing on "hot" topics rather than more significant topics with less popularity, and so forth (i.e., publishing in English language journals). High citation counts do not necessarily equate with high quality given that some articles might be cited for a multitude of issues such as inadequate methodology, spurious results, and erroneous conclusions. Consequently, Weingart (2005) advocates "informed peer review," whereby citation counts are supplemented with qualitative information. In the United States it is

common to have a tenure candidate's record evaluated using outside reviewers that comment on the significance of the scholar's research.

This research postdates Bednarz's (2000) proposed research agenda, so this study is able to track if progress is being made in connecting across disciplines and especially with those from education. Using volume 34 (2010) of the *Journal of Geography in Higher Education* we will collect the citations to its 37 articles from 2010 to the mid-late 2017. The *JGHE* was selected because it was a major geography education journal during a 2009-2011 study showing it sent twice the citations it received from another prominent journal (Albert, Gerrish, & Adu-Prah, 2017). Individual articles from *JGHE* (2010) referred to in the text are referenced using its volume, issue, and number for identification (Appendix A).

Data and Methods

Resources utilized for citation data collection were primarily from Google Scholar (Google, 2017), Scopus (Elsevier, 2017), and Web of Science (Clarivate, 2017). We compiled the searches from June 1 through August 1, 2017, so only partial data exists for 2017. Each resource was searched systematically for the title of each article published in volume 34 (2010) of the *Journal of Geography in Higher Education*; then the lists of items citing each article were downloaded and compiled into one master list. Due to overlap between the three key resources, each round of searching was progressively faster, because with each round, the odds shrank for finding unique items that had not already been captured.

Google Scholar was selected as a starting point because of its more comprehensive coverage. For the sake of convenience and speed, this first step of data collection relied heavily on the freeware program, Publish or Perish 5 (Harzing, 2007), which searches and retrieves Google Scholar data in a format more easily manipulated and downloaded into a spreadsheet. Each article title in turn was entered as a New Google Scholar Query in Publish or Perish. After retrieving the article citation itself, the "Lookup citations in Publish or Perish" command was run to retrieve all Google Scholar items that cited the *JGHE* article in their references. The list of citing items for each *JGHE* article was downloaded in comma-separated values (CSV) format and imported into Excel. The imported data columns were Authors, Title, Publication Year, Source, and Uniform Resource Locator (URL); an additional column also identified the origin of the resource (in this case, Google Scholar). The list of Google Scholar items was de-duplicated to remove any repeat listings of the same item citing the same article, though the same item might still appear in the master list twice if it cited multiple *JGHE* v34 articles.

We used a similar process while searching Scopus and Web of Science (WOS), with unique citing items added to those discovered via Google Scholar. Then the Open Syllabus Project (The American Assembly, 2017) was searched for each *JGHE* article title. This determined whether the article was assigned as a course reading in the database of over one million college course syllabi. This database is not comprehensive, and no statistics are available on its coverage of syllabi in different fields, so it was understood that the results of this search would be anecdotal at best, but the researchers hoped this

search would provide at least a window into whether *JGHE* v34 articles were being leveraged as required course readings; however, ultimately none of the *JGHE* v34 articles were found in the Open Syllabus Project database. Further, an attempt to find a comprehensive search engine for gray literature failed as most of these were highly specialized (e.g., separate search engines for gray literature in health, aeronautics, civil engineering, and dozens of other niche areas), so this too was a dead end. Nevertheless, negative results support our suspicion that most of the hits would be from Google Scholar followed by Scopus and then Web of Science.

Finally, each URL in the compiled master list was accessed so that the item could be classified as an Article, Book, Book Chapter, Thesis/Dissertation, Presentation, Report, or Other item type (including Unidentifiable); this Item Type was added to the spreadsheet alongside the other data columns. While viewing each item to determine Type, the URLs provided by Google were sometimes replaced with more stable, direct, and/or useful URLs. Finally, for each thesis or dissertation, details were added to the dataset to indicate the relevant academic department and graduate level (master's or doctoral).

With regards to citing items obtained via Google Scholar data, it is worth noting that the occasional erroneous result does enter into the data, which is to say, an item is occasionally identified as citing the specified article, but when the item's bibliography is manually investigated, the citation is not present. Without greater detail regarding proprietary search algorithms and possible changes made to online files, it is difficult to say how these errors enter into the data. The size of the dataset seemed to preclude the reasonableness of verifying every individual item, and in any case not all items were available in online full-text to verify. A selection of 149 items (20% of the 743 total citing items initially identified) were spot-checked for accuracy; two or more citing items for every *JGHE* article (except those articles with less than 2 citing items) were selected for spot-checks, and the selection primarily focused on items found in Google Scholar only, since Scopus and Web of Science generally have a higher level of quality control for identifying and linking cited items and since identification by multiple sources increased the likelihood of accuracy. As a result of these spot-checks, 142 items were confirmed accurate (95.3% of items checked), while 7 erroneous items were removed from the dataset (4.7% of items checked). Data for this study are available from the corresponding author upon request.

Findings and Discussion

There were 37 articles totaling 615 pages, including one editorial (34-1-1), published in the *Journal of Geography in Higher Education* during 2010 (v34 - see Appendix A). Using Foster's ripple, wave, and splash analogy to rank citation status, plus adding a category for unranked articles, or "ebb" tide status for those articles with less than 10 ten citations, the 37 articles were categorized (Table 1). While the ocean analogy scheme is arbitrary, it seems to operate on an appropriate scale for ranking citations in geography. Several studies have applied this ocean analogy (see Foster et al., 2007; Wrigley & Overman, 2010; Albert, Gerrish, & Adu-Prah, 2017); further, Brunn (2017) applied an

arbitrary-based categorization (*alpha*, *beta*, *gamma*) with similar class-limits to rank Google Scholar and Web of Science citation impacts of American Association of Geographers presidential addresses.

Table 1
Hits and Status of JGHE (2010) Articles

Volume-Issue-Number	Hits	Status	Volume-Issue-Number	Hits	Status
34-1-1	1	Ebb	34-2-9	6	Ebb
34-1-2	36	Ripple	34-3-1	47	Wave
34-1-3	1	Ebb	34-3-2	40	Wave
34-1-4	5	Ebb	34-3-3	3	Ebb
34-1-5	8	Ebb	34-3-4	14	Ripple
34-1-6	14	Ripple	34-3-5	23	Ripple
34-1-7	76	Splash	34-3-6	20	Ripple
34-1-8	3	Ebb	34-3-7	26	Ripple
34-1-9	1	Ebb	34-3-8	68	Splash
34-1-10	29	Ripple	34-3-9	45	Wave
34-1-11	7	Ebb	34-4-1	8	Ebb
34-2-1	11	Ripple	34-4-2	16	Ripple
34-2-2	70	Splash	34-4-3	12	Ripple
34-2-3	8	Ebb	34-4-4	6	Ebb
34-2-4	9	Ebb	34-4-5	12	Ripple
34-2-5	63	Splash	34-4-6	6	Ebb
34-2-6	12	Ripple	34-4-7	2	Ebb
34-2-7	7	Ebb	34-4-8	13	Ripple
34-2-8	8	Ebb			

Using the ocean analogy, 17 (46%) or almost half the articles made minimal or ebb tide impact on the scholastic community at large. Thirteen (35%) articles were cited to the ripple level with at least 10 but less than 40 citations; three articles reached wave status of between 40-59 citations, and four gained splash status with over 60 citations (Figure 1). The four articles in the splash category included Mitchell and Forer's (34-1-7) "Blended Learning: The Perceptions of First-year Geography Students," Jarvis & Dickie (34-2-2) "Podcasts in Support of Experiential Field Learning," Alberts, Hazen and Theobald's (34-3-8) "Classroom Incivilities: The Challenge of Interactions between College Students and Instructors in the US," and Hennemann and Liefner's (34-2-5) "Employability of German Geography Graduates: The Mismatch between Knowledge Acquired and Competences Required" (See Appendix A).

These splash-level studies were hot topics in higher education, including the rise of online and hybrids instruction mode (face-to-face with online), infusing technologies into

field learning, and assessing whether what is taught in academia matches the knowledge and skills sought by employers. Geographers are in an advantaged positioned to address these issues because of their exposure and training in geospatial technologies (geographic information systems, remote sensing, global positioning system, unmanned aerial vehicles for capturing spatial data), continuing tradition for fieldwork, field courses, and travel experiences, and propensity of offering applied and career oriented instruction. That others outside geography would be reading these splash-level articles is understandable given our expertise. Another common thread in these splash articles is their focus on student perceptions, attitudes, and behaviors. While not unique to geography, this latter item is increasingly consuming faculty and institutional resources. Our institution, Sam Houston State University, perhaps similar to most, has a program titled Early Alert (formerly known as First Alert) to help faculty and students ameliorate or solve issues stemming from incivilities and other management issues (missing class, entering late, leaving early, poor behavior, and so on) in the classroom.

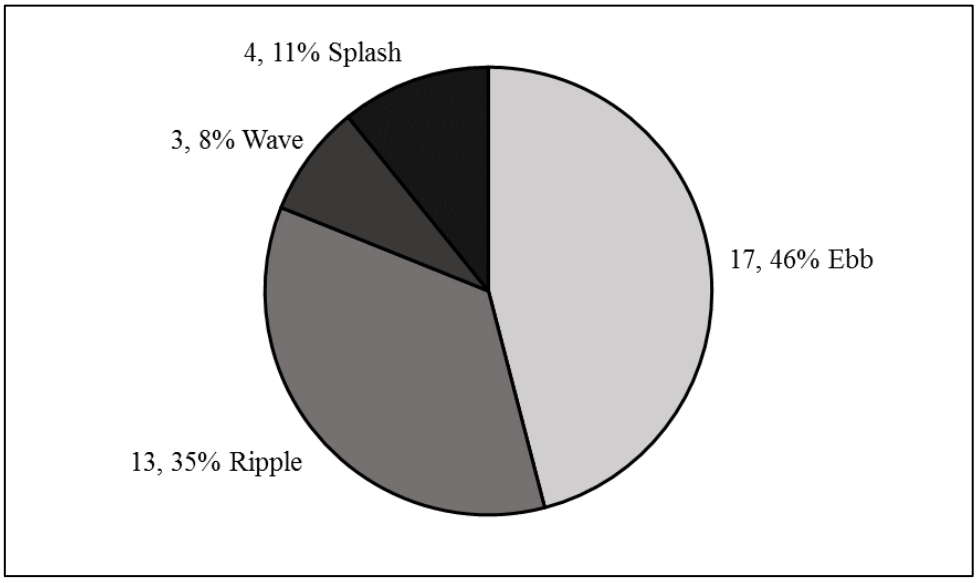

Figure 1. Citation Status: 2010-2017, Journal of Geography Higher Education, 2010

Item Type

Of the 736 hits generated the 37 articles from 2010 to 2017, Google Scholar captured 691 (93.6%), Scopus 313 (42.4%), and Web of Science 193 (26.2%). This decreasing capture percentage is understandable since Google Scholar is the least and Web of Science the most discriminating. There were 422 (57.3%) articles, 161 (21.9%) dissertations/theses, 88 books or book chapters (12.0%), 33 (4.4%) conference papers, and 32 (4.3%) other or unidentifiable items that cited the *JGHE* (v34) from 2010 to June-August, 2017. The "other" item type included a variety of entries such as blog posts, a grant, reports, presentations, proposals, a wiki, and student papers; 12 (1.6%) of items in the other category were unidentifiable. The mean citations of *JGHE* articles was 19.9 with

a high of 76 and low of 1 for a range of 75. Since the median (12) is less than the mean, this is a positively skewed distribution with a standard deviation of 20.9.

Year Cited

Counting the year of publication beginning from year 2010, the maximum number of citations occurred six years out, with 132 citation for 2015 (Figure 2). Thereafter, citations dropped to 117 in 2016, and 63 during the first half year of 2017. While the articles from the *JGHE* (2010) will continue to generate citations, enough were captured to examine patterns. Of the 736 entries citing from the *JGHE* (2010), there were just 18 instances when year of citation was indeterminate. Our tracking period 2010-2017, therefore, should be an appropriate length of time to evaluate results.

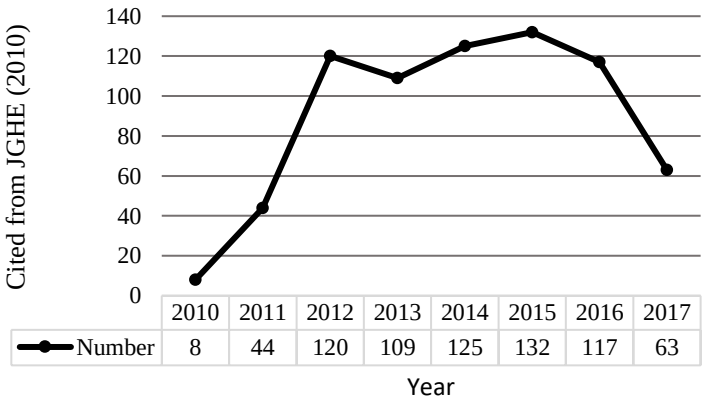

Figure 2. Cited from JGHE (2010) by Year: All Item Types (Note: The count for 2017 is for a partial year).

Articles

The articles in the *JGHE* (2010) were cited 422 times over the study frame (2010-2017 partial year) with combined searches of Google Scholar (400), Scopus (257), and Web of Science (193). There was a twofold difference between the most and least discriminating databases, respectively, Google Scholar and WoS. It is unsure whether this volume (34) of *JGHE* has reached its citation half-life with 82, its highest count, occurring in 2016, seven years out from publication. With 42 citations in the first six to eight months (citation searches were conducted over a three month period from June through August 2017), it is unknown whether this volume has completely peaked or has begun its descent.

Of the 422 citations, 171 were identified with geography journals, including those cited in *Journal of Geography in Higher Education* (93) and the *Journal of Geography* (18). The remaining 60 citations were in geography journals with less than the ripple threshold of 10 citations each. Just over forty percent (40.5%) of *JGHE's* (2010) cites circled within geography journals and effectively, the discipline. There were numerous journals from the United States and United Kingdom plus others published out of Turkey, Ukraine, Norway, New Zealand, South Korea, Spain, Poland, and Belgium. The

remaining 251 citations (59.5%) from the *JGHE* (2010) were from 214 different journals. Given these statistics, it is evident that geographers are reaching across the disciplinary fence and others are listening. While we know that our fellow geographers are in tune with our message, how do we figure out the rest of our listening audience? To answer this question, individual word counts from the 422 journal titles were generated (WordClouds.com, 2017). The five most common words, after excluding the ubiquitous *journal* from the titles, were (listed from most to least): *education*, *geography*, *higher*, *international*, and *research*. Even after subtracting out the 93 instances of *higher* and *education* to reduce the bias generated from the *Journal of Geography in Higher Education*, these five words were still dominant. The order is slightly changed to *geography* (135), *education* (113), *international* (42), *research* (30), and *higher* (24), but still indicating a strong connection between *geography* and *education*. The word *international* is indicative that these articles are diffusing around the world as expected of international journals. These publications strive to have a diverse editorial boards with authors submitting manuscripts from all compass directions. The words *higher* and *research* further support that our studies from geography education were permeating academia, our main audience.

To account for the quality of those journals citing *JGHE* (2010), WoS citations counts are examined here. The WoS is the premier database for just the highest quality research appearing in the sciences, social sciences, arts, and humanities. Thirty-two of the 37 (86.5%) articles from the *JGHE* (2010) were cited at least one time. This reconfirms the quality and dominance of the *JGHE* found in our earlier studies (Albert & Cassidy, 2017; Albert, Gerrish, & Adu-Prah, 2017). However, only five articles reached ripple status with at least ten citations; none managed to break into wave or splash status so far. The articles with the highest citation counts were "Podcasts in Support of Experiential Field Learning" from Jarvis and Dickie (34-2-2) and "Employability of German Geography Graduates: The Mismatch between Knowledge Acquired and Competences Required" from Hennemann and Liefner (34-2-5) with 21 WoS citations each. As the reader might recall, these same articles received splash status overall, that is, over all item types (articles, books/chapters, etc.).

Books/Chapters

Books or book chapters cited articles from the *JGHE* (2010) 88 times, with 26/37 (70.2%) of its articles cited. Google Scholar captured 80% and Scopus 52% of the citations; 20% registered with Scopus but not Google Scholar. This illustrates that using Google Scholar with Scopus enhances searches for citations in books and chapters. The average citation year for Google Scholar and Scopus was almost the same at 2013.9 and 2013.7. Eleven of *JGHE's* articles were uncited in books or book chapters after seven and one-half years; another nine articles managed one citation over the same period. Two articles garnered 11 cites each for 25% of the total for this item type. These were Mitchell and Forer's (34-1-7) "Blended Learning: The Perceptions of First-year Geography Students" and Hennemann and Liefner's (34-2-5) "Employability of German Geography Graduates: The Mismatch between Knowledge Acquired and Competences Required."

Again, these two *JGHE* articles were among the most cited overall and across the article and book/chapter item types as well.

Even if we examined every item closely, it would be difficult to assess whether these books and chapters were targeting geography or nongeography audiences. This is because readers might be experts in both fields, nevertheless, examining the titles for keywords: 1) geography(ies), GIS, and GIS&T, 2) learning, education, and pedagogy, and 3) overlapping words from set 1 and 2 allow us to place, albeit coarsely, the reading audience along a continuum. Those titles with just words from set 1 are marketed for geography, those with just words from set two are for education, and those with a combination of words from set 1 and 2 are perhaps targeting those audiences recognizing the synergy between both fields (Table 2). Thirty-six of 56 words (64%) from these titles included *learning*, *education*, or *pedagogy* without reference to *geography* or *GIS/GIS&T*. While this is simplistic, it supports the notion that *JGHE* (2010) citations were filtering into books and chapters targeting education professionals.

Table 2
Keywords from Titles of Books and Chapters Citing Journal of Geography in Higher Education (2010) from 2010-2017

Set 1		Set 3	Set 2	
Geography(ies)	6	8	Learning	25
GIS/GIS&T	6		Education	16
			Pedagogy	3
Word Count	12		*Word Count*	44

Conference Papers/Proceedings

Conference papers, at least in geography, are often viewed as inferior to articles published in *bona fide* journals. For up-and-coming scholars, the peer-review journal article is the gold standard. This might explain the low number (33) of citations from the *JGHE* (2010) registering in conference proceedings. Google Scholar found 30 of the 33 citations from conference proceedings; Scopus 10 citations, and three of these even evaded Google Scholar. This is a miniscule stream of citations (4.4%); nonetheless, it is a reminder that Scopus canvasses peer-reviewed conference proceedings. The most cited article (8 cites, 24.2%) within this item type is titled "Blended Learning: The Perceptions of First-year Geography Students" from Mitchell and Forer (34-3-7). While not reaching even ripple status, this particular article has shown amazing utility, reaching number one status in another category— conference proceedings. With the proliferation of online courses and programs, including various hybrids between online and face-to-face platforms, it is understandable that an article about e-learning gained some followers.

Theses/Dissertations

The 37 articles from the *JGHE* (2010) were cited 161 times in theses and dissertations with most of these hits captured with Google Scholar (Table 3). These citations were almost three times more prone to be found in dissertations than in theses (72.0% versus

27.5%). Since dissertations are the pinnacle of the Ph.D., a higher degree than the master's degree and its thesis, it is understandable that more citations were found in dissertations. The discipline citing the articles from *JGHE* (2010) the most was education with 90 citations (55%). Again, dissertations rather than theses accounted for the overwhelming citation counts in education. Thirty-one (19.3%) of the citations from theses and dissertations were from geography, followed by 9 (5.6%) from communications or speech communications. Theses and dissertations from an assortment of degrees from business, business and technology, psychology, tourism, meteorology, environmental education, and others, registered 31 citations (19.3%). Three of the 37 articles from the *JGHE* account for almost half (46.6%) of all the citations in this item type. These include studies from Alberts, Hazen, and Theobald (34-3-8), Cotton, Stokes, and Cotton (34-3-9), and Dibiase and Kidwai (34-3-1). That the more cited articles revolve around students' behavior, attitudes, and experience is enlightening and supports an increasing consumerism approach to higher education. Our data support the notion that information generated in the *JGHE* (2010) was diffusing across academic lines, particularly into the disciplines of education.

Table 3
JGHE (2010) Articles Cited in Theses and Dissertations by Discipline from 2010 to June-August 2017

Discipline	Masters Theses	Doctoral Dissertations	Total
Geography	12 (7.5%)	19 (11.8%)	31 (19.3%)
Education	17 (10.6%)	73 (45.3%)	90 (55.9)
Communication	5 (3.1%)	4 (2.5%)	9 (5.6%)
Others	11 (6.8%)	20 (12.4%)	31 (19.3%)
Total	45 (27.5%)	116 (72.0%)	161 (100.1%)

Note: Total percentage does not sum to 100 because of rounding values to nearest tenth.

Other and Unidentifiable

There are too few items in this type to made definitive statements. This is especially so because 12 of the 32 items citing *JGHE* (2010) articles are unidentifiable and not verifiable. It would also not be appropriate to attribute too much credence to items cited a single time. Nonetheless, the range of items types is impressive, with citations appearing in blogs (i.e., learning contracts for student behaviors, extending shelf-life of instructional videos), a wiki on technology in education, and a color and glossy paged booklet on blended learning from the Nellie Mae Education Foundation. There was also a final report on increasing class engagement in large psychology classes, a presentation from the 2011 Royal Geographical Society/Institute of British Geographers Annual Conference in London, and a teaching and learning seminar at the University of Reading. Most venues are targeting nongeographers in the teaching and learning fields in education, educational technology, and psychology.

Conclusions

What can be said about trends in geography education after our three studies? Were the streams of communication one- or two-directional? The flow of information occcured two-way; these studies have shown that geography education scholars have engaged with the larger geography community and with pedagogists from the disciplines of education. For example, more than half (56%) of the *JGHE*'s (2010) citations found in theses and dissertations were from education programs.

Is the information flow confined to academic venues; that is, were citations exchanged to and from journals and books—the standard measure of success in academia? Mostly, although we have found a low level of exchange filtering into reports, blogs, pamphlets, wiki, and student presentations. If not, were there connections between academic and applied circles that link students, teachers, and professional organizations with research insights and initiatives? Our attempts to find research from geography education filtering into applied circles failed to generate much, as a search of the Open Syllabus Project demonstrated. In other words, "is geographic research being operationalized in the classroom, workshops, newspapers, and wherever geography is happening?" It is difficult to answer this question, as it is possible for research to generate enormous change without generating many "hits." For example, Dr. Leo Tan's (2016) advocacy to green Singapore's urban landscape is visually noticeable, though few citations exist to "prove" his efforts.

Has the status of *JGHE*, and by default the field of geography education, been enhanced from 2000 to 2010 and where is it in now (2017)? Yes, our research has documented that geography education scholars have gravitated away from producing simple studies on teaching methods and strategies to those on learning and thinking (Albert & Cassidy, 2017; Albert, Gerrish, & Adu-Prah, 2017). However, with this research shift toward learning and thinking, we should guard against such studies becoming generic and a mere backdrop to influences outside geography (i.e. disciplines of education). The National Center for Research in Geographic Education (NCRGE) has announced a "new research-based approach" labeled Powerful Geography designed to promote a geography that teachers, students, and society need. This initiative hopes to "expand opportunities for all students to experience powerful geographic knowledge in schools" (NCRGE, 2017). Powerful Geography, with its emphasis on practical knowledge and experience, might offer an appropriate balance with learning and thinking oriented research and it reliance on theory. The field of geography education enjoys an enhanced status with a cadre of established journals, a revamped *Focus on Geography*, and up-and-coming new journals such as *Review of International Geographical Education Online, European Journal of Geography*, and *Journal of Research and Didactics in Geography.* Over the last decade, we have been exchanging information (citations) with the larger geography community and the disciplines of education. It is understandable the most cited articles from geographers were those sharing our tradition and expertise with field teaching and learning, and our role in training students for applied careers using geographic perspectives and geospatial technologies. We are not speaking

into a void, but this study documents that there are those outside the realm of geography that are listening.

Appendix A

Articles from Journal of Geography in Higher Education, volume 34 (2010)

Volume, Issue, Number	Article Title	Author (s)	Pages
34-1-1	Transition and Renewal	David Higgitt	1-5
34-1-2	Creating a community of support for graduate students and early career academics	Kenneth E. Foote	7-19
34-1-3	Lost in Translation: Cross-Cultural Experiences in Teaching Geo-Genealogy	Paul A. Longley, Alex D. Singleton, Keiji Yano & Tomoki Nakaya	21-38
34-1-4	First Steps Towards an Interactive Real-time Hazard Management Simulation	Alastair M. D. Gemmell, Ian G. Finlayson, & Philip G. Marston	39-51
34-1-5	Lifelong Learning and the Professional Development of Geography Teachers: A View from Slovenia	Karmen Kolenc Kolnik	53-58
34-1-6	Challenges and Opportunities in Cross-cultural Geographic Inquiry	Sonia Wesche, Niem Tu Huynh, Erin Nelson, & Leela Ramachandran	59-75
34-1-7	Blended Learning: The Perceptions of First-year Geography Students	Phillipa Mitchell & Pip Forer	77-89
34-1-8	Student Preparation for the International Environmental Profession	Ian Thomas & Barry Meehan	91-107
34-1-9	Geography Undergraduates into Teaching: A Five Year Experiment	John Bradbeer	109-124
34-1-10	Students as Tour Guides: Innovation in Fieldwork Assessment	Neil M. Coe & Fiona M. Smyth	125-139
34-1-11	Assessment based on exercise work and multiple-choice tests	Jan ketil Rød, Sveinung Eiksund & Olav Fjær	141-153
34-2-1	Teaching Research Methods Courses in Human Geography: Critical Reflections	Valorie A. Crooks, Heather Castleden & Ilja Tromp-van Meerveld	155-171
34-2-2	Podcasts in Support of Experiential Field Learning	Claire Jarvis & Jennifer Dickie	173-186
34-2-3	College Science Students' Perception Gaps in Preferred–Actual Learning	Chun-Yen Chang & Yueh-Hsia Chang	187-203

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