

Shaping education policy research in an Asia-Pacific context

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Abstract Globalization increasingly calls for comparing educational policies across countries. In this study, we assemble and analyze academic journal publications of the past decade in order to shape education policy research within an Asia-Pacific context. After examining Asia-Pacific research publication data from the Web of Science, we find a few stylized facts: (1) increasing research collaboration, (2) growing policy evaluation research, (3) swelling empirical research with quantitative methodology and (4) growing attention to higher education. Moreover, education stakeholders show exclusive interest on globalization, private tutoring, and language education policies within and across countries. Finally, we find a significant difference in research impact and diffusion between Asia-Pacific and American education policy studies. Further, we examine what determines research impact and diffusion. Our results indicate that research collaboration, national context, publication year and issue, policy area, and research methodology are significantly associated with publication citations. Based on the findings, we suggest useful implications for future directions on education policy research in an Asia-Pacific context.

Keywords Education policy research · Research impact and diffusion · Asia Pacific Education Review

Introduction

Education reforms undergo nationwide and/or across-countries attention. Policy makers pull out all the stops in

order to design and implement effective education policies for successful development. It is commonly conceived that education policy must be timely and efficacious prescriptions to any problems and challenges that education stakeholders confront. Although public policy is diversely defined, problem solving is taken as granted for its innate and essential role (Lasswell 1971). In this manner, looking into education policy research allows us to better understand the contemporary problems and issues in education for a particular society.

Globalization increasingly calls for a comparison of national education systems and policies across countries. Foremost, one advantage of the cross-nations comparison is sharing precedent decent ideas and solutions to common problems and challenges that plural countries face. In consequence, international cooperative actions could be possibly taken. Moreover, there might be a policy transfer from one country to another in a risk policy failure.¹ Besides its practical advantages, a final advantage of comparing education policies within a consistent theory is related to the production of knowledge that is valid and generalizable across countries (Anderson 1961). There is a growing demand for comparative policy analysis across states and countries (Blömeke et al. 2012; Hanushek et al. 2013). We often observe a large body of literature that examines education policy from either a single country or a few countries with a comparative perspective. Nevertheless, there is a dearth of comparative policy research that draws a map of education policies across countries, particular in an Asia-Pacific context.

In this study, we assemble and analyze education policy studies across Asia-Pacific countries in the past decade.

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¹ See Dolowitz and Marsh (2000) for an extensive review of policy transfer.

Many Asia-Pacific countries—such as Singapore, South Korea, China, and Japan—have been ranked as top countries in international tests, such as PISA and TIMSS, during the last decade. In order to verify the reason of high performance, many researchers and scholars pay attention to education policies implemented in these Asia-Pacific countries. Many education policies in this region have been investigated in order to figure out the impetus of developing an education system across Asia-Pacific countries. By considering that explosive effort for understanding the primary features of Asia-Pacific education policies have been in the last decade, we attempt to examine the trend of education policy researches in this region. The purpose of our study was to overview the recent education policy research across nations, thereby shaping its big picture in an Asia-Pacific context. More specifically, we first classify and summarize education policy studies by research topic, purpose, method, author characteristics including nationality and affiliates, and policy procedural category. Additionally, we compare them with those from a different continent. This method will help us to build a unique picture of education policy research in an Asia-Pacific context. It will also provide an analytic window to contemporary policy issues that Asia-Pacific countries now face in education. Moreover, we focus on the number of citations for a particular article as a metric of its research impact to another (Nightingale and Marshall 2012; Owens 2009). Further, we investigate what factors determine the research impact and diffusion of education policy research. Finally, our significant results will draw useful implications for future directions of education policy research. In doing so, we take advantage of *Asia Pacific Education Review* (hereafter APER), an Asia-based outlet of education policy research.² Since 2005, APER has persistently appeared in the Social Science Citation Index, produced by Thomson Reuters. A great advantage of the index registry is that it offers us with such useful information, such as authors, their affiliates, topics, and citations for every single article.

The structure of this article is as follows. Section “[An overview of education policy research in the past decade](#)” overviews education policy studies from Asia-Pacific

countries and compares them with ones from America. Section “[Research impact and diffusion of education policy research](#)” explores what factors affect the research impact and diffusion of education policy research. Finally, section “[Concluding remarks and implications for future research](#)” presents the conclusions and implications for future research in education policy.

An overview of education policy research in the past decade

In this section, we assembled and overviewed education policy studies over the 9 years in order to shape education policy research in an Asia-Pacific context. On November 13, 2013, we first retrieved research publication data from the Web of Science, which has useful information on education policy research publications, including *Asia Pacific Education Review* as well as other international academic journals. Specific information of our interest includes the characteristics of authors and publications—(1) the number of authors, authors’ nationalities, affiliates, and other author characteristics, (2) research topic, purpose, method, and other research characteristics, and (3) how many times a particular research article is cited by other research publications. Finally, we gathered and compared with education policy studies from America.

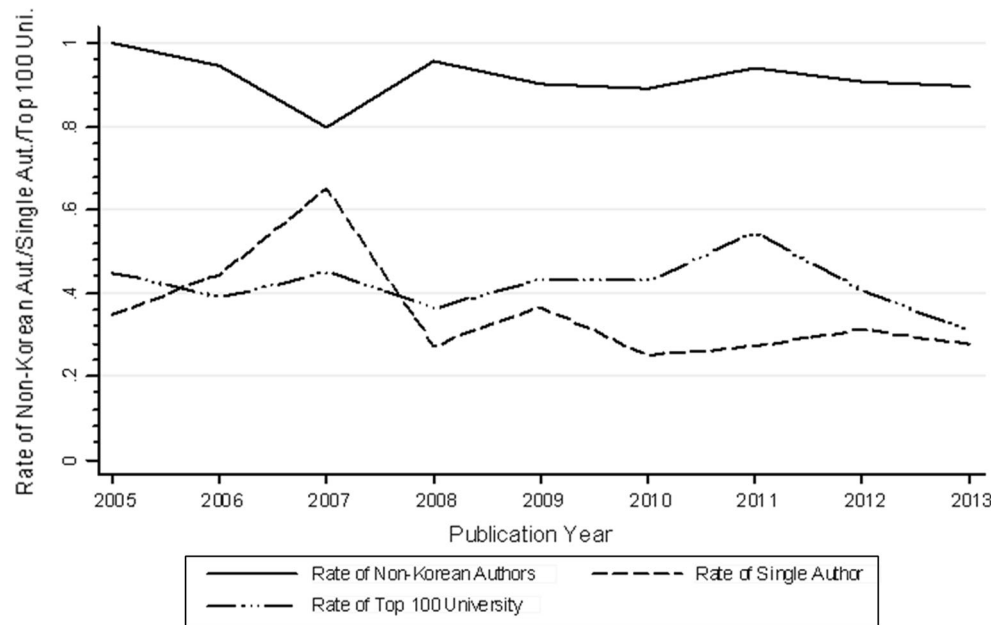
Shape of education policy studies in Asia Pacific Education Review

Foremost, we pay attention to authors of education policy literature. Figure 1 first describes how authors varied over time in terms of the number of authors, nationality, and affiliate. We find that a majority of authors are constantly outside of Korea, for example, Vietnam (Griffin and Anh 2005), Taiwan (Su 2006), and Hong Kong (Ho 2007). The proportion of non-Korean authors have remained stably high (close to 0.9) during the last decade. In 2013, *Asia Pacific Education Review* provided education research publications written by authors from 17 different countries. These indicate that APER is a truly international outlet, where transnational scholars disseminate and share their analytic research on education policies. Diversity is conceived as one of the values that international and comparative education research journals ultimately pursue.

We now focus on the number of authors as a measure of collaboration between/among researchers. We classify articles into two groups: single-authored and co-authored. We sometimes observe that even the single-authored group has received great attention from the audience (e.g., Arimoto 2009; Kim 2005, 2007; Wan 2006). Nevertheless, our finding is that co-authored articles have drawn even

² Of course, there are a few other Asia-based journals publishing education policy studies, including KEDI journal of Educational Policy (hereafter, KJEP). We decided to utilize data from APER for the following reasons. First of all, APER has a longer history as an international education journal compared to any other Asia-based journals. Specially, APER has been indexed in SSCI since 2005, whereas KJEP has appeared since 2007. Second, APER has a higher degree of research impact and diffusion compared to any other Asia-based journals (for the year of 2012, the impact factor of APER is estimated 0.500 while the equivalent number for KJEP is 0.235). Lastly, APER is a more representative journal for Asia-Pacific countries than any other journals. The proportion of articles written by non-Korean author amounts to seven out of ten articles.

Fig. 1 Changes in author characteristics of education policy research over time



greater attention than single-authored ones (e.g., Chang et al. 2009; Goktas et al. 2008; Guven et al. 2009; Memduhoglu et al. 2007; Rasmussen et al. 2006). More importantly, from Fig. 1, we find that the proportion of single-authored articles have decreased over time in a gradual manner during the last decade. Our results demonstrate that the rate of single-authored papers plunged to half from 2007 to 2013. This rate suggests that there is a growing demand and importance of collaboration among education researchers.

We also looked into the degree of institute reputation that an author(s) is currently affiliated with. We take advantage of the QS World University Rankings 2013 in order to figure out the level of university reputation. Figure 1 shows that four out of ten articles constantly come from top 100 universities—for instance, University of Hong Kong (Ho and Lee 2012); University of Tokyo (Kaneko 2009); Seoul National University (Moon 2007). The proportional rate would hardly, though, change over time. A university's global ranking serves as a stable proxy variable of its research competence.

We now focus on research characteristics, such as research type, method, and topics. We divided education policy studies into two groups: theoretical and empirical. More specifically, research articles describing and analyzing theoretical issues and perspectives surrounding education policies are classified into the first group, theoretical research (e.g., Kim 2005; Lee 2005; Romano, et al. 2005). In contrast, those articles examining the changes and effects of particular education policies on outcomes are categorized into the other group, empirical research (Bae et al. 2010; Chang 2008; Mok and Xu

2008). Figure 2 describes how theoretical and empirical research has moved over time. Our interesting finding is that the proportion of empirical research grows in a steep slope, thereby surpassing the proportion of theoretical research. On the one hand, it suggests a growing demand of education policy evaluation for the purpose of education development in practice. Education policy makers could take the most advantage of policy research for improving education policy design and implementation. On the other hand, it might call for a more theoretical review of education policy under the values and goals of education policy.

Next, we move on to research methodology. We categorize education policy articles into three according to method: quantitative (e.g., Chang et al. 2009; Chang 2008; Guven et al. 2009), qualitative (e.g., Ng 2013; Sung et al. 2013; Yin 2013), and literature review (e.g., Goktas et al. 2008; Shah et al. 2011). Figure 3 depicts how research methodology has changed in the last decade. We find that the percentage of quantitative research stably stays high relative to qualitative research. The results indicate that quantitative articles take up approximately 10 % of total articles published in 2007 and increase to 50 % in 2013. Hence, it is important to note that there is a growing body of qualitative literature in education policy. In general, quantitative research allows us for a better understanding of input–output relationships involving education policy. However, it hardly provides any ideas in the development of those relationships. An increasing demand for qualitative research indicates that education stakeholders are more concerned over the black box of education policy implementation.

Fig. 2 Changes in research type of education policy studies over time

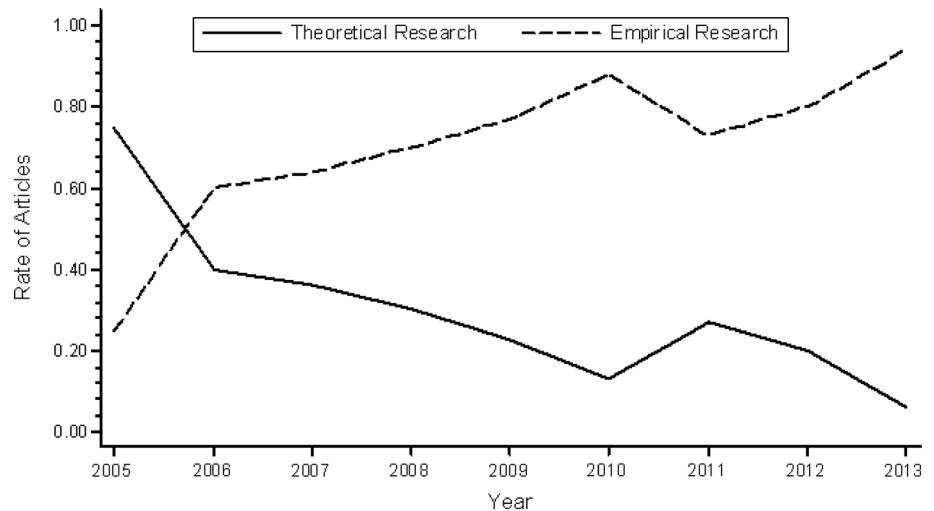
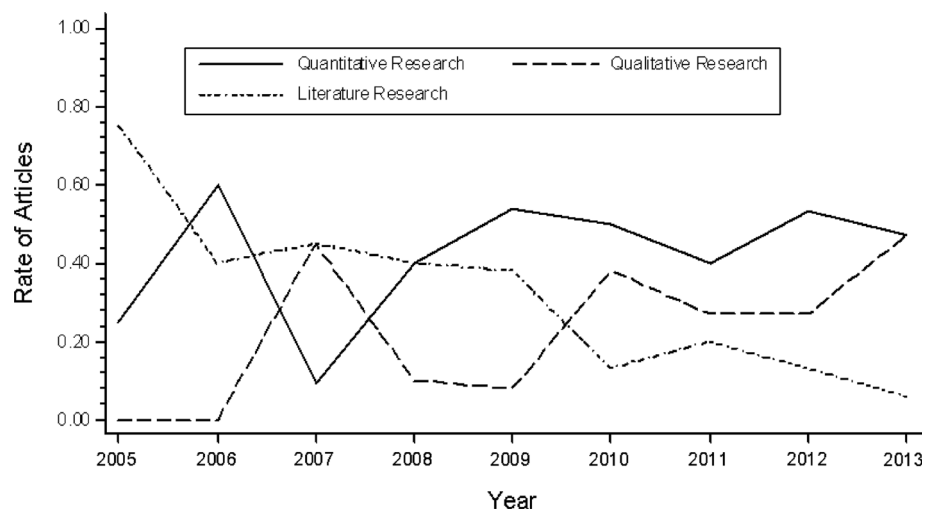


Fig. 3 Changes in research methodology of education policy studies over time



We now move our attention to policy procedure from policy formation and adoption to policy evaluation. In this part, we classify education policy studies into four groups: policy formation and adoption (e.g., Cheung and Kan 2009; Joo and Halx 2012), policy implementation (e.g., Deng and Pei 2009; Seo 2009), policy evaluation (e.g., Lee et al. 2010; Ngok 2007; Parker and Walters 2008), and other policy procedures (e.g., Liu 2012; Oh 2011). Figure 4 describes how a research focus varies by policy procedure over time. It first shows that policy evaluation research remains stable and high relative to any other policy research. Combined with Fig. 3, we find that there is an increasing body of policy evaluation research with a quantitative approach. It suggests that education stakeholders are most interested in whether a particular policy prescription works well in eliminating or reducing educational problems and challenges that they face. Moreover, it is noteworthy that a body of policy implementation literature remains significant. Our results indicate that policy

implementation research takes up around 20 % of total research, even though it fluctuates over time.

Then, we focus on policy topics and areas. We first separate education policy articles into three groups: primary and secondary education (e.g., Chang 2008; Guven et al. 2009; Rasmussen et al. 2006), higher education (e.g., Nishimura 2006; Pun 2013; Teichler 2009), and teacher education (e.g., Yuksel 2008). Figure 5 depicts how the share of each category moves over time. We find that policy research on primary and secondary education remains dominant relative to other areas. The results indicate that the proportion of primary and secondary education policy research falls between 0.4 and 0.6. Interestingly, it is found that policy research on higher education grows in an upward slope. Our results demonstrate that the share of higher education doubles from 2005 to 2013. Moreover, it suggests that higher education becomes a realm of policy research that calls more for public attention and governmental intervention.

Fig. 4 Changes in education policy research by policy procedure over time

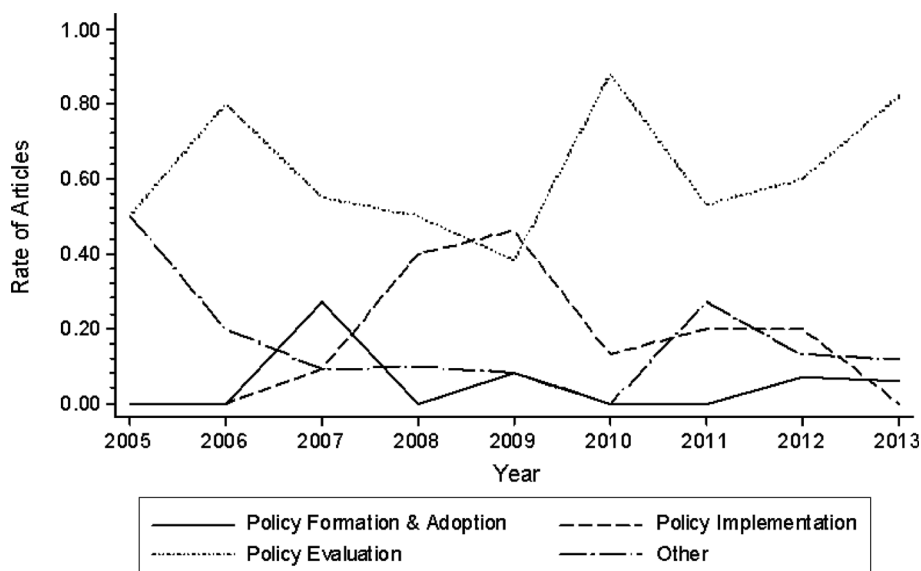
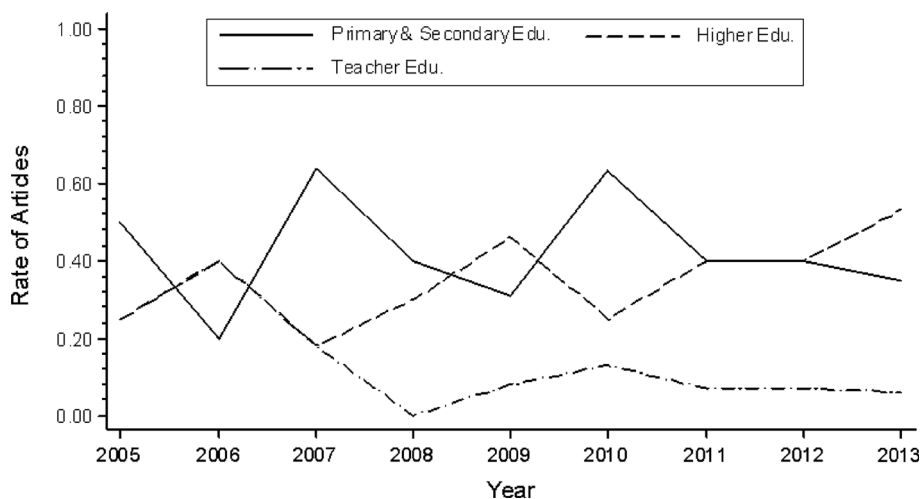


Fig. 5 Changes in education policy research by school level over time



Education policy issues in Asia-Pacific countries

In this section, we make an attempt to discover what education policy issues are in the limelight in an Asia-Pacific context. In doing so, we conducted a qualitative content analysis in order to identify what issues were discussed in the last decade. We first classify the articles published in APER into several education policy categories, and then draw important policy issues, including professional development, globalization, shadow education, and language education policy according to the order of total frequency.

First, professional development has been popularly discussed as one of the primary education policy issues in Asia-Pacific countries. Darling-Hammond and McLaughlin (1995) emphasize that educational policies should contribute for the development of teacher capacity in order to

take responsibility for student learning, and to furthermore reform education in the right direction. This is not an exception for Asia-Pacific countries. From the content analysis, we find two significant policy issues regarding professional development. The first issue is designing policy instruments in the contextualization of each Asia-Pacific country (Goktas et al. 2008; Teo et al. 2009). Education policy makers often encounter challenges of strategically designing professional development policy instruments in the unique context of each country. For example, Asia-Pacific countries tend to institute ICT-based teacher education, performance-based bonus, and peer literacy program as policy instruments designed for improving professional development. Next, teacher evaluation in Asia-Pacific countries has been conceived as an increasingly important issue for improving teacher professional development. Further, qualitative research has

been conducted in an Asia-Pacific context, clarifying the underlying issues revealed in the process of implementing school-based teacher evaluation practices (Irving et al. 2011; Malakolunthu and Vasudevan 2012).

Second, globalization has intensively been discussed in Asia-Pacific countries. Heavy interest is placed on two noticeable issues: marketization of higher education and internationalization of students and college curricular. Foremost, in the Asia-Pacific, prominent studies particularly attempt to examine the actual change of higher education policy toward marketization as well as explain it as an enactment of New Public Management and Institutional isomorphism (Byun 2008; Joo and Halx 2012). Next, internationalization of student and curriculum in higher education is another important issue in Asia-Pacific countries. It has been a sub-issue resulting from the inflow of internationalized universities into Asia-Pacific countries as well as a consequential side effect of internationalization. Mok and Xu (2008) demonstrate how the Chinese higher education system, which pursues openness of education market toward oversea university, affected academics, and administrators' recognition.

Third, language education policy has been spotlighted as a pivotal instrument to boost national competence in an era of globalization. Many Asia-Pacific countries declare English as the official language or second language. English skills have been highlighted in Asia-Pacific countries due to their association with monetary return from the labor market (Nunan 2012). Moreover, high English test scores are shown to be definitely correlated with academic success and long-term life success (Cheng 2014). Growing interest in language education policy deals with how to train English teachers for efficiently improving their English skills. In doing so, English-speaking teacher program, EFL/ESL teacher training programs, and English medium instruction have been discussed as policy instruments. For example, Luo (2007) qualitatively points out that the native English-speaking teachers (NEST) policy in elementary schools encounters some challenges, which would hinder from the actualization of appropriate teaching–learning process in an actual English classroom.

Fourth, we also find that shadow education has been largely discussed as a unique issue in Asia-Pacific countries. Shadow education is a hot issue in Asia because it is driven by a competitive climate and strong belief in the value of education for social and economic advancement (Bray 2006). In the Asia-Pacific region, many countries have tried to clarify how to reduce household expenditure for private tutoring. A few key policy instruments including after-school programs, which are school equalization programs, have been introduced for this purpose (Bae et al. 2010). Another issue related to shadow education is the relationship between private tutoring and formal education

Table 1 A mean comparison with education policy research from America

Variable	APER	EEPA	Total
Total number of citation per article	1.24	8.89	5.66
Yearly average citation per article	0.23	1.28	0.83
Number of references per article	41.85	48.51	45.69
Number of authors per article	1.96	2.72	2.40
Number of countries under study (2005–2013)	15	6	15
<i>Research type</i>			
Theoretical	0.24	0.01	0.11
Empirical	0.76	0.99	0.89
<i>Policy procedural stage</i>			
Formulation and adoption	0.06	0.04	0.05
Implementation	0.18	0.08	0.13
Evaluation	0.61	0.87	0.76
Other	0.14	0.01	0.06
<i>Research area</i>			
Primary and secondary education	0.42	0.65	0.55
Higher education	0.38	0.17	0.26
Lifelong education	0.04	0.01	0.02
Teacher education	0.06	0.11	0.09
Administration, finance, and other	0.10	0.06	0.08
<i>Research method</i>			
Quantitative	0.43	0.91	0.71
Qualitative	0.27	0.04	0.14
Literature review	0.27	0.01	0.12
Mixed method	0.04	0.04	0.04
<i>N</i>	98	134	232

system in Asia-Pacific countries. For instance, Lee et al. (2010) investigate the history of shadow education policy in South Korea, focusing on the response of the government to change the demands for private tutoring. Moreover, Mori and Baker (2010) contend that shadow education comes after the institutional change of formal education and that this will be gradually integrated into the broader boundary of education.

A comparison with education policy research from America

In the remaining part, we attempt to compare education policy studies between Asia-Pacific countries with America. A policy research comparison would allow us to draw a distinctive contextual feature of educational policy research in Asia-Pacific areas. More importantly, it provides us with insightful directions for educational policy research in the future. After searching for influential academic outlets for education policy research, we have decided to utilize *Educational Evaluation and Policy*

Analysis (EEPA) as a comparison. Foremost, EEPA is the most representative of educational policy research outlet in the USA. It is consistently reported to mark a higher impact factor than any other policy journals in the field. We assembled and analyzed education policy studies from EEPA by adopting the same analytic framework, as in the previous part. Table 1 demonstrates a means comparison of author and research characteristics between APER and EEPA for the same period of time.

On the one hand, we observe many similarities in those characteristics between two education policy journals. One similarity is found, in which more weight is placed on policy evaluation research compared to any other policy procedures. The results indicate that six out of ten policy studies focus on policy evaluation in Asia-Pacific countries. The equivalent number is eight for American policy research. Another is research topics focusing on primary and secondary education. Four to six of ten articles depending on the journal are devoted to policy analysis on primary and secondary schooling. A final similarity is their heavy reliance on the use of quantitative methodology. Four of ten education policy studies from Asia-Pacific countries are based on quantitative methods. The equivalent figure is nine for America.

On the other hand, we also find many differences in author and research characteristics between two journals. Foremost, it is found that education policy studies from America have much more influential power on literature than those from Asia-Pacific countries do. Our results indicate that Asia-Pacific policy research is, on average, 1.24 times cited in total in the relevant literature, whereas the equivalent figure becomes 8.89 for American policy research. The difference in the influential power is again confirmed in the form of impact factor, which the Thompson Reuter annually announces in the Journal Citation Report (e.g., 1.489 for EEPA vs. 0.500 for APER in the year of 2012). Another difference is research collaboration among scholars and commentators. We find that American policy researchers are more likely to collaborate with their peers on conducting and co-authoring research papers compared to Asian-Pacific researchers. Our results indicate that the number of authors per article is, on average, 1.96 for APER while it is 2.72 for EEPA. Moreover, there is a significant difference in a variety of author's nationality between APER and EEPA. We find that the total number of author's nationality is 15 for APER and 6 for EEPA in the last decade. This result demonstrates that Asia-Pacific education policy researchers have much more interest on various education policies and programs implemented in other countries compared to American researchers.

We find that APER produces education policy research that focuses more on higher education. Four out of ten

policy studies in Asia-Pacific countries investigate policy issues on higher education, whereas the equivalent number is, at best, two for America. This result may be because issues and challenges in higher education are now on the rise among Asia-Pacific countries. As a matter of fact, many Asian countries more increasingly design and implement higher education policies than ever before. Moreover, it is an explosive interest increase on the post-massification issue of higher education among Asian countries is observed (Shin and Teichler 2014). Otherwise, it could be the case that there is no single higher education journal based on Asia. In contrast, there are a few American-based higher education journals, such as *Research in Higher Education*, *Review of Higher Education*, and *Journal of Higher Education*.

We finally show which issues are popular in American education policy research and then compare them with Asia-Pacific countries. This approach is beneficially useful for understanding the unique features of education policy research issues from contrasting differences between both regions. In addition, this approach also substantiates what the common areas of education policy issues are in both regions, from clarifying the commons. In doing so, we again conduct a content analysis to find contemporary education issues in both regions as well as seek for issues differentiated from each other. We particularly investigate both the similarities and differences of education policy issues between Asia-Pacific countries and the USA.

First, we compare academic issues in education policy and draw some common issues that have been investigated in both regions. As indicated in Fig. 6, there are some less contextual issues, including professional development, equity, and instruction policy. Most of all, professional development issues, including teacher quality, pre-teacher curriculum, and teaching method in teacher training programs, have long been viewed as key issues in both regions. Additionally, equity issue is also a widespread and universal issue across regions. Educational inequality in access to education is regarded as a serious impediment to accomplish "education for all," to promote social integration and to exacerbate inefficiency of resource allocation (Stiglitz 2012). Many researchers focus on gender, urban-rural, and racial and ethnic economic class inequalities (Ham et al. 2011; Li and Yang 2013). Moreover, researchers have attempted to estimate the impact of targeted funding program for educationally disadvantaged students and the effect of minority training program prepared for unprivileged students on their achievement (Henry et al. 2010; Schultz et al. 2011).

Next, we move on to the distinguishable differences in education policy issues between Asia-Pacific countries and the USA. On the one hand, we first find that American unique education policy issues in the last decade include

Fig. 6 Comparison of contents between APER and EEPA



accountability, retention, and equity, as presented in Fig. 6. Foremost, accountability has been intensively discussed as a distinguishable issue in the USA. Since the enactment of No Child Left Behind Act (hereafter NCLB) has been implemented, a great deal of literature focuses heavily on the impact of accountability policy (Lauen and Gaddis 2012; Mintrop and Trujillo 2007). Moreover, retention is a clear issue of concern in the American education policy (Lau 2003). Furthermore, we find that school choice is also a popular issue in American education policy research, as depicted in Fig. 6. School choice has been introduced as an education policy instrument for reshaping public education into consumer-oriented education in this region. This policy issue is based on the assumption, that competition among schools, which is caused by parents' choice, may be a fundamental factor improving the quality of education (Lubienski 2005). For supporting effective public school choice for both students and parents, many types of policy instruments, including Magnet school, Charter school, and Voucher program, have been initiated from the state or local government.

Finally, we find subtle differences even in common policy areas, such as professional development and equity. For example, American studies concentrate on estimating the effect of particular profession development program. In contrast, Asian-Pacific studies focus more on describing profession development practices (Correnti 2007; Grigg et al. 2013; Liu 2012; Malakolunthu and Vasudevan 2012). Moreover, another in-depth difference is observed in equity research. While recent studies in America try to estimate the effects of particular school reform policies or programs for reducing inequality (Henry et al. 2010; Schultz et al. 2011), those from Asia-Pacific countries focus heavily on describing education policy efforts for reducing such gap (Ham et al. 2011; Li and Yang 2013).

Research impact and diffusion of education policy research

In this section, we now focus on the possible factors affecting the impact and diffusion of education policy research in the literature. A large body of literature uses citations of academic journal articles as a metric of academic research impact and diffusion. Publication citations are conceived to serve as an informational role and acknowledgement of the primacy of contributions by others (Nightingale and Marshall 2012; Owens 2009; Posner 2000). It is identifying the potential determinants of publication citations that would not only make us better understand and formulate academic research impact and diffusion, particularly in the Asia-Pacific region. However, it would also provide us with useful directions and perspectives of education policy research. In the long run, these new directions would contribute to the development of academic society, which has special interest in education policy in the region of Asia-Pacific.

Data and variables

Following Owens (2009), we take advantage of a total number of citations as a metric of research impact and diffusion among education policy studies. On November 13, 2013, we retrieved the data of publication citations from the Web of Science, which provides a citation report for each publication. In order to examine the potential factors affecting research impact and diffusion in education policy literature, we establish a model of publication citations that depend on the author, research, and publication characteristics.

A group of author characteristics include the number of authors, nationality, and affiliated institution. More

specifically, we first created a continuous variable by counting the number of authors per paper. The unity of the value means a single-authored paper. We also generated six dummy variables, indicating the nationality of the author. A reference group is Singapore. In addition, we created five dummy variables, indicating the rankings of university that an author(s) is affiliated with. A second group of research characteristics include research type, policy procedural stage, research area, method, and a number of references. We created a dummy variable, indicating empirical research as opposed to theoretical research. We also produced three indicator variables, specifying the policy procedural stages: policy implementation, policy evaluation, and other phase research. A reference group is policy formation and adoption research. For the research area, we generated four dummy variables, indicating primary and secondary education, higher education, lifelong education, and administration and other areas. A reference group is teacher education research. As for the research method, we created three dummy variables, indicating qualitative research, mixed method, and literature review. A reference group for this variable is quantitative research. We counted the number of references that a particular research article has. A final group of publication characteristics includes publication year and issue number. Eight year dummies and three issue dummies are, respectively, generated for each article.

Method

One can specify a model of research impact and diffusion as a linear function of author, research, and publication characteristics. This basic model specification is expressed as follows:

$$Y_i = \alpha + \beta_i \mathbf{AUT} + \gamma_i \mathbf{REA} + \delta_i \mathbf{PUB} + \varepsilon_i, \tag{1}$$

where Y is a total number of citations for article i , \mathbf{AUT} is a vector of author characteristics for the article, \mathbf{REA} is a vector of research characteristics for the article, \mathbf{PUB} is a vector of publication characteristics for the article, and ε_i is a stochastic error. Parameters of β , γ , and δ are of our interest to figure out the relationships between publication citations and author, research and publication characteristics.

A classic standard approach to estimate Eq. (1) is to use an ordinary least square (OLS) estimator. However, OLS estimation may cause some limitations when applied to count data as a dependent variable (Greene 2008). First of all, the linearity assumption of the least square is not appropriate for count data. The least square requires some assumptions for the unbiased and consistent estimator. One of these assumptions, the linearity of coefficients, is violated when it comes to count data. Moreover, because a

Table 2 Results of Poisson regression of publication citations in total

Variables	Coefficient	Incident rate ratio
Number of authors per article	0.40*** (0.12)	1.49*** (0.17)
Number of references per article	0.00 (0.01)	1.00 (0.01)
<i>Nationality</i>		
Germany	1.62* (0.98)	5.06* (4.96)
Japan	1.48* (0.87)	4.38* (3.81)
Korea	1.49** (0.69)	4.44** (3.06)
Malaysia	2.76** (1.40)	15.73** (22.03)
Turkey	1.76*** (0.65)	5.79*** (3.77)
USA	2.26*** (0.79)	9.60*** (7.58)
<i>University rankings</i>		
1–50	0.42 (0.33)	1.22 (0.72)
51–100	0.14 (0.67)	1.09 (0.66)
101–250	–0.63 (0.52)	2.75 (1.56)
251–601	0.23 (0.50)	1.28 (0.76)
<i>Publication year</i>		
2006	0.20 (0.59)	1.22 (0.72)
2007	0.09 (0.60)	1.09 (0.66)
2008	1.01* (0.57)	2.75* (1.56)
2009	0.25 (0.60)	1.28 (0.76)
2010	–1.06 (0.65)	0.35 (0.22)
2011	–1.68** (0.68)	0.19** (0.13)
2012	–2.82*** (0.89)	0.06*** (0.05)
2013	–19.21 (2046.37)	0.00 (0.00)
<i>Publication issue</i>		
Issue 1	0.78** (0.38)	1.15** (0.77)
Issue 2	0.32 (0.40)	0.53 (0.28)
Issue 3	0.12 (0.40)	1.26 (0.63)
Constant	–2.12** (1.02)	
N	98	

Standard errors are presented in parentheses

*** Significant at the 1 % level

** Significant at the 5 % level

* Significant at the 10 % level

normal distribution assumption is not proper any more for count data, a least square regression would estimate an inconsistent standard error. As alternatives, a Poisson distribution is generally used to estimate count data, such as publication citations.

Our Poisson estimation is expressed as follows:

$$\text{Prof}[Y = y_i | x_i] = \frac{\exp(-\lambda_i) \lambda_i^{y_i}}{y_i!}, \quad \lambda_i = \exp(x_i' \beta), \tag{2}$$

$$y_i = 0, 1, 2, \dots$$

where x combines three vectors of author, research, and publication characteristics (\mathbf{AUT} , \mathbf{REA} , and \mathbf{PUB}). A

Poisson regression model would be relevant when homogeneity and independence assumptions hold. We conducted an over-dispersion test in order to investigate whether this equation $E[y_i|x_i] = \lambda_i = \exp(\beta'x_i)$ is equivalent. The results indicate that there is no evidence of violation related to over-dispersion. In addition, we performed a chi-squared test in order to evaluate the goodness of fit of our model. The chi-squared test statistics show that our model fits well. These test results suggests that the assumptions of homogeneity and of independence are met for our Poisson model.

Results and discussion

Table 2 first presents the results of the basic Poisson regression of publication citations on author and publication characteristics (**AUT** and **PUB**). The coefficients and standard errors are shown in the first column. It is important to note that each coefficient estimated from the Poisson model cannot be interpreted as linear, similar to a classic linear regression. An estimated coefficient denotes the expected increase or decrease of log count when one unit increases in the explanatory variable. For the interpretational purpose, an incident rate ration is estimated and reported for each independent variable. The second column presents the incident rate ratio and their standard errors.

First of all, we find that collaboration and co-authoring are essential in determining the research impact and diffusion in the field of education policy research. Specifically, when more researchers participated in conducting research and writing a research paper together, their publication citations would significantly increase. Our results indicate that one unit increase in the number of authors leads to a 49 % increase in the incident rate of total citations, holding any other factors constant. This confirms the previous findings of the solid relationship between research collaboration and productivity (Melin 2000; Lee and Bozeman 2005). It is, accordingly, recommended that researchers be collaborative and cooperative with their peers for a high level of impact and diffusion of education policy research.

Second, we find little evidence that top university professors and researchers are productive and have high quality for education policy research. Our results, interestingly, indicate that there is little difference in the research impact and diffusion between researchers affiliated with high- and low-ranked universities.

Third, we find that countries count for the research impact and diffusion of education policy research. Our results indicate that country dummies are statistically significant at the level of 0.05, even though individual characteristics are adjusted for. Interestingly, education policy

research from the USA, Germany, Korea, and Japan is shown to have a high level of research impact education policy research from Singapore. This suggests that education policies in those countries draw more attention from education researchers, thereby influential on other country policies. Education policies from a particular country are often observed in order to get transferred to another country—the so-called policy transfer (Dolowitz and Marsh 2000).

Finally, we find that old research has seemingly a high degree of research impact and diffusion than a new one. The results indicate that publications in the year of 2008 have a 0.06 times lower incident rate of citations than in the year of 2005. The equivalent numbers are 0.81 and 0.94 for the years of 2011 and 2012, respectively. Once holding the publication year same, publications in the first issue are shown to have a 1.15 times higher incident rate of citations than those at the last issue.

Next, we complicated the basic model of publication citations by entering the research characteristics (**REA**) into the specifications presented in Table 2. For the convenience of readers, we report, in Table 3, the coefficients and incident rate ratios only for the newly entered variables of the research characteristics.

One of the most interesting finding is that research areas matter in determining the research impact and diffusion. Our results reveal that there are statistically significant differences in publication citations among research areas. More specifically, policy research on administration, finance, and other issues is found to have a 2.3 times higher incident rate of citation than policy research on teacher education. In addition, higher education research appears to have a 1.5 times higher incident rate of citation than the reference group. In contrast, policy research on lifelong education appears to have a 0.86 times lower incident rate of citation. More specifically, there are significant differences in research impact and diffusion across research areas.

Another significant finding is that research methodology counts as well. In particular, a mixed method research combining quantitative and qualitative approaches is shown to have significantly more publication citations than any other research. The results indicate that mixed methods research has a 1.57 times higher incident rate of citation than quantitative research. The mixed methods approach takes advantage of scientific causal explanations of education policy as well as context-based in-depth understanding of education policy by qualitative research (Creswell 2009). Accordingly, it allows us to better understand education policy and its consequences on desired goals. Finally, we find, from the first row of the table, little evidence that research type, whether theoretical or empirical, matters. Neither has found any differences in

Table 3 Results of Poisson regressions on research characteristics

Variables	Research type (reference: theoretical research)		Policy procedural stage (reference: policy formation and adoption)		Research area (reference: teacher education)		Research method (reference: quantitative research)	
	Coefficient	IRR	Coefficient	IRR	Coefficient	IRR	Coefficient	IRR
<i>Research type</i>								
Empirical Research	0.05 (0.33)	3.14 (3.19)						
<i>Policy procedural stage</i>								
Policy implementation			-0.30 (0.61)	1.55 (0.25)				
Policy evaluation			-0.04 (0.59)	0.88 (0.12)				
Other stage			0.37 (0.65)	1.13 (0.39)				
<i>Research area</i>								
Primary and secondary education					0.11*** (0.14)	1.12*** (0.16)		
Higher education					0.41*** (0.15)	1.50*** (0.22)		
Lifelong education					-0.15* (0.53)	0.86* (0.46)		
Administration, finance and others					0.83** (0.17)	2.30** (0.40)		
<i>Research method</i>								
Qualitative research							0.15 (0.45)	1.23 (0.15)
Literature review							0.38 (0.37)	0.22 (0.13)
Mixed method research							1.37** (0.56)	1.57** (0.21)

Standard errors are in parentheses. We include author and publication characteristics: number of authors, number of references, nationality, publication year, publication issue, and university ranking

- *** Significant at the 1 % level
- ** Significant at the 5 % level
- * Significant at the 10 % level

policy procedural stages in terms of research impact and diffusion.

Concluding remarks and implications for future research

In this article, we made a first attempt to develop a sculpture of education policy research across Asia-Pacific countries. Specifically, we assembled and examined education policy studies published in a major academic outlet, *Asia Pacific Education Review*, over the past decade. Moreover, we compared them with those from America, published in *Educational Evaluation and Policy Research*. Finally, we investigated the impact and diffusion of education policy research and further explored its potential determinant. In this final section, we summarize the most significant findings of this study, thereby suggesting useful implications for future research on education policy.

Foremost, we draw a shape of education policy research among Asia-Pacific countries by demonstrating the stylized facts observed over the past decade. First, research collaboration and co-authoring increasingly emerge on education policy research relatively to single-authored research. Second, empirical research sharply grows while theoretical research shrinks. Third, policy evaluation research combined with quantitative approach constantly propagates and becomes dominant in the literature. Lastly, there is a growing body of policy research on higher education. Comparing with education policy studies from the USA, we find similarities in the first three stylized facts presented above. Interestingly, we find a significant difference in policy research on higher education. Asia-Pacific countries increasingly face crucial challenges of rebuilding their higher education systems in an era of globalization. Education stakeholders also show explosive interest on globalization, private tutoring, and language education policies within and across countries.

Another significant finding from the comparison is that education policy studies from the Asia-Pacific region have a lower level of research impact and diffusion than those from America. Surprisingly, our results indicate that American education policy research shows eight times more publication citations than in the counterpart. In order to reduce the gap in publication citations, we should better understand the research impact and diffusion as well as figure out the potential factors affecting them. As shown in Table 2, we find evidence that research collaboration and co-authoring are positively associated with publication citations. A mean comparison in the number of authors per article, presented in Table 1, indicates that Asian-Pacific researchers maintain a lower level of research collaboration with their peers. It is well documented that a high level of research collaboration leads to high productivity in terms of research quantity and quality (e.g., Katz and Martin 1997). Thus, the discrepancy in research collaboration could possibly account for some disparities in research impact and diffusion. Hence, it definitely calls for Asian-Pacific researchers' greater efforts of collaborating and co-authoring. What factors contribute to research collaboration? Existing literature suggests changing funding patterns, increasing the desire to acquire cross-fertilization across disciplines and promoting interdisciplinary research. For more suggestions, consult Katz and Martin (1997).

Lastly, it is important to establish a solid community for Asian-Pacific education policy researchers across countries. It not only could be an essential place for sharing and disseminating education policy research, but also could be a stepping stone for a higher level of research collaboration and problem solving. They are, accordingly, encouraged to submit high-quality manuscripts in the Asian-Pacific context to Asian-based academic outlets, such as the *Asia Pacific Education Review*.

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