



Reconceptualising international academic mobility in the global knowledge system: towards a new research agenda

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Abstract

The cross-border movement of people in higher education has been attracting scholarly attention for decades, but the definition of ‘international academic mobility’ bears ambiguities. This article reviews the literature on international academic mobility published in the journal *Higher Education* and beyond. By bridging the literature on international academic mobility from higher education studies and other disciplines, this article proposes to redefine international academic mobility, which highlights the integration of both international student mobility and international faculty mobility. Furthermore, this article outlines a new conceptual framework and research agenda, on the role of international academic mobility in the national, regional, and global knowledge systems. The framework highlights the relationship between international academic mobility and worldwide knowledge acquisition, production, transfer, circulation, networks, and the geopolitics of science. The article also proposes further methodologies for future research on international academic mobility.

Keywords International academic mobility · International student mobility · Global knowledge system · Transnational knowledge circulation · Transnational research networks · Knowledge diplomacy

Introduction

The cross-border movement of people in higher education has been attracting scholarly attention since the 1950s (Nash, 1976; Pace, 1959), but the initial focus was predominantly on international students. In particular, there was a ‘significant jump’ in the number of publications on international student mobility in higher education journals after 2005 (Abdullah et al., 2014). It was not until the 1990s that research on the mobility of academic staff began to emerge (Teichler, 1996; Welch, 1997), which has been attracting more and

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more scholarly attention in the last two decades (e.g. Huang & Welch, 2021; Richardson & McKenna, 2002; Richardson & Zikic, 2007). The growth of academic studies is also accompanied by the drastically increased scale of cross-border movements of students and staff (Franzoni et al., 2015).

Following these developments, the concept of ‘international academic mobility’ has emerged, which includes both international students and staff mobility. The discussions of international academic mobility constellate in different research fields, including higher education, geographies, science policy, economics, and migration studies. Among them, many studies revolved around the social and psychological aspects of mobility, and mainly focused on the economic, cultural, political, and social impacts of mobility (e.g. Crossman & Clarke, 2010; Herschberg et al., 2018; Mook, 1984; Paige et al., 2009).

Grounded in multiple research fields, studies on international academic mobility also utilised diverse theoretical lenses. In the current literature on international academic mobility, the push–pull model is still a dominant theory, but it mainly explains the motivation and choice for mobility (Li & Bray, 2007). In addition to the push–pull model, several theories attempt to explain the process and outcome of international academic mobility. Many studies adopted cultural psychology or sociological perspectives, to explore the acculturation, adaptation or cultural interaction of internationally mobile researchers (Selvaratnam, 1985; Smith & Khawaja, 2011). The human capital theory is another dominant framework applied in those studies to discuss brain drain, brain gain, and brain circulation issues (e.g. Baláz & Williams, 2004; Blachford & Zhang, 2014). Research on international academic diasporas, however, has critically challenged the concepts of ‘brain drain’ and ‘brain gain’ (Fahey & Kenway, 2010). Studies from the perspective of social stratification examined the impacts of class and gender on the opportunities, willingness, and results of international academic mobility (e.g. Leemann, 2010). The social capital theory was also employed to explore the relationships established, maintained, or terminated during international academic mobility (e.g. Bauder, 2020; Wang & Shen, 2020). Furthermore, building on the human capital and social capital theories, scholars proposed the scientific and technical human capital theory to explore the relationship between individual academics and collaborative networks (Bozeman et al., 2001; Jacob & Meek, 2013).

The research on international academic mobility sits against a changing global backdrop. The rise of nationalism, the politicisation of science, the censorship of knowledge, and the emphasis on national security have led to tighter control over global academic mobility. With the development of technology, the increasing eco-awareness regarding travelling, the COVID-19 pandemic and consequent travel restrictions, virtual mobility and ‘internationalisation at a distance’ are becoming even more significant than ever (Falk & Hagsten, 2021b; Mittelmeier et al., 2021). Furthermore, the world is witnessing dynamics of power shifts in global research, evidenced by the decolonisation of knowledge, the surging attention to the value of non-Western and indigenous academia, and the rise of China and non-Western systems in global sciences (Marginson & Xu, *forthcoming*). Some of these trends may appear as yesterday once more. For instance, the tightened state’s control over academics, knowledge, and information circulations seems to resemble what happened during the Cold War period (Daniels, 2019). However, the current situation is not entirely the same as the past, and the future is yet to unfold.

International academic mobility is manifested in different ways across countries and regions. Some countries are traditional host countries and have more inbound than outbound movements of international students and staff, such as the USA, Australia, the UK, Russia, and Canada (UNESCO, 2021). On the contrary, some countries have a higher number of outbound students and staff than inbound ones, such as China, India, Vietnam,

Kazakhstan, Brazil, and Colombia (UNESCO, 2021). Inbound and outbound mobility within the region is dominant for some countries, which is the case for many European countries (UNESCO, 2021). Noticeably, while students and academics are still moving to the traditional host countries, there has been a reversed direction of mobility to other countries like China, Poland, and Turkey (e.g. Kurek-Ochmańska & Luczaj, 2021; Nevra Seggie & Calikoglu, 2021; Xu et al., 2022). These differences and changes mean that while international academic mobility can be explored as a global phenomenon, the research on this topic needs to be contextualised and grounded in different realities.

This article revisits the definition of ‘international academic mobility’. As part of the special issue for the 50th anniversary of the journal *Higher Education*, it provides a dedicated review of studies published in *Higher Education* over the past 50 years. But considering the multidisciplinary nature of the research on this topic, this article also expands the review to research outside the journal and the field of Higher Education.

Building on the review of the existing literature, this article reconceptualises international academic mobility as part of the global knowledge system and proposes a new research framework that centres around ‘knowledge’. Here, we define ‘knowledge’ in a broad sense and as a construction of reality, which includes not only theoretical knowledge but also people’s concepts, values, and ideas (Berger & Luckmann, 1991). The global knowledge system constitutes both national knowledge pools and structures, and the ‘invisible college’ (Wagner, 2009) beyond national borders, where scientific networks connect, circulate, generate, communicate, and distribute knowledge (Marginson, 2022). The flow of knowledge and people co-occur at the national, regional, and global levels. For instance, intra-regional mobility of doctoral students and scholars is considered a means of regional integration and tends to be, to some extent, antagonistic to globalisation (Mathies & Cantwell, 2022).

This article is structured as follows. In the following section, we provide a definition of ‘international academic mobility’, and propose that international graduate students’ mobility should be integrated with international faculty mobility. The third section presents a systematic review of the research on international academic mobility in *Higher Education* in the past 50 years. In the fourth section, we propose a new conceptual framework and research agenda on the role of international academic mobility in the global knowledge system. The fifth section discusses possible methodologies for future research on international academic mobility. This article concludes with reflections on the existing research and discussions on possible future research directions.

Defining ‘international academic mobility’

The term ‘international academic mobility’ is defined with ambiguity in the existing literature. Some scholarships use relevant concepts such as scientific mobility, academic mobility, faculty mobility, researcher mobility, and student mobility (Robinson-Garcia et al., 2019) to denote a similar idea about what we define as ‘international academic mobility’ in this article.

The meaning of ‘international’ in ‘international academic mobility’ is homogeneous across the literature, which means that mobilities occur between nations. It can be used as a synonym for ‘cross-border’ or ‘transnational’. For instance, Mahroum (2000: 367) defined ‘scientific mobility’ as ‘cross-border physical and geographic movement that comprises a stay in another country of no less than one year’.

Existing scholarships associate the term ‘academic’ in ‘international academic mobility’ with various denotations. Some relate it mainly to ‘academic researchers’ or ‘academic staff’, which include faculty members and postdoctoral researchers. Some also used the term ‘international researcher mobility’ (Coey, 2018). Some research extends the category of ‘academic’ to students that include undergraduate, graduate, and particularly doctoral students. As Czaika and Toma (2017) argued, the international mobility of students and scholars are ‘intrinsically related’. Ackers (2005) also noted that ‘any new research should curb the existing boundaries between undergraduate and other forms of academic mobility’. Jöns (2015), for instance, used the term ‘academic mobility’ to mean the movements of students and staff in higher education and research. Baron (1993) included students in the discussion of academic mobility in Western Europe. The book *Academic Mobility in a Changing World*, edited by Blumenthal et al. (1996) and focused on academic exchange programmes, argues that international academic mobility includes both student mobility and academic mobility.

Many studies include doctoral students in the category of academics and as research participants, when investigating international academic mobility (e.g. Greek & Jönsmoen, 2021; Petzold, 2017, 2020). Lee and Elliot (2020) proposed redefining international doctoral students as diasporic academics, rather than perceiving them as ‘research commodities’, or deficient against a ‘Western standard’. Doctoral students are termed ‘R1 Researchers’ in Cañibano et al. (2019), which is the first phase in the four stages of researcher’s careers. Similarly, Fontes et al. (2013) also divided scientific mobility into two stages: PhD and post-PhD. Graduates, doctoral students, and post-doctoral researchers were included in discussions about the fairness of opportunities in international academic mobility (Gerhards et al., 2018), the relationship between mobility and team diversity (Barjak & Robinson, 2008), and scientists’ international mobility (Netz & Jaksztat, 2017). In the ‘intellectual migration’ conceptual framework proposed by geographers, student mobility and highly skilled migration were positioned as a continuous spectrum (Li et al., 2021).

A broader definition of ‘academic’ includes materiality and immateriality outside the people category. Jöns (2018) proposed a conceptual framework of actants in academic mobilities that include the materialities (such as books, resources, equipment), dynamic hybrids (such as people, organisms, engagements), and immaterialities (such as ideas, knowledge, emotions). Jöns (2018: 157) noted that more research was needed on the role of ‘other-than-human organisms’. Gunter and Raghuram (2018) also argued that the international mobility of institutions, staff, students, and knowledge resources should be analysed together.

The ‘mobility’ in ‘international academic mobility’ also has different meanings. Based on the duration of stay and the direction of movement, Jöns (2018) classified knowledge mobility into nine types: short/medium/long-term linear mobility (internship, degree mobility, career migration), short/medium/long-term circular mobility (academic travel, credit mobility, return migration), and short/medium/long-term reciprocal mobility (commuting, transnationalism, diaspora). Smeby and Trondal (2005) used five types of activities to measure international academic mobility, namely participation in international conferences, guest lecturing abroad, international visits for study and research, international peer review work, and research collaboration. Lee and Kuzhabekova (2018: 374) examined transnational academics’ movement in pursuit of professional development and jobs, including ‘teaching, researching, consultancies, sabbaticals, and full-time employment’. While physical mobility has been the predominant form of international academic mobility, virtual mobility is gaining increasing attention

due to the development of technology, growing discourses about eco-friendly academia, and the drastic influences of the COVID-19 pandemic (Tzanakou & Henderson, 2021). In addition to mobility, issues of immobility have also been explored from gender perspectives (Henderson, 2021; Leung, 2014).

Building on the review of the literature, we define international academic mobility as the cross-border movements of people and organisms (including students, especially postgraduate students, researchers and academics, and academic communities), coupled with materials (such as infrastructures, resources, equipment) and immaterialities (such as ideas, information, knowledge, skills, emotions, imaginations) in higher education contexts. The movements can be short-term, medium-term, or long-term; physical or virtual; and one-directional or reciprocal (Bamberger, 2022; Jöns, 2018; Urry, 2002).

In particular, we argue that postgraduate students, especially doctoral students, should be included in international academic mobility research. They all share the identity of being (early-career) researchers, and are knowledge agents and bearers. Furthermore, when examining the life course of academic careers, the international mobility experience of graduate students, postdoctoral fellows, and faculty members is intertwined. For instance, international students can mobilise into the academic labour markets and become international or local postdoctoral researchers and academic faculty. International mobility during PhD. and Post-docs will eventually translate into advantages in attaining academic positions (Leemann, 2010). In addition, in transnational education settings and international branch campuses, international student mobility and international faculty mobility are dominant and inter-related phenomena.

Review of research on international academic mobility in *Higher Education*

The following section reviews all publications in *Higher Education* on international academic mobility in the past 50 years, applying the definition above. In total, 280 journal articles were found through a search on Scopus within the journal *Higher Education*, published between 1981 and 2021. The search was limited to ‘article’ types, and with keywords including ‘higher education AND mobilit*’ OR ‘international mobilit*’ OR ‘international migrat*’ OR ‘international/transnational faculty/academic*’ OR ‘international/transnational student*’ OR ‘brain drain/brain gain’ OR ‘returnee*’ OR ‘academic visit*’ OR ‘study abroad’ OR ‘diaspora’ OR ‘relocate*’ OR ‘Erasmus’ OR ‘Fulbright’ OR ‘Marie Skłodowska-Curie Actions’ OR ‘MSCA’. As *Higher Education* publishes only in English as of 2021, all searches and results were in English. Since this paper focuses on international academic mobility and its impacts, we manually screened the search results and only included articles focusing on international academic mobility, rather than utilising it as research context. Four types of articles were excluded: (1) articles with duplicates or erratum and correction (274 left); (2) articles that are solely concerned with social mobility and do not address international mobility; (3) articles focusing on language acquisition, learning difficulties, or social integration with international mobility as the research context; and (4) articles examining institutional partnerships or university policies, with international student and faculty mobility as background information. A final corpus of 140 articles was analysed. The following sections summarise and discuss the findings.

Publication years

Among the 140 articles published in *Higher Education* on international academic mobility, the earliest one was published in 1981. The annual publication number has been generally increasing since 2005 but with fluctuations (Fig. 1). In particular, 56% of the articles were published between 2015 and 2021, indicating a heightened research interest in this topic in the past few years.

Agents in the reviewed articles

Among the articles reviewed, 61% of them focused only on the international mobility of students, 24% on the faculty and staff, and approximately 14% on both categories of agents. Research examining the international mobility of students has focused on undergraduates (e.g. Dias Lopes, 2020), master's students (e.g. Jacobs, 2022), and doctoral students (e.g. Reale et al., 2019); however, the majority of research has focused on undergraduates. The comparatively high proportion of research on international students is consistent with the broader scholarships on international academic mobility, where faculty and researchers remain relatively under-researched compared to students (Coey, 2018).

Types of mobility

On the basis of duration, research on international academic mobility can be divided into three categories. The first group focused on short-term mobility, which includes internships (Petzold, 2021), exchange programmes (Wiers-Jenssen & Støren, 2021), and international sojourns (Zimmermann et al., 2021). Medium-term mobility, such as that associated with degree programs, is the second group (e.g. Lindberg, 2009). The third group examined

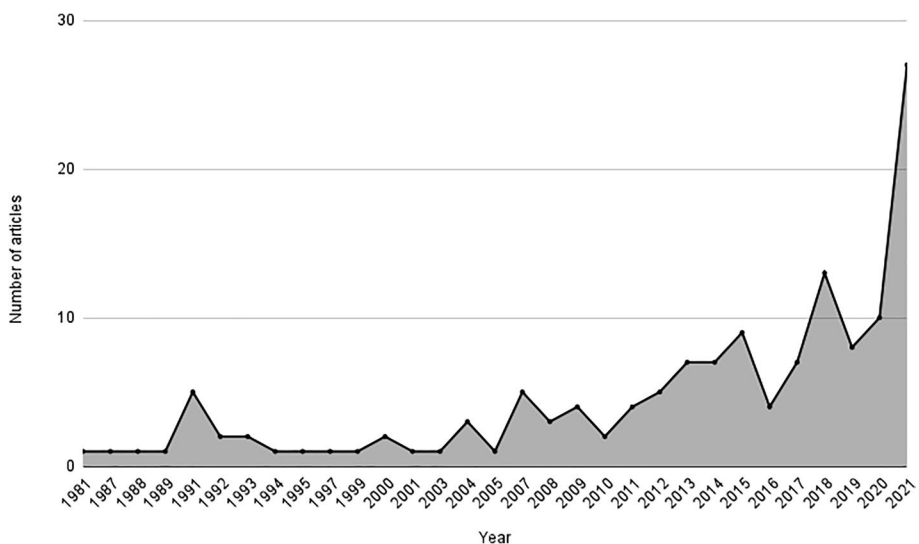


Fig. 1 The number of articles published per year on academic mobility, between 1981 and 2021 in *Higher Education*

long-term mobility, which involved return and migration concerns (e.g. Kobayashi, 2021; Pham, 2021). Research also noted a contrast between on-site physical mobility and virtual mobility (Bayne et al., 2014). In addition, issues of immobility were also addressed in the literature (Tzanakou & Henderson, 2021).

It is worth noting the studies on exchange programmes. Seven articles (5%) in *Higher Education* focused on the three typical short-term exchange programmes: Erasmus programme, Marie Skłodowska-Curie activities (MSCA), and Fulbright programmes. Main themes discussed included the economic and cultural impact of these programmes at the individual, regional, and national levels (Bótas & Huisman, 2013; Messer & Wolter, 2006; Tubin & Lapidot, 2006); and motivations driving the mobility at both the individual and institutional level (Lesjak et al., 2015; Rodríguez González et al., 2010). Notably, research found that although the movement of academics participating in these programmes is transient, networks built through the mobility can have a lasting impact on the host institution, industry, and even the nation of study (Dineen, 1992; Falk & Hagsten, 2021a).

Geographical focuses

This section provides a tally of the countries and regions researched in *Higher Education*. For articles that clearly indicated the direction of academic mobility, we distinguished between countries of outflow and inflow.

Articles examining international academic mobility issues were related to 279 different geographical contexts. The most studied ones are the USA (8%), the UK (7%), and China (7%). In terms of regions, the majority of publications are concerned with Anglo-European systems (Europe as 39%, North America as 10%) and Asia (32%), with only 1% and 5% of articles focusing respectively on Latin America and African countries. In addition, there is an imbalance in inter-regional academic mobility. This is exemplified by interregional cross-border mobility in Europe. Our analysis of articles concerning regional academic mobility in Europe reveals that North-western and Western Europe have been researched more than Central and Northern Europe, whilst Southern, South-western, and South-eastern Europe have received even less attention. The imbalanced research coverage partially reflects the influence of regional disparities in cultural, educational, and economic development on studies of academic mobility.

Our analysis of articles that explicitly stated countries of inflow and outflow (shown in Figs. 2 and 3) reveals that scholars are more concerned with the international academic outflow from Europe (38%), East Asia (20%), and Africa (12%). Meanwhile, Europe (38%), North America (18%), and East Asia (16%) have significant presence in the studies of inflow countries, with the UK and USA being the most frequently noted research contexts.

While these findings mainly reveal research interests published in *Higher Education*, they also reflect partly the dominant international academic mobility patterns. For instance, the most studied contexts are also major sending or receiving countries and regions. China is the largest sending country in the world for international students; and the USA, Australia, and the UK are the top destinations for international students (UNESCO, 2021). Notably, some countries and regions, such as Latin America and Africa, are underrepresented in studies published in *Higher Education*. The differences between geographical focuses for outbound and inbound mobility echo some global academic mobility trend too. There is still a tendency for international academic mobility to be directed towards traditional host countries, and from ‘Global South’ to ‘Global

outbound mobility

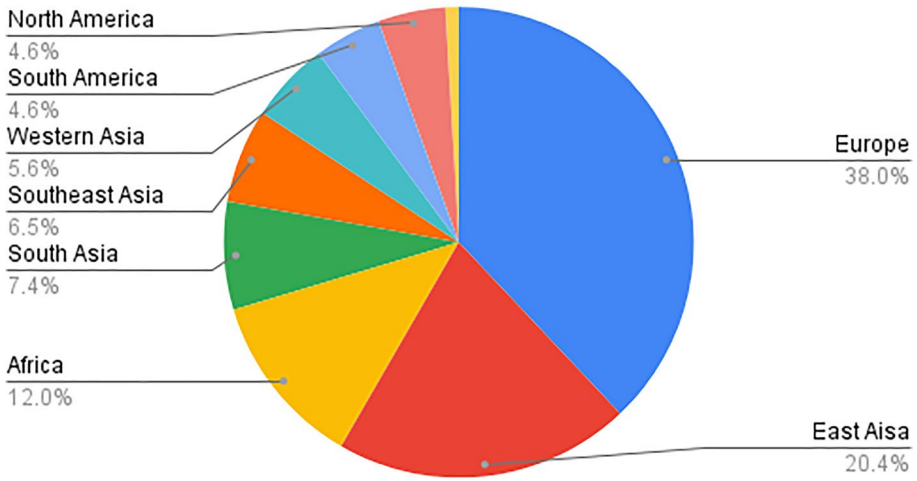


Fig. 2 Percentage of the countries studied for outbound mobility

Inbound mobility

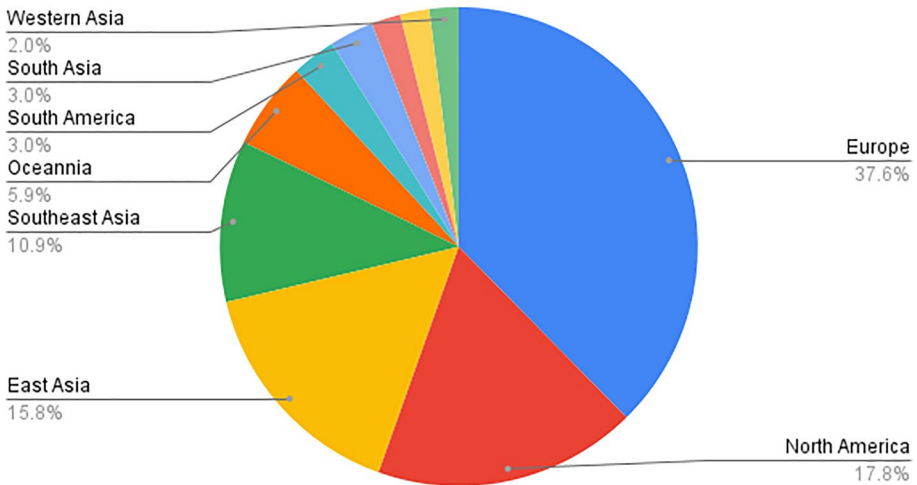


Fig. 3 Percentage of the countries studied for inbound mobility

North⁷. Nonetheless, there is also evidence of reverse flows and brain circulation, particularly to and within East Asia and Southeast Asia. The unequal geographical focuses also reflect the unbalanced landscape in the English-language higher education research world, where Anglo-European systems draw the most attention and other regions like Latin America remain largely missing from the discussion (e.g. Guzmán Valenzuela & Gómez, 2019).

Methodologies

The majority of articles employed qualitative (46%) and quantitative methods (44%), with the rest using mixed methods (10%). In qualitative research, interviews (including focusing group discussions) and documentary analysis are often used as data collection and analysing tools, whereas survey questionnaires, scientometric analysis, and network analysis are commonly used in quantitative research.

Based on the distinction between research-intensive and review-intensive articles (Abdullah et al., 2014), the majority of articles (80%) are research-intensive, which means the articles are conducted on the basis of empirical research. The other 20% are review-intensive, which contain detailed commentary, literature reviews, documentary analysis, or criticisms of international academic mobility issues.

For articles solely on international students, 38% are qualitative-focused research, while quantitative-focused research contributes to approximately 48%. For research solely on faculty mobility, qualitative-focused research accounted for 53% of the sample analysed, while quantitative-focused research contributed approximately 38%. The cohort of mixed methods research accounted for 9%. The majority of research focusing on both international students and faculty mobility is either review articles or based on questionnaire surveys, with a low proportion using interview methods.

Theories of mobility

In reference to Tight's (2004) explanation of how to determine whether an article has a theory, we describe as having applied theory papers that include a description, discussion, re-examination, or modification of theories, concepts, models, or paradigms directing the research or review. The majority of publications (70%) reviewed applied theories in an explicit or evidence-based manner, whilst the remaining 30% are atheoretic.

The capital theories, including Bourdieu's cultural and social capital theories, as well as human capital and signalling theories, accounted for 14% of the articles reviewed. Other most frequently used theories include push and pull models (12%), world-system theory (7%), stickiness (4%), internationalisation at home (3%), and career theory (3%). Additionally, the theories of social stratification, glonacal agency heuristics, self-formation, and actor-network theories each appeared in 2% of the articles reviewed.

Core issues and themes

Among the diverse issues covered, a noticeable strand of discussion focuses on the motivations of mobility. Research on the factors that influence people's mobility decisions has mostly focused on their experiences and needs in both sending and receiving countries (Cantwell & Taylor, 2013), as well as the adaptation after they return home (Johnsrud, 1993). Gender issues are another important topic with nuances to consider, as the mobility patterns of male and female academics vary across different contexts (Sautier, 2021). Literature has discussed the decision-making process of international students and identified influential factors using the 'push-pull' framework.

According to the research findings, the factors that impact students' decisions to study abroad are diverse (Li & Bray, 2007). Specifically, social-economic status restricts individual options (Delval & Bühlmann, 2019; Tsang, 2013), making the decision to study abroad inherently elitist. From a market perspective, some studies (Messer & Wolter, 2006;

Petzold, 2021) examined the economic benefits of studying abroad and how it affects employment. For institutions, the operational capability of institutions is crucial for attracting global talent (Roberts et al., 2009). It has been demonstrated that scientific research excellence, university size, country group, and teaching load have a substantial impact on whether MSCA grantees select an institution as a host institution (Falk & Hagsten, 2021a). Universities strive to attract a variety of skills because of its possible benefits in establishing connections with the market and encouraging national and regional economic growth (Lesjak et al., 2015). The motivation to study abroad is also tied to national policy orientations. International student mobility is a global phenomenon that is influenced by economic, educational, and political factors. McMahon (1992) has presented a more in-depth explanation of these three dimensions, where individual choices are inextricably linked to national and global shifts in trade mode, domestic education emphasis and opportunities, and international relationships. Thus, the changes in worldwide study patterns reflect individual-level shifts in motivation.

Many studies have explored the positive aspects of international academic mobility. They include providing opportunities to absorb innovative knowledge, transfer one's identity, transmit knowledge (Laudel & Gläser, 2008), higher level of scientific production (Horta, 2013), greater labour-market reward for undergraduates, and shorter education-to-work transition (e.g. Van Mol et al., 2021). Additionally, in the discussion of brain drain issues, some research suggested that in some cases, brain circulation can be seen as a global public good that enhances knowledge exchange (Marginson, 2007) and diaspora can also contribute to both sending and receiving countries' development by building relationships between universities and industries (e.g. Sharabati-Shahin & Thiruchelvam, 2013).

However, other research emphasised more on the negative aspects of mobility and suggested that for master's students, the positive influences of mobility on the labour market are minimal, which also vary largely across their backgrounds (e.g. Lindberg, 2009). Internationalisation of higher education in countries with more outbound mobilities may be hindered by brain drain (e.g. Teferra & Altbach, 2004). Research also highlighted the geopolitics of knowledge production, as well as the relationship between this dilemma and global inequality in higher education (e.g. Burford et al., 2021).

New research lens: knowledge and international academic mobility

Building on the review of the previous literature published outside and in *Higher Education*, this article proposes to foreground 'knowledge' as a new research lens, which entails four clusters (shown in Fig. 4): knowledge acquisition, transfer, and circulation; knowledge production; transnational knowledge networks; and knowledge, science diplomacy, and the geopolitics of knowledge flow. In the following sections, we bring together various strands of extant discussions to conceptualise this knowledge lens and its potentials for investigating international academic mobility.

Under this framework, knowledge is embodied in different forms, such as embrained knowledge (conceptual and cognitive), embodied knowledge (important in the case of experiments and where there is practical learning as in the arts), encultured knowledge (shared systems of meaning), and embedded knowledge (organisational practices) (Williams & Baláz, 2008).

People participating in the mobility are 'knowledge agents' who have the agency to acquire, circulate, produce knowledge, and navigate through knowledge networks and

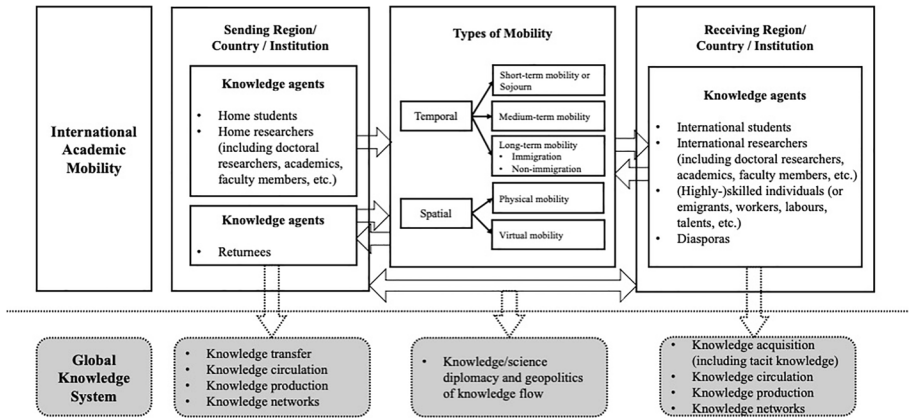


Fig. 4 Conceptual framework for knowledge and international academic mobility and global knowledge system

geopolitics of knowledge. The ‘knowledge agents’ concept highlights the centrality of knowledge and the agency of people, thus moving beyond discourses about mobile people merely being ‘human capitals’ or ‘talents’ under the geopolitical perspectives. In the framework, we have outlined various terminologies for knowledge agents used in various scholarships, some of which were used interchangeably or as overlapping categories. The terms include the following: local and international students; local and international researchers, local and international academics, and local and international faculty members; (highly) skilled individuals, emigrants, workers, labours, and talents; diasporas; and returnees. Noticeably, the existing literature mainly explored issues of international academic mobility from the global, regional, national, and individual perspectives, but the role of institutions has not been examined to a large extent. We thus note the sending and receiving institutions in Fig. 4, which deserve more attention in future research.

The types of mobility are categorised into temporal and spatial dimensions. Temporal dimensions include short-term mobility or sojourn, medium-term mobility, and long-term mobility which can be immigration or non-immigration. Spatial dimensions include both physical and virtual mobility. The latter, as discussed earlier, has becoming more significant and thus would benefit from more future research.

Global knowledge system overlaps with national knowledge systems but is not simply an integration of them. The global encompasses knowledge structures within nations and regions, while at the same time operating with agency and the autonomy of research communities beyond national borders (Marginson, 2022). Similarly, the regional knowledge system is embedded in both the national and global, while having a certain degree of autonomy. International academic mobility thus influences and is influenced by the national, regional, and global knowledge systems. Along with mobility, knowledge not only flows across national borders into each country, but also flows beyond borders into the regional and global knowledge systems. Nonetheless, since various forms of inequity, inequality, and injustice exist in knowledge systems (Marginson & Xu, forthcoming), the acquisition, transfer, circulation, production, networks, and geopolitics of knowledge in international academic mobility are also characterised by power and politics.

Knowledge acquisition, transfer, and circulation

The discourse of the knowledge economy became popular in the 1990s. With the end of the Cold War, the number of international students has also increased greatly since then. Altbach (1991) noted that international student mobility could influence the international transfer of knowledge, but the specific influence was not further discussed then. In later scholarships, economists conceptualised learning abroad as a knowledge import process, contributing to the economic growth in developing countries (Kim, 1998). The sociology of science studies suggested that knowledge is carried by students returning home from studying abroad (Schott, 1998). Nonetheless, Lee and colleagues (Lee et al., 2006) pointed out in a review that the relationship between international student mobility and science and technology transfer was neglected in the research.

In the studies of international students' knowledge acquisition, a large body of literature found that non-Western students need to readjust their cognitive strategies, learning styles, and approaches towards knowledge in a foreign (often Western) learning environment. Students from East Asia, particularly from China, are often stereotyped—they are perceived as deficit learners accustomed to memorisation and repetition that need to be transformed to critical thinkers (Holmes, 2004). Nonetheless, there have been many critiques of the over-simplified dichotomy and over-emphasis on cultural determinism in examining international students (Van Oorschot, 2014).

Researchers also obtain new knowledge during international academic mobility. After the Second World War, the USA, Australia, and other governments introduced aid programmes to sponsor study abroad. The focus of these programmes is the transfer of knowledge and local capacity building (Rizvi, 2011). Studies found that highly skilled talents from India leave the USA with knowledge and skills in STEM and business attained during their sojourn (Jacobs, 2022). Studies on Slovakian returnees also reveal that returnees acquire various types of tacit knowledge, explicit knowledge, embodied knowledge, and encultured knowledge through international mobilities. In particular, the division of tacit knowledge and explicit knowledge is very important for understanding the phenomenon of studying abroad. Researchers have suggested that tacit knowledge is place-specific and must be obtained by learning abroad in the destination country. This is the fundamental reason why student mobility will continue to become important (Baláz & Williams, 2004). The embodied knowledge obtained during studying abroad includes capabilities and confidence to tackle new challenges, and encultured knowledge includes the capabilities of foreign languages and adjusting to new cultures (Baláz & Williams, 2004). Teichler and Maiworm's (1997: 148) study of ERASMUS students also confirmed the importance of English proficiency in employment. Foreign language ability, the ability to understand and cope with different cultural differences, can be conceptualised as cosmopolitan competence, which has a high value in the labour market (Gu & Schweisfurth, 2015). Although traditionally developing countries emphasise the importance of international mobility on acquiring the 'hard knowledge' in STEM areas, international mobility also plays important roles in the circulation of knowledge in the social sciences and humanities (Coey, 2018), often demonstrated in business and social innovation (Glorius, 2021). The distinction between different types of knowledge, especially between explicit and tacit knowledge, is useful for future research on international academic mobility. Tacit knowledge is considered indispensable for innovation, so how international students acquire tacit knowledge in host countries is an issue worth exploring (Leonard & Sensiper, 1998). Furthermore, the middle and upper classes have clear advantages in obtaining cosmopolitan capital, that is,

the knowledge, skills, and dispositions gained through international experience (Delval & Bühlmann, 2020; Petzold et al., 2015). Future research could focus on the social effects of unequal access to cosmopolitan capital.

International academic mobility can facilitate cross-border knowledge transfer and circulation. Previous research suggests that upon returning, students with overseas study experience will use the knowledge acquired abroad to advance their home country (Richmond, 2007; Wang, 1991). For researchers, cross-border mobility is proven to be efficient for international knowledge exchange, which can be traced by bibliometric metrics like shared uses of references and lexical terms by co-authors (Aman, 2018). However, some knowledge can only be partially transferred. In addition, international students face many obstacles when transferring knowledge across borders, such as a relatively closed or limited scale of labour markets (King et al., 2016). Furthermore, knowledge transferred by international students may not satisfy the home countries' demands, due to a mismatch in the knowledge structures between the home and host countries. For example, highly professionalised knowledge is often needed in industrial countries—often the host countries; but in the developing countries which are often the home countries, skills needed in the industry sector can be more diversified (Mooch, 1984). In addition, returnees may find it difficult to adapt to the local cultural environment or face difficulties in career development after returning home, making knowledge circulation ineffective (Ai, 2019). In transnational higher education programmes, knowledge transfer faces cultural challenges, due to the divergence between the providing and host institutions regarding their academic practises and expectations. Additionally, a franchise model of teaching without foreign academics in presence is also not conducive to the transfer of knowledge (Leung & Waters, 2013). In the process of international knowledge transfer, some were successfully transplanted, some were localised and then diffused, and some were not successfully transplanted. How people with international academic mobility experiences promote diffusion is a question worthy of future research.

At the global level, knowledge mobilises both from the so-called global academic 'centres' (often the host countries) to 'peripheries' (often the sending countries), and the other way around. As Kondakci et al. (2018) points out, the emergence of regional hubs outside the traditional 'centres' deviates from the traditional international student mobility patterns and challenges the Euro-American centric understandings of internationalisation. In terms of forming human capitals, countries at the 'centres' seem to benefit less from cross-border mobilities—a study on 3155 American students over 43 years found that studying abroad and studying at home appear equally effective at forming human capital (Schmidt & Pardo, 2017).

Meanwhile, knowledge does mobilise to the 'centres'. Many studies have pointed out that international students or visiting professors are important sources of skill migration (Levatino, 2015; Stuen et al., 2012). As Goodwin and Nacht (1988: 117) suggest, in a globalised era, American students and faculty need to acquire sophisticated knowledge of the world, including foreign languages, cultures, and perspectives. Internationalised knowledge is essential to academics, they argue. Similarly, international students, particularly doctoral students, are not only knowledge learners, but also knowledge producers. International graduate students should be redefined as agents of knowledge formation.

The term 'knowledge circulation' can be more accurate than 'knowledge transfer' (Madge et al., 2015). Studies found that the mobility of researchers can facilitate knowledge exchange (Aman, 2018), and diasporas can facilitate knowledge circulation (Fahey & Kenway, 2010). In investigating international doctoral students' role as brokers in knowledge circulation, Bilecen and Faist (2015) identified trust, reciprocity, and solidarity as the

social conditions of knowledge brokerage. However, the circulation is not always reciprocal. Research has found that many migrant academics collaborate with academics from their countries of origin, as a demonstration of knowledge and brain circulation. But due to epistemic differences between them and academics from their countries of origin, they are more willing to collaborate with countries of destination, often those countries considered the ‘centres’ (Ortiga et al., 2018).

Knowledge production

Knowledge is not only circulated across countries, but also generated through international academic mobility. With the increasing globalisation of scientific research since the 1990s, the growth of scientific knowledge has been intimately bound up with geographical movement and international cooperation (Livingstone, 2019). For instance, a large-scale retrospective trace study (Paige et al., 2009) surveyed more than 6000 alumni with study abroad experiences during their undergraduate study between 1960 and 2005. In total, 39% of the participants reported having knowledge production after their study abroad experience. Among them, 51.7% reported that the study abroad experience had influenced their knowledge production to a large degree. As King and Raghuram (2013: 136) pointed out, ‘there is scope for a much richer understanding of the role of international students in producing and spreading knowledge’. Future research can further investigate the influence of international mobility on researchers’ knowledge production at different career stages, from different disciplines (beyond the existing focus on STEM areas), and from different gender groups (more research is needed about female mobile students and academics).

The international mobility of doctoral candidates, postdoctoral researchers, and academic faculty can strengthen the knowledge production in host institutions and countries (Mahroum, 2000). Take the USA as an example. In 2019, foreign-born workers accounted for 45 per cent of the US Science and Engineering occupations at the doctoral degree level, and a large proportion of them were born in China and India (US National Science Foundation, 2022). Research found that international students and skilled immigrants have been making significant contributions to knowledge production and technological innovations at US scientific laboratories, such as evidenced by positive effects on research outputs and patents (Chellaraj et al., 2008; Gaule & Piacentini, 2013; Stuen et al, 2012). For instance, a study by Gaule and Piacentini (2013) on 16,000 Ph.D. graduates in 161 US chemistry departments found that Chinese students perform as well as the National Science Foundation (NSF) doctoral fellowship programme awardees, and are between 22 per cent and 44 per cent more productive than other non-NSF students. They thus argued that ‘given that the graduate student is the workhorse of the modern laboratory, the influx of talented students is bound to enhance the productivity of the U.S. universities’ (Gaule & Piacentini, 2013: 700). Similarly, research in the Australian context also reveals the positive impacts of skilled immigrants on innovation (Crown et al., 2020). The USA and Australia are special in terms of their attractiveness and their pools of foreign-born students and staff. Therefore, more research is needed on the impacts of international academic mobility on knowledge production in other contexts. Future research can also move beyond the measurement of knowledge production outputs based on quantitative metrics (such as publication and patent numbers), and explore the knowledge creation process and outcomes based on wider criteria (Mitchell & Boyle, 2010).

In addition to knowledge production during international mobility, another topic of concern is knowledge production after international mobility. Research findings on the comparison of knowledge output between returnees and non-mobile scholars are inconsistent depending on the national and disciplinary context. Based on a survey of academics in Korea, Hong Kong, and Malaysia, Shin et al. (2014) did not find academics with PhDs abroad to be more productive than the local PhDs, while Marini and Yang (2021) found the productivity of Chinese academic returnees to be higher than those without international mobility experiences. Researchers also show that international mobility can have positive and negative effects depending on their timing, purpose, and varying according to fields of knowledge and others (Horta et al., 2018, 2020). We propose that future research should not only focus on the differences in research performance between returnees and local scholars but also on the differences in research agenda setting, methodological orientation, and creativity between these two groups to reach a nuanced understanding of the impact of international mobility on knowledge production.

Transnational knowledge networks

An extensive body of literature has investigated the relationships between international academic mobility, international research collaborations, and transnational knowledge networks. International academic mobility, particularly research training and mobility during postdoctoral periods, is found to be a key driver for international research networking and collaborations (Turpin et al., 2008).

After returning to their home countries, researchers with overseas academic experience tend to keep their international collaboration ties with colleagues abroad. They also have more internationally collaborated research outputs (Jonkers & Tijssen, 2008). Between 1981 and 2000, more than two-thirds of Humboldt research fellows co-authored with their German colleagues (70.1%)—disciplines with the highest rate of co-authorship being physics (92.3%), chemistry (89.8%), medical sciences (87.8%), engineering (87.2%), and biosciences (87.1%) (Jöns, 2007). Among China's international co-publications in 2017, 27% were published by researchers with overseas work experience (Cao et al., 2020). Chinese visiting doctoral students are also found to have co-authored with their collaborating supervisors abroad (Shen, 2018). All of the evidence demonstrates the importance of international visiting schemes for facilitating transnational research collaboration. Notwithstanding, research reveals a one-directional relationship between international academic mobility and international research collaboration—international academic mobility can lead to international research collaboration, but not the other way around (Kato & Ando, 2017).

Establishing and sustaining transnational knowledge networks depends on social capitals. Researchers are found to still rely on their pre-existing knowledge networks after moving to other countries (Sidhu et al., 2015). But not all pre-existing collaboration sustains. A study examined 378 academics who moved to Singapore and found that after the move, their collaboration with prior countries gradually faded in a way that 'publications co-authored with colleagues in previous countries dropped significantly in the first few years and continued to decline for over ten years' (Wang et al., 2019: 458).

Many international students choose to stay in the host countries upon graduation, rather than returning to their home countries. Those with high-skill talents are termed as 'diaspora' in the existing literature (Fahey & Kenway, 2010). The diaspora groups play key roles in constructing transnational knowledge networks. Nonetheless, they are becoming targeted by governments under geopolitical conflicts. In the USA, some ethical Chinese

students and professors are suspected of being non-traditional collectors of intelligence and subjected to unfair investigations (Zweig, 2021). It remains a question whether the diaspora can keep playing their roles in facilitating international collaborations (e.g. Marmolejo-Leyva et al., 2015). Research also shows that the diaspora's identification of their home countries is selective. Therefore, nation-states cannot take it for granted that the diaspora would be useful overseas academic resources (Jöns et al., 2015). Future research may trace the development of academic diasporas' research cooperation networks and its spillover effects.

Studies found that postdoctoral researchers are more successful in establishing social capitals (Woolley et al., 2008), but it is worth further exploring the relationship between transnational research networks and researchers at different academic career stages. Transnational knowledge networks are also not limited to academia. Research on transnational professionals in Hong Kong SAR revealed the key role overseas education experiences play in constructing the transnational professional network (Waters, 2007).

Knowledge/science diplomacy and geopolitics of knowledge flow

Knowledge diplomacy means the creation of an in-depth understanding of the host country, familiarity with the host region, and awakened consciousness of the world through subsequent life experiences (Asada, 2021). It can be exemplified by the US Fulbright programme (Scott-Smith, 2016). During the Cold War period, Euro-American countries and the Soviet Union provided abundant scholarships to compete for international students and educational exchange was considered an important means of knowledge diplomacy (Bu, 1999; Selvaratnam, 1988). Aside from the Fulbright programs, many other countries around the world have cultural and science policies in place to encourage diaspora returns and attract international students and scholars. For example, in Sweden, enhancing knowledge about Sweden abroad is a notable purpose of the Swedish state scholarship to support educational exchange (Åkerlund, 2014). International academic exchange as a tool of knowledge diplomacy also existed at the regional level; notable are the programmes of the European Union, particularly Erasmus and MSCA, which are crucial to the growth of excellent education in the European Education Area (European Commission, 2020). As noted previously, the two programmes make it easier for students and staff to travel across European countries and facilitate communication between organisations and institutions, which can ultimately lead to the promotion of policy formulation and cooperation. Slightly different from Erasmus, MSCA emphasises the scientific excellence pillar and aims to increase participation and strengthen the European research area through providing PhD and post-doctoral scholars academic positions in European universities.

Geopolitics facilitates but also hinders knowledge flow. After the Second World War, countries like the USA have been controlling the international transfer of knowledge and technology (Krige, 2014). Against a recent backdrop of anti-globalisation, control over knowledge flow is tighter, such as on the Chinese diaspora in the USA. Through a systematic review of diaspora scholarships in higher education, Bamberger (2022) finds that most studies on the diaspora as human capital and state possession focus on China, given the rise of China in global science and higher education. However, the perception of the diaspora as an asset for both the host and home countries is changing, especially during the COVID-19 pandemic. This not only manifests in the rise of 'the red scare' on American campuses (The Economist, 2020), but also in the UK, where collaborations with Chinese companies

and research institutions are under stricter scrutiny, in names of protecting national security and intellectual property (Warrell & Staton, 2021). Censorship and securitisation of scientific collaboration with China are intensified, indicating the de-globalisation trend and restrictions on knowledge, especially high-tech knowledge, all over the world.

The instability of geopolitics as an impediment to the diffusion of knowledge can also be illustrated by several instances from around the world. Since the outbreak of the Ukraine conflict in 2022, there was a suspension of university-level cooperation due to international sanctions against Russia and Belarus (e.g. Coimbra Group, 2022) and the crisis in international mobility in higher education faced by Ukrainian students as a result of the war (Marston & Tsolakis, 2022). As science connects the networks that disseminate knowledge globally with the national and institutional structures that house and fund scientific activities (Marginson, 2021), political unrest between nations can have a profound effect on knowledge flow at the individual, institutional, and national levels.

Nonetheless, geopolitics does not stop researchers from collaborating. Recent bibliometric studies found that even under strict regulations of knowledge circulation, the overall number of co-authored science and engineering papers between China and the USA far exceeds that before the COVID-19 pandemic (Lee & Haupt, 2021). However, geopolitics has negatively influenced cross-country scientific collaborations, and the number of researchers with dual US–China affiliations has dropped by more than 20 per cent over the past 3 years (Van Noorden, 2022). It remains to be seen how the partnership will be characterised in the future.

Methodologies for future research on international academic mobility

Traditionally, the research methods in relation to international academic mobility are interviews (e.g. Chou, 2021; Greek & Jønsmoen, 2021), surveys (e.g. Welch, 1997), or mixed-method studies combining interviews and surveys (e.g. Sidhu et al., 2015). However, international academic mobility is a complex and circulatory process that involves the flows of both people and knowledge, intertwined in complex relationships. New types of data and methods are needed to examine international academic mobility with further accuracy, comprehension, and depth (Fontes, 2007).

Based on the knowledge framework, we propose several methods for future research, which are particularly useful for examining international academic mobility through the knowledge lens.

The first is bibliometric analysis. With the improvement of the database (Author ID in Scopus) and author disambiguation algorithm, academics' mobility trajectory is traceable through the publications covered in two important bibliographical databases, which are Scopus and Web of Science (Robinson-Garcia et al., 2016). Using this quantifiable method, bibliometric data such as affiliations of the authors, individual scientists' publications, and citations can provide a more comprehensive understanding of academic mobility. By merging different datasets, researchers can identify an author across publications and track the mobility trajectory of millions of scholars (Verginer & Riccaboni, 2021). However, it is also important to note the limitations of this approach, namely the inaccuracy that can be introduced when judging the process of scholar mobility through the institution to which the scholar's paper belongs.

Secondly, analysis of academic CVs is useful to study the 'career trajectories, mobility, and the mapping of collective capacity' (Cañibano & Bozeman, 2009: 88; Cañibano et al.,

2011) in investigating international academic mobility. For quite a long time, higher education researchers depended primarily on questionnaires to analyse the knowledge production of faculty in higher education institutions. We believe that bibliometric analysis and CV analysis can improve traditional academic career research in two ways. First, they provide more precise and comprehensive data than self-reported academic output variables. Second, they provide a longitudinal analysis that is difficult to achieve with a one-time survey.

Thirdly, social network analysis is an analytical method suitable for 'relational data' (Scott, 2017: 4), used to visualise aggregated social relations, examine the social structure around relations, and disclose implications for social action (Scott, 2017: 2). In mobility studies, social network analysis can track and display the flow patterns from different countries for different research concerns (e.g. Kondakci et al., 2018), while is underused in higher education research. In addition, a new attempt is to combine big data with network analysis to find which global cities scientists flow to and stay in (Verginer & Riccabon, 2021). Similar to social network analysis, qualitative network analysis is used to study network relationships, but the latter emphasises the use of qualitative tools such as interviews to collect data on network relationships. It can visualise and elicit interview participants with the co-constructed qualitative network diagrams and the interpretation in the process, to explore the flows and relationships relevant to both the research and the participants (Oancea et al., 2017).

Fourthly, the relationship between international academic mobility and knowledge production and diffusion requires a more rigorous analysis of the causal mechanism. With the rise of multivariate data (big data) and causal inference methods, a rigorous casual explanation may be achieved through sophisticated research design, which combines CV data, publication data, and survey data.

Fifth, we find that the perspective of historical analysis is rare among papers about international academic mobility published in the *Higher Education*. In the field of historical studies, the interests on international academic mobility has been going on for a long time (Bu, 1999; Daniels, 2019). Future research should further integrate the existing historical analysis results to achieve a holistic understanding. Finally, it should be pointed out that in the qualitative research tradition, some new research methods such as self-ethnography are being used to study international academic mobility (Henderson, 2019).

There are, of course, many new approaches that are emerging, but the analysis of the previous literature shows that there is still a minority of research on this topic that uses mixed methods, so we also hope that future research will be able to combine multiple research methods to complement each other and thus better explore the relationship between academic mobility and knowledge dissemination.

Conclusions

This article reviews the existing scholarships about international academic mobility, in the past 50 years of *Higher Education* and from different research fields. Based on the critical review, this article proposes a reconceptualization of international academic mobility, and proposes a new conceptual framework to examine international academic mobility in the global knowledge system.

From the review of the previous literature published on *Higher Education*, we identified the following facts. First, the overall trend of study on international academic mobility is

expanding, and the topics of mobility and knowledge diffusion have been and will continue to be hot topics over the past several years and into the future. Second, most articles on research agents have been undertaken on students and faculty as distinct research groups, yet there are commonalities between the two in terms of worldwide mobility and the transfer of knowledge. In addition, the literature analysis revealed that there are numerous forms of mobility, but fewer studies have incorporated them systematically. Notable is the fact that, after compiling the research regions of interest in the journal articles, we discovered that the core regions of current scholarly interest consist primarily of countries with strong economic or political power, whereas countries on the periphery or semi-periphery have received relatively little attention. Also, at the level of research methodology, qualitative and quantitative studies are employed at roughly comparable rates, whereas mixed research methods are employed by fewer studies. Moreover, the emphasis on theory in educational research is further demonstrated by the fact that the majority of published research is theory-based. Lastly, the study of themes suggests that researchers are becoming increasingly concerned with the flow and dissemination of knowledge and are adopting a more critical and systematic viewpoint to acquire a more thorough grasp of the process of knowledge dissemination.

Building on the above findings, the article extends the existing definition of international academic mobility, by proposing that both students and academics should be conceptualised as knowledge agents in the definition. The broadened definition reflects the actual practises of knowledge production. As knowledge production becomes increasingly team-based and collaborative, more research are conducted together by students, postdoctoral researchers, and academic faculty members, and international academic mobility is playing growing important roles.

Hence, this article highlights the association between international academic mobility and the national, regional, and global knowledge systems. It is well documented that international academic mobility has played an important role in the rapid development of global science or the globalisation of science (Franzoni et al., 2015). The studies also show how international academic mobility contributes to the development of national research systems (Cao et al., 2020; Selvaratnam, 1985). At the same time, there has also been a trend of regionalisation in higher education and science. What role international academic mobility plays in this deserves further analysis (Heilbron et al., 2018; Robertson et al., 2016).

We argue that there are some deficiencies in current theories about international academic mobility. On the one hand, push–pull theory focuses on decision-making that precedes mobility. On the other hand, the existing theoretical explanations of the process and outcome of mobility from the perspective of knowledge mainly understand mobile people as knowledge carriers and consumers, ignoring their role as knowledge agents in knowledge production. We propose that future research can utilise the knowledge framework (Fig. 4) and explore further the implications of international academic mobility on knowledge acquisition, circulation, production, and networks, and investigate the engagements between international academic mobility and knowledge diplomacy, as well as geopolitical influences.

Furthermore, we suggest that methodologies for future research can expand beyond the current major ones (survey, interviews, review) to include bibliometric analysis, CV analysis, social network analysis, and qualitative network analysis. Finally, the geographical contexts of the existing literature, particularly those published in *Higher Education*, have concentrated on Anglo-European contexts, Oceania, and (East) Asia. However, international academic mobility happens not only in those contexts but around the world. More

research contextualised in other world regions like Latin America and Africa needs to be conducted and seen in the global knowledge pool about international academic mobility.

Declarations

Conflict of interest The authors declare no competing interests.

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