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TECHNOLOGY ADOPTION IN HIGHER EDUCATION AND CHALLENGES FOR SOUTH ASIAN STUDENTS IN DIGITAL LEARNING ENVIRONMENT

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Abstract: Certainly, the entire global education system has been drastically transformed in the last two decades. Nevertheless, post-pandemic Digital Technology is also setting new challenges for educators, academicians, policymakers and students. During the pandemic, online mode was the only available option for running the global education system and for commencing uninterrupted teaching-learning. The pandemic caused the worst hit on the global economy but the marginalized and disadvantaged groups had been suffering the most. Post-pandemic education technology is also extended vastly in every area of higher education systems without even understanding the repercussions and challenges. Various other changes are observed in the education sector such as NEP, International exchange programs, Students' Mobility Tracking, Resource Generation, Accreditation, Global Ranking System and Corporate academia linkage etc. Digital technology especially Artificial Intelligence (AI) is prepared to reshape the future of higher education. Various educational portals are developed for information sharing, credit transfer and interaction as a part of e-governance initiatives. Post-pandemic student mobility is showing positive trends in many nations. To limit the students' mobility developed countries use live tracking tools to trace the mobility trends in various courses and institutions. In addition, many universities are introducing digital learning platforms and Massive Open Online Courses (MOOCs) for students and teachers. The pandemic was a lesson for many middle-class parents who had been borrowing educational loans from banks to send their children abroad for education. Moreover, affording advanced digital technology to offer a modest education for all is another bit challenge for many parents. Dropouts and suicides are also reported in notable and productive institutes due to undue pressure on students. This article presents an overview of the Global education system, technology adoption in HEIs, mobility issues, and challenges for South Asian students studying in digital learning environments.

Keywords: Technology Adoption, Higher Education Institutions (HEIs), Student's Mobility, Virtual Mobility, Accreditation, Education Technology, Artificial Intelligence (AI)

Introduction: South Asia is the second largest and most diversified region in terms of Higher Education enrollments. Approximately 25% population of the world is living in eight countries. South Asia is home to the largest share of the world's youth population with 48 percent of its population below the age of 24 years (JustJobs Network, 2017). In addition, student mobility from this region to other countries is showing positive trends. An increasing number of Private Universities also play an important role in the transformation of higher education in this zone. On one side investors are exploring new opportunities in South Asian countries as this zone is opening new vistas for them. On the other side, China and India account for almost half of the international students migrating to other nations. The whole world perceives this zone as a market for educational products including digital technology. Moreover, institutions do not plan and design educational products for the hub where most diversified and marginalized population resides. For educational technology, this young hub is the right destination for both experiences and experiments. The adoption of new technology is setting new challenges for learners and teachers in most Asian countries (UNESCO, 2009). Nevertheless, the percentage of teachers and students using technology from marginalized and disadvantaged groups is very less due to various socio-economic barriers encountered by them. COVID-19 strained the entire world and the global education system transformed drastically with ICT initiatives, Virtual Mobility, Educational Apps and online teaching-learning. The second-largest education system in the world and is known as a hub for cultivating the youngest global manpower. Hence, innovative strategies are used to develop manpower by many professional institutions. Post-pandemic many changes are observed in higher education whereas continuous growth in the sale of digital devices was also noticed in India. Generative Artificial Intelligence (GAI) and Machine Learning (ML) are the recent concepts transforming the education system. Virtual Student Mobility (VSM) is offered by many global institutions. Moreover, as per the NEP 2020 online education is an integral part of the higher education system in the future. Many students and teachers have faced difficulty in using ICT and Capacity Building tools for teaching and learning. Socio-economic status of the students affects computer ownership and internet access. Contesting online exams is another big challenge for marginalized students and socially disadvantaged. Similarly buying online study material is not easy for everyone and open sources do not fulfill the requirements of the syllabus and curriculum prescribed by the institutions. Getting the updated software and Apps is an additional burden on socially disadvantaged groups.

This micro-level study is proposed to investigate the various problems faced by students in technology adoption in the higher education system. The study was challenging as we have different types of governments and private institutions in South Asia and identifying socio-economic barriers to technology adoption in different learning environments is a daunting task. Therefore, a rigorous literature review is conducted on similar topics, information is gathered from

international organizations, and reports are reviewed to find out the challenges faced by diversified Asian students in technology Adoption.

Research Methodology: The study is based on secondary data and information collected from various sources for summarizing the findings such as Reports, News Papers, and Databases. The information is gathered, compiled, and tabulated for presenting the crux of the study.

Research Question: Is the higher education system ready for technology adoption by introducing online education in the current scenario? What barriers do South Asian students encounter when taking online courses or using technology for education? How does Education technology work in a teaching-learning environment in South Asian countries?

Research Gap: There are only limited studies on similar topics therefore, it is important to conduct this research and find out the status of Technology adoption in higher education in South Asian countries. The study will explore the crucial areas of primary studies in the related field.

Research Objectives: The following research objectives are framed for investigating the research problem and explaining facts related to the subject matter:

1. To explore the status of technology adoption and ICT usage in higher education institutions.
2. To find out the barriers to Technology Adoption and ICT usage faced by disadvantaged groups and marginalized in South Asian countries.
3. To investigate the remedial measure of the engagement of various groups in Technology Adoption in South Asian countries.
4. To investigate the educational policies and initiatives recently taken by higher education institutions for technology adoption.

Literature Review: A few studies have been conducted on technology adoption in higher education therefore, the literature review is presented in this section. Lockdown impacted most but the worst hit was women and marginalized. Students and teachers both face problems in online learning (Kantameni, 2020). In another study conducted on online learning in five developing countries, India, Pakistan, Bangladesh, Nepal and Afghanistan, it was found that 30% of the students were not participating in e-learning due to various socio-economic problems (Mathrani, 2022). Access to smartphones and the internet is limited in India, Pakistan and Bangladesh and only 27% of people were using smartphones, and 28% lack electricity for online education in Asian countries. Poor participation in online education is reported and reflected in the motivation of students towards online learning in most South Asian countries (Ford Lumban Gaol, 2020). The lockdown caused major disruption in the academic work in learning of graduate students in most Asian Universities (Junling Li, 2022). Authentic assessments, timely feedback, Academic Credit Bank and credit transfers are recent issues emerging in the Chinese higher education system (Huikang Li, 2013). ODL, LMS, MOOCs are crucial part of online learning is the availability of helpful formative assessments and timely feedback to online learners (Nikhil Kant, 2021). Many

technical, social, cultural and financial barriers are observed in online learning especially factors like curriculum developers, teachers, parent students, social authorities, and technological specialists. Preparing for virtual and actual interaction among children and teachers and society is a challenge in online learning (Xuefei Nancy Deng, 2022). Factors against the practicability of online education in Nigeria include the state of the internet infrastructure, cost of computers and internet access, level of ICT know-how among students and lack of constant electricity supply (Junling Li, 2022). Therefore, it is important to identify the learning barriers in technology adoption specific to South Asian countries (Baela Jamil, 2020). South Asian countries already suffered from financial and infrastructural issues and funding agencies are misleading these countries by providing them with substandard technology tools in the name of grants and Aid. Sometimes the institutes are not able to identify the needs of various segments before spending a huge amount on education technology. Fast education technology growth is putting immense pressure on teachers and students to learn new things (Global Education Monitoring Report, 2023).

Observations and Findings: Education technology impacts students and teachers in a multidimensional way. On one side a few studies concluded a positive impact on teaching-learning on the other side few studies indicated the negative impact of excessive use of technology on teaching-learning. Moreover, online contents are prepared by dominant groups in a society hence their views and ideologies produce a lopsided result. The voices of the unheard are still not getting an appropriate place in the mainstream. There are many regulatory and ethical challenges in technology adoption and data security of the users. In some cases, it was found that for global ranking and affiliation, the educational institutes boast or make exaggerated claims about the usage of technology in teaching-learning. The application of digital technology varies by community and socioeconomic level, by teacher willingness and preparedness, by education level and by country income (Global Education Monitoring Report, 2023). In a report of UNICEF, it was observed that disadvantaged groups and especially women are most impacted by their initiatives in South Asia (UNICEF, 2018). In this section, various aspects of technology adoption are discussed in the context of higher education:

1. Establishing Equality, Quality and Efficacy in higher education: Overall the enrollment of students in higher education is improving, but establishing equality and easy access to technology in South Asian countries for all is indispensable. It is important to develop sound pedagogy and a phase-wise plan to provide quality education to all (UNESCO, 2011). ICT-enabled teaching-learning is used by most higher education institutes in modern times and it helps in providing quality education but the control of ICT-based teaching-learning is in the hands of dominant groups in most nations. Most of the online content in repositories is either developed or regulated by North American and European countries. The application of ICT in research is also increasing steadily and institutions already started linking the research globally (UNESCO, 2009) but the dominance of developed countries is noticed in most publications. Moreover, paid journals, books and databases usually charge very high fees for full access therefore, disadvantaged groups are unable to afford online books and articles. Women are far behind in terms of ICT usage and

leadership in different fields. Diversified groups, differently abled and minorities in the entire South Asian zone are neglected while catering to the ICT needs of the students from various backgrounds. The cost of hardware and software related to higher education is also high and sometimes it is too expensive for young learners and scholars. Moreover, in most South Asian countries public-funded education is not pushed towards privatization through autonomy.

Conceptualizing equity and inclusion regarding digital technologies in education

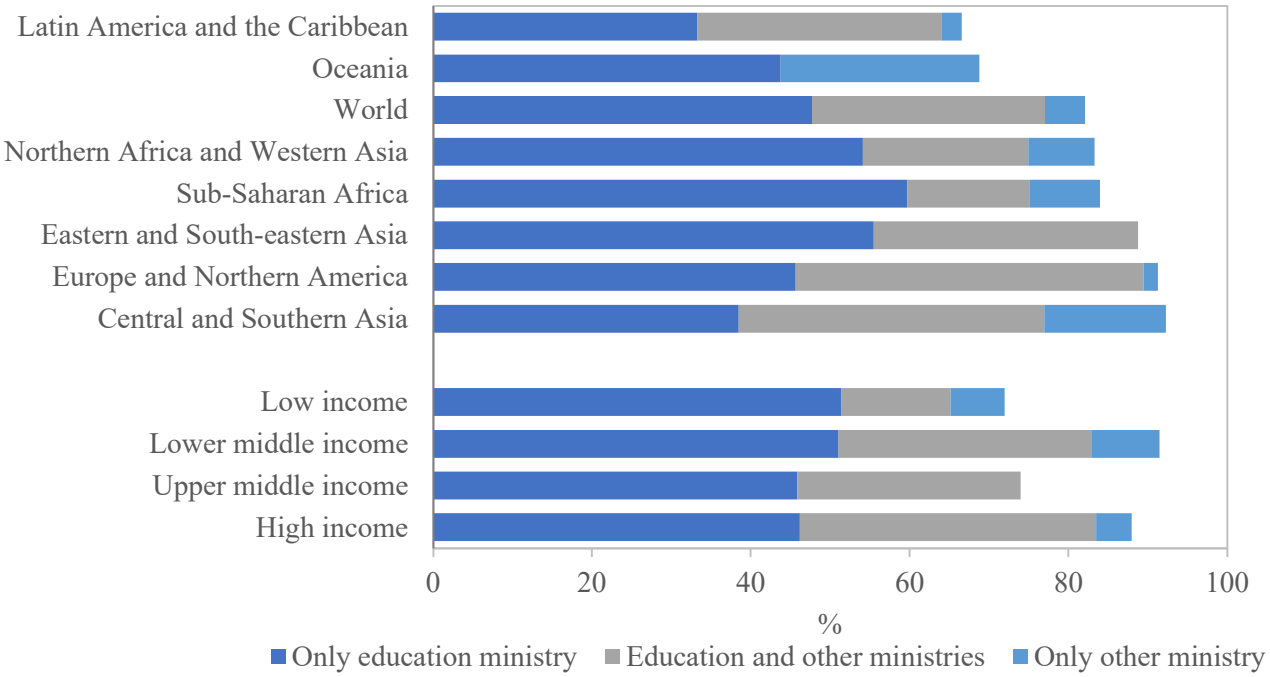
	In education	For equity/inclusion in education
Equity	Digital equity in education: Promoting fairness and equity in access to digital technologies (including hardware, software, high-quality broadband etc.), digital skills, uses and attitudes for all students	Digital technologies for equity in education: Using digital technologies to promote equity in education, such as providing additional learning resources for students in need to promote equitable outcomes to help them participate fully in (digital) education.
Inclusion	Digital inclusion in education: Overcoming barriers to participation in digital education based on student differences. This would also involve ensuring digital tools in education are designed and used in a way that promotes participation and inclusion of all learners.	Digital technologies for inclusion in education: Adapting digital technologies and learning environments to promote inclusion in education, acknowledging, accepting and respecting student differences. Using digital technologies to promote inclusion in education should aim to ensure students feel included, promote belonging and a sense of well-being, while ensuring nondiscrimination.

(Table 1- Source OECD Working Paper 299)

1. Educational Technology is increasing the gap between Rich and Poor: Education is our right but the cost of education and education technology is not uniform in most countries including South Asia. Digital equity and inclusion matter at every stage of education in developing countries. Technical advancements have a great potential to establish equity if used effectively and education technology can cater to the needs of diversified students (OECD Education Working Paper, 2023). Funding in low-income countries through PPP linkage has already been introduced. Hence, many institutes are increasing the fees and others are gradually increasing. Globally the percentage of internet users increased from 16% to 66% from 2005 to 2022 (Global Education Monitoring Report, 2023). In developed nations, toddlers are exposed to AI-generative tools whereas in many developing nations students have no access to technology even in secondary and higher education. Infrastructure differs massively from country to country in South Asia. Sometimes, the excessive use of technology creates a big difference among learners and may negatively impact their cognitive learning process. Hence, it is important to implement legislation, standards and agreed good practices to protect learners' and teachers' human rights, well-being and online safety, taking into account screen and connection time, privacy, and data protection of the affected parties (Global Education Monitoring Report, 2023). . Location and family income are two important determinants in technology adoption in remote areas and in low economic zones. Nevertheless, in the absence of control mechanism digital literacy and digital skills can further create a wider gap between rich and poor learners from different backgrounds. Globally only 46% of people have PCs or laptops at their homes with the percentage ranging from 7% to 80%. Many students do not even have access to computers in schools and institutions.

2. Policy Challenges and Regulation: The rising demand for ICT skills is putting pressure on Governments to incorporate digital technology through sound investment plans, guidelines and regulatory frameworks to prepare students for the future job market (OECD , 2020). ICT innovations in governance and management also put immense pressure on students and teachers to follow the guidelines and regulations. From enrollment till completion of the examination, the students are asked to fill in the information through many gateways and in the name of ICT development and labs fees is charged by the students. The users are exposed to various web portals, Apps and networks. Their data is used for various purposes and without protecting their privacy the institutes are keeping them uninformed about the regulations. In most countries, education technology is governed by state or central governments, government departments and education ministries but only 16% ensure the data privacy of users in the world (Global Education Monitoring Report, 2023). Regulations related to the safety of users, screen time, usage of mobile phones in institutions and labs are developed by a handful of institutes. A few countries even banned Microsoft products that do not comply with General Data Protection Regulations in the interest of students and teachers.

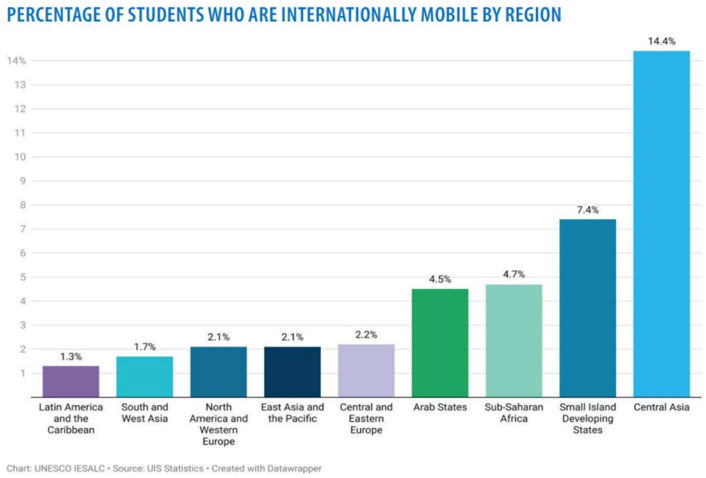
Ministries of education lead government education technology agencies in 6 out of 10 countries



Graph 1- Source: Profiles Enhancing Education Reviews (PEER).

Despite of so many efforts data protection and privacy are still in developing stage in many nations. Most South Asian countries are neglecting the data protection and privacy issues in education and their legislation. On the other side, artificial intelligence is inviting an additional upcoming risk to data privacy. It is expensive, tedious and sometimes legally questionable. Careless and deliberate misuse of machine learning algorithms can result in biased decisions (Stuart Russell, 2022).

3**. Student Mobility in Low-income Economy and High-income Economy:** The recent trends in India and China show high mobility of students. South Asian countries also show a positive trend in student mobility. South Asian and Central Asian students are migrating most to the rest of the world. The number of internationally mobile students has almost tripled from 2000 to 2019 (UNESCO, 2022). South Asia regions constitute around 2.2% share of internationally mobile students. Migration matters in the economic development of a region. Academic mobility is noticed due to research and higher studies. Post-pandemic many students faced the delay in research grants or suspension of research projects (UNESCO, 2022).



Graph 2- Source – UNESCO Institute of Statistics Database

4. Government Initiatives for Technology Adoption in Higher Education: Teachers are the change agents for students' learning hence training the trainers for using technology effectively is important. Governance of education technology is in the hands of government but increasing privatization is giving more control in the hands of stakeholders. Involvement of government in education technology is heavily dependent on stakeholders' interests. Governance today is more fragmented education technology providers are extending their 'territory of influence' over institutional policies.

6. Academic integrity and Ethics in Higher Education: Academic integrity Bills and Legislations are introduced globally but the understanding of academic integrity is poor in South Asia. Intellectual honesty and ethical practices are expected in higher education. Subprime crisis, global warming, failing states, poverty, terror threats and war, and similar global challenges faced by society indicates that there is degradation of moral values in general and particularly among 'the educated class'. One of the reasons for this could be that we have not bothered to instill the values of honesty, transparency, trust, professional duty and morality in schools and colleges and particularly in technical and professional courses. The need of the hour is to strengthen the moral values of professionals across nations and across disciplines by sensitizing them towards ethical and moral values like transparency, honesty, diligence, and discipline in life. As teaching is the mother of all professions, the importance of professional conduct must be greatest among educators, teachers and administration in educational institutions. It is assumed that in the absence of moral DNA in society, law of ethical entropy takes its toll on society. It has resulted in amoral attitudes and unethical professional practices among professionals and teachers alike. If the onus of building an ethical character among pupils rests on teachers, who are expected to conduct themselves professionally by adhering to qualities like discipline, honesty, integrity, trustworthiness and like, more attention be paid to the ethical conduct of teachers. To support ethical practices and to avoid academic thefts many acts and legislation are drafted by nations and educational software such as Turnitin, Urkund and Drillbit, etc., are introduced in the higher

education system. Academic plagiarism in not a new phenomenon but easy plagiarism detection tools, sound research training programmes and librarians can reduce the cases of plagiarism. Cheating, copying and using content of popular authors is common in higher education in South Asian countries (British Council , 2014). Skill development is a dimension added to higher education and students are expected to learn new skills and soft skills through better usages of education technology.

Global Ranking Framework: The global ranking networks are putting immense pressure on teachers and students to improve teaching-learning and various other dimensions. Ranking bodies demand every detail on the institutional website for stakeholders. Modernization of tools, processes, infrastructure and technology is expected by ranking bodies. Public perception through digital technology and social media is observed by the ranking institutions. QS, NIRF and other ranking bodies observe the academic and employer reputation. Technology is used for providing information to the stakeholders and sharing information with the students. Funding agencies and collaborating bodies are accessing similar information for cross-verifying the institutional details.

Conclusion: ICT initiatives and technology adoption is inevitable and higher education institutions are transforming globally. South Asian countries are lacking a bit due to several reasons as discussed above. Inclusivity and diversity both need to be considered in technology adoption in higher education. Most diversified populations and youngsters are residing in South Asian countries. Standard models and Western techniques may not fit here completely because a large number of students belong to disadvantaged groups and marginalized communities. For overall development and progressive higher education, it is essential to opt for an effective modus operandi for South Asia.

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