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Exploring EMI in STEM disciplines: a case study of KAIST

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ABSTRACT

This research aims to overview the English-medium instruction (EMI) situation in Korean Higher education (HE), briefly describing and studying HE policies and examining their impact on Korean teachers and students. The case of the Korea Advanced Institute of Science and Technology (KAIST) has been addressed and investigated intensively in the Korean context concerning STEM. It is significant to examine the 21st-century controversial issues regarding English Medium Instruction (EMI) implementation in Korean HE, focusing on a case study of the 'KAIST'. Notably, the issue of EMI has been questioned across Korean society and educational fields. This research focuses on reviewing relevant literature and analysing it in detail to learn how KAIST helps us understand Koreans' EMI pedagogy methods and education-related (Korea's EMI policy implementation in general and EMI's impact on students and teachers) issues. However, the secondary materials are based on press reports, public statements of the people concerned, and statistical data. It lays the groundwork for a step deeper future qualitative or quantitative approaches to the case of KAIST for the improvement and success of EMI in Korean HE. It has been found that modern EMI pedagogy methods can lower excessive pressure so that students and teachers can educate and enjoy the EMI education policy.

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Introduction

The goal of English-medium instruction (EMI) in education is to boost students to 'international competitiveness' or empower them. Also, EMI aims to enhance student and lecturers' mobility and to reflect developments in English Language Teaching (ELT) (Galloway et al., 2017, p. 4; Murata, 2019). In Korea, language planning and policy (LPP) to support English has been implemented in education through EMI. Korean Universities started EMI in the 1990s and increased the numbers when the Korean Government provided a high number of budgets to support them in mid-2000 (Fenton-Smith, 2017, p. 53). Jae Jung Song (2012) noted that the English role in Korean society is a very controversial topic and LPP-related debates are political. Primary schools have adopted English since 1997 and in 2008, President Myung-Bak Lee announced English as a planned medium in 2012 (Song, 2012). The projects like, 'Brain Korea 21 Project' (1999) and the 'World Class University Project' (2008) initiated EMI.

Many Koreans were not happy with this decision due to the funding spent on English language training (Song, 2012). This debate, issues, and EMI-related challenges have been discussed in this research. The paper focuses on the KAIST case study to know the role of EMI in Korean students' and teachers' academic lives. Selected previous literature on EMI has been used to explain the context of EMI in Korea and in HE. However, the issues about excessive stress – mental health, and pedagogy-related issues have also been argued with strong evidence of the causal relationships between EMI and mental health in general. Interestingly, the paper has conducted an empirical study, especially focusing on EMI in STEM/STEAM disciplines. The article focuses on the challenges of EMI HE in Korea concerning the case study of suicide. This paper examines how the Korean EMI policy (mandatory to teach all undergraduate

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courses in English) implementation has affected teachers and students. This KAIST case study attracts our minds and highlights the Korean higher education system. This case study is not only a challenge to Korean teachers and students but the whole world – local to international. Many EMI programs and courses adversely impact on non-English speakers' minds and lower their confidence. Most of the students see a forceful imposition of English as an additional language or in the form of EMI rather than enjoying learning a language.

Review of literature

The studies related to EMI in HE has been widely explored in Europe during the past decades (see Ammon & McConnell, 2002; Coleman, 2006; Waechter & Maiworm, 2008). In Asia, a comparatively small amount of research has mainly focused on India, Singapore, Malaysia and Hong Kong (see Altbach, 2004; Evans & Morrison, 2011; Naun, 2003). In Korea, currently, some endeavours have been taken to enhance the insight and effectiveness of EMI implementation in HE (see Byun et al., 2011; Choi, 2012; Kang, 2012; Kang & Park, 2005; Kim, 2011b). Debates and arguments on the requirement and practicality of English-only instruction in Korean academia began early in 2000. Korean universities hope to receive benefits from the Korean government in economic aid and to develop the evaluation (Byun et al., 2011).

Interestingly, many empirical studies have focused on the experiences of students and teachers toward EMI in Korean HE). Investigators aim to find better ways to improve the current EMI policy. Considering students' perceptions of EMI, their optimistic assessments of EMI over Korean lectures have represented a need to improve their English skills (Yun, 2009) while their adverse reactions to EMI on students to believe that it is unproductive to comprehend the content clearly (Park, 2009). Oh's (2011) research reveals that students are more satisfied with their English acquisition than their content learning in EMI classes. Also, he observes that students are not satisfied when they evaluate EMI as ineffective in terms of comprehension. Also, the students adversely view EMI as a means to improve their English skills (Song, 2008). A high level of social struggle has conveyed a predominance of psychological health problems. Tragically, a high suicide rate and pressures also have been observed in contemporary Korea (Piller & Cho, 2013, p. 26).

Many empirical studies focus on instructors' perspectives on EMI in the Korean context and are rarely compared to studies from the learners' point of view (one of them is Chuang, 2015). The recent research by Byun et al. (2011) says that it is a relatively comprehensive empirical approach to the effectiveness of EMI teaching policy in the Korean HE (Including the students and instructors as well as survey/interview participants). However, the research is a case study of Korea University (KU), one of Korea's most prestigious universities. It shows both positive and negative attitudes of participants towards recent EMI implementation. Then, it proposes some recommendations based on the data drawn from student opinion surveys and deals with interviews conducted by the Center for Teaching and Learning at KU.

Method and methodology

This paper examines a case study of KAIST to look at the EMI policy's impact on Korean students' and teachers' academic lives. It is significant to know how an EMI pedagogy challenges learning and teaching in English; for this, the teacher and students from the STEM fields have been majorly taken into consideration. A case study of KAIST represents the world's challenges in education, thus, it is important to examine the recent history of EMI policies in STEM. This paper fills the gap in the Korean EMI, language policy development and challenges from 2011 to 2022. Also, a brief acquisition of knowledge through EMI, the learning process, students' development and teachers' teaching methods have been discussed.

EMI case study is important to investigate through the LPP, implementation and challenges in the education field. Today, many schools and universities have adopted EMI to be global and promote internationalisation. However, the shift of English as a foreign language to EMI influenced this research to work on the KAIST case study and critically examine it.

KAIST is the first and top science and technology university in Korea (Korea Advanced Institute of Science & Technology, 2020) and represents the world's STEM and EMI issues in the HE across the

world. KAIST as a case study helps to understand STEM students' and teachers' issues and challenges in today's time.

A case study of KAIST exploring EMI in STEM disciplines has analysed through Korean newspapers, journals, public statements of the people concerned and statistical data as secondary material (online and print materials). These documents have been covered by recently published reports and research work. This document analysis method has great value to the paper to discuss the data analysis process. This fills the gap in the literature review from 2011 to 2022. EMI implementation and related issues are trying to understand the emerging themes of LPP and its impact on the students and teachers – serious excessive pressure and challenges of EMI in HE.

The availability of the KAIST as a serious issue has not been given much attention due to our ignorance. The limited related knowledge and availability of this topic led our attention to work on the KAIST as a case study. An evaluation of KAIST gives us a better understanding of its influence and issues in EMI which require a dialogue between EMI policy, LPP, its implementation, and attitude towards the teachers and students.

A case study of KAIST

In 2011, a series of suicides were committed by 4 students and 1 professor at the KAIST. One of South Korea's (hereafter Korea) top universities (from winter to spring of 2011) drew huge attention to the language policy in Korean HE from the public and academic spheres. Also, the exclusive use of English as an instructional medium was partially blamed for the suicides (McDonald, 2011; Heo, 2011). If an examination grade was lower than the requirement, then students had to pay for enrollment and tuition fees. This seriously causes a reason for suicide. The students usually have no experience with failure. Unfortunately, the conflict between the elitism of KAIST's education and the sudden experience of the lowest grades leads to suicide (Chang-Woon, 2012). Iwazaru (2011) highlights the suicide issues of the KAIST case. In KAIST, a seventy-five-year-old president and former MIT professor named Suh Nam-pyo established policies in which critics have leaped on 4 students' suicide.

After the suicide, 'some professors at KAIST boycotted the all-out EMI policy' (Sharma, 2011) and the debates started on EMI. In 2018, Katherine also raised EMI policies and suicide issues in 'EMI Policies in South Korean HE.' After this case, many Korean and global researchers and policymakers paid attention to EMI teaching methods and started to create a discourse on 'neo-liberalism' and 'neo-colonialism.' In detail, they examined the role of English education concerning the policies, education and Korean socio-economic market perspectives.

A transformation from the native language to a second language English always has a greater or lesser extent impact on the dual identity of a learner and teacher as well – non-native English speaker and learning English as a foreigner. Excessive pressure to learn English and English learning as a native speaker led to lesser confidence of the natives. This English implementation culture is a neo-colonial pressure; it challenges to learn the English language. Teaching and learning science in EMI greatly impacts the student's grades and performance levels. It needs to look at English as an Additional Language (EAL) for teaching and learning in science, technology, engineering, arts and mathematics (STEM or STEAM) disciplines in Korea, as these disciplines are related to KAIST and other Korean universities.

EMI policy and education-related issues in Korea

EMI issue has steadily been controversial on and off Korea's campus. Especially in HE, it has still been a so-called 'hot potato.' So far, the Korean government and university authorities have steadily pushed ahead with more English (only) classes. However, the English-only policy in classes at the university was thought of as one of the primary causes and blamed for the suicides at that time. This research aims to overview the EMI situation in Korean HE, briefly describing and studying HE policies and examining their impact on Korean teachers and students. Then the case of the KAIST has been addressed and investigated intensively in the Korean context concerning STEM. It is significant to examine the 21st century controversial issues regarding EMI implementation in Korean HE, focusing on the 'KAIST' as a case study.

Notably, the issue of English-medium instruction has been questioned across Korean society and educational fields. To examine the language imbalance and pressure on teachers and students – Kym and Kym give the reasons for the EMI policy in Asia,

The need for an EMI policy in Asian higher educational settings is apparent for two main reasons. Firstly, students are trained for professional workplaces, where English is a communication medium. Trade, tourism, banking, government organizations and the exchange of culture, technology and knowledge are a few examples of English used for communication. (Kym & Kym, 2014, p. 36)

EMI system in HE has dramatically increased since the new millennium around the globe (Choi, 2012) was a ‘neo-colonization’ through English functions with challenges for non-English speakers. This powerful turn is associated with multilingual or monolingual countries. Thus, the policies to implement EMI must be set from a different viewpoint. Inherited English language policies lead to neo-colonialism and create a conflict in Korea’s neoliberalization.

English has a vital role in the neoliberalization of education, serving as a direct index of elite schools and track placement. If Korea’s neoliberalization brings about drastic consequences of inequality, exploitation, isolation and death, then having to learn a language, particularly one that supposedly has much utility in this globalizing world, does not sound very high on the list of evils that we must fight. Would not securing fair employment, equal pay, adequate housing and dignity of human life be more pressing issues than questioning why one should learn English? This is certainly true. However, it is also important to note that Korea’s emphasis on English is not just about learning the language. English in Korea has played a prominent role in advancing Korea’s neoliberalization through the way it was symbolically employed in rationalizing neoliberal logic (Byean, 2015; Park, 2021). As everyone knows, economic and cultural globalization or internationalization is possible with English. The English power is a global *lingua franca* (Crystal, 2003; McCrum, 2010), the ‘Bologna Process’ as a kind of student, researcher or staff exchange program. The widespread academic publication in English; is especially in the science field.

However, the scale of tertiary education from 1990 to 2004 demonstrates that many students and institutions are interested in HE. Their numbers are increasing year by year in Korea. ‘As one of ‘Expanding Circle’ countries in English’ (Kachru, 1985). Korea is now a lot more strongly pushing the English-only instruction policy. Especially in its college education sector under the banner of globalization. Since the beginning of 2000, the number of EMI lectures at Korean universities has swiftly heightened (Byun et al., 2011). However, the worries and complaints of instructors and students about many side effects of its blind and rapid implementation by the government and college authorities are also gradually increasing. Although they are all profoundly recognizing the importance and necessity of the EMI system on the whole and in principle (Choi, 2012; Kim, 2011a). Cho (2012) writes about the effect of the EMI policy on Korean Universities,

The Korea Advanced Institute of Science and Technology (KAIST), a science and engineering university, announced in 2006 that all lectures, even courses on Korean history, Korean literature and foreign languages, should be given in English... In the spring semester of 2010, about 88% of undergraduate courses and 95% of graduate courses at POSTECH were taught in English. However, the policy was implemented without consulting the faculty members and students. (p. 137)

Similar to Cho’s view, Carrió-Pastor finds that the challenge with Korean professors is to perceive EMI policy positively and expect EMI to be profitable for students and institutions. However, on the negative side, these professors realise that EMI will impact the lower standard of the academic experience. There are also challenges for a self-perceived lack of knowledge and understanding of the subjects, and a lack of English skills and motivation (2019, p. 50). In a survey, a few students talked about challenges and difficulties at the beginner level. They previously had not taken EMI courses but now, EMI improved their English ability and helped them to learn the content (through YouTube, English subtitles and other content). A diverse student population should have completed ELL courses before entering EMI (Lee et al., 2021, p. 46). Otherwise, their confidence level and anxiety may cause stress and this pressure may lead them to commit suicide or go into mental and psychological problems. This challenge can be handled by understanding the needs of students and monitoring the professor’s pedagogical impact on the students’ learning and mental health. These are the problems that lower the self-confidence of teachers and students, so they think of committing suicide.

EMI has been applied and researched in many countries (e.g., Indonesia, Korea, Japan and Vietnam can be explored in Sahan et al., 2022; Shao & Rose, 2022; the African context can be seen by Kamwangamalu, 2013). Among them, two studies were conducted in Turkey (Kirkgoz, 2005a; 2007b; Sert, 2008). All these global studies have reported adverse effects of EMI. Two major findings of the EMI study are 1. 'The students feel distanced from their native language and culture and 2. Ineffective delivery of course content' (Choi, 2012, p. 140). In the boiling and controversial issue of EMI in Korea, KAIST has been centered so far because of the overall implementation of the EMI system since 2007.

However, less research has been done on the exclusive use of English as a teaching medium for education in Korea. There was no mention of the tertiary education sector (Choi, 2012; Kang, 2012). The 'Times of India' reported that on 21st March 2009, G. Geetha Rani (21 years old and pursuing MSC) attempted suicide as she could not cope with EMI. Similarly, many cases exist across the globe. Thus, this KAIST case study represents all other cases where the pressure of learning English and EMI is a burden.

A similar case by Ibrahim (2001), pointed out from the context of Indonesia. His study addresses the challenges of teaching content in English. The limited teachers' English proficiency fails to enhance the student's English skills. With this finding, Ibrahim proposes a partial EMI program to use the mother tongue in specific situations, such as discussion sessions and questions. His suggestion can also be a solution to the KAIST to reduce the English pressure and this way KAIST cases (suicide cases from KAIST) or a case of Geetha (India) will never happen again. Barnard (2014, July) says that the probable link between EMI and students' suicide is extremely disturbing. However, other factors are less personally tragic. But important to consider critically, EMI continues to be recommended for adoption in Korea and elsewhere. Joo-Kyung Park explains that EMI in Korea was initially reinforced by the Korean government's 'Korea Study Project' (2004). A recent study conducted by Kim et al. (2016), demonstrates that many students studying in 3 leading engineering schools preferred Korean-medium instruction (KMI). They did not think that EMI would boost to acquire English skills.

The challenges of EMI

English language policy

KAIST is a specialized national top science-technology university established on 16 February 1971. It has a significant effect on Korean society and academia:

1. The overall implementation of EMI classes of almost 100% compared to that of other top universities (see Table 1)
2. The program-based EMI system is distinct from the EMI feature of other Korean universities that have been required to introduce an EMI system. At least to make only a section of each program's curriculum available in English (Byun et al., 2011). Of course, very strongly supported by the first factor.

From the above table, it seems that the EMI issue of KAIST started in 2007. Dr. Nam-pyo Suh has been an MIT faculty from 1970 and currently serves as the Ralph and Eloise Cross Professor Emeritus at MIT. He was the first elected president of KAIST in 2006. Since taking office, Dr. Suh has pushed forward not a few unconventional and innovative policies on the campus whose three representative steps were as follows:

- A. 'Tuition fee policy' of tuition-free for those whose GPAs drop below 3.0 on a 4.0 scale.
- B. 'Faculty tenure policy' of strengthening professor tenure requirements is particularly alarming for a country where professors are hardly ever fired.

Table 1. EMI status of Korea's major universities in 2010 (Adapted from Task (2011)).

Universities	EMI ratio (% , 2010)
Korea Advanced Institute of Science and Technology (KAIST)	91
Pohang University of Science and Technology (POSTECH)	57.8
Korea University (KU)	40
Hankuk University of Foreign Studies (HUFs)	36.4
Sungkyunkwan University (SKKU)	35.7

C. 'English language policy' of the overall implementation of EMI.

In particular, the third measure of EMI brought an enormous echo and controversy in Korean society and academic circles beyond KAIST.

'English-only instruction' issue ignited serious and substantial discussions

KAIST decisively introduced English-only lecturing in all the courses, excluding the Korean language and history classes. Including foreign language classes such as Chinese and Japanese in 2007 and immediately, its 'English-only instruction' issue ignited serious and substantial discussions on the suitable time, efficacy, feasibility and so forth of the introduction and implementation of the EMI system in Korean education across the country. When the English-in-the-classroom debate persists to lead policymaking at the university, Dr. Suh Nam-Pyo (Ramstad, 2012), president of KAIST said, 'Part of the contentiousness of the debate is generational resistance and part is due to the state of flux that KAIST's faculty is in.' He followed by stating that,

Although every one of my professorial colleagues would share my view that KAIST has to become one of the best science universities in the world, once we start talking about language of instruction, it poses really unusual challenges for some people. Many of the younger people we hired don't have any problem ... But overall, if you come to KAIST, I think you'll get a majority of people will support our new policy and teaching in English.

The critical viewpoints of not a few KAIST professors on EMI more or less have been spurted out steadily. Professor Choi Gwang-mu (cited in Han, 2011b) from the Department of Computer Science at KAIST said that 'teaching English lecture is downright crazy. Teaching in English is like having students study during math class. Just because you learn a subject in English does not mean you are globalized. Students should have pride in their mother tongue. It's wrong to force them to study in English' Prof. Han Sang-geun (Han, 2011a) from the Department of Mathematical Science said, 'English-speaking lectures cut the personal contact between professors and students, thus drying up the students' emotions.' Some KAIST Professors claimed,

English-language lectures aren't promoting globalization but they're promoting Americanization. Looking at 283 associate professors at KAIST, 66.4% received their doctoral degree in America, 26.9% in Korea and only 2.5% in non-English-speaking countries; in 2003, 7.8% of full-time professors had received their doctorate in non-English-speaking developed countries. (Park, 2013)

About this issue, the KAIST Undergraduate Student Council held an Emergency UG Student Assembly and performed a vote on whether or not President Suh's reforms were a failure and the vote barely failed. Because 416 students considered the reforms negative, only 10 were the majority (Chang & Park, 2011). On the other hand, a fellow KAIST graduate (Han, 2011b) said, 'Of course it's tough. We all knew it would be tough, but we chose to come anyway. And if you think about it, English is a must in Korean society and for those who want to study abroad. I think it's better to struggle now than later'. Kym and Kym's comparative study is with Chinese, Korean and American instructors in the EMI process. They found that native language and non-native language speakers in students' whole fulfillment and aptitude to grasp significantly differed according to the instructor's native language (English or non-native), background knowledge and study-abroad experiences (2014).

In sum, it should be clear to understand the essential aim of an EMI is to acquire the content and language. Also, students should get more advantages from EMI. They can improve their English skills and enhance their background knowledge. EMI issue at KAIST reached a climax from winter to spring in 2011. Four students and a professor killed themselves from January to April 2011. The suicides sparked the warmest debate over lectures in English nationwide. However, the cause of suicides might be from many other factors, including EMI stress. In the end, the effect was the adjustment of Dr. Suh's policy (slightly cutting the number of classes in English) and his resignation from KAIST in 2012. Similar cases also occur in other countries where students feel that English is a big headache.

A recent data collection from Seoul, Korea University (KU) and Kyung Hee University (KHU), Jon et al. (2020) find that student's problems in speaking or hesitation in asking questions in the classroom, as

well as professor's issues, have also been focused in detail (how teacher's struggle for teaching preparation, and faces much disrespectful behaviour from the students, lack of response also makes teachers frustrated and some other issues have been focused with analysing the professor's interviews). Professors' decoupling behaviors to EMI policy helps students learn, so they ask questions in class and understand their problems. Decoupling helps to engage and assist Korean students. The teaching and learning of STEM in EMI are challenging but can be sorted out according to the requirement of time, resources, student needs, and so on. In Korea, teachers' perceptions and practices of STEM education in EMI are still challenging and positively changing their behavior. You might need to look at the EAL of teaching and learning STEM or STEAM disciplines in Korea, as these disciplines are related to KAIST.

Finding and discussion

EMI in Korean HE

Korean parents spend \$20 billion yearly on children's additional education. Mainly in English and math (Park, 2007). Koreans spend \$15 billion a year on English activities/programmes. This is for standardized tests of English and study-abroad programs (Chun & Choi, 2006). In response to this new paradigm and the feverish national situation of English, the government has taken many measures to integrate English into schools. In Korea, English was introduced as a compulsory from Grade 3 in primary school in 1997. Afterward, it was introduced as the only EMI in primary school English-language classes in 2001. According to Kim (2011b) on the Korean English policy, the 7th 'National English Curriculum' of 1997 (Ministry of Education, 2007) proposed a plan called 'Teaching English through English' (TETE) to strengthen communication which is the main focus of Korea's current English education. TETE classes began fairly from elementary school grades 3 and 4 and middle school 1st year and then they were methodically increased up to high school more and more strictly until 2004.

Findings

The HE English-only teaching policy of the Korean government first emerged in the early 2000 and speeded up in 2001. The government proposed a proposal to attract more international students at that time. However, the program generated few substantial changes at the institutional level (Byun et al., 2011). In 2004, the government announced a plan titled, 'Study Korea Project.' Afterward, it introduced a financing plan for the universities to offer EMI with their significant interest in EMI. EMI has since assumed a leading role in Korean colleges' globalization policies (Ibid.). The whole world, we are experiencing 'an economic ideology—neoliberalism—serves as a covert language policy mechanism pushing the global spread of English' (Piller & Cho, 2013, p. 23) and Korea also comes under this pressure and trying to experiment and keep balance with a monolingual Korean with the English language.

The government document (e.g., Strategic Plan of internationalization of Korean HE in 2007) summarizes the primary reasons for the enlarged use of EMI in Korean HE: (1) EMI can help students to make future business careers or academic pursuits and provide domestic labor market with graduates having a higher level of internationally-oriented skills, (2) EMI allows institutions to employ visiting scholars from abroad and helps lure more international students to compensate for a decline in the domestic population of college-age students and (3) EMI enhances the language skills and confidence of Korean faculty and can boost greater mobility and idea exchange within the internationalized scholarly field (Byun et al., 2011, p. 432).

According to the 'Korean Ministry of Education' (2007), the statistic related to EMI in Korean HE is that Korean universities have offered around 410,000 courses. In 2006, the 1st and 2nd semesters of study EMI accounted for about 9,000 courses. Approximately 2.2% to draw more international students and improve the English-language proficiency of domestic students. However, the government set the aim for 2010 to raise the EMI ratio to 3.1% of all courses.

The LPP was designed to positive change in society but the KAIST case study finds that EMI became a challenge to the teachers and students. It has been found that EMI plays an important role in Korean HE. Many courses, degrees and training have started to promote EMI under the Korean LPP for varied

benefits. A modern EMI pedagogy method can lower excessive pressure so the students and teachers can educate and enjoy the EMI education policy. This KAIST case study research finds that there is still scope for its improvement and success. EMI still required changes in pedagogy for its improvement to achieve the LPP goal.

Discussion

We must first consider the reason and goal for accepting the exclusive use of English. EMI in the Korean HE fields in a proportional way or across the entire curriculum. Comprehensively speaking, the main motivations for adopting English-medium instruction at the tertiary level in Korea are:

1. to enhance the English ability of domestic Korean students for better competitiveness in high-quality job positions,
2. To internationalize the student body and the faculty as well for better international competitiveness in this globalization era, most of all focusing on boosting the number of self-financed or scholarship-supported students from abroad in the current situation of a shrinking population of college-level applicants,
3. To hold up lots of people at home who are ready to go to study overseas, especially for the sake of English learning and
4. Ultimately, most importantly and increase domestic university world rankings. Such motivations have been driven by explicit government policies and financial support in Korea during the past ten years or so.

Now, turning back to the situation of KAIST, we could say that the introduction and implementation of EMI were highly successful in terms of the above reasons. Especially, in the world ranking, despite not a few controversies and troubles. That's because KAIST sharply increased from the 198th of 2006 to the 60th of 2013 in the QS World University Ranking. Therefore, considering the international competitive power of KAIST is on the rise. It could also be said that the effectiveness of EMI teaching and learning is clear, indisputable and accordingly. It is pretty out of the question to mention the abolishment or drastic reduction of EMI classes beyond their slight adjustment depending on different levels of English and subjects, which are core issues of EMI in KAIST. Many students face English medium instruction as a challenge and struggle for their education. Consequently, many students come under pressure and cannot perform well.

Academic pressures know how to be fierce in HE and minimising this 'decoupling' and active classroom brings a change in the teaching and learning in EMI. The KAIST and school psychologists have developed counseling services from the time of these suicide cases. The school president revoked a controversial policy that embarrassed many students by charging them more tuition fees if their grades dipped (McDonald, 2011). However, we still have more considerations for the EMI issue at KAIST. Concisely speaking, first, the questions must be answered about which factors, including English-medium lectures, affect QS global college evaluation. And then to know how much EMI affects that; that is because of Seoul National University (this is well known as Korea's top university). This has 15% EMI classes (as shown above as of 2010) and was ranked 42nd in 2011, 37th in 2012 and 35th in 2013 at the same QS World University Ranking. In addition, the second consideration is the necessity, reasonability and possibility of almost one hundred percent EMI classes excluding some subjects such as the Korean language in Korean HE, including KAIST, given the considerable impact and efficacy of EMI upon the enhancement of the collegiate world ranking and globalization. About the possibility, we may say it is okay from the case of KAIST despite the last several years' complications while the necessity and reasonability are still controversial among authorities, instructors and students. It is mostly not faced with whether or not to adopt EMI but how to effectively implement EMI at the Korean HE level in the relevant research. This is crucial for achieving future career success with no pressure.

Recommendations

The primary positive outcome is EMI's efficacy in enhancing students' English proficiency. At the same time, there are complaints about its compulsory enforcement without regard to students' or professors'

language proficiency and insufficient support measures. The suggestions and recommendations like a more flexible approach considering learners' language proficiency and career plans as well as the qualities of numerous academic disciplines are required. And more thorough planning to execute EMI policy is today's need.

Another more recent study by Choi's study (2012) was on EMI in Korean HE, focusing on professors' perspectives. She did qualitative research on ten EMI instructors. She found that they view peripheral factors, such as the college and university rankings and the assessment parameters are based on EMI progress. They mention the significance of improving the international competitive edge of Korean HE in globalisation and they perceive EMI positively.

However, strongly problematizing the blind acceptance of EMI policy and externally forced EMI expansion movement in Korean HE. The research claims that a methodical sustainable implementation plan with a suitable approach should be taken at both the national and institutional levels.

Mewadev and Roshan write, 'Students may be expected to be more connected to the world outside of their classroom. This promotes genuine interaction with a variety of resources, trainers, peers and experts by comparing the language used in a large sample of picture books and adult-directed speech to a list of speech samples collected from adults who speak to other adults and for a talk aimed at children' (Mewadev & Roshan, 2020). KAIST should help students to find happiness, satisfaction and success in their way. As a result, we may stop serious issues like suicide cases, and it could be surely removed from the dictionary of KAIST (Chang-Woon, 2012). For the success of EMI policy in Korean HE, this case study creates a space to learn the needs of today's Korea to achieve EMI goals. Policymakers should take a positive attitude and motivational steps for EMI. Also, a positive attitude towards learning a second or foreign language (such as English) can help to acquire languages and knowledge and enhance the ability to learn and think in other languages. A step also can be taken, 1. Without the pressure of learning English and motivation is required. 2. Providing needed equipment, dictionaries and various short-term or long-term courses. 3. By creating a proper environment to learn four skills and 4. There is always a need to measure the response of teachers and students by crosschecking if the course content fulfills the aims and objectives and at what level: are learning resources enough to teach and learn? 'Cognitive' and 'emotional' engagements mediate the relationship between motivation and the satisfaction of students in EMI courses (Le & Nguyen, 2022) and these factors apply to learning any language.

Kang critically reviews the current educational trend on the limited use of EMI for HE in Korea. After offering evidence against English-only lectures and the advantage of using the first/mother language in college classrooms. She concludes by saying,

The current English-only policy in Korean HE is reminiscent of the submersion or 'sink or swim method which was found illegal and outlawed in the US in 1974. To avoid repeating history, it is necessary to provide students with supplementary English lessons and ensure their full mastery of academic content through the first language until they can transition smoothly to English-only instruction. (Kang, 2012, p. 33)

In short, the above-analysed literature review demonstrates that EMI despite the gradual increase in studies and understanding of the current EMI expansion has driven the Korean tertiary sector. There has existed no survey or including the case of KAIST related to EMI in Korean HE. So far, this has brought significant ripple effects and implications since the EMI system was introduced into the Korean academic society. The present study is expected to update the knowledge of EMI and how can be addressed in Korean HE through the KAIST case study. Also, the research contributes to contemporary literature in Korean EMI pedagogy.

Conclusion

To conclude, the importance of English-only teaching has recently been strongly emphasized, particularly in higher education sectors in Korea, in the proactive support of the globalization trend by decision-makers. In contrast, the people on the opposite side have continuously resisted an overall and sudden change in language teaching policy, regarding the current globalization as a kind of Americanization or academic partialism. In a sense, at the crucifix of the clash of their idealism, there seems to have happened the tragedy of KAIST. Still, the conflict and disagreement of the two groups lie

in hiding as a dangerous ‘powder keg’ in the country. Although, the wave of globalization is already likely to prevail.

E. G. Kim et al. (2021) are worried about Korean schools not having an evaluation process to know the level of teaching and teachers’ English command. Thus, teachers’ English levels are undetermined; most of the professors are Korean native speakers who have restricted exposure to an English-speaking environment during graduation. It is possible that English levels require further training to adopt EMI. Korean EMI policies reveal that ‘the unilateral and mandatory nature of initial planning, which failed to take into account the varying positions of stakeholders, led to many of the problems associated with EMI’ (Kang, 2018, p. 32). In statistical data, Bradford et al. (2022) found the challenges are current constructions within the Korean academic cultures whereas Japan has not encouraged pervasive adoption of EMI-related Professional Development (PD). As national and international competition increases the pressure on universities to internationalisation is also rising. As a result, professors (in Japan and Korea) are gradually fraught with teaching responsibilities, student care and administrative tasks so there is less time remaining for PD.

After investigating, we need to understand the purpose of EMI and consider the matter of ‘Americanization’ through the EMI system, as claimed by some KAIST professors. It must be carefully examined and reviewed to understand EMI from the aspect of academic diversity and depth and the nation’s global competitiveness. For this study, we need to monitor educational policies and their positive and negative impacts on students and teachers. Analysing and criticising the education system brings a developed and sustainable education policy so that students and teachers may not feel the pressure of anything. Imposing a particular language is not a solution to make students and teachers learn and teach English, but a good education policy does not put mental pressure. As a result, the student and teacher perform well, feeling confident and not thinking about suicide. This is to achieve the primary goal of EMI. This case study helps us to know the similar forms of Asian universities and the impact of EMI on students and teachers. From a Korean perspective, the ground level of EMI, globalization, English language requirements, and linguistic imperialism are challenging for Korean monolingual native teachers and students. Excessive English language pressure and little exposure bring tension to academic life.

Timely monitoring and changes can bring positive changes for strengthening the healthy academic level. Thus, it is necessary to make a qualitative, quantitative and comparative approach to the KAIST EMI case for overall improvement. Williams developed four distinct micro-CGTs labeled: ‘Past Experiences Shape Trust,’ ‘Support Shapes Trust,’ ‘Trust Affects Access’ and ‘Trust Affects Interactions.’ His research indicates that trust plays a fundamental role in the students’ EMI experiences (2019). In 2022, Ahn reports that in the changing linguistic reality of Koreans, English has become an additional language (in academics). In an empirical study, he finds that to some extent, English has become a language of social communication language.

Limitations and future research areas

This research has certain limitations thus, the paper has not touched on higher education reforms and policies in detail with other Korean regional language policies. The future scope of this research can be explored through primary and secondary school education and issues after COVID-19. As suggested by Choi, ‘EMI has also been implemented and researched in Asian countries such as Turkey, Indonesia, Vietnam, Japan and Korea’ (Choi, 2012, p. 139). Thus, it can be fascinating to do a comparative study.

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