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Users' perspective on the adoption of e-learning in developing countries: The case of Nepal with a conjoint-based discrete choice approach

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ABSTRACT

The traditional approach of teaching and the learning environment has shrunken the information access capability and widened the knowledge gap, rather than preparing for the global competitive market. It can be minimized by integrating technology in education by exploiting the technology effectively. To date, integration of technology in education is often done through forced adoption without considering the perception of the real consumer. Using conjoint-based discrete choice modeling, this study aims to identify the preference for e-learning in a school environment, providing key implication for effective reformation of education incorporating the demand side for the optimum outcome. The identified preferences will allow the government to more effectively map and mobilize resources for the use of technology in the learning environment.

1. Introduction

The technological advancement along with its integration in the learning environment has brought a remarkable breakthrough in quality education. However, because of the lack of a policy framework and resources, the integration of technology in education has not become widespread. Often, the adoption of a technology-assisted learning environment has become voluntary and limited to some profit oriented (privately run schools) and resourceful institution to attract more students, rather than serving to advance the overall education system. The voluntary adoption of technology in a learning environment without a proper policy framework does not contribute to reducing the digital gap, it rather increases the disparity in various aspects of education. Without ICT as a tool to advance the education system, education reformation policy is not complete (Jhurree, 2005). However, in developing countries such as Nepal, such reformation utilizing ICT as a primary building block has not been prioritized (Mathema, 2007), entailing further being trapped into the ICT-driven society. The top-down approach of reformation strategy employed by developing countries, i.e., not considering the characteristics of the demand side, cannot guarantee basic required outputs to obtain sustainable growth. Moreover, as pointed out by Shields (2011), modernizing the education system in Nepal by integrating ICT is performed inconsistently and incoherently due to a lack of a clear national agenda and policy debate, which shows that the government has not prioritized the reformation of the education system through the integration of ICT (Mathema, 2007). However, the Government of Nepal enacted its first IT policy in 2000, which has broadly recognized the need for ICT education and the integration of ICT into the educational environment. The policy has been further strengthened through the School Sector Reform Plan (2009–2015), enacting the IT Policy 2010, and subsequent policy updates and education reform plans (UNESCO, 2015). However, the implementation strategy has not

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been consistent due to the influence of donor agencies on policymaking, aid dependency (Bhatta, 2011), a lack of policy debates among the stakeholders (Shields, 2011), and regular re-assessment of existing policies. Thus, the country's educational system is based on the development goals set forth by multilateral development agencies (Regmi, 2015), not encouraging the noble cases of technology initiatives from community-lead organizations (Pun, 2013), and/or the use of low-cost micro-computers (Thapa and Sein, 2018).

The World Bank (2016) report on "Digital Dividends" stressed that without strengthening the necessary absorption capabilities, benefits brought by digital technologies cannot be obtained. Education is undoubtedly the major foundation of sustainable growth, but without a strong ICT-enabled education system, the inclusion, efficiency, and innovation required for an even distribution of the digital dividend for the next generation is not possible. Furthermore, the disparity in access to ICT and its utilization limits the effectiveness of the national innovation system (Wiseman and Anderson, 2012). Thus, an authoritative top-down approach towards education reformation without assessing the preferences of the target group will fall short of producing an optimal output.

In 2000, the Government of Nepal enacted an education policy envisioning providing ICT education for all, however, it has been constrained by a number of challenges such as a lack of digital content, poor infrastructure, inadequate human resources, and financing issues. Some efforts have been undertaken to advance teaching-learning techniques, and serve in some cases to attract students by some privately run schools in the urban areas and in other cases to improve quality through collective community efforts and self-funding in rural areas. Nevertheless, technology adoption in the classroom environment has not been introduced as fast and widespread as expected by the policy and government vision, even considering subsequent policy updates with the support of international agencies such as UNESCO. It can be reasoned that the currently available resources such as infrastructure and human resources are not prepared to implement the reformation strategies advised by the report (UNESCO, 2015). Thus, resource mapping and mobilization in accordance with users' adaption behavior as well as assessments of ability and preparedness, rather than practicing traditional approaches or forcing the adoption of new systems are required. Otherwise, government strategies, policies, and their implications are constrained to continuing old ways rather than upgrading the system to create an environment conducive for new and creative solutions. Based on state-of-art services and government policy, this research intends to analyze the consumer affordability, behavior and perception towards a future technology-assisted learning environment in high school education.

A number of studies have focused on a performance analysis of the integration of technology in schools (Astrachan et al., 2011; Chen and Liu, 2013; Fazelian and Soraghi, 2010; Fernández et al., 2011; Mohammadi et al., 2011; Sharma and Chhabra, 2011). In addition, other studies focused on the choice of the instructional format (Artino, 2010) or the choice of assignment marking (Grieve et al., 2016). Technology integration is pedagogically important as it enhances the learning environment in a creative way to transform the education landscape. Despite the advantages of technology integration, the issues on affordability or specific choice of the facility could affect the system acceptance and so far, no research attempt has been made to investigate the consumers' preference in the adoption of ICT services in an educational environment. Thus, this study aims to analyze the preference structure of e-learning adoption in schools, which is based on the features of e-learning packages available in a particular school and further tries to interrelate preference with socio-demographic factors.

The key objectives of this study are to suggest an appropriate policy framework for accelerating the creation of an efficient education sector and identifying incentives to enrich e-learning content, provide quality infrastructure, and a preferred computational platform at an affordable cost, so that ICT integration to drive e-learning adoption behavior moves in a predictable direction. The study puts forward a methodological framework using a conjoint survey to identify and analyze consumers' preference structure, their taste variation, and effects of socio-demographic characteristics, that dictate the preference with respect to the attributes of e-learning adoption. By analyzing the influence of attributes on their preference structure and choice patterns of the respondents to the e-learning system, the utility that every attribute level poses to the average consumers is derived. Through the use of willingness-to-pay (WTP), the perceived value for each level of attributes is identified, which can useful to derive suggestions for the realization of a sustainability model of e-learning adoption from the perspective of consumers, service providers, and policy makers.

This manuscript starts with a review of literature on the adoption of technology and related theories. It also summarizes the literature on e-learning and technology adoption in the educational environment, from which it identifies the attributes for this research. Section 3 discusses the methodologies and data collection procedures employed to conduct this research. Section 4 is dedicated to the estimation using the model, discusses the result of the estimation, and concludes with policy remarks based on the estimation results.

2. Literature review

Previous literature has focused on reform-based technology adoption considering the administration as a decision maker (Bell et al., 2013). In general, the cost of primary education is borne by the government; however, the government also allows the private sector to facilitate education infrastructure. In the case of developing countries, computer education or technology integration in general either require additional funds in publicly managed schools or are implemented primarily in privately run institutions. In both cases, education costs for computers and the computer-assisted learning environment lead to additional financial burdens.

2.1. Technology adoption models

Technology adoption models have been widely studied by researchers in the ICT field using several theoretical models. Researchers interested in technology adoption and consumers' behavior have employed the theory of reasoned action (TRA) (Fishbein and Ajzen, 1977), Theory of planned behavior (TPB) (Ajzen, 1991), and the Theory of acceptance and use of technology

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