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Higher education research in Asia: an archipelago, two continents or merely atomization?

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Abstract This study analyzes higher education research in Asia since the 1980s, based on internationally indexed publication data, focusing on research approaches and themes. The analysis is based on scientometrics, science visualization, and social network analysis measures and methods. We find an increase in the number of higher education publications in both specialized and non-specialized higher education journals, although at a much faster rate in the latter. Based on the results of a community algorithm, research themes were grouped into two research approaches in line with theoretical expectations on the organization of higher education research: (1) teaching and learning approach and (2) policy approach. We found these approaches to have an equivalent representation in both specialized and non-specialized journals, although the system policy theme is found to be highly influential of other themes in specialized journals. However, a scholarship schism between the approaches is evident. Further, in the 1980s, the policy approach was dominant in Asia, while in the 2000s there is greater focus on the teaching and learning approach. A further analysis of eminent researchers of higher education in Asia confirmed the schism and indicated a slight cross-fertilization between higher research approaches, but also found evidence of the isolation/atomization of these scholars.

Keywords Higher education research · Asia · Scientometrics · Science visualization methods · Social network analysis · Higher education as a field

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Introduction

As higher education across regions is confronted by economic, social, cultural and political challenges, higher education researchers continue to seek answers to tackle these challenges (David 2011; Shin and Harman 2009; Altbach et al. 2007; Tight 2003; Jones 2012). Due to the complexity of these challenges, research topics have diversified, thereby suggesting a broadening of scope and approaches (David 2011; Tight 2004). This broadening diversity characterizes higher education researchers well. Higher education research has been conducted by scholars with different backgrounds—including social scientists, educators, and administrators—occasionally drawing as much from their experience as from the literature and influenced by diverse disciplinary roots including economics, public administration, sociology, and education (Morley 2003). In a recent article, Macfarlane (2012) refers to the higher education research archipelago to describe this diversity, but argues emphatically regarding a schism between two higher education research approaches, previously revealed by Tight (2003): policy and teaching and learning approaches. He further argues that currently the research focus has become increasingly concentrated on teaching and learning, a change in scholarship associated with the growth in academic development and research activities focused on student learning (Macfarlane 2012).

The evolution of higher education research as a field has not been linear, as it seldom is in any scientific field. Higher education has garnered increasing interest due to its role in the knowledge society; thus, research on higher education has been growing during the past decades, becoming a more established and attractive research area (Altbach et al. 2007; Tight 2012a). However, despite developments, scholars affirm that higher education research continues to be limited by an absence of theory (Tight 2004), methodological monism (Keller 1998), monotony of paradigm (Milam 1991), disconnection from practice and policy (Terenzini 1996), and an inward-looking, parochial nature (Conrad 1988). It has also received marginal attention from policymakers. Dennison (1992) ironically stated that higher education has become a major area of public expenditure, while higher education research receives relatively little financial support. Moreover, despite the developments, higher education research still remains relatively under-researched (Tight 2004).

A good example of this is reflected in Asia, one of the most dynamic regions in the world in terms of higher education. Most of its higher education systems are undergoing a fast process of massification, reforms are taking place at unprecedented levels in recent years, and the drive for internationalization and quality in research and education has been relentless (Marginson 2011; Shin and Harman 2009). As Naidoo (2011) argues, the rise of higher education in Asian countries is of major interest as it is wielding increasing political and cultural influence globally. However, Atkinson (2013) notes an under-representation of Asian scholars in higher education research in specialized journals, but indicates that they are much better represented in other non-specialized journals (mainly education journals) while dealing with subjects related to higher education. Similarly, Jung and Horta (2013) analyze journals specializing in higher education and find that higher education research in Asia is at its infancy, concentrated in East Asia, regionally unarticulated, somewhat internationalized, but with limited visibility. They also found that in Asia, the higher education research effort is highly dependent on a few isolated scholars rather than on research groups.

In this context, this study contributes to the literature on higher education research by empirically assessing Macfarlane's (2012) assertions regarding higher education research. It does so by focusing on one of the most dynamic evolving regions of the world in terms of higher education: Asia. To do this, we analyze the evolution of higher education

research in Asia in terms of the evolution of the number of articles focused on higher education published in international indexed specialized and non-specialized journals between 1980 and 2012. Then, based on Tights' (2004, 2012b) framework of higher education research themes, we assess if a scholarship schism is identified in higher education research in Asia and how the main themes of interest of higher education evolved in terms of publication focus. Then, following scientometric methods, we deepen the analysis by focusing on eminent researchers in higher education research in Asia to determine their relations in terms of collaboration with and referencing one another. This is intended to ascertain the "isolation" of Asian higher education scholars, as suggested by Jung and Horta (2013) but from a different perspective since these authors' analysis of higher education research in Asia was mainly focused on national and institutional levels.

The remainder of this article is organized in the following manner. First, we present a brief characterization of higher education research, followed by a description of the methods used in the analysis. Thereafter, the analysis results are presented and discussed and a conclusion summarizes the main findings of the article.

What is higher education research?

Higher education research is described as an "open-access discipline" (Harland 2012: 1) and a "multiple series of intersecting cognate fields" (Macfarlane and Grant 2012: 1). It relies theoretically on the humanities and social sciences, borrowing from a variety of disciplines to define and add intellectual substance to its own (Davis et al. 1991). Its academic community is characterized as "tribes or communities of practice" (Tight 2008: 594), but due to the broad range of themes and multidisciplinary nature of higher education research, it might be perceived as something that "virtually anyone can do" (Harland 2012: 705). In fact, a large group of higher education researchers is described as "part-timers" since they only get involved in higher education research when they are motivated with a specific subject based on their own academic background rather than based on specific training or specialization in higher education (May 1997; Harland 2012). Indeed, the main issues in higher education research tend to be "problem solving" or "object-oriented" ones to respond to social changes and challenges (Teichler 1996). Table 1 shows that the range of topics and facets in higher education research is remarkably broad but also that higher education scholars have long been concerned with providing a clearer characterization of the field (for example, see Teichler 2005).

Identifying themes in higher education research is important to contextualize and connect with new forms and research practices (David 2011). Tight (2004) abridged two dominant approaches to higher education research: one is a policy critique focused mainly on national and institutional levels, while the other is more focused on teaching practices and activities, learning, and course design issues.

Policy studies have been traditionally considered a key area in higher education research, influencing policy decisions and institutional practices (Dennison 1992). Policy issues related to accountability, affordability, access, and equity are prominently identified in many higher education studies (Conner and Rabovsky 2011). Research that focuses on quality assessment and governance has been gaining relevance due to the policy drive to make institutional practices and policies more effective and efficient (David 2011). In alignment with this trend, institutional management issues have been receiving further attention and there is an increased number of studies on the topic; some of them have been identified as institutional research, although scholars argue that the gap between

Table 1 Examples of research themes, topics and facets in higher education

Silverman (1987)	Academics and research Personnel Institutions State and national Discipline approaches Sectors
Volkwein et al. (1988)	Faculty issues Administration/management/governance Research issues/methodologies Students service/issues Curriculum/instruction Outcomes/growth Economics/finance Sociology/demographics Organizational effectiveness/climate Gender/minority/affirmative action Community colleges International/comparative studies Legal/ethical issues External relationship/environment Adult/non-traditional education Technology/information system
Altbach (1991)	Academic freedom Academic profession Accountability Costs Expansion of higher education Foreign students Graduate education Higher education and the labor market History New universities Private higher education Student political activism University reform Higher education in developing countries Woman and higher education
Clark and Neave (1992)	National systems of higher education Higher education and society The institutional fabric of the higher education system Governance, administration and finance Faculty and students Teaching, learning, and research Disciplinary perspectives on higher education Academic disciplines
Teichler (1996)	Quantitative structural aspects Knowledge and subject related aspects Person related, teaching and research related aspects Organization and governance aspects
Frackmann (1997)	Role and function of higher education Nature of knowledge and learning Coordination mechanisms between society and higher education Learning and teaching Higher education and European integration
Hayden and Parry (1997)	A focus on higher education policy An emphasis an academic practice

Table 1 continued

Tight (2004, 2012a, b)	Teaching and learning Course design Student experience Quality System policy Institutional management Academic work Knowledge and research
David (2011)	Mass global expansion in relation to social stratification Social mobility and the links with new skilled forms of employment Widening access and participation in higher education Social change and higher education

institutional research and other higher education research remains considerable (Altbach et al. 2007).

Concurrently, there is a growing focus on studies on teaching, learning, and assessment in higher education. These studies aim at improving learning processes, pedagogy, curricular structures, and create better ways to measure learning outcomes. These studies are also characterized by an increased interest in the evaluation of teaching, measurement of instructional outcomes, and assessment of teaching practices (Altbach et al. 2007). Studies that focus on student learning issues, including those related to the integration of students in the social and learning environment have always been steadily researched as central issues in higher education (e.g., Teichler 2007).

One of the main issues between these dominant approaches is their perceived mutual exclusiveness—they seldom reference or communicate with one another and exist as independent entities that do not share knowledge as much as desirable; this indicates the existence of a schism. Thus, Macfarlane (2012: 130) uses the metaphor of a "sea of disjuncture" to describe the gap between the two dominant research approaches to higher education. In this article, using Tights' (2004, 2012) research theme framework and internationally indexed publication data for Asia, we empirically assess this schism in Asian higher education research.

Methods

Drawing from the SCOPUS dataset, the study analyzes higher education articles published by researchers with Asian affiliations in internationally indexed literature from 1980 to 2012 (see "Appendix").[1] Publication information was gathered first from specialized journals in higher education following the methodology used in similar studies (e.g., Hutchinson and Lovell 2004). This approach uses articles from specialized higher education journals as a meaningful process to identify higher education researchers and communities, as these research communities use specialized journals to preferably divulge research results, update the field knowledge pool, and communicate with authors in the

[1] The higher education literature analyzed in this article refers mainly to publications written in English, the most common language found in indexed international journals datasets such as SCOPUS (Wagner and Wong 2012). Although not included in the analysis of this article, Asian countries have scholarly communities in higher education research that publish their research in national scientific outlets, in the country's native language.

same field (Budd and Magnusson 2010). However, it is known that many articles on higher education are published in non-specialized higher education journals. Thus, publications in specialized higher education journals provide limited information as they encompass only the more engaged community of higher education researchers (Goodwin and Goodwin 1985). This has been considered a limitation of previous studies that analyze higher education research because a considerable amount of research could be omitted from the analysis (see Hutchinson and Lovell 2004)—in particular, research conducted by "part-time" researchers (Harland 2012).

Therefore, the publications data collection was expanded to encompass publications that focused on higher education in non-specialized journals. These were identified in the SCOPUS dataset, through a Boolean search of the words "higher education" and "tertiary education" in the title, keywords, and abstracts of publications beyond specialized higher education journals, published between 1980 and 2012. Articles in the specialized and non-specialized journals will permit a richer analysis regarding potentially similar or dissimilar thematic trends among both the more-engaged and less-engaged higher education researchers.

Through this process, we first identified 36,058 articles. This first sample was reduced to include only publications of researchers with Asian affiliations, following Jung and Horta's (2013) methodology. This resulted in a data set with 9,690 articles. However, we filtered out 6,362 articles that were included in the search results due to the fact that the keyword "higher education" showed up in the name of a publisher (for example, "Higher Education Press"). This reduced the data set to 3,328 articles. Further screening of the data enabled the elimination of duplicate items and articles that could not be considered higher education research. These were often health-science studies that used "higher education" as an independent variable to predict dependent variables related to health condition, illness risks, or smoking habits. After each publication was screened, we obtained a final data set of 2,339 articles.

This data set is analyzed on the basis of science visualization, scientometrics, and social network analysis methods. Our analysis is based on Tight's (2004) research thematic framework, to which we added internationalization as a theme due to its growing influence in higher education, massive worldwide interest, and increasing number of publications on the topic (see Kehm and Teichler 2007). The themes were coded from 1 to 9. Each article was assigned a single or multiple codes after reading each article's abstract, keywords, and often introduction and conclusion. Multiple codes were assigned to articles whose subject and focus encompassed more than one theme. In adapting a pragmatic, mixed categorization of themes, we followed Tights' (2004, 2012b) methodological recommendation. After this classification process, a clustering/community algorithm, using the Louvain method—a heuristic method that is based on modularity optimization of large network datasets—was run using the software GEPHI. This algorithm identifies communities as sets of highly interconnected nodes through a three-stage modularization process and is known for its optimization accuracy (for details on how the algorithm works see Blondel et al. 2008). Full randomization of the data was applied to enhance data decomposition, thus further refining the accuracy of the modularization (i.e., identification and grouping of similar nodes and communities).

To test Jung and Horta's (2013) proposed argument on the isolation of higher education researchers in Asia, we draw from the scientometrics literature on eminent researchers. These researchers are known for serving as benchmarks based on which the research communities gauge their own research trajectories and success, but also have also a disproportional effect on leading scientific fields (Heidler 2011; Parker et al. 2010). These

characteristics make them appropriate for studying not only community associations in terms of research approaches since they regularly focus completely or majorly on one main research approach, but also as researchers, thereby enabling us to perceive the connection and influence among eminent higher education researchers in Asia. To do this, we analyze co-publication and citation patterns. Twenty-four authors were identified as those who had publication output between 1980 and 2012 and were in the top-quartile of the most frequently published scholars in higher education in Asia (see Hunter and Kuh 1987).

Results

We begin by examining the evolution of higher education research in Asia as measured by the number of articles published in specialized higher education journals as well as in all journals. Figure 1 depicts the quinquennial evolution of higher education publications in Asia between 1980 and 2012. The analysis shows that up to the mid-1990s, 60–85 % of all articles on higher education were published in specialized journals. This began to change from this period onward as it witnessed exponential growth in the number of higher education articles in non-specialized journals particularly since the mid-2000s, but following a more modest growth during the mid- and late 1990s. This indicates two trends. The first trend is that interest in publishing about higher education themes has been increasing at an accelerated rate in Asia, and that this growth rate has been constantly increasing. From 1980–1984 to 1990–1994 there was a 38 % increase in the number of articles published, followed by a 4.5 times increase from 1990–1994 to 2000–2004, and a seven times increase from 2000–2004 to 2008–2012. The second trend refers to the changing relevance of non-specialized journals for higher education research: in the 1980s, most articles were published in specialized journals, while in the 2000s, an average of 25 % of the articles were published in specialized journals.

These trends can have two explanations. The first is that most growth occurs in non-specialized journals because it is where this publication growth rate can take place. Although there has been an increase in the number of higher education journals, including the frequency of volumes and issues of these journals, specialized journals would be incapable of accommodating such publication growth rates. There is more demand (interest in publishing articles on higher education) than supply (space for publishing articles in specialized journals). The second is that non-specialized journals reflect a mixture of publishing patterns and trends. These include one-time only articles—often, but not exclusively, written by scholars from the health sciences or engineering fields—that are concerned with the evolution of teaching in the field and published in the corresponding field literature (e.g., articles on curriculum reform in chemistry education published in Chemistry journals). Several articles belonging to this genre were identified in the data. The one-time only publication pattern is not an exclusive pattern of higher education articles published in non-specialized journals. Jung and Horta (2013) found that 66 % of Asian authors published articles in specialized higher education journals only once.

Other articles in non-specialized journals may be written by "part-time" scholars, as identified by Harland (2012). Such authors tend to publish in non-specialized journals because it is less demanding in terms of reviewing as compared to more specialized journals (Tight 2012b). In our sample, there are 46 % more articles on higher education research written by Asian scholars in general education journals than in specialized higher education journals. However, this encompasses other trends related to the need of higher education researchers in Asia to broaden their publication outlook. In this context, several

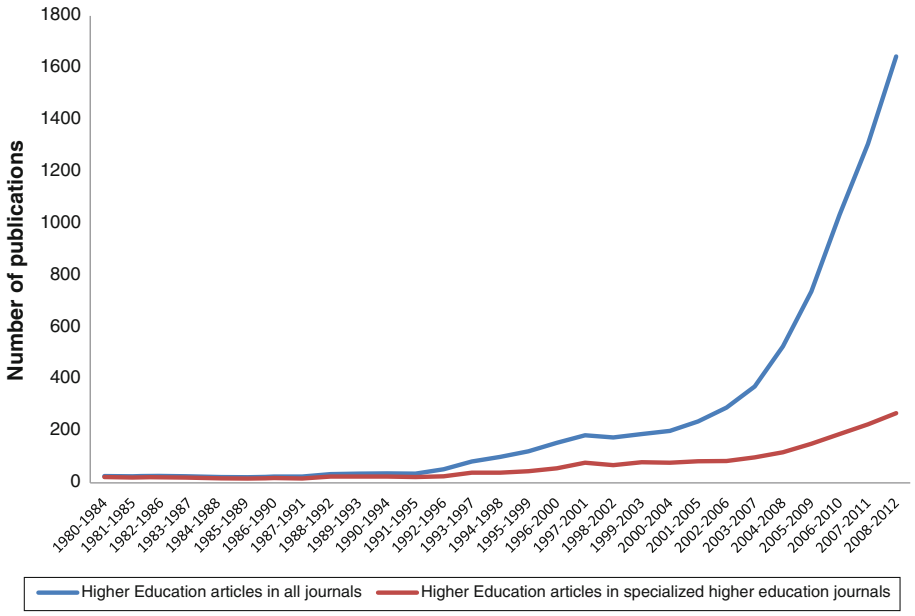
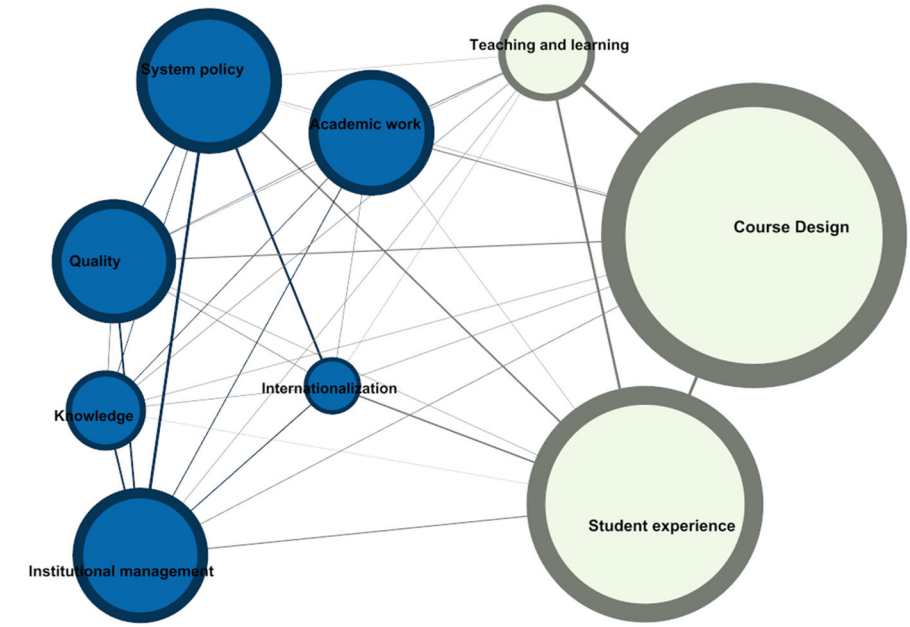


Fig. 1 The evolution of higher education publications in Asia, 1980–2012

articles in non-specialized journals were found to be authored by leading higher education researchers in Asia, who publish in both specialized and non-specialized journals. This is related to findings that indicated that research in higher education is becoming increasingly diverse and fragmented, not only in terms of themes but also publication targets (Jones 1997).

With regard to the characterization of higher education research themes in Asia, Fig. 2 depicts all published articles on higher education research in Asia and those published in specialized journals since 1980–2012, according to research themes. The results obtained from running the Louvain algorithm reveal the existence of two distinct communities, meeting the general expectations in literature regarding the thematic composition of each group (Macfarlane 2012; Tight 2012b). One community, identified as the teaching and learning approach, encompasses the themes of course design, teaching and learning, as well as student experience. The other community, identified as the policy approach, encompasses the themes of system policy, institutional management, academic work, quality, knowledge, and internationalization. This result is in line with the approach schism argued by Macfarlane (2012) and is consistent with the remarks of Macfarlane and Grant (2012) that the higher education field has been characterized by a bifurcation as scholars who have generally coalesced around policy-based studies or learning and teaching research. Interestingly, this schism is observed both in specialized journals and the entire literature (including non-specialized journals).

However, when examining these figures, one needs to consider the extent of this schism and how difficult is it to cross the "sea of disjuncture" between these two higher education research approaches. This is important since Macfarlane and Grant (2012) argue that the lack of communication between these two research communities may partially explain the challenge in establishing higher education as a coherent field. By analyzing the links between themes derived from articles that incorporate several thematic areas in a more or



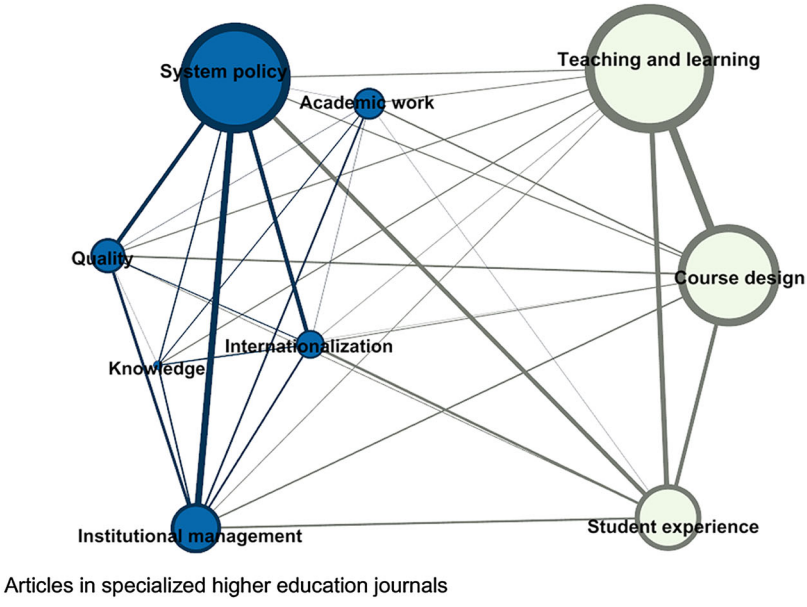


Fig. 2 Analysis of higher education research articles (in Asia) following Tights' themes framework

less overlapping manner (Tight 2012a, b), as expected, the strongest linkages exist between themes that belong to the same research approach. The strong links between teaching and learning and course design, and those between system policy and institutional management are illustrative of this argument. However, there are themes where there seems to be a

bridging between the two research approach areas and this can be observed in all publications on higher education as well as those in specialized journals. These thematic bridges refer to the linkages between student experience and system policy, which ranks fifth in the strongest links between all the themes in higher education specialized journals and eighth in the all higher education articles out of a total of 36 identified linkages between all themes. This is complemented to a lesser extent by the strong links between student experience and internationalization, which ranks ninth in the areas with strongest links in both the entire literature and specialized higher education literature. This thematic bridging suggests interesting potential cross-fertilization of knowledge between the two research approaches and assumes particular importance when higher education scholars argue for the need to strengthen the higher education research community though knowledge sharing and links between diverse thematic specializations (Jones 2012).

Other interesting trends emerge from the analysis of Fig. 2. One is related to the size of the themes in terms of the number of publications. Teaching and learning, system policy, and course design are the three themes with the most articles published in specialized higher education journals, while course design, student experience, and system policy are the three themes with the most articles published in all higher education publications. These results suggest a relatively similar trend concerning the most published themes, since course design and system policy are amongst the themes with the most articles published in all higher education literature as well as in specialized journals. This is further confirmed by the fact that the volume of articles published in the teaching and learning and policy approaches was basically the same—49 % of all articles published by authors with Asian affiliations were focused on teaching and learning approach issues, while 53 % of articles published in specialized journals were on the same research approach.

Some differences do emerge when the weighted degree of each research theme (node), which takes into account all the links between themes (i.e., the articles that combine more than one research theme) is calculated. In social network analysis, the weighted degree of a node refers to the number of ties that one node has to other nodes in a network and is a typical centrality measure (see Opshal et al. 2010). The analysis shows that these differences are not as great as some scholars predicted based on the growth of a magnitude of policy-related issues such as new managerialism, marketization, entrepreneurship, and others (e.g., Tight 2012b). At least, these differences are not as great for higher education researchers based in Asia. System policy, institutional management, course design, teaching and learning, and student experience are themes above the network average weighted degree (avd) in both all literature papers (avd: 140) and in specialized higher education journals (avd: 69). This implies that in both cases, the themes with the greatest influence and impact in the higher education research field are the same. The differences appear in the extent of influence of each theme in the overall higher education literature and in specialized journals. Some themes have more influence in all papers produced—namely, institutional management (181), course design (180), and student experiences (171); while in specialized higher education literature, system policy (105), institutional management (88), and course design (86) are the most influential themes.

Taking into account these results, it is plausible to argue that one of the reasons why scholars believe that specialized higher education journals tend to be more policy oriented is due to the fact that the weighted degree of the theme system policy (a key theme of the policy approach in higher education research) is 52 % higher than the network average weighted degree. This theme has a very high centrality and, thus, a disproportionate influence on the remaining thematic areas focused on in these journals. Course design, the most central theme identified, belonging to the teaching and learning approach has a degree

centrality of only 25 % higher than the average network weighted degree; however, this is still lower than institutional management, another thematic area of the policy approach, which is 28 % higher than the average network weighted degree. This trend is not reflected in all articles on higher education written by Asian scholars where a top centrality parity is observed between institutional management and course design, with both themes having a much lesser prominence in relation to the average network weighted degree (both approximately 29 % higher).

While Fig. 2 presents the aggregate data analysis of the themes in higher education in Asia, Fig. 3 depicts the dynamic evolution of the themes. Based on all higher education publications, the themes are ordered in the figure according to the research approach that they belong to, as identified though the analysis of Fig. 2. This enables the chronological analysis of the literature with a focus on the two higher education research approaches in Asia. The analysis shows that during the 1980s, the policy approach was dominant and the focus on system policy issues is apparent. Research on this theme represented 30–40 % of all publications in higher education research until the early 1990s. Issues of system diversification, privatization, massification, and organization of higher education at the macro-level are among the core issues dealt with in higher education articles during this period. At the time, several Asian countries, particularly those in East Asia, were quickly massifying their higher education systems. An example of this fast massification can be perceived by the gross enrollment ratio in tertiary education in South Korea and Japan—29 and 32 %, respectively, in 1985 from 17 to 8 %, respectively, in 1971.

Since the early 1990s, the two main research approaches have maintained a relative state of equilibrium in terms of number of articles published. As the publication focus in the system policy theme proportionally decreased in the 1990s, there was a rise in the number of articles published in the teaching and learning approach. The areas of interest began changing from quantity, associated with the expansion of higher education enrollment, to quality issues and concerns regarding providing a better learning experience and quality to those participating in higher education. Policymakers and higher education scholars began considering several aspects of quality after attaining a certain level of massification (Shin and Harman 2009). This thematic evolution fits well with Teichler's (1996) "chronology" of changing themes in higher education responding to social change in Europe, although within a different time frame for higher education in Asia.

However, the 1990s also marked a growing number of articles published in non-specialized journals (see Fig. 1) mainly from researchers in economics, agriculture, engineering, and the health sciences (see Harland 2009). These publications are overwhelmingly focused on the teaching and learning approach. Since the early 1990s, the analysis shows that, on average, the number of articles published in the teaching and learning approach are 8 % more than those in the policy approach. Interestingly, throughout the period under analysis, the number of publications on student experience issues has maintained a very stable level of interest (approximately 20 % of the total publications in higher education research). Further, what is remarkable is the little interest in internationalization issues, as the field accounts for a mere 5 % of all the articles published by higher education researchers with Asian affiliations in the most recent years, with periods of indifference during some periods.

To assess the extent of the schism between the policy and the teaching and learning approaches and to ascertain the "isolation" of Asian higher education scholars, as suggested by Jung and Horta (2013), this analysis is focused on the core researchers in Asian higher education research. Figure 4 illustrates the collaboration patterns among these researchers by co-authorship analysis. Publication co-authorship represents the most

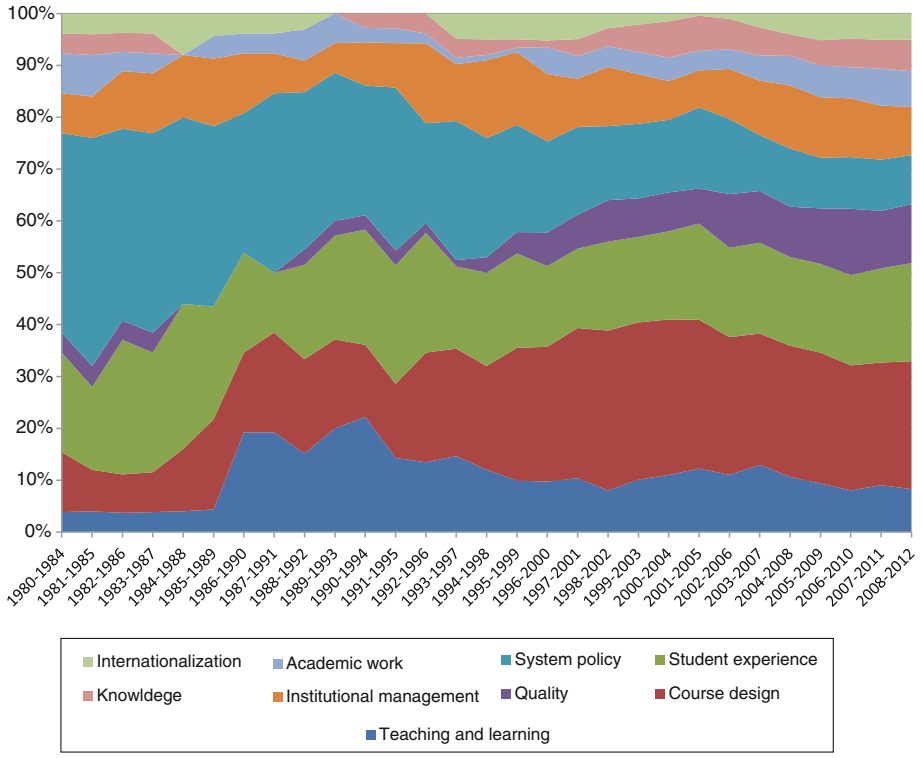


Fig. 3 Evolution of topics in Asian higher education research

reliable method of observing collaborative activity while unveiling relevant aspects of research collaboration (Acedo et al. 2006). The key aspects determining collaboration among peers are scientific excellence, complementarity, and search of external knowledge, which leads to knowledge transfer and cross-fertilization between fields and disciplines (see Jeong et al. 2011). The Louvain algorithm was once again run to identify co-authorship communities—"research groups"—based on co-authorships. The analysis shows that the 24 higher education researchers that publish the most in Asia seldom collaborate with one another, as measured by co-authorships, and that there are almost as many "research groups" as researchers (18 "research group" communities among 24 researchers).

The eminent researchers in Asia that co-author publications with one another also belong to the same higher education research approach: Kember, Ho, Hong, and Leung represent a teaching and learning "research group" that has only weak links —through Ho—with the other teaching and learning "research group" comprising Watkins and Prosser. Chen J-K and Chen I-S are the only eminent researchers that co-author publications in the policy approach, while Yang C.-C. and Chen, S-H. co-author publications in both the policy and the teaching and learning approaches. No linkages through co-authorship exist between any of these research groups. Strikingly, most eminent researchers do not co-author publications, and the other researchers that they co-author with do not have articles published in co-authorship with any of the co-authors of other eminent scholars. This indicates that the "isolation" argument raised by Jung and Horta

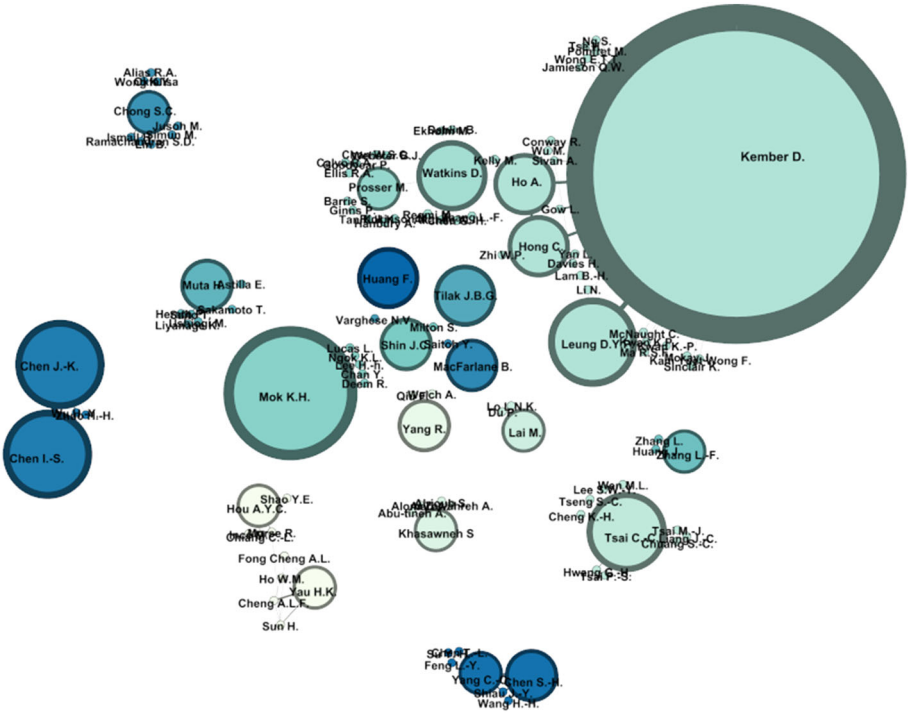


Fig. 4 Co-authorship analysis of the 24th most producing authors in Asian higher education research

(2013) for higher education research in Asia is valid. However, despite co-authorship being considered the most efficient and useful form of measuring collaboration, co-authorship represents a formal means of measuring (successful) collaboration and thus presents an incomplete analytical picture (Lundberg et al. 2006).

Therefore, in Fig. 5 the analysis adopts a different analytical stance as it shows the citation relationship analysis between the same eminent researchers. Citation relationships have been extensively used in scientometrics literature to evaluate and identify disciplinary trends, knowledge structures, and flows (Wang et al. 2012). Figure 5 illustrates a cross-citation network among the 24 higher education researchers in Asia that publish the most, providing a map of knowledge communication among these authors, as well as facilitating an understanding of the knowledge flow through the directionality of the communication dynamic. In other words, it provides an understanding of who cites who in both static and dynamic ways. The first result of the analysis is that there is some disconnection among the authors. Three of the eminent researchers do not cite others nor are cited by the others (Macfarlane, Chong, Yau). Further, two of the "research groups" identified in Fig. 4, the one of Chen J-K and Chen I-S (policy approach) and Yang C.-C. and Chen, S-H. (combining policy and teaching and learning approaches) limit their citations to within the research group, that is, they cite each other's publications but not the work of the other eminent researchers. This again emphasizes the isolation of higher education researchers in Asia and of the field itself.

Cross-citation among eminent researchers seems to occur within the framework of higher education research approaches. The scholars who are more oriented toward the

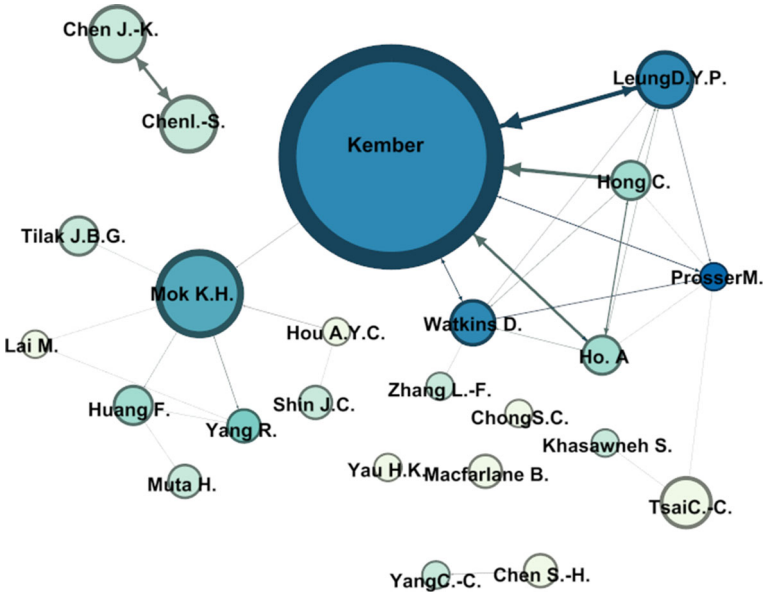


Fig. 5 Citation relationship analysis of the 24th most producing authors in Asian higher education research

teaching and learning approach—including Kember, Leung, Tsai, Watkins, Ho, Hong, Khasawneh, Prosser and Zhang, albeit with varying levels of intensity and directionality—tend to cite one another. The same trend is observed for those scholars who are more oriented toward the policy research approach—including Mok, Huang, Tilak, Shin, Yang, Hou, Lai, and Muta—and their cross-citation patterns are also characterized by varied levels of citation intensity and directionality. In the former group, Kember has the highest value of out-degree citation, thereby implying that he is the most highly cited author (see Vandermoere and Vanderstraeten 2012) in the group oriented toward the teaching and learning approach, while in the latter group, Mok assumes this position. Interestingly, these are the only authors that cite another author from a different approach. This not only confirms the knowledge schism between the two approaches, but the overall citation relationship emphasizes the analytical results of Fig. 4—that is, in addition to the schism between research approaches there is also an atomization ("isolation") of higher education researchers in Asia in terms of knowledge sharing.

Conclusion

The field of higher education research is moving toward achieving greater levels of legitimacy in the worldwide scientific community (Altbach et al. 2007). Policymakers also perceive the field as important as they strive to gain a better understanding of formal learning processes and how to tackle increasingly complex challenges brought about by the role of universities in the knowledge society (Metcalfe 2008). As attested by recent research, interest in the field is growing worldwide, particularly in Asia where the dynamics of higher education are evolving at an accelerated rate (Naidoo 2011). In this article, we identified an upward trend of publications in the field by scholars based in Asia,

mainly in non-specialized journals. There were several explanations for this trend, but two findings are of particular relevance.

One is that there is a relative equilibrium between the publications of the policy approach and teaching and learning approach in both the specialized and non-specialized higher education journals. Apart from identifying the higher education themes belonging to each of the research approaches, this study highlighted the distribution of these approaches in both types of journals. These journals are remarkably similar in terms of thematic approach. The main difference between them is related to the influence that the theme of system policy influences the other themes in specialized journals, thereby leading some scholars to perceive the specialized journal as being mainly policy oriented (Macfarlane 2012). In relation with this finding, we conducted a dynamic analysis of thematic publications in higher education research in Asia. This lead to the conclusion that the focus of higher education research approaches followed the evolution stages of development of higher education in Asia. The early stages of higher education massification seem to be related to a focus on policy approach, which began to be replaced by a growing focus on the learning and teaching approach as the massification processes subsequently stabilized.

Another key finding is that a large proportion of the contributions to higher education literature is from "part-timers" that publish one-time only articles beyond specialized journals (Harland 2012). This trend was already empirically identified in specialized journals (Jung and Horta 2013). The sporadic contributions suggest a fragmented and poorly articulated field (Jones 1997) that continues to grow but perhaps is not developing as it should be. It is possible that contributions that might be of great value to higher education will lie scattered in disciplinary literature, available but at risk of being overlooked and thus unused, a concern that Hobbs and Francis (1973) were already expressing in the 1970s. A continuous engagement of researchers in the higher education community is key for fostering this community (Clegg 2012). However, the analysis of the most frequently published higher education researchers in the region—those strongly engaged in the field—display a large degree of atomization in terms of collaboration and even in terms of referencing one another's work. The latter finding is not so concerning as most eminent researchers tend to cite the work of those working in the same higher education research approach (see Jansen et al. 2010), but each eminent scholar works in isolation from the others, including those in the same higher education research approach. Perhaps more concerning is that almost no cross-fertilization of ideas and knowledge among these scholars was observed between the two research approaches.

This trend is representative of the entire higher education research field in Asia, where the schism between research approaches in higher education argued emphatically by Macfarlane (2012) is empirically confirmed in our study. The teaching and learning and policy approaches to higher education studies do seem to represent separate continents with a sea of disjuncture between them. However, there is some bridging occurring between some themes associated with both research approaches particularly in the theme triangle of student experiences, system policy, and internationalization. This raises hope for a greater integration of research approaches in the future, as these themes are expected to be increasingly significant for the development of higher education in Asia (see Shin and Harman 2009).

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Appendix

Journal list

Chronicle of Higher Education, Higher Education, Research in Higher Education, Assessment and Evaluation in Higher Education, Studies in Higher Education, Innovative Higher Education, Times Higher Education Supplement, Journal of Geography in Higher Education, Journal of Higher Education, Higher Education Policy, Teaching in Higher Education, Internet and Higher Education, Journal Official Journal of the Association of Black Nursing Faculty in Higher Education, Tertiary Education and Management, Journal of Higher Education Policy and Management, Review of Higher Education, Higher Education Quarterly, International Journal of Sustainability in Higher Education, Higher Education Research and Development, Arts and Humanities in Higher Education, Quality in Higher Education, Higher Education in Europe, Active Learning in Higher Education, Journal of Hispanic Higher Education, Journal of Marketing for Higher Education, Journal of Further and Higher Education, Art Design Communication in Higher Education, Journal of Diversity in Higher Education, Alternative Higher Education, Christian Higher Education, Journal of Continuing Higher Education, Perspectives Policy and Practice in Higher Education, International Perspectives on Higher Education Research, Journal of Computing in Higher Education, Assessment Evaluation in Higher Education, Journal for Higher Education Management, Naspa Journal about Women in Higher Education, Higher Education and Research in the Netherlands.

Asian countries:

Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, China, Hong Kong, Macao, Japan, South Korea, North Korea, Mongolia, Taiwan, Afghanistan, Bangladesh, Buthan, India, Iran, Maldives, Nepal, Pakistan, Sri Lanka, Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, East Timor, Viet Nam, Armenia, Azerbaijan, Bahrain, Georgia, Iraq, Jordan, Kuwait, Lebanon, Occupied Palestinian Territory, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen.

Source: Composition of macro geographical (continental) regions, geographical sub-regions, and selected economic and other groupings http://unstats.un.org/unsd/methods/m49/m49regin.htm.

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