

## **The Changing Nature of University Teaching: Students' learning experience during the Covid-19 pandemic. (Working Paper)**

### **Abstract**

**Brief background/rationale:** The outbreak of the Covid-19 pandemic challenged higher education (HE) institutions across the globe, mainly through necessitating an urgent shift of their teaching and learning activities to a hybrid approach. Universities came up with several technological challenges, amongst others, in securing a smooth delivery of their hybrid approach, yet major obstacles and challenges were also experienced by all university students owing to this urgent shift. With hybrid teaching and learning to becoming the new pedagogical norm of the higher education sector globally, this research seeks to assess, evaluate and compare the students' new learning experiences of hybrid teaching delivery within two diverse/distinct teaching environments, and to outline the main impediments and challenges associated with their learning experience during the Covid-19 pandemic.

**Research Aim(s):** This study seeks to identify the impediments and challenges faced by university students in two distinct educational institutions (i.e., British and Bangladeshi), and to evaluate and compare their learning experiences of online / hybrid teaching and learning.

**Research findings:** So far, 548 students completed the questionnaire (e.g., 285 British and 263 Bangladeshi). The vast majority from both cohorts are undergraduate students (214 UG / 71 PG British – 168 UG & 95 PG Bangladeshi), with an equal representation of male and female students. Research findings highlight students' dissatisfaction of hybrid teaching and learning, mainly because of the lack of fulfilling their university life experience due to self-isolation, limited social interaction, lockdown restrictions, technology challenges (e.g., bandwidth, connectivity, familiarity with tools, right equipment etc.).

**Contribution:** This research contributes to the existing International HE literature by providing important insights relating to the adoption of online / hybrid teaching and learning in two distinct educational institutions. Our research findings and discussion further offer recommendations to policymakers to understand, assess and evaluate better key aspects of the hybrid provision, and accordingly to suggest innovative e-learning solutions post-pandemic. Further research is called to examine the challenges identified by students, and thus to allow HE institutions to offer better teaching and learning solutions to enhance their students' learning experience. Although this working paper is limited by the selection criteria being employed, it could set the foundational point of future research.

**Key words:** University Hybrid Teaching and Learning, Higher Education, International Tertiary Sector, Covid-19 pandemic.

## **1. Introduction**

The outbreak of the Covid-19 pandemic challenged organisations of all types to migrate their operations to an online mode to secure everyone's health and safety. One of the main sectors being affected the most was that of the Higher Education (HE) globally. The Covid-19 pandemic has raised significant challenges as well as opportunities for the higher education community worldwide to learn and explore, with the most urgent being the urgent and unexpected request for previously face-to-face university courses to be taught online and vice versa near about the end of pandemic. Such unexpected shift, accompanied by the closure of many HE institutions, prompted national authorities to suggest emergency plans, including hybrid teaching (i.e., online asynchronous, and synchronous provision – Hrastinski, 2008) to ensure that staff and students remain active in this pandemic era. Therefore, the suitability of conventional methods, such as the traditional face to face teaching, was highly questioned, and thus being replaced by online, both synchronous and asynchronous, methods (e-learning) for the time being.

Such an urgent shift to an online / hybrid teaching and learning approach on behalf of the universities across the globe, also came up with several challenges affecting the smooth delivery of their pedagogical approach. In addition, other impediments, experienced both from HE institutions and their staff and students, added to the complexity of this urgent shift, mainly resulting in negative experiences of the stakeholders being involved. Although there are studies which uncover the challenges associating with hybrid teaching and learning (Tarus et al., 2015; Aung & Khaing 2016), research is nascent on examining the university students' experience of hybrid teaching and learning in the context of the pandemic. The shift from traditional face-to-face education to online was not an easy journey for many institutions across the world, as a bunch of changes in terms of digital competencies, pedagogical knowledge, psychosocial counselling, varied levels of interaction, engagement and assessment strategies, support structures, were required to be adopted in the institutional policies and practices.

With online / hybrid teaching and learning to becoming the new pedagogical norm of the higher education sector globally in an attempt to secure their programmes' learning excellence in such difficult times, this study seeks to identify and discuss the impediments and challenges experienced by university students in two distinct HE institutions (i.e., British and Bangladeshi), and thus to compare their hybrid learning experience during the Covid-19 pandemic in a developed and developing country respectively. Therefore, the following research questions were developed to address the objectives set above through the lens of both UG and PG students:

*RQ1: What are the challenges associated with online / hybrid teaching and learning in universities during the Covid-19 pandemic?*

*RQ2: How has the university students' learning experience affected due to hybrid teaching and learning?*

## **2. Literature review**

With Covid-19 pandemic, it has become clearer that educational systems across the globe were susceptible to external forces which could jeopardise the smooth operation and provision of their educational programmes (Bozkurt & Sharma, 2020). It is widely noted that the digital transformation, which was necessitated due to the pandemic, for the majority of the HE institutions' pedagogical approaches also associated with several logistical challenges and attitudinal modifications (Ribeiro, 2020). This digital transformation of teaching and learning in universities is not a novel discovery, as it accompanies HE institutions for some years now (Kopp et al., 2019). However, this urgent shift to an online / hybrid teaching and learning approach in HE globally becomes again a topical issue in the context of the Covid-19 pandemic, mainly because of the challenges brought forward by the pandemic, both for university staff and students. In addition, this working paper features as of high interest to several internal and external stakeholders to inform HE policies for the post pandemic era.

In the fourth industrial revolution era with the high speed of the Internet, post-Covid education is expected to be neither fully online nor face-to-face but rather “phygital” in Education 4.0. A new trend called “phygital” (i.e., a blend of physical and digital space, “phygital” = physical + digital) learning is gaining popularity in recent times. It is the concept of using technology to integrate the digital learning space with the physical world for the purpose of providing a unique interactive experience to the learners. Phygital is more comprehensive than digital or face-to-face education and it is not blended learning as the latter does not blend the best practices of face-to-face and online education instead operates both singly (Aktaruzzman, 2021).

Online courses must involve contributors doing regular, significant happenings that benefit to keep them focused. The significance of the regularity of communication in making online classes was also explained by Hung et al. (2010). It was also found that lack of immediacy in getting answers to their queries was also found to be a challenge in online education (Muthuprasad et al., 2021). It was also reported by Hartley and Bendixen (2001), Petrides (2002), Vonderwell (2003). Hence, care should be taken by the instructor to answer the queries of the learners' immediately. Researchers have also employed self-efficacy instruments in various academic and technology-related courses and observed that it has a positive influence on students' achievement and persistence in specific tasks (Mishra, 2009). Findings reveal that the lockdown, social distancing and self-isolation requirements

are stressful and detrimental for many individuals (Nurunnabi et al., 2020). Tendency is a serious concern among university students that can affect educational achievement both positively and negatively (Hossain et al., 2019a).

Numerous studies discussed the acceptance of online / hybrid teaching and learning on behalf of the stakeholders being involved (e.g., academic staff, students, policy makers - Leszczyński et al., 2018). Hrastinski (2008) and Fry (2001) examined the two types of online / hybrid teaching and learning (i.e., asynchronous, and synchronous), and suggested that for these to be effective and efficient the use of various technologies is needed to develop educational material, as well as to inform the instructional delivery of the programmes offered. Additionally, Selim (2007) identified the key success factors (KSFs) relating to online / hybrid teaching and learning in HE institutions, grouping them into three clusters (i.e., academic staff, students, information technology and institutional support). For academic staff, KSFs include their informational technology attitude and competencies, while in relation to information technology, the reliability of the institutional infrastructure is outlined (ibid). Respectively, for students, KSFs relate to their discipline and time management capacity, whereas in relation to the institutional support, the technical support provided, and the level of IT experience are noted (ibid). Selim (2007) argued that lack of consideration of those factors that could influence users' acceptance of hybrid teaching and learning could prove challenging and critical for the successful implementation of a hybrid teaching and learning model. Thereafter, the use and provision of hybrid teaching and learning features as the key challenge for most HE institutions during the Covid-19 time and post-pandemic.

Several studies examined the challenges associating with the introduction of online / hybrid teaching and learning in relation to the clusters identified above. From the academic staff's perspective, Islam et al. (2015) classified challenges into five categories, including those relating to learning styles and culture, pedagogical approaches, use of technology, IT literacy, and time management challenges. From an institutional point of view, Aung and Khaing (2016) and Tarus et al. (2015) highlighted the inadequate institutional IT infrastructure and support, the lack of interest and commitment to adopt a hybrid approach in some cases, as well as financial constraints, specifically for developing countries, such as Bangladesh. Borotis & Poulymenakou (2004) and Aydın & Tasci (2005) provided further evidence on institutional unpreparedness to introduce hybrid teaching and learning initiatives. Lastly, Watkins et al. (2004) argued that as many people are attached to already existing pedagogies, that makes it even more difficult for them to adjust to innovations and upgrade existing practices. Similarly, from the students' perspective, Carr (2000) argued that student perception of hybrid teaching and learning has mostly been negative due to past experiences, further resulting in high dropouts, low motivation, and low student satisfaction (Baczek et al., 2021; Bali & Liu, 2018; Ali & Ahmad, 2011). All in all, the mainstream literature/research, examining the challenges

and/or the factors affecting the use and provision of hybrid teaching and learning, boils down to three perspectives, all of which should be considered to successfully implement hybrid teaching and learning approach.

With more and more students being willing to participate in distance education these days, either because of the pandemic or for any other reasons, an online / hybrid teaching and learning approach features as an alternative to traditional, well-established, methods. Therefore, the issue at hand associates greatly to the emergency of moving online and enhance students' learning experience and secure their satisfaction. Therefore, this study focuses primarily on the challenges experienced by students owing to the provision of hybrid teaching and learning in a developed (i.e., United Kingdom) and developing (i.e., Bangladesh) county to highlight their similarities and nuances, and thus to set the foundational point of future research.

### **3. Methodology and the rationale of case study research.**

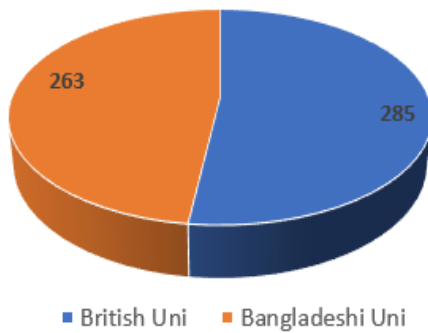
This working paper employs a case study research strategy to compare British and Bangladeshi undergraduate (UGs) and postgraduate (PGs) students' experience of hybrid teaching and learning during the Covid-19 pandemic. The rationale of adopting two case study HE institutions lies with our intention to compare the use and provision of hybrid teaching and learning, and their students' learning experience, in distinct national and educational contexts, namely that of a developed and a developing country respectively.

An online survey questionnaire distributed through emails, and through posting it on various social networks (e.g., LinkedIn, Twitter, Facebook). The questionnaire included a range of open-ended, close-ended, and multiple-choice questions aiming at addressing our three research questions. The snowball technique was also used to disseminate the survey, and thus to reach a higher number of participants. The survey questionnaire distributed to approximately 1400 students in both universities (UGs & PGs), returning 548 valid responses, thus a response rate of 39% as for today. The vast majority from both cohorts are undergraduate students (214 UG / 71 PG British – 168 UG & 95 PG Bangladeshi), with an equal representation of male and female students.

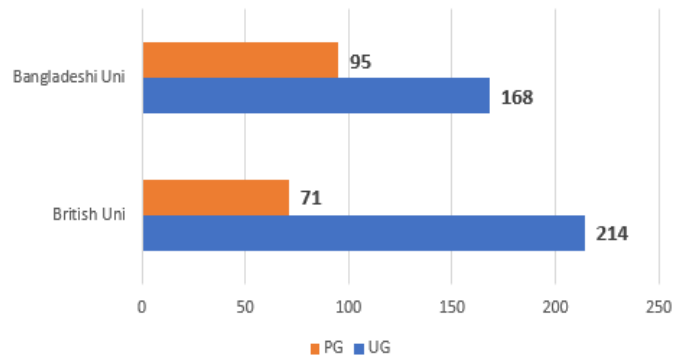
### **4. Research Findings and Discussion**

The present study examined the challenges students in HE institutions identified in relation to the online provision of their courses during the Covid-19 pandemic. To start with students' demographics, the graphs below indicate the percentages/total numbers per country respondents, programme level, age group and gender.

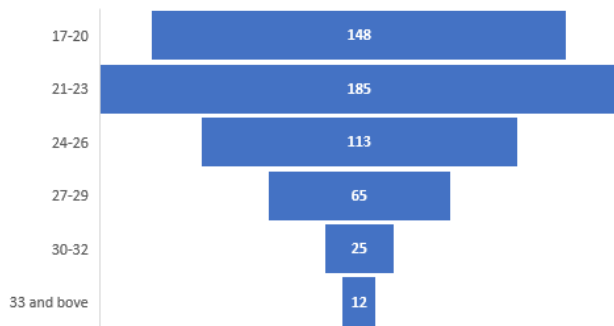
Total number of respondents per Uni



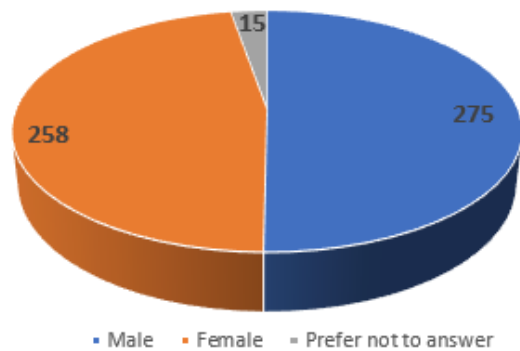
Students (UG & PG)



Age Groups



Gender of respondents

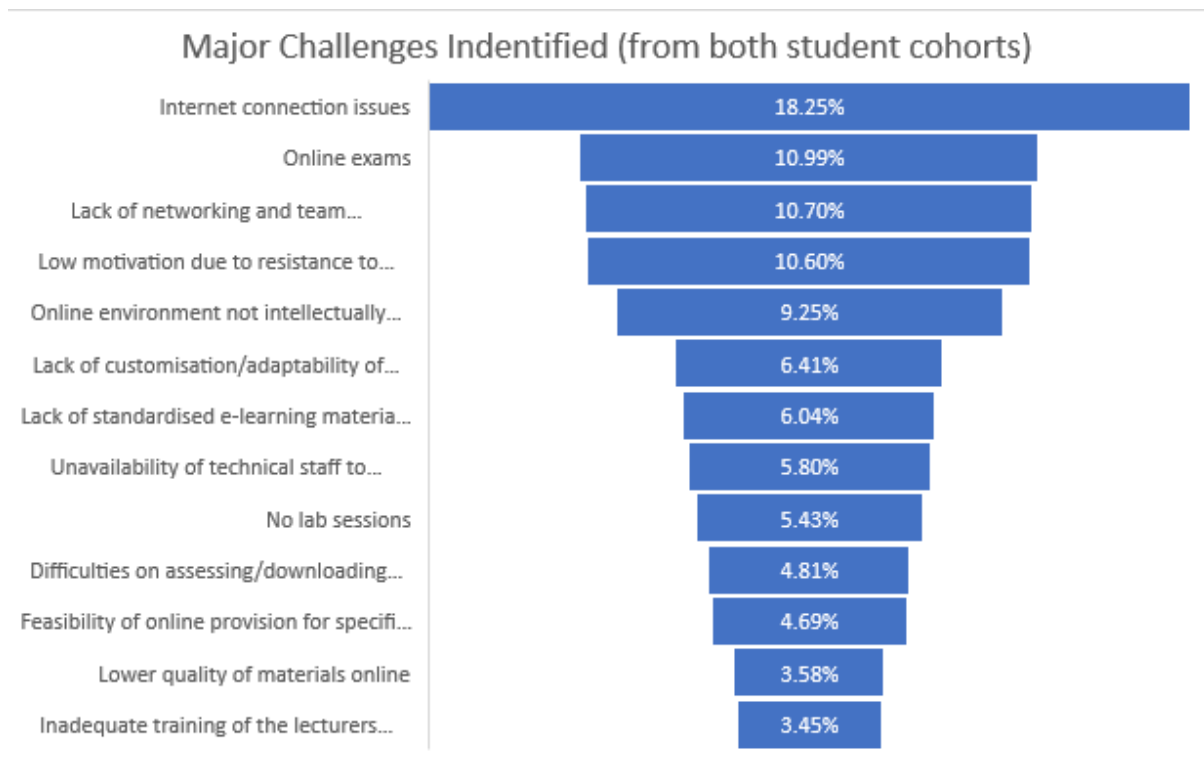


**Fig.1: Sample Demographics**

As shown above, there is an almost equal representation of male and female participants from both educational institutions. However, there is a slightly higher rate of UGs who completed the survey questionnaire compared to their PG counterparts. That results to a higher number of participants within the age group of 17-23 years old.

Comparing a developed and a developing country, and their educational systems, through the lens of both UG and PG students from a leading university in each country, it was found that students in developing countries are facing greater challenges (e.g., poor internet connectivity, inadequate knowledge on the use of IT and weakness of content development) compared to their counterparts in developed ones. Although students, from both countries, demonstrated adaptability and success in traditional teaching methods, we argue that this cannot necessarily guarantee success of a hybrid teaching and learning model. This confirms Guglielmino and Guglielmino (2003) and Watkins et al. (2004) proposition that a crucial factor to consider before switching to a hybrid teaching and learning approach is to examine the students' readiness and willingness to move in such mode.

Students from both educational institutions, regardless of their level of studies, classified the following challenges as the most important ones (fig.2).

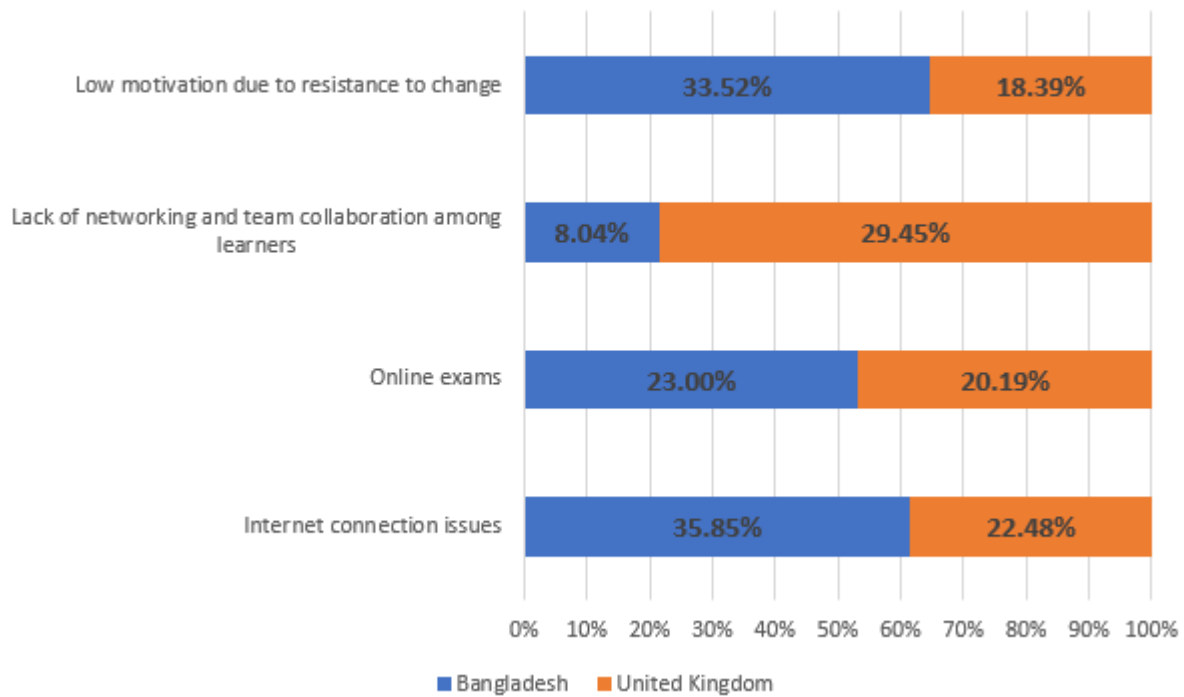


**Figure 2: Challenges of hybrid teaching and learning in the era of the pandemic**

Our study indicates that accessibility (e.g., getting online, poor connection etc.) is the most important challenge students are facing because of the hybrid teaching and learning provision. Alike, sitting online exams made them feel uncomfortable mainly due to the connection issues they were facing, but also because they have not done this before. Such findings contradict previous research identifying access and cost of the internet as less important barriers to hybrid teaching and learning (Mulenberg and Berge, 2005). Yet, we acknowledge that the authors' research was conducted in a developed country, thus we considered whether differentiations and/or similarities exist between the two distinct educational contexts.

Our respondents' (per country) classification of the same challenges outlines the nuances between a developing and a developed country (fig.3).

### Top 4 Challenges per student cohort



*Figure 3: Classification of challenges (top 4) per country/student cohort.*

In Bangladesh, where students do not have access to portable devices as their British counterparts, as well as internet connectivity is poor, they classified the “internet connection issues” challenge as the most important one (35.85%), followed by the “online exams” (23%), moving then down to 8.04% for the “lack of networking and team collaboration”. Such suggestions come in line with Ahmed and Nwagwu’s (2006) study where the authors argued that human resource development, telecommunications, and information technology policies, among other reasons, were the key challenges for online learning in developing countries. In contrast, British students classified the “lack of networking and team collaboration” as the most important challenge (29.45%), followed by the respective suggested from their Bangladeshi counterparts, yet in lower percentages (internet connection issues 22.48% / online exams 20.19%).

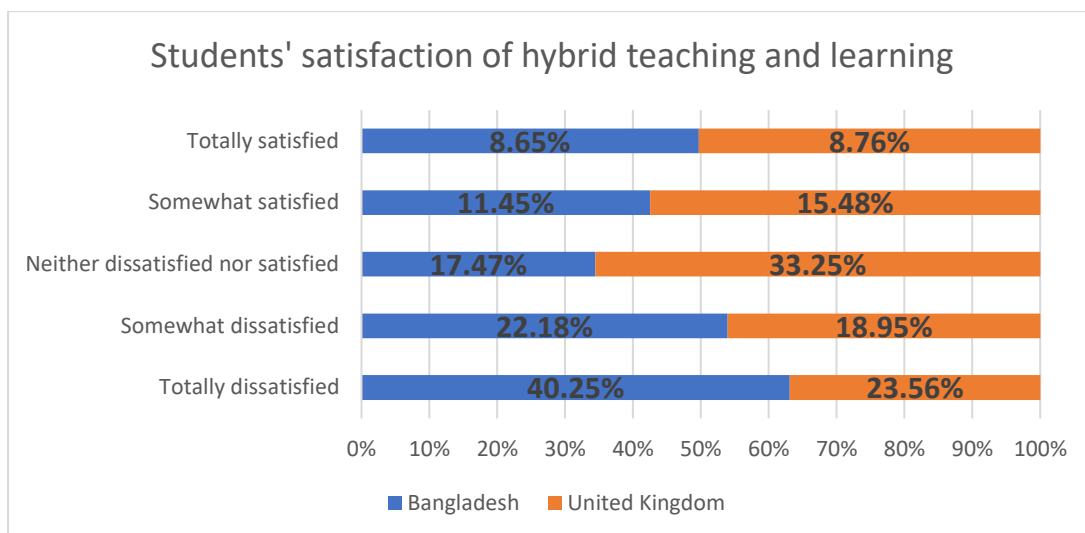
Such differentiation relates to our RQ2, with our research findings clearly indicating students’ dissatisfaction of hybrid teaching and learning, mainly because of the lack of fulfilling their university life experience due to self-isolation, limited social interaction, lockdown restrictions, technology challenges (e.g., bandwidth, connectivity, familiarity with tools, right equipment etc.), at least mostly for the British sample. Our findings contradict pre-pandemic research which examined students’ satisfaction of online education (Zaheer et al., 2015). The authors further revealed students’ suggestion that e-learning can support higher education in



developing countries where HE institutions are limited; a proposition not confirmed from our Bangladeshi sample though.

Furthermore, the “low motivation due to resistance to change” challenge associates with students’ unwillingness and lack of preparation for a complete online experience. The rate was greater for the Bangladeshi cohort (33.52%), compared to their British counterparts (18.39%). From a cross-cultural point of view, this could be explained because of the higher “uncertainty avoidance” score of our Bangladeshi sample (i.e., score 60 compared to 35 for UK). Generally, students were afraid to change to the new mode as they believed only troubles will bring (e.g., difficulties on sitting online exams). Existing research highlights resistance to change as many students were attached to accepted, and well delivered, pedagogies (Borotis & Poulymenakou, 2004). Steinmayr and Spinath (2009) also argued that students’ motivation levels contribute to their learning experience. Therefore, since students were not prepared to an online / hybrid teaching and learning model, intrinsically, they were not motivated to adapt. This also partially justifies students’ identification of the following challenges (e.g., Inadequate training of the lecturers/teaching teams to deliver online / feasibility of online provision for specific subjects / Lack of customisation/adaptability of course/module context according to students' requirements / lower quality of materials online etc.) as the triggers of failure for hybrid teaching and learning due to the unpreparedness of the institutions and their staff (Aydin and Tasci, 2005). Yet, we also need to acknowledge that hybrid teaching and learning features as the most effective way to transition from face-to-face to e-learning as that could allow both students and teaching staff to acquire the basic training and prepare the material required (Hoic-Bozic et al., 2008).

Upon having identified the most important challenges relating to hybrid teaching and learning during the Covid-19 pandemic, we have asked students to indicate their satisfaction or dissatisfaction with the approach offered by their educational institutions. Following the greater accessibility challenges that the Bangladeshi students encountered, their responses on this particular question also reflected through their lower satisfaction rates compared to their British counterparts. Precisely, comparing the two student cohorts, the difference is notable (fig.4).



***Figure 4: Students' satisfaction of hybrid teaching and learning.***

From the responses provided, the conventional classroom seems to be preferred from both student cohorts due to the socialisation opportunities offered (Zaheer et al., 2015). Despite the emergency, hybrid teaching and learning featured as the best way to go with during the pandemic. However, the responses returned by students indicate that they are less likely to benefit from this type of approach initiated by the institutions. The transition was not smooth, leaving both students and teaching staff wondering on what to follow (Kopp et al., 2019).

All in all, our research findings outline the nuances between a developed and a developing county around the challenges of hybrid teaching and learning, and their student cohorts' satisfaction of online education. Online education is deeply rooted in adequate planning in line with existing educational theories and models, but the quick change to hybrid teaching and learning were put under question because such swift also indicated the absence of proper planning. All those crisis-response pedagogical methods offered by both educational institutions were limited to a purely online delivery of material without taking into consideration relevant educational models and theories, but most importantly without acknowledging their "customers'" preferences. Therefore, HE institutions' responses to the pandemic cannot be fully described as an effective digital transformation, but rather to be viewed as an emergency remote teaching platform.

**5. Theoretical contribution and practical implications**

This research adds value to the existing HE international literature by providing important insights relating to the adoption of hybrid teaching and learning in tertiary sector in two distinct educational institutions. It further contributes to the existing literature by identifying students' responses of the associated challenges during the pandemic, and thus offers

recommendations to policymakers to understand, assess and evaluate better key aspects of the hybrid provision model, and accordingly to suggest innovative e-learning solutions post-pandemic.

Especially for developing countries, such as Bangladesh, our practical insights could serve as potential solutions to the challenges encountered by universities, as well as to represent the triggers of their digital transformation. Although there are several challenges that students and teachers face in teaching online, the good news is that there is no doubt that conducting classes online is a commendable initiative taken by the current Bangladesh government to reduce the loss of students' academic activities. For the correct implementation of this task, students and teachers must be encouraged and viewed as a challenge to carry out appropriately. Students should be mindful that they are the primary stakeholders and must be self-motivated to have a greater interest in getting a response to the digital classes with all their endeavours. There is a need to bring a strategic change from the course curriculum to the teaching process and ensure an amalgamation of all types of interventions (online / hybrid) for online learning activities through a unified policy direction such as adoption of a new policy for a certain period of time, and inclusion of community people, which might play a catalytic role to minimise the loopholes of online learning in the pandemic.

## **6. Research limitations and directions for future research**

Our study highlights the need for further examination of the challenges identified by students to allow educational institutions to offer better teaching and learning solutions to enhance their students' learning experience. Therefore, although this working paper is limited by the selection criteria being employed, it could set the foundation point of future research.

Future research could include the teaching and administrative staff to allow for a comparison of the various perspectives that could be identified. In addition, the inclusion of more educational institutions could offer deeper insights into the suitability and acceptance of hybrid teaching and learning, as well as students' learning experience and satisfaction across the globe. Respectively, the teaching teams' experience of hybrid provision could inform future decisions on similar occasions.

## **References**

- Ali, A., and Ahmad, I. (2011). Key Factors for determining student satisfaction in distance learning courses: A study of Allama Iqbal open university. *Contemporary Educational Technology*, 2(2), 118-134. <https://doi.org/10.30935/cedtech/6047>
- Aktaruzzman, Md. (2021). Reimagining higher education policy for Digital Bangladesh in post-Covid world. Available at: <https://www.tbsnews.net/analysis/rethinking-higher-education-policy-digital-bangladesh-post-covid-era-262978> [Accessed 12 April 2022].
- Aung T. N., and Khaing S. S. (2016). Challenges of Implementing e-Learning in Developing Countries: A Review. In: Zin T., Lin J.W., Pan J.S., Tin P., and Yokota M. (Eds). *Genetic and Evolutionary Computing*. GEC 2015. Advances in Intelligent Systems and Computing, Vol.388. Springer, Cham. [https://doi.org/10.1007/978-3-319-23207-2\\_41](https://doi.org/10.1007/978-3-319-23207-2_41)
- Aydin, C. H., and Tasci, D. (2005). Measuring readiness for e-learning: Reflections from an emerging country. *Journal of Educational Technology & Society*, 8(4), 244-257. <http://www.jstor.org/stable/jeductechsoci.8.4.244>
- Bączek, M., Zagańczyk-Bączek, M., Szpringer, M., Jaroszyński, A., and Wożakowska-Kapłon, B. (2021). Students' perception of online learning during the COVID-19 pandemic: A survey study of Polish medical students. *Medicine*, 100(7), 1-6. doi:10.1097/MD.00000000000024821
- Bali, S., and Liu, M. C. (2018). Students' perceptions toward online learning and face-to-face learning courses. *Journal of Physics: Conference Series*, 1108, 1-7. <https://iopscience.iop.org/article/10.1088/1742-6596/1108/1/012094/meta>
- Borotis, S., and Poulymenakou, A. (2004). E-Learning Readiness Components: Key Issues to Consider Before Adopting e-Learning Interventions. In J. Nall & R. Robson (Eds.), *Proceedings of E-Learn 2004--World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education* (pp. 1622-1629). Washington, DC, USA: Association for the Advancement of Computing in Education (AACE). Available at: <https://www.learntechlib.org/primary/p/11555/> [Accessed 10 March 2022].
- Carr, S. (2000). As distance education comes of age, the challenge is keeping the students. *Chronicle of higher education*, 46(23), 39-41. <https://www.chronicle.com/article/As-Distance-Education-Comes-of/14334>
- Fry, K. (2001). E-learning markets and providers: Some issues and prospects. *Education+ Training*, 43(4/5), 233-239. <https://doi.org/10.1108/EUM0000000005484>
- Hrastinski, S. (2008). Asynchronous and synchronous e-learning. *Educause Quarterly*, 31(4), 51–55.
- Guglielmino, L. M., and Guglielmino, P. J. (2003). *Identifying learners who are ready for e-learning and supporting their success*. In Proceedings of the 12th International Conference on e-Learning - ICEL 2017, Florida, USA.

Hoic Bozic, N., Mornar, V., and Boticki, I. (2008). A blended learning approach to course design and implementation. *IEEE transactions on education*, 52(1), 19-30. doi: 10.1109/TE.2007.914945.

Hossain, S.F.A., Mohammad Nurunnabi, M., Hussain, K. and Saha, S.K. (2019a), Effects of variety-seeking intention by mobile phone usage on university students' academic performance. *Cogent Education*, 6(1), 1-18. <https://doi.org/10.1080/2331186X.2019.1574692>

Hung, M.L., Chou, C., Chen, C.H. and Own, Z.Y. (2010). Learner readiness for online learning: scale development and student perceptions. *Computers and Education*, 55(3), 1080-1090. <https://doi.org/10.1016/j.compedu.2010.05.004>

Islam, N., Beer, M., and Slack, F. (2015). E-Learning Challenges Faced by Academics in Higher Education. *Journal of Education and Training Studies*, 3(5), 102-112. <https://doi.org/10.11114/jets.v3i5.947>

Kopp, M., Gröblinger, O., and Adams, S. (2019). *Five common assumptions that prevent digital transformation at higher education institutions*. INTED2019 Proceedings (pp.1448-1457). Doi:10.21125/inted.2019

Mishra, S. (2009), "E-learning in India", *International Journal on E-Learning*, 8(4), 549-560.

Muilenburg, L. Y., and Berge, Z. L. (2005). Student barriers to online learning: A factor analytic study. *Distance education*, 26(1), 29-48. <https://doi.org/10.1080/01587910500081269>

Muthuprasad, T., Aiswarya, S., Aditya, K.S. and Jha, G.K. (2021). Students' perception and preference for online education in India during COVID -19 pandemic. *Social Sciences and Humanities Open*, 3(1), 100-101.

Nurunnabi, M., Almusharraf, N. and Aldeghaither, D. (2020). Mental health and well-being during the COVID-19 pandemic in higher education: evidence from G20 countries. *Journal of Public Health Research*, 9(1). DOI:10.4081/jphr.2020.2010

Petrides, L.A. (2002). Web-based technologies for distributed (or distance) learning: creating learning-centered educational experiences in the higher education classroom. *International Journal of Instructional Media*, 29(1), 69-77.

Ribeiro, R. (2020). *How university faculty embraced the remote learning shift*. EdTech Magazine. <https://edtechmagazine.com/higher/article/2020/04/how-university-faculty-embraced-remote-learning-shift> [Accessed 15 Feb. 2022].

Selim, H.M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education*, 49(2), 396-413. <https://doi.org/10.1016/j.compedu.2005.09.004>

Steinmayr, R., and Spinath, B. (2009). The importance of motivation as a predictor of school achievement. *Learning and individual differences*, 19(1), 80-90.

<https://doi.org/10.1016/j.lindif.2008.05.004>

Tarus, J. K., Gichoya, D., and Muumbo, A. (2015). Challenges of Implementing E-Learning in Kenya: A Case of Kenyan Public Universities. *International Review of Research in Open and Distributed Learning*, 16(1), 120-141. <https://doi.org/10.19173/irrodl.v16i1.1816>

Vonderwell, S. (2003). An examination of asynchronous communication experiences and perspectives of students in an online course: a case study. *The Internet and Higher Education*. 6(1), 77-90. [https://doi.org/10.1016/S1096-7516\(02\)00164-1](https://doi.org/10.1016/S1096-7516(02)00164-1)

Watkins, R., Leigh, D., and Triner, D. (2004). Assessing readiness for e-learning. *Performance Improvement Quarterly*, 17(4), 66-79. <https://doi.org/10.1111/j.1937-8327.2004.tb00321.x>

Zaheer, M., Babar, M. E., Gondal, U. H., and Qadri, M. M. (2015). E-learning and student satisfaction. In Proceedings of the 29th Annual Conference of the Asian Association of Open Universities: New frontiers in ODL, (pp.275-285).