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The Impacts of the COVID-19 Pandemic on First-generation, Low-income and Rural Students in Indonesia and Vietnam: A cross-cultural comparative study

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Abstract

The COVID-19 pandemic has had a significant impact worldwide, affecting 600 million students in higher education institutions across 200 countries. However, comparative studies by country on this topic are limited. In this paper, we explore the question: how has the COVID-19 pandemic affected higher education students and which ones have been impacted the most? Indonesia and Vietnam are our focus. We leveraged a rich set of data collected online from college/university students from both countries involving over 2600 participants, and used regression analyses to measure the students' outcomes, including the dimensions of their wellbeing, financial hardships, access to technology, and educational satisfaction. As expected, we find that there are statistically significant differences between both countries, especially among first-generation, low-income and rural students in almost all the outcomes in our four domains. We observed that low-income students and rural students in both countries were less likely to have access to technology during the pandemic than their more affluent and urban counterparts. They also were more likely to endure financial hardships during the pandemic. We did not find any statistically significant estimates for students' burnout measures among the students in these two countries. In addition, we observed lower likelihood of satisfaction from rural and low-income students in Indonesia. We provide our policy recommendations for both countries.

Keywords: COVID-19 pandemic, comparative study, higher education, inequality, disadvantaged students

Introduction

The COVID-19 pandemic has had a significant impact worldwide, affecting 600 million students in higher education institutions across 200 countries. Studies from across the world have also shown that there is a widening gap for access to digital devices between those who come from an upper socioeconomic (SES) status and their counterparts who do not (World Bank 2020b; Rodriguez-Planas, 2020; Adnan & Anwar, 2020; Pokhrel, 2021; UNESCO, 2020; Murgatroid, 2020). This study aims to explore the question: how has the COVID-19 pandemic affected higher education students and which ones have been impacted the most? We focus specifically on Indonesia and Vietnam.

The COVID-19 pandemic has affected several domains of students' outcomes in higher education in Indonesia and Vietnam, particularly students' wellbeing, their access to technology, and the financial hardships that they have endured, as well as their satisfaction with the quality of learning that they have experienced throughout the pandemic. Many studies focused on the COVID-19 pandemic and its impact on higher education have only examined within-country or its regional effects (Rodriguez-Planas, 2020; Aucejo, et al., 2020; Agasisti & Soncin, 2021; Coman et al., 2020; Arënliu et al., 2021). However, no current comparative studies have explored this question for the Southeast Asia (SEA) region, which was one of the most rapidly industrializing, urbanizing and economically growing regions globally in the second quarter of 2020 before the COVID-19 pandemic hit (Djalante et. al., 2020). For developing countries such as Indonesia and Vietnam, the pandemic's enormous impact on their higher education students has been notable. Throughout this study, we intend to bridge the gaps that we observe in the literature.

We selected Indonesia and Vietnam as two countries to compare for several reasons. First, not only do they both exist in the same region of Southeast Asia, but more importantly, they are both experiencing demographic bonus dividends from their respective populations in which there will be an increase of labor market participation that may boost the productivity of their economies. Over the last few years, these two countries have invested significant amounts of time and money into improving the quality of their higher education systems in anticipation of current and future demographic dividends that will positively impact their economies (Afandi, 2017, The World Bank, 2016). There has also been strong support from their governments that has resulted in an upward trend in the total enrollment of higher education students over the last two decades, including first-generation higher education students (Asian Development Bank, 2011). Therefore, examining the COVID-19 pandemic's impact on these two countries that share common features sheds light on future policy implications.

Second, studies have shown that the retention rate of SEA first-generation students is among the lowest rates for students in higher education systems across the globe. It is worthwhile to deeply understand the contexts of these two countries because both countries were simultaneously trying to provide financial assistance to low-income families during the pandemic (Djalante et. al., 2020). Studies have also shown that there are different approaches at how the two governments handled the pandemic. Vietnam has shown itself to be one of the most successful countries globally for its handling of the COVID-19 pandemic, while in stark contrast, Indonesia has suffered immensely from the pandemic (Djalante et. al., 2020; UN News, 2020; Willoughby, 2021). With more than 12 million higher education students in the SEA region and over 75% of them from Vietnam and Indonesia, our study will provide important lessons learned

about the impact of the COVID-19 pandemic, specifically on higher education institutions and their students located in the SEA region.

The remainder of this paper will be divided into four sections. First, we will discuss prior research findings and the literature about first-generation students, as well as comparative studies about the COVID-19 pandemic and its impact on higher education. In addition, we will highlight parts of the literature that aim to bridge the gap with our research study. Second, we will elaborate on the cross-sectional data in this study, specifically the methods and empirical strategies that we will employ to test our hypothesis. In the third section, we will present our results and then discuss our findings. In the final section, we will conclude with our findings, provide important policy implications, acknowledge the limitations of our study, and point out opportunities for future studies.

Literature review

COVID-19 studies from around the globe

Research on the impacts of the COVID-19 pandemic on higher education is emerging from many parts of the world and those studies have shown that the COVID-19 pandemic has negatively impacted many aspects of higher education. Within-country studies from both western and eastern parts of the world have shown consistent results. Aucejo et al. (2020) surveyed students in the U.S. and found many negative effects as a result of the COVID-19 pandemic, including delayed graduation, loss of jobs, and negative prospective earnings. These consequences were more adverse among students from lower income families. Choi et al. (2020) found that the pandemic has affected student readiness due to delayed classes, assistantships, and internships in the UK. In Italy, Agasisti and Soncin (2021) found that communication and governance have played an important role in the continuation of operating, learning, and

teaching at the university during the global pandemic. Other studies in Romania, and Kosovo, show that the pandemic has negatively impacted students' education through unequal access to technology, low digital literacy, and their wellbeing because of anxiety and depression (Arënliu et al., 2021; Coman et al., 2020).

Studies from Asia found similar patterns. Baloch et al. (2021) found that gender, age, and year of study successfully predicted anxiety levels, where gender was the most consistent predictor among Pakistani students with female students experiencing higher anxiety levels than males. Barrot et al. (2021) found that the greatest challenge students faced was the learning environment at home and the smallest challenge was technological literacy and competency and the quality of learning and students' mental health in the Philippines. Gopal et al. (2021) showed that the quality of instructors, course design, prompt feedback, and the expectations of students positively impacted students' satisfaction and performance in their online classes during the pandemic in India. Lastly, Hassan and Bao (2020) found that insufficient online literacy and fear of academic loss negatively influenced college students' mental health in Bangladesh.

Comparative studies on the COVID-19 pandemic

At the international level, researchers also started to conduct comparative studies, but those are limited in numbers. Many of these studies focus specifically on the countries' policy responses and how they would shape the countries' paths out of the crisis (Helsingen et al., 2020; Jae Moon et al., 2021; Kumar, 2020). The consensus is that the pandemic has worsened global inequalities (Bambra et al., 2021). There are also a few studies on the comparative impacts of the COVID-19 crisis on higher education. However, the need to study this area is certain and urgent (Araújo et al., 2020). Indeed, the scholarship on comparative higher education is still emerging, especially scholarship centered on the shift to online learning (Chan, 2020) during the pandemic.

Comparative studies focused on the impact of the COVID-19 pandemic in higher education systems across the globe not only highlight its negative impact on students in accessing the internet and technology, a high quality of instruction, and finances, but also how younger generations have had to cope with their mental health or (Djajadikerta et al., 2021; Ma et al., 2021; Mlambo and Ndebele, 2021; Tejedor et al., 2020; Tang et al., 2021). For example, Aristovnik et al. (2020) conducted a large-scale study (30,383 observations from 62 countries) which found that deficient computer skills and a perception of a higher workload during the pandemic negatively impacted students' perceptions of their own performance. Students also expressed concerns about future jobs and studies which in turn have affected their well-being. In short, the literature on higher education and the pandemic is mainly focused on students' access to technology, the quality of higher education and available resources, as well as students' mental health. There are still missing sub-groups in the literature, which consist of first-generation, rural and low-income students (McFadden, 2015).

The COVID-19 pandemic and disadvantaged students in higher education

Emerging studies on first generation, low-income, and rural students existed pre-pandemic. Some studies about rural students and low-income students showed that students from these sub-groups experienced more barriers while navigating higher education systems than their counterparts did, but most of these studies are from the U.S. (Bastedo & Jaquette, 2011; Byun, et. al, 2012; Engle & Tinto, 2008; Eagle & Tinto; 2008; Goldman et al., 2020; House et al., 2020; Irvin, et. al., 2012; Kilgo et al., 2018; Lightweis, 2014; Padron, 1992; Tate et al.; 2015).

There are very few studies from the pandemic that focus on these vulnerable sub-groups, and the ones which are available only focus on a within-country context. For instance, Lee et al. (2021) found that first-generation students in the U.S. were more likely to take a gap year or time

off from school. Another study has shown that compared to students in general, low-income students were 1) more likely to experience barriers attending online classes during the pandemic; 2) more prone to dropping their courses; and, 3) more likely to experience financial and personal distress, including securing daily basic needs and shelter (Rodríguez-Planas, 2020). Another study from the California State University and University of California systems – one of the largest community college systems in the U.S. – has shown that the pandemic was much harder on students from minority and lower-income backgrounds within these groups of students, indicating that the most significant drop in enrollment was for community college students (17%) (Bulman & Fairlie, 2021). Additionally, OECD has shown that young people who live alone with lower socioeconomic status (SES), and who have no secure employment, experienced higher rates of mental distress when compared to their counterparts who were able to retain their jobs during the pandemic (Scarpetta et al., 2020).

Studies on the impacts of the COVID-19 pandemic on higher education in Indonesia and Vietnam

The COVID-19 pandemic and the shutdown of schools created some disruptions in Vietnamese and Indonesian education, which to date, have not been evaluated. However, some emergent literature has focused on the impact of school disruption and higher education's response to governmental policies. Recent studies from Indonesia also note that access to technology, the quality of the instruction during the pandemic, as well as personal motivation and wellbeing have been significant determinant factors regarding the success of online learning during the COVID-19 pandemic (Yudiawan et al., 2021; Khusna & Khoiruddin, 2020).

In Vietnam, Dinh & Nguyen (2020) surveyed 186 undergraduate-level social work students at a national university in order to study the adaptations the university made to address

disruptions in learning and teaching. Pham & Ho (2020) described the possibilities and challenges of online learning in Vietnam's higher education system, acknowledging there may not have been sufficient policies and resources to fully integrate online learning. They concluded, however, that "the COVID-19 pandemic has brought about an opportunity to introduce e-learning comprehensively into Vietnamese higher education" (Pham & Ho, 2020, p.1329), outlining pathways for its incorporation into post-COVID-19 Vietnam. Another study shows that there has been a high level of disruption from the COVID-19 pandemic on students' work, study productivity, and modes of learning (Nguyen et al., 2020).

However, these studies from Indonesia and Vietnam only look at specific institutions or regions. Through our research, we aim to not only compare the outcomes between Indonesia and Vietnam, but we will also compare them nationally. With virtually no comparative studies available about the impact of the COVID-19 pandemic on first-generation, rural, and low-income students, especially from the context of Asia, we aim to bridge the literature gap. Before discussing our research question, we will provide in the following section an overview of the Indonesian and Vietnamese higher education systems and the countries' policies during the pandemic.

Overview about higher education systems in Indonesia and Vietnam

Indonesia's higher education: An overview

Indonesia's education sector comprises three different stages: elementary, secondary, and higher education. Elementary education consists of six years, while secondary education starts from middle school (three years) with an additional three years in either general high schools, religious high schools or vocational schools.

For higher education institutions, secondary school graduates in Indonesia may choose to attend five different options: universities, institutes (such as teachers' preparation programs), schools of higher learning/colleges, academies (military or nursing) as well as polytechnic institutions for vocational school graduates (The Ministry of Education, 2003). Currently there are 122 state universities and over 3,129 private universities across Indonesia, serving almost seven million students (The Ministry of Education, 2017; BPS, 2019). There was a significant increase in the enrollment rate at higher education institutions in Indonesia, from about 3% in 2005, to more than 13% in 2014 alone, and the trend has been increasing ever since to almost 17% in 2019 (OECD, 2019). However, the majority of higher education enrollment is mainly at private institutions, and concerns about their quality exist (see Appendix A for details).

Other concerns about higher education in Indonesia have centered around its access. Students in urban areas are more likely to have access to higher education than those in rural areas, and more males attend higher education institutions than females (Digdowiseiso, 2020). Moreover, based on Table B (see appendix), the enrollment for higher education institutions from all levels of income quartiles showed positive trends over the years, while those who come from the lowest income level (Quartile 1) are less likely to have access to higher education than those who come from a higher SES.

With more development taking place in western Indonesia, access to higher education in the east still lags. Access to public institutions, which are considered to have a higher quality of education, is also limited. Every year about 500,000 students apply to public universities for the 75,000 available seats (Nizam, 2016). This high level of competition leaves the majority of students graduating from secondary schools to either attend a private university or to participate in the labor market.

The Indonesian government is preparing long-term plans for several key sectors to leverage the demographic dividends opportunity when the majority of the population in Indonesia (15 to 64 years old) is projected to participate in the labor market compared to the proportion of the dependent population who do not participate in the labor market (Afandi, 2017). Reforms of the education, economy and health sectors are top priorities that the government advocates in order to give a real boost to the economy (BAPPENAS, 2017). The government is making big investments into the higher education sector to prepare young Indonesians with a high quality of education and the skills required for the global market. The government is establishing collaboration between higher education and the industrial sector, as well as developing training centers within universities for people who need special services. The government is providing more incentives and financial support to universities to conduct research and to recruit a highly qualified teaching force. The government is also providing subsidies not only for public universities, but also for private universities through scholarships. It is expected that through these strategies, Indonesia will be able to better prepare its younger generation for the labor market.

Indonesia's higher education system and the COVID-19 pandemic

However, much like other countries around the globe, all these efforts have been disrupted by the COVID-19 pandemic. The Indonesian Ministry of Education and Culture (Kemdikbud, 2020) has issued several strategies and nationwide policies to ameliorate the barriers of transitioning from in-person learning to virtual learning through the *Surat Edaran Kementerian Pendidikan dan Kebudayaan Nomor 4 Tahun 2020* or the Emergency Learning bill No. 4 that includes its commitment to help teachers, K-12 students, and higher education students and instructors with access to the internet during the pandemic. Through the

Permendikbud bill No. 25 2020 (Kemdikbud, 2020), the government also decided to help students who come from low-income families who make less than \$200 per month with financial packages for higher education tuition. For instance, for those who are qualified for the program, students may pay half of the tuition during the pandemic if they only take up to 6 credits. However, this policy only applies to students who attend public institutions. Since the majority of higher education students attend private institutions in Indonesia, the government's ability to help them is limited. For this latter group of students, the government has offered some financial packages for about 800,000 of them who come from low-income families and are able to maintain good performance in their studies through its *Kartu Indonesia Pintar* and *Bidikmisi* scholarship programs, respectively (Kemdikbud, 2020).

Vietnam's Higher Education System: An Overview

Currently, Vietnam has a twelve-year-schooling system followed by a three-year-college or four-year bachelor's degree, a two-year master's degree, and a three-to-four-year Ph.D. (Bui et al., 2017). There are four types of higher education institutions: 1) National/regional universities are "prestigious multidisciplinary educational and research centers;" 2) Senior colleges and institutes "are more narrowly focused in their program offerings, to the point that they may provide programs in only a single subject area;" 3) Junior colleges and vocational training centers "offer sub-degree programs;" and, 4) Research institutes are mostly "research centers with the capacity to offer Ph.D. programs" (Bui et al., 2007, pp. 266-7). Since the early 2000s, privatization in higher education has thrived. Private institutions, however, "are responsible to the state through their own governing boards, comprising mainly notable members of the local community or the professional association" (Hayden & Lam, 2007, p.76). In the last two decades, Vietnam has made significant reforms in its strategy to develop higher education,

especially since “access to higher education has more than doubled since 2000” (World Bank, 2020a). According to a report from the Ministry of Education and Training on higher education, there were 237 higher education institutions in Vietnam with 172 public institutions and 65 private institutions serving 1,778,855 students in undergraduate and graduate programs.

The State provides the most funding and resources for public higher education institutions which the Ministry of Education and Training manages. However, some specialized institutions report directly to their respective specialized ministries (Bui et al., 2017). For example, the Academy of Banking is under both the Ministry of Education and Training as well as the Ministry of Finance. In 2005, the government recognized the existence of “for profit” higher institutions. However, it stated that “the State would provide preferential support for private sector institutions that were ‘not for profit’” (Hayden & Lam, 2007, p.77).

Issues still exist in higher education in Vietnam, however. There is a lack of representation of ethnically minority students (Hayden & Lam, 2007) and inequalities in access to higher education between rural and urban students (Trinh & Korinek, 2017; Vu et al., 2013). The quality of instruction and training is another concerning issue (Hien, 2010; Phan et al., 2016; McCornac, 2014; Tran, 2013). Except for some key national universities and private international universities, most higher education institutions in Vietnam need significant aid in terms of research, teaching, and learning. Finally, the fact that higher education institutions lack institutional autonomy also asserts more challenges for their operation (Hayden & Lam, 2007). As the World Bank report concluded, Vietnam “largely missed opportunities in achieving good results on quality and relevance, and in furthering coverage and equity” with its main problems which include, “higher education networks, academic staff and teaching methods, quality assurance and management mechanisms” (World Bank, 2020a).

Vietnam's higher education system and the COVID-19 pandemic

Vietnam has been a world leader because it successfully contained the spread of COVID-19 by the government's prompt and proactive precautions and legislation (117/2020/ND-CP) in areas such as transportation, immigration, information dissemination, and health care (Tran et al., 2020; Hartley et al., 2021; Le et al., 2021). The Vietnamese government was particularly responsive in the education sector. In January 2020, the government made rapid decisions to close all schools and move to online learning at all levels (Tran et al., 2020; Le et al., 2021, Pham & Ho, 2020).

On August 13, 2021, the Ministry of Education and Training issued the Circular No. 08/2021/TT-BGDĐT where it added regulations for online teaching and learning in higher education. This Circular stated that for full-time and part-time students, online teaching and learning will account for at most 30% of their programs. Universities must maintain the quality of teaching and learning at a comparable level to in-person teaching and learning. In cases of natural disasters, epidemics, or force majeure, higher education institutions will follow regulations and instructions from the Ministry of Education and Training. Many universities in Vietnam have prepared for these changes in teaching and learning from in-person to online by building online learning systems.

As of July 2021, the Vietnamese government had not passed any specific policy for higher education to resolve the aftermath of the pandemic. Public universities in Vietnam operate under different financial mechanisms: fully financially autonomous, partly financially autonomous, and fully financially dependent institutions. For financially autonomous, and fully financially dependent institutions, their budgets have been allocated by the national or local government; therefore, they have been severely impacted by the pandemic. For colleges and

universities at the provincial level of supervision, local governments may provide further financial support to develop the necessary infrastructure and technology needed for online teaching and learning.

The Vietnamese government has passed two budget packages for COVID-19 relief; however, these packages do not specifically target higher education students. Some universities have had their own policies to support students during the pandemic, such as rent fee support, internet access support, and lodging support. The Vietnamese government has focused on two simultaneous goals: fighting the pandemic while also maintaining economic development. Both goals are expected to keep the labor market stable for now. However, the current challenge is that Vietnamese students have had difficulties finding jobs after graduation. The pandemic may continue to exacerbate this reality.

Research question

As mentioned earlier, even though there is an emergence of research into the impacts of the COVID-19 pandemic on higher education, not many comparative studies have been done, particularly studies that focus on vulnerable students. In our exploratory study, we ask: how has the COVID-19 pandemic impacted low-income, rural, and first-generation higher education students in Indonesia and Vietnam, and how does it compare to their counterparts within each country? We will examine four domains in our analysis: the students' overall wellbeing, their financial and personal hardships, their access to technology and the internet, as well as their educational satisfaction.

Methodology

Data and Sample

The data for this study come from an online survey that we distributed to higher education students in Vietnam, Indonesia and the U.S. through their International Student Offices, and we use convenience sampling to gather the data. We built the survey based on surveys from studies about the COVID-19 pandemic that look specifically at its impact on higher education students' outcomes and wellbeing (Rodríguez-Planas, 2020; Means, 2020; The Understanding America Study Survey; OECD PISA 2015 Student Questionnaire; Lee et al., 2021). In our survey, we focus on four domains: students' overall wellbeing, their financial hardships, their access to technology, and their levels of educational satisfaction during the COVID-19 pandemic. There are 48 questions categorized that ask the respondents about their demographic backgrounds and the four main domains of our research. We provide versions of the survey in multiple languages: English, Bahasa Indonesia, and Vietnamese and ask the participants to respond to the survey using their primary language.

The details of all the domains are as follows. First, for access to the technology domain, we want to know how the respondents accessed technology (electronic devices and the internet) during the pandemic, their mode of learning during the pandemic, and the quality of the supporting technology in their studies. Second, we ask the respondents about their financial concerns for the economic hardship domain, including their educational spending. Third, for the wellbeing domain, we ask the respondents to indicate their level of agreement on several statements about the sources of significant concern during the COVID-19 pandemic and the intensity of their burnout rates, as well as whether they thought about dropping out of school in the next term or semester. Fourth, we divide the educational satisfaction domain into two

different analyses: the factors contributing to students' academic satisfaction and students' overall ratings during the pandemic on several aspects, including the overall quality of their schools, classroom engagement, the quality of instruction, the relationships between professors and students and the opportunities that their schools provided. Lastly, we ask the respondents about their demographic backgrounds, including whether they are first-generation students, their major, their year in college, their age, their gender, their parental income level, the type of university that they attend, their ethnicity, and the area where they come from. We obtained 2,643 responses from both countries with 2,080 responses from Indonesia and 563 responses from Vietnam from these cross-sectional data.

Analytical strategy

For the analysis, we provide descriptive statistics of respondents' demographics from both countries. These demographic characteristics include age, year of college, gender, income, urbanicity, type of higher education institution and its size, the sources of financing higher education, as well as whether the respondents indicate that they are first-generation students. We also provide descriptive statistics for all the outcomes from four different domains by comparing the two countries. Lastly, we provide within country comparisons between first-generation students and low-income students and their counterparts from each country. Specifically, we calculate:

$$Y_i = \beta_0 + \beta_1 \text{Firstgen}_i + \beta_2 \text{Income}_i + \beta_3 \text{Rural}_i + X_i + e_i$$

Y_i represents all of the individual i outcomes from all four domains. This variable Y_i is a binary variable that takes the value of 1 if the respondents i answered "Yes" or "Agree" to each of the statements in each of the four domains, and 0 if otherwise. Coefficients β_1 to β_3 represent our primary explanatory variables in our analysis. *Firstgen* is an indicator variable that takes the

value of 1 if student i is a first-generation student and 0 if otherwise. We define first-generation students as higher education students whose parents did not finish any college education, following the definition from past research studies (McKay & Estrella, 2008; Pascarella et al., 2003). In addition, *Income* is a proxy of students' i socioeconomic status (SES), if the students' parents make less than \$200 monthly. *Rural* is an indicator of the urbanicity of the students. X is a vector of demographic controls, including the students' major and which year they are in, the type of university they are enrolled in and its size, their age, their gender, and their source of financial support for their education.

Results

Demographics of higher education students in Vietnam and Indonesia

We begin by providing some important demographic descriptive statistics of our sample (see Table 1). Of the total sample of 2,643, about 79% of the sample respondents are Indonesian, and only about 21% of the respondents are Vietnamese. As expected, we observe that almost all demographic characteristics between these two countries are statistically different: income status, urbanicity, age, gender, type of university, and the source of students' college financing. On the other hand, we do not observe a statistically significant difference in the first-generation status and the college year of the students.

<Table 1>

There are several vital findings, particularly from variables that show a significant difference between these two countries. First, there is a higher percentage of low-income students (students from families who make less than \$200/month) from Indonesia than Vietnam (55% vs 25%). We use the cut-off of \$200 to categorize the students as low-income students based on the guideline from the World Bank. In addition, we also notice that more students come

from a rural area in Indonesia (39%) than those in Vietnam (4%). Third, we have over half our samples in both countries who are categorized as first-generation students and over three-fourths of the sample in both countries who are categorized as undergraduate students. The rest of Table 1 presents the remaining summary statistics about higher education students' demographics in Indonesia and Vietnam.

Cross-country comparisons: Indonesia and Vietnam

In the next set of results, we provide a cross-country comparison of outcomes from four different domains in this study by giving the average responses for each outcome. The details of the cross-country comparison can be seen in Table 2.

< Table 2 >

From the cross-country comparison in Table 2, we observed that in almost all outcomes in the domains that we measured, we found statistically significant differences between higher education students in Indonesia and Vietnam. We have found that there is a higher proportion of students in Indonesia who expressed their concern for having poor internet quality during the pandemic (23%) than the students in Vietnam (12%), and the proportion of students who chose to do virtual learning in Indonesia (85%) is higher than in Vietnam (77%). In contrast, we do not observe any differences between the two groups on the financial hardship (running out of money within 3 months). This finding implies that, on average, higher education students in both countries experienced the same level of financial hardship during the pandemic.

We also found that there is a large gap between the personal burnout rate among Indonesian students when compared to Vietnamese higher education students (almost 20 percentage points vs. 20 percentage points). On average, based on the self-reported responses from the students, we noticed that there is also a statistically significant difference in students'

perceptions of their workload during the pandemic by about a 20 percentage point difference, with Indonesian students having higher rates than Vietnamese students. However, we observe null results between the two countries on the rate of students thinking of dropping out of school during the pandemic. Lastly, for the educational satisfaction domain, we observe that on average, Vietnamese students tend to give an overall higher rating of their study experience during the pandemic than Indonesian students do (Table 2 Domain 4).

Within-country comparisons

For our next analysis, we seek to provide within-country comparisons among first-generation, rural, and low-income students for each country. We seek to compare these three sub-groups of students with their counterparts within each country. Tables 3 – 7 provide the summary of our results. We did not find significant results in all of our outcomes, and we will focus more only on the significant results in these following discussions.

<Table 3>

For our first domain of access to technology (see Table 3), we found that low-income students are less likely to have access to technology when compared to their high-income counterparts by about 22 and eight percentage points in Vietnam and Indonesia, respectively. A similar trend is also observed regarding very poor internet quality. On average, when compared to their counterparts, low-income students in both countries are associated with a higher likelihood of experiencing very poor internet quality by 10 percentage points and nine percentage points in Vietnam and Indonesia, respectively; and, for those who come from rural parts of Indonesia, the likelihood is even higher than for nonrural students (15 percentage points). For our second domain, we have found that being Indonesian and first-generation was associated with six percentage points of being more likely to run out of money in three months

during the pandemic. Low-income Indonesian students were also 14 percentage points more likely to run out of money compared to high-income students. Finally, rural Indonesian students were five percentage points more likely to run out of money compared to their urban counterparts. A similar trend is observed in low-income Vietnamese students. Low-income students were 11 percentage points more likely to run out of money during the pandemic compared to students who did not come from a low-income background (see Table 4)

<Table 4 here>

In our third domain of students' well-being (see Table 5), we do not find any statistically significant differences among all three sub-groups of students from Indonesia in any of the outcomes. However, we found that on average, being a first-generation Vietnamese student is associated with a lower likelihood of experiencing physical burnout than their Indonesian counterparts, by about nine percentage points. In addition, we have found that being a low-income student in Vietnam is associated with an increase of about 18 percentage points when compared to their counterparts if they mention that they experienced a heavier school workload during the pandemic than before the pandemic.

<Table 5 here>

For our last domain of educational satisfaction determinants, we seek to understand what the determinants of students' educational satisfaction during their pandemic-learning experience is (see Table 6), the students' overall ratings of their schools, the quality of learning and instruction in the classroom, as well as what their engagement and relationships with their peers and instructors all mean (see Table 7). From Table 6, we find that compared to their counterparts, both first-generation and low-income Indonesian students, as well as low-income Vietnamese students, are associated with a higher likelihood of saying that the cost of attendance

is a key factor in determining their educational satisfaction during the pandemic by six, four and 13 percentage points higher, respectively. On the other hand, we find that low-income Vietnamese students are about 12 percentage points less likely than their counterparts to say that teacher-student relationships and knowledge or skills obtained during the pandemic are key factors in determining their satisfaction for education. This number is six percentage points for low-income Indonesian compared to their counterparts. We also find a similar trend among first-generation Indonesian students when they are asked whether safety measures taken by their schools are a key factor for their educational satisfaction during the pandemic (four percentage points lower than their counterparts).

<Table 6>

Lastly, we observed that regarding our rating outcomes in Table 7, low-income students from Indonesia tend to give higher ratings of their educational experience during the pandemic. Specifically for their school's overall quality, they are rated five percentage points higher compared to their counterparts; for quality of instruction, they are rated eight percentage points higher; for instructor-student and student-student relationships, they are rated seven and six percentage points higher, respectively; and finally, they rated job opportunities provided by their school six percentage points higher when compared to their counterparts. We did not find this pattern among Vietnamese students.

<Table 7>

Discussions and Policy Implications

In our exploratory paper, we found that college students in Indonesia and Vietnam differ in many aspects which is expected since both countries differ in educational structures and policies, even though they are in the same geographical region and have similar economic

growth. Such differences may also stem from the demographic composition of our samples, where Indonesian students are from rural and low-income families, and Vietnamese students are mainly from urban areas and study at private universities. In Indonesia and Vietnam, private universities are more expensive, which could be an indicator for their students' high socioeconomic status. Therefore, we would expect to see differences in students' responses in the survey resulting in the differences we found in later analyses (Table 1).

When we compare outcomes in all four domains between Indonesia and Vietnam, despite the fact that the majority of the outcomes do not show significant results, which is expected as discussed above, we still find that there are a few statistically significant differences between Indonesian and Vietnamese higher education students. Indonesian students appear to have more concerns about their quality of education and perceive a higher level of burnout and workload compared to Vietnamese students. Vietnamese students, on the other hand, tend to give an overall higher rating for educational experience compared to their Indonesian counterparts. Many factors can explain these differences. First, Indonesia is geographically larger and has a bigger population compared to Vietnam. Given the size of Indonesia, it may have been more challenging to implement quick policy changes during the pandemic. Vietnam, on the other hand, is a more systematically and politically centralized nation. Changes, therefore, may have happened faster. Changes in educational policy, therefore, were more consistent and prompter in the Vietnamese context, which helped with the students' perception of workload and levels of burnout.

In a sense, having a stable environment supports mental health and the quality of academic work. Vietnam was able to achieve both with its rapid policies when the pandemic first started (Tran et al., 2020; Hartley et al., 2021; Le et al., 2021). The differences in reactions to the

pandemic from the Vietnamese and Indonesian governments at the early stages of the pandemic may have contributed to the differences between the two student populations.

Finally, we have found that many more Vietnamese students in the sample are from urban areas compared to their Indonesian counterparts. This fact could explain why students in Vietnam experienced less burnout and had an overall better perception of their educational experiences online compared to the Indonesian students. Students from urban areas are more likely to have access to technology (Trinh & Korinek, 2017; Vu et al., 2013). They are also more likely to come from affluent families and to have higher academic achievement. These reasons may explain the differences between the two countries.

However, it is still important to realize that first generation, low-income, and rural students from both countries faced some significant challenges during the pandemic. This finding aligns with existing findings that highlight how the pandemic has worsened the pre-existing inequalities among sub-groups of students (e.g., Eagle and Tinto, 2008; Lee et al, 2021; Mlambo and Ndebele, 2021).

We had somewhat similar conclusions for within-country comparisons even though not all outcomes are significant. We found that in some outcomes, first-generation, rural and low-income college students are more likely to experience financial distress, specifically struggling to access technology as well as experiencing limited access to the internet, as they navigated virtual learning during the pandemic when compared to their counterparts within their own country. It is then understandable to see that these students, particularly those who are low-income students as well as students from rural areas, are also less likely to have had better learning experiences during the pandemic. These results resonate with the existing literature (e.g., Coman et al., 2020;

Barrot et al., 2020; Djajadikerta et al., 2021; Ma et al., 2021; Trinh & Korinek, 2017; Vu et al., 2013).

Policy implications

Understanding how the COVID-19 pandemic has impacted higher education students unequally in these two countries may provide important guidance on how the higher education systems in Indonesia and Vietnam should navigate and address the widening gaps between these sub-groups. Some targeted assistance for these vulnerable sub-groups of students during the pandemic may have also helped these countries in the long run in maintaining a consistently good quality of the workforce which will be necessary for maximizing each country's potential for the demographic-bonus opportunities that they are both anticipating. Since higher education institutions are not merely entities for students to gain knowledge but are also entities designed to prepare their students to shape the complexity of their country's social fabric in the future, more open and comprehensive collaborations among central and local governments, higher education institutions, private sectors and community members are necessary to address the inequalities and the learning losses that students may have endured during the pandemic.

Indonesia. We found that students in Indonesia experienced burnout and limited access to technology during the pandemic. Among them, first generation students, students from low-income families, and students from rural places were more likely to be affected. Even though the Indonesian government already had some aid packages targeting students, they should have specifically targeted this vulnerable group to help them during the pandemic.

In the long term, the government should invest in its country's social infrastructure to address inequalities. Future policies should include technology, communication, and internet development in remote areas. At the same time, higher education institutions should address

concerns about modes of teaching and learning because the pandemic has revealed that the current system is not flexible, adaptive, and supportive enough for students. Educators and policymakers should also be concerned about the quality of students' mental health during unexpected circumstances like the pandemic.

Vietnam. The pandemic has exposed and exacerbated many existing issues in higher education in Vietnam which among them are unequal access to technology and a heavy focus on traditional in-person teaching and learning. The Vietnamese government should invest in infrastructure focusing on information and technology, innovating instruction and learning modes, and granting higher education institutions more autonomy, especially in uncertain situations.

There is a stark difference in communication infrastructure between rural remote areas and urban areas. Rural and remote students, usually from low-income families, face many challenges with online learning and teaching. These students may not have the necessary devices and sufficient internet connection to effectively navigate learning on an online platform, even though mobile internet service has rapidly developed in recent years. The quality, however, is still low and unstable in rural and remote areas. The government, specifically the Ministry of Information and Communications and its local authorities, need to develop policies that will improve access to technology and the internet in these areas. In addition, the government should have appropriate and prompt policies to support students from low-income families with needed devices and services at Community Learning Centers to assist with their education.

In addition, even though the Ministry of Education and Training has issued many documents and regulations concerning online learning and teaching, these documents are often broad and are especially insufficient for evaluating online teaching and learning platforms and

outcomes. The lack of online evaluations may invalidate these online programs, which will negatively impact students' job prospects.

Limitations and future research

Our study faces certain limitations which are typical for a correlational and survey design study. First, our data were collected at one point in time. Even though we tried to collect as many responses from as many different levels and majors as we could in the two countries, we had limited success in the representation of the data. We cannot say the sample is representative of all of the student population in higher education in Indonesia or Vietnam, especially in the case of Vietnam, because our responses were mainly from the Northern part of the country. Second, our study does not imply causal inference. Interpretations from this study should be used with caution. Yet, when causal inferences are challenging, correlational studies still provide meaningful insights.

Our study, however, still contributes significantly to the emerging literature on the impact of the COVID-19 pandemic on higher education globally. Especially for Indonesia and Vietnam, our findings and policy implications are meaningful for their social and economic problems immediately after the pandemic while moving successfully into a post-pandemic world. We plan on three future approaches. First, we aim to broaden our study within the region of Southeast Asia. With this approach, we will cover a wider range of countries with differential economic development and distinguished cultural aspects. In the second approach, we plan to follow up with what the pandemic's aftermath will look like in Indonesia and Vietnam by conducting follow-up research on the same topic. This approach will give us a continuum of the pandemic's impact on the two countries. Lastly, we plan to conduct in-depth qualitative research into the impacts of the pandemic on first generation and low-income students. This approach will provide

meaningful insights and answers to our overarching research question: what have been the impacts of the COVID-19 pandemic on students in higher education in Indonesia and Vietnam?

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Tables and Figures

Table A: Indonesia's Overview of Higher Education Institutions by types and sectors (2019)

No	Type of institutions	Public Institutions				Private institutions			
		Total institutions	Total freshman	Total enrolled Students	Total graduates	Total institutions	Total freshman	Total enrolled Students	Total graduates
1	University	63	589,575	2,683,427	439,712	552	710,046	2,872,994	591,574
2	Institute	12	42,555	96,311	30,318	102	42,126	205,070	42,671
3	School of Higher Learning	0	0	0	0	1424	264,890	1,103,182	276,973
4	Academy	0	0	0	0	851	40,848	138,844	57,461
5	Community Academy	4	240	527	296	30	1,130	1,056	738

6	Polytechnic	43	51,506	148,138	54,392	170	25,594	89,615	27,699
	Total	122	683.876	2,928,403	524,718	3129	1,084,634	4,410,761	997,116

Table B: Indonesia's Gross Enrollment of Higher Education Students by Income

Income Quartile	Percentage of Higher Education Gross enrollment by Income level					
	2015	2016	2017	2018	2019	2020
Quartile 1	5.08	8.08	9.96	10.19	11.44	16.13
Quartile 2	8.60	13.69	14.74	14.86	16.34	19.31
Quartile 3	14.99	18.78	19.80	20.98	21.88	24.27
Quartile 4	26.48	30.47	29.72	31.38	29.83	30.23
Quartile 5	59.61	58.12	60.78	63.41	62.14	56.87

Table C: Vietnam's Overview Higher Institutions (Academic year 2019 - 2020)

Total undergrad students: 1.672.881 students			
By type of institutions	Public institutions: 1,359,402		Private institutions: 313,479
By gender	Male: 760,221 students		Female: 912,660 students
By ethnic groups	Ethnic minorities: 103.181 students		The Kinh: 1.569.700 students
By mode of study	Full – time: 1.514.862 students	Part – time: 118.419 students	Distance learning (E-Learning): 39.600 students
Total graduate students: 105.974 students			
By level of the program	Master's: 94.920		PhD: 11.054

(Except for higher education institutions belonging to the national security system)

(Source: <https://moet.gov.vn/thong-ke/Pages/thong-ko-giao-duc-dai-hoc.aspx?ItemID=7389>)

Table 1: Descriptive statistics for demographics

Variable	Indonesia			Vietnam			
	Observations	Mean	Std Dev	Observations	Mean	Std Dev	P-value
First generation	2080	0.55	0.49	563	0.51	0.47	0.125
Low income (monthly income less than \$200 per household)**	2080	0.55	0.49	563	0.25	0.43	0.000
Rural***	2080	0.39	0.49	563	0.04	0.21	0.000
Age***	1636	37.31	14.33	545	22.19	3.77	0.000
Undergraduate	2080	0.75	0.43	560	0.78	0.02	0.1755
Female***	2050	0.77	0.42	555	0.58	0.49	0.000
Public university***	2080	0.44	0.49	563	0.14	0.38	0.000
Big University (>10000 students)***	2080	0.51	0.50	563	0.60	0.49	0.000
Family pays for education***	2080	0.4	0.49	563	.85	0.35	0.000

Table 2: Descriptive statistics of outcome variables

Variable	Indonesia			Vietnam			
	Observations	Mean	Std Dev	Observations	Mean	Std Dev	P-value
Domain 1: Access to technology and the internet							
Virtual learning***	1933	0.85	0.36	523	.77	0.42	0.000
Have access to technology during the pandemic	1686	0.93	0.25	451	.90	0.88	0.082
Pay for technology from their own money***	1686	0.69	0.46	451	.75	0.43	0.008
Very weak internet quality***	1686	0.23	0.42	451	.12	0.33	0.000
Domain 2: Financial hardship							
Run out money in the next 3 months	2081	0.42	0.49	563	.45	0.49	0.271
Increased tuition ***	2080	0.06	0.24	563	.12	0.32	0.000
Taking more than 18 credits during pandemic***	1988	0.54	0.52	541	0.19	0.39	0.000
Domain 3: Well-being							
Health is major concern during pandemic	1686	0.79	0.41	451	.76	0.43	0.173
Physically exhausted during pandemic***	1686	0.87	0.33	451	.56	0.49	0.000
Emotionally exhausted***	1686	0.89	0.31	451	.69	0.46	0.000
Thinking of dropping out of school	1686	0.19	0.39	451	.20	0.40	0.509
Heavier schoolwork during pandemic***	1933	0.66	0.47	523	.55	0.49	0.000
Domain 4: Educational satisfaction							
Cost of attending is a factor in considering educational satisfaction**	1780	0.15	0.36	478	0.19	0.39	0.026
Teacher-student interaction is a factor in considering about educational satisfaction during pandemic***	1780	0.26	0.44	478	0.2	0.4	0.003

Job prospect is a factor in considering about educational satisfaction during pandemic	1780	0.07	0.25	478	0.05	0.23	0.286
Safety is a factor in considering about educational satisfaction during pandemic***	1780	0.07	0.25	478	0.21	0.41	0.000
Knowledge and skills they obtained from their classes are factors contributing to their educational satisfaction during pandemic***	1780	0.38	0.48	478	0.27	0.44	0.000
Higher school's overall quality rate during pandemic***	1780	0.19	0.39	478	0.24	0.43	0.010
Higher rate on engaging class during pandemic***	1780	0.29	0.45	478	0.37	0.48	0.000
Higher quality of instruction during pandemic***	1780	0.23	0.42	478	0.35	0.48	0.000
Better relationship between professor and student during pandemic***	2081	0.23	0.42	563	0.28	0.45	0.008
Better relationship among students during pandemic**	2081	0.23	0.42	563	0.31	0.47	0.000
Better rate for school to provide job and opportunities during pandemic***	2081	0.21	0.4	563	0.31	0.47	0.000

Robust standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

Table 3: Domain 1 Access to technology
(All models below control for demographic differences)

Explanatory variables	Virtual Learning		Access to Technology		Spend own money for technology		Poor internet quality	
	VIE	INA	VIE	INA	VIE	INA	VIE	INA
First generation	.059 (.038)	.037* (.02)	.005 (.056)	-.029 (.029)	.014 (.043)	-.005 (.028)	-.006 (.031)	.044* (.025)
Low income	-.017 (.045)	-.029 (.02)	-.221*** (.078)	-.079*** (.029)	-.098* (.052)	.002 (.028)	.1** (.042)	.089*** (.025)
Rural	.098 (.079)	.008 (.02)	-.151 (.164)	-.017 (.031)	.1 (.085)	-.07** (.028)	-.01 (.073)	.149*** (.026)
Constant	.76*** (.162)	.951*** (.044)	3.873*** (.226)	.716*** (.179)	.679*** (.061)	1.037*** (.113)	.295*** (.108)	.073 (.053)
Observations	498	1498	429	429	1306	1353	429	1306
R-squared	.022	.034	.057	.034	.017	.023	.036	.068

Robust standard errors are in parentheses

*** p<.01, ** p<.05, * p<.1

Table 4 Domain 2 Financial Hardship
(All models below control for demographic differences)

Explanatory variables	Run out of money in 3 months		Increased tuition		Taking more than 18 credits (undergrad)	
	VIE	INA	VIE	INA	VIE	INA
First generation	.065 (.043)	.061** (.026)	.002 (.028)	-.024* (.013)	-.038 (.034)	-.008 (.024)
Low income	.113** (.051)	.142*** (.026)	.048 (.034)	-.008 (.013)	-.002 (.04)	.021 (.024)
Rural	.128 (.103)	.048* (.027)	-.055 (.057)	.001 (.012)	-.025 (.079)	.073*** (.025)
Constant	.187 (.173)	.27*** (.056)	.077 (.111)	.066** (.029)	.405*** (.136)	1.024*** (.054)
Observations	534	1617	534	1617	515	1542
R-squared	.023	.045	.035	.012	.012	.225

Robust standard errors are in parentheses

*** p<.01, ** p<.05, * p<.1

**Table 5 Domain 3 Well-being during pandemic
(All models below control for demographic differences)**

Explanatory variables	Health is a major concern		Physically exhausted		Emotionally exhausted		Thinking of dropping out of school		Heavier school workload	
	VIE	INA	VIE	INA	VIE	INA	VIE	INA	VIE	INA
First generation	.059 (.041)	-.027 (.025)	-.094** (.048)	.013 (.021)	.026 (.046)	-.005 (.018)	.022 (.039)	.042* (.024)	-.035 (.044)	.015 (.027)
Low income	-.029 (.049)	-.041* (.025)	.042 (.054)	.009 (.021)	.035 (.052)	.003 (.018)	.043 (.046)	.026 (.023)	.178*** (.049)	.011 (.026)
Rural	.01 (.102)	.015 (.025)	.038 (.102)	.009 (.02)	-.029 (.108)	.015 (.017)	-.028 (.084)	-.031 (.022)	-.004 (.106)	.021 (.026)
Constant	.537*** (.158)	.776*** (.055)	.815*** (.187)	.735*** (.049)	.566*** (.187)	.77*** (.042)	.272 (.165)	.164*** (.053)	.875*** (.178)	.75*** (.057)
Observations	429	1306	429	1306	429	1306	429	1306	498	1498
R-squared	.028	.019	.044	.022	.007	.038	.044	.013	.049	.014

Robust standard errors are in parentheses

*** p<.01, ** p<.05, * p<.1

**Table 6 Domain 4 Educational satisfaction
(All models below control for demographic differences)**

Explanatory variables	Cost of attendance is a key factor on students' educational satisfaction during pandemic		Teacher-student interaction is a key factor on students' educational satisfaction during pandemic		Job prospect is a key factor on students' educational satisfaction during pandemic		Safety is a key factor on students' educational satisfaction during pandemic		Knowledge and skills obtained are key factors on students' educational satisfaction during pandemic	
	VIE	INA	VIE	INA	VIE	INA	VIE	INA	VIE	INA
First generation	-.031 (.037)	.057*** (.02)	.01 (.038)	-.001 (.026)	.031 (.022)	.018 (.015)	.024 (.038)	-.034** (.015)	-.045 (.042)	-.018 (.028)
Low income	.131*** (.048)	.04** (.02)	-.119*** (.039)	.014 (.026)	.006 (.026)	.01 (.014)	-.042 (.043)	-.016 (.015)	.035 (.05)	-.061** (.028)
Rural	.058 (.106)	.004 (.019)	-.021 (.08)	.043* (.026)	-.01 (.047)	-.021 (.013)	-.069 (.076)	-.001 (.014)	-.005 (.106)	-.032 (.028)
Constant	.269* (.144)	-.009 (.043)	.188 (.134)	.22*** (.056)	.029 (.097)	.057* (.033)	.241 (.162)	.028 (.03)	.201 (.173)	.671*** (.061)
Observations	455	1385	455	1385	455	1385	455	1385	455	1385
R-squared	.04	.09	.025	.061	.018	.011	.025	.017	.035	.026

Robust standard errors are in parentheses

*** p<.01, ** p<.05, * p<.1

Table 7 Domain 4 Educational satisfaction determinants

Explanatory variables	Higher school's overall quality rate during pandemic		Higher rate on engaging class during pandemic		Higher quality of instruction during pandemic		Better relationship between professor and student during pandemic		Better relationship among students during pandemic		Better rate for school to provide job and opportunities during pandemic	
	VIE	INA	VIE	INA	VIE	INA	VIE	INA	VIE	INA	VIE	INA
First generation	-.017 (.04)	.005 (.024)	-.018 (.045)	-.016 (.027)	.007 (.044)	-.035 (.025)	-.04 (.039)	-.007 (.023)	-.025 (.04)	-.029 (.024)	-.012 (.04)	-.018 (.022)
Low income	.003 (.046)	.013 (.024)	-.076 (.052)	-.027 (.027)	-.095* (.05)	.008 (.025)	-.001 (.046)	.002 (.023)	-.011 (.048)	-.014 (.023)	-.095** (.045)	.004 (.022)
Rural	.039 (.096)	-.048** (.022)	-.009 (.104)	-.043 (.026)	.012 (.101)	-.075*** (.024)	-.026 (.091)	-.066*** (.022)	-.06 (.093)	-.056** (.022)	.013 (.094)	-.063*** (.021)
Constant	.198 (.168)	.131*** (.051)	.125 (.185)	.252*** (.058)	.222 (.184)	.214*** (.052)	.209 (.155)	.225*** (.049)	.273* (.156)	.297*** (.048)	.322* (.165)	.188*** (.045)
Observations	455	1385	455	1385	455	1385	534	1617	534	1617	534	1617
R-squared	.042	.033	.018	.016	.037	.029	.01	.015	.014	.011	.024	.029

Robust standard errors are in parentheses

*** p<.01, ** p<.05, * p<.1