

## What Might Policy Borrowing Contribute to Policy and Practice in Mathematics Education?

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**Abstract:** This article elaborates the meaning of policy borrowing and Phillips' theoretical framework of policy borrowing. Then, it provides a background of various practices of policy borrowing in education and mathematics education specifically. Thirdly, the article argues two contributions of policy borrowing to policy in mathematics education and envision mathematics education policies in future. Finally, it takes China's mathematics curriculum reform as a case to analyse two contribution of policy borrowing to practice in mathematics education and conclude by envisioning the future mathematics education practice.

**Key words:** Policy borrowing; Education; Development

**Publication date:** December, 2020

**Publication online:** 31 December, 2020

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### 1 Introduction

Over the past decades, two opposite policy borrowing trends, which are West-to-East borrowing and East-to-West borrowing, gain the popularity in international and comparative studies in the globe. This approach provides policy makers a way to improve the quality of education in their 'home' country through a political method. Policy borrowing takes place within a continuum of educational transfer from imposed educational transfer at one end, to voluntary adoption of foreign examples, models and discourses at the other (Phillips and Ochs 2004; Steiner-Khamsi 2000). As Clapham and Vickers (2018) claim that policy borrowing plays an important role in informing

policy decisions. In the policy borrowing trend, PISA is usually seen as an indicator reflecting the academic outcome of senior secondary schooling. As a popular part that has been focused by scholars and politicians for a long time, the rank of a nation's mathematics achievement might inform the quality of mathematics education compared to other countries.

This article elaborates the meaning of policy borrowing and Phillips' theoretical framework of policy borrowing. Then, it provides a background of various practices of policy borrowing in education and mathematics education specifically. Thirdly, the article argues two contributions of policy borrowing to policy in mathematics education and envision mathematics education policies in future. Finally, it takes China's mathematics curriculum reform as a case to analyse two contribution of policy borrowing to practice in mathematics education and conclude by envisioning the future mathematics education practice.

### 2 Policy borrowing

#### 2.1 The meaning of policy borrowing

According to Phillips and Ochs (2004), policy borrowing is a purposive action that the borrower engages in deliberately adapting a policy observed in another country or context. This conscious adoption should be distinguished with the accidental coincidence between two home-grown policies in different contexts. As Phillips and Ochs (2004) state, the similarity might be serendipitous in two national contexts, which does not signify the borrowing and lending connection between the two policies. They (2004) also point out that imposed policy cannot

be regarded as a borrowed policy. For example, the policy imposed by France in some countries where France control previously or presently cannot be seen as a legitimately borrowed policy (Lincoln, 1997). The imposed policy of French approaches is not implemented initiatively and deliberately by policy maker in the governed territory.

A famous theoretical model approached by Phillips (2005) provides a framework of policy borrowing in education. Many scholars (Forestier and Crossley, 2015; Tan and Reyes, 2016) apply this model to analyse the political intervention.

## 2.2 The framework

(1) Impulses: The impulses will initiate cross-national attraction. Impulses might originate from: Internal dissatisfaction, Systemic collapse, Negative external evaluation, Economic change/competition, political and other imperatives, novel configurations, knowledge/skills innovation, and political change.

(2) Decision-making. There are four types of decision: Theoretical, Realistic/practical, 'Quick fix' and 'Phoney'.

(3) Implementation: Implementation depends on the contextual conditions of the borrowing country.

(4) Internationalisation: There are four steps in internationalisation. Orderly, they are : Impact on the existing system, the absorption of external features, synthesis and evaluation.

## 3 Policy borrowing in education

In education, there are many ways for educators, researchers, and politicians to increase the quality of education in the 'home' country, such as borrowing educational theories and educational policies from other 'successful' contexts.

Established in comparative researches in education (Phillips and Ochs, 2004), policy borrowing is a popular international and comparative approach applied in multiple areas (educational reform, STEM Education, curriculum...) of international and comparative educational studies. Researchers (Phillips and Ochs, 2004) has critiqued the oversimply notion and political implementation that transferring the target policy from one context to another without considering various factors, such as cultural and ideological factors. As a result, the implementing policy borrowed from other countries may lead to failure. However, this problem could be

a negative example for policy makers to avoid; the positive effect of policy borrowing should be still taken into account. With the hope of educational policy development in their 'home' context, some countries and organizations try to find out what aspects contribute to success in education in other countries (Phillips and Ochs, 2004). For example, the Organization for Economic Cooperation and Development (OECD) investigate Finnish education as a good example for foreign models might be learnt by other countries (Phillips and Ochs, 2004).

### 3.1 Why policy borrowing: educational policy borrowing in the context of globalisation?

Globalisation brings cooperation and competition nowadays. Based on the research of Zajda (2005), with the global trends of revolutionary change and skills addressed by OECD, educational policy would play a hegemonic role among economic, political and cultural globalisation. Seah (2011) points out the first factor of western interests in the 'East' education system is related to economy. For example, because of China's economic development since 'opening to the world' (gai ge kai fang in Chinese) in 1978, China's education system has become the prime interest to mathematics education researchers and politicians around the world (Seah, 2011). The second factor is related to a trend that increasing number of Chinese immigrants achieve higher (Mathematics) achievement in local school systems. For instances, a number of Chinese students rank top in the Victorian Certificate of Education (VCE) examinations (Seah, 2011). As Seah (2011) states, in China, as in some East Asian countries, the crucial relationship between the quality of school mathematics education and the nation's economic development attracts amount of attention from all levels of government around the world. Therefore, with various reasons, many countries involve in seeking a way to develop mathematics education through a political lens.

### 3.2 Policy borrowing in Mathematics Education

While many scholars contribute to mathematics education through studying mathematics education from perspectives of epistemology, such as Piaget's constructivism and Vygotsky's socio-cultural theory, politicians concern more about overall mathematics achievement compared to other countries and they usually stipulate, revise and implement policies to reach their desired goal through political lens, which,

to some extents, can also facilitate the development of mathematics education.

### **3.3 PISA: Large-Scale studies of mathematics education**

The Organisation for Economic Co-operation and Development (OECD) has inaugurated the Programme for International Student Assessment (PISA) in 2000, in order to assess the mathematical skills of 15-year-old students around the world (Cantley, 2019). Different to another large-scale assessment, the Trends in International Mathematics and Science Study (TIMSS) in which students are assessed by a curriculum approach, PISA focus on students' problem-solving skills (Labaree, 2014). According to Cantley (2019), the comparative data of PISA potentially make contribution to relevant mathematics education policies. Therefore, most policy makers tend to evaluate the outcome of mathematics education through comparing the data of PISA. However, PISA has its problems and limitations, and it is critiqued that it cannot provide a sound foundation to inform policy decisions on mathematics pedagogical approaches (Cantley, 2019). At present, it is still organized by OECD and it keeps developing.

### **3.4 What might policy borrowing contribute to policy in Mathematics Education?**

Providing a path to improve the quality of mathematics education, policy borrowing supports policy makers and educators to reach educational goals as soon as possible through the lens of politics. First and foremost, it lights the direction of mathematics education reform. Second, it raises the awareness and understanding of the 'borrower' towards other countries, especially with different ideologies, by which policy makers might associate their 'home' context with others to think about the adaptability of the policy they intend to borrow; the lender will gain the acknowledgement from others. Third, policy borrowing mediates and bridges different policies among countries, which globally promote the development of various policies in diverse contexts.

(1) Given the impulse of immediate demand of improving the education system and the quality of domestic mathematics education, policy borrowing helps the borrower quickly find a reference for improvement.

Phillips (2005) has elaborated the typology of Impulses, including negative external evaluation and economic change or competition, in his framework of policy borrowing in education. As in South-East Asian countries, some are facing sudden changes in economy, whilst some view education as a new form of competition in global economy (Phillips, 2005). Since 19th century, East Asian countries have sought to catch up with Western countries (Tan and Chua, 2015). Accordingly, these countries (such as China, Japan and Korea) have immediate demand of a reference for a guidance of making a nation's educational policy. The core ideas in policies they intend to borrow are relatively advanced and mature at that time, so Eastern policy makers tend to learn from the 'West' to search a direction for mathematics educational development. Therefore, in the case of East-to-West borrowing, policy borrowing serves as a referencing tool for the borrower to improve the domestic mathematics education. Another case is West-to-East borrowing over the last three decades. Recently, Western countries (the United State, UK and Australia) are attracted to East Asian societies which have excellent academic performance in PISA (Sellar and Lingard, 2013). Rappleye (2007) finds that the United State raised the interest of Japan's education because it ranks top in The International Association for the Evaluation of Educational Achievement (IEA) studies. You (2019) points out one of their motivations is that these countries want to maintain their superiority in the global order, including their position in global economic competition. Through the lens of policy borrowing, the 'West' turn to the 'East' for 'best practice' in mathematics education (Sellar and Lingard, 2013).

Reflecting on the political intervention for improving quality of mathematics education, some scholars have critiqued that the main problem of this political action is that borrowed policies are simply copied and implemented directly. In the late 1990s, the United State directly imported Singapore Mathematics textbooks to over 100 schools (Chenoweth, 2000). Although these textbooks are published in the English language, Chenoweth (2000) states that the units of measurement are different between Singapore and the United State; besides, the contexts of mathematical problems are alien to American students. In England's program, Clapham and Vickers (2018) figure out the failure in

importation of 'teaching for mastery' in mathematics education ignores the cultural context leading to changes to policy implementation and internalisation.

Therefore, policy borrowing provides any nations a method of referencing policies from 'successful' nations. Furthermore, policy makers and educators might take Phillips's framework of policy borrowing (2005) as a fundamental theory on which their political and comparative actions can be based. "The policy 'becomes' part of the system of education of the borrower country, and it is possible to assess its effects on the pre-existing arrangements in education" (Phillips, 2005). No matter for which impulses, the contribution of policy borrowing usually occurred when the borrower applies this comparative approach upon the premise that policy makers considerably evaluate the policy and assimilate it into the 'home' context appropriately.

(2) Considering the influence of ideologies in various contexts, policy borrowing helps the borrower make adaptable decision (in the second stage in Phillips's framework) through raising their awareness and understanding of other types of ideologies; besides, the lender might gain the ideological and political acceptance from other countries.

In the study of 'new Orientalism', You (2019) discusses the embedded East-West power relation when the 'West' tend to reference East Asian education. You (2019, p.1) argues that Anglo-American societies represent high-performing East Asian societies as 'the inspiration for education reforms' and 'a threat to the domestic economy'. This viewpoint continues the legacy of Orientalism which characterise the 'Orientalised East' as inferior to the 'West' (Said, 1979). The perception towards the 'East', to some extents, implies the bias on and refusal to Eastern ideology and culture. Thus, simply copying the practice rather than investigating the specific context and its ideology, the policy borrowing will result in failure. As Clapham and Vickers' (2018) argument, the misunderstanding or even ignorance of how borrowed policy plays in its original socio-cultural environment might be unworkable for implementing and internalising borrowed policy at the micro scale (teaching practice).

Based on the study of Phillips (Phillips and Ochs, 2004; Phillips, 2005; Clapham and Vickers, 2018), politicians should understand the borrowed policy clearly, including how its adaption in the original

social, cultural and ideological context, and then assimilate it into the 'home' context. Through this process, politician may have the opportunity to look into other ideologies which might be the ideological foundation of why foreign politicians make this policy situated in their countries. For example, in Stripp's (2015) visiting in Shanghai schools in 2014, he strongly believes that what he learns from this observation could develop his professional skills by dispelling his stereotype that Chinese teaching looks like learning by rote with no discussion. Therefore, policy makers and practitioners may gain the inside of the borrowed policy and make it more adaptable to their 'home' country.

Besides, Steiner-Khamsi (2004) suggests that the practice of policy lending bring benefits for the lender. For example, in the 1990s, the trade of quasi-market school reform strategies between America and UK was used to present international support for the reforms in a political way (Halpin and Troyna, 1995). Steiner-Khamsi (2004, p.207) conclude that "the need for a stamp of approval by external authorities". No matter the lender lends policies for survival or kindness, lending policy means, to some extent, something is acknowledged by other countries.

(3) Envision: Policy borrowing plays an important role as a mediation in coordinating the development of various mathematics education policies situated in diverse historical, social and cultural environments. Imagine to what extent mathematics educational policies in various countries and contexts would develop? First, it will achieve sustainable development with the development of the world. Under the trend of globalisation and based on Phillips's theory of policy borrowing, different countries might gradually maintain their advantages and overcome their shortage through the lens of politics. When the integration of the advantages and tackled weakness is achieved in mathematics teaching practice, those policies politicians take would be the most adaptable policies at that time. Since mathematics has been developed for a long period, meanings of mathematics education are varying in different periods. The 'achieved' policies may develop with the changing meaning of mathematics education, but it will maintain a relative balance in varying contexts. In Phillips's (2005) framework of policy borrowing, globalizing tendencies is a factor in novel configurations as a type of impulses. The novel

configurations in future would be that every country achieve its feasible policies in their 'home' context.

### **3.5 What might policy borrowing contribute to practice in Mathematics Education?**

Practice in mathematics education comprises realistic educational practice and studies of mathematics education. As a powerful tool of international and comparative approach, policy borrowing has direct impact on mathematics educational practice and implicitly defines and develops the meaning and the role mathematics education plays in global societies through facilitating studies of mathematics education.

(1) The direct contribution of policy borrowing would be the improvement of realistic educational practice, such as, in mathematics curriculum provision and teachers' pedagogical strategies.

After making decisions in the process of policy borrowing, policy makers will implement the borrowed policy in their 'home' country (Phillips and Ochs, 2004). The new (borrowed) policy may be related to aspects of mathematics education, such as curriculum reform, pedagogical strategies, or the way of summative assessment (etc.). Thus, the first impact that the political intervention brings would be schooling curriculum provision as well as teachers' pedagogical strategies. In turn, it will influence students' mathematics performance, whether positive or not. Under the premise, as I mentioned in last section, that policy makers considerably formulate the new policy and appropriately integrate it into their specific 'home' context, this political action will orient to and closely reach their goals through improving the educational practice.

Taking China's mathematics curriculum reform as a case to analyse.

① The reformed curriculum provision lays the foundation of mathematics learning

Looking partly into narratives of mathematics curriculum reform in China, politicians and researchers learn and absorb the advanced and mature ideas of mathematics curriculum provision from the West. After imperial rule ended in 1911, China introduced 'Western' mathematics curriculum (Zhang, 2005). In the comprehensive curriculum reforms began in 1999, the primary school section launched the trialling process in 2001, while middle and high schools (primary and junior secondary schools) began to use the new curriculum in 2005

(Seah, 2011). Seah (2011, p.167) portrays that "this comprehensive reform is characterized by a content which is essentially Westernised in its conception and articulation." As his (2011) statement, comparing with 'Western' mathematics education, it is obvious that the mathematics discipline taught in Chinese schools has been similar to that in the United States or Europe for approximately a hundred years.

In Zhang's (2005) observation, pedagogical ideas embedded in 'Western' policies are also introduced to China's curriculum reform. Integrating the 'soul' of these ideas into the current goals of development of technology and education, the Mathematics curriculum emphasised China's valuing of 'two basics' ---- basic knowledge and skills and 'three abilities' ---- computation, logical thinking and spatial visualization (Wong, Han and Lee, 2004; Zhang, 2005). These series of political actions gradually lay a foundation for nowadays mathematics development in China. In the 11th International Congress on Mathematical Education (ICME-11), Mathematics education in China is described as an important role of foundational knowledge and skills (see ICME-11 Chinese delegation, 2008).

② The improved pedagogical strategies might better contribute to the development of students' lifelong abilities

In the official document, Outline of the Curriculum Reform for Basic Education (Trial), published by Ministry of Education (MOE) in 2001, the current basic education system in Chinese mainland is critiqued to be "unable to fully adapt to the developmental needs of the times"; therefore, a reform is needed to "meet the demands of quality-oriented education" (MOE, 2001, p.1). Through an implicit influences of policy borrowing, most scholars insist that the mathematics curriculum reform has borrowed ideologies, policies and practices from 'the West' particularly (Ryan, 2013; Seah, 2011; Tan, 2012). As the prime objective of the reform, 'quality-oriented education' (su zhi jiao yu) emphasise the development of students' lifelong learning skills such as practical abilities and creativity (Huang, 2004; Tan 2016b). The reform signals the change of teachers' pedagogical strategies from imparting knowledge to students to decentralise the role of teachers for students' active participation (Tan 2016b). Teachers are suggested to adopt novel 'student-centered' teaching approaches, a borrowed idea as a 'global

signifiers' (Nóvoa and Yariv-Mashal, 2003; Tan 2016b), to engage students in active inquiry and investigation (Tan 2016b). In this way, students' abilities to question, inquire and learn through practice will be developed.

Tan (2016b) argues that the reform is followed by an emerging challenge of how to displace 'exam-oriented education' by 'quality-oriented education', which should be taken into consideration by scholars and educational practitioners. Seah (2011) also identifies tensions of meaningfully implementing curriculum reform in China. Indeed, in the process of educational reform in any countries, it might face protentional tensions or incompatible difficulties. However, it does not necessarily lead to failure; on the contrary, it can be turned into academic achievement once the problems are overcome.

(2) The implicit contribution of policy borrowing might be deepening people's understanding of mathematics education by facilitating studies of achievement and problems emerged in implementing and internalising borrowed policies about mathematics education.

Based on the research by Tan (2012; 2016a) and Seah (2011), China's mathematics education reform brings benefits to students, teachers, and other educational stakeholders. The significant outcome in PISA can be an evidence to the extent that mathematics education in China has improved in mastering fundamental knowledge and skills compared to other countries or regions. The successful policy-borrowing actions might attract scholars' attention to find out what factors and features

contribute to the achievement of the achievement in learning from other countries. On the other hand, the challenges and failures are also possible after policy borrowing. Through investigation and critical analysis, researchers will reflect on the problems they find, from which they may conclude various aspects that have interplay with mathematics education. In this way, mathematics education is continuously developing.

(3) Envision: In the book *The Philosophy of Mathematics Education* (Ernest, 1985, p.10), one of the concerns of critical Mathematics education is that 'society can be changed'. Meanwhile, mathematics is developing, while education is developing. As a combination of 'mathematics' and 'education', mathematics education is also developing. Upon the envisioning of policies in mathematics education in future, politicians will still try to improve the practice of mathematics education. In this case, every country will move towards the goals of mathematics education outcomes, in which they might develop specific policies and practices which adapt to the nation. These development in every corner in the world can reflect diverse facets of mathematics education situated in various socio-cultural contexts.

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