

Effect of Online Learning Environment on Behavioral Changes and Academic Performance of Children in Pre – Adolescence

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Abstract

The evolution of education paradigms in the new millennium has been influenced by the rapid integration of technology in learning environment worldwide, with Sri Lanka being a notable exception until recent times. The global pandemic triggered an unprecedented shift in Sri Lanka's educational landscape demanding a rapid transition from traditional classroom learning environment to online learning environment in 2020 as a resolution to the island-wide lockdown process. Very little was known about its effectiveness and challenges, although the process has become widely popular and mandatory in the system of education in the country. This paper aims to explore the impact of online learning environment on behavioral changes and the academic development of children in pre -adolescence. A survey questionnaire was administered to 120 participants studying in the Badulla educational zone to collect data related to the study. The study adopted a subjective approach and analyzed quantitative measures of academic performance using Partial Least Square - Structural Equation Modelling (PLS - SEM) among pre -adolescent students engaged in an online learning environment. Findings of the study suggested that the online learning environment has a positive impact on both behavioral changes and the academic performance of pre-adolescent students. The process has been empirically evaluated as an effective strategy for both learners and teachers to enhance their knowledge and skills in accomplishing intended academic goals in the new millennium. The study also demonstrated that the process fosters learner autonomy and motivates them to be authentically engaged in academic activities even though it brings challenges in social interaction and emotional well-being. These insights underscore the significance of educators and policy makers to design online curricula that not only promote academic achievement but also nurture the holistic development of pre-adolescent children during their critical formative stage.

Keywords: Academic development, Behavioral changes, Education paradigms, Online learning, Pre - adolescents.

Introduction

The evolution of educational paradigms in the 21st century has been greatly influenced by the swift integration of technology in the learning environment worldwide, except Sri Lanka until the global pandemic. Online learning environment, a new mode that facilitates the delivery of subject content via the internet, has gained significant prominence, particularly in times of global crisis. Subsequently, the

unexpected strike of the COVID-19 virus served as a catalyst for re-evaluating conventional educational pedagogy. The crisis has brought a dramatic change in the pedagogy of education worldwide with the emergence of the online learning environment (UNESCO, 2020). Accordingly, a digital pedagogy or online Learning Environment has emerged with the use of contemporary Information and Communication Technology in Sri Lanka during the crisis stated (Haththotuwa, 2021).

This study investigates the impact of the pandemic on the educational experiences of pre - adolescent children in Sri Lanka, particularly focusing on the transition to online learning environments. The process has resulted in several significant changes that require thorough examination, especially regarding academic development and behavioral changes of pre-adolescent children. The target group of the study typically consists of children aged 9-13 and is particularly sensitive to changes in the learning environment owing to the cognitive, emotional and social development that occur during this period. Pre-adolescence is a crucial stage for developing both emotional and social intelligence in children. They tend to improve their interpersonal skills that enhance social interaction which eventually lead to emotional and social development. Hence, this new learning process can also be social dynamics. This may raise curiosity about how this novel process will affect the social behavior of these children. In contrast the new pedagogy projects great potential improving the quality of education island- wide identified by the government. (Ministry of Education, 2020).

Hence, the rapid shift of paradigms in education, online learning environment has resulted in a direct impact on learners' behavior and academic development which seemed to be a global phenomenon and opened a trail for this particular study. The impact of the online learning environment on children's behavior remains unclear and all these challenges undoubtedly have an impact on learners' behavior and academic performance (De Silva, 2020). Subsequently, the behavioral changes of pre-adolescents associated with the transition to online learning platform present a significant issue within the target group. The cultural context cannot be avoided in understanding the research problem. The study of Dias & Eliatambi (2020) stated that the new circumstance of uncertainty and the rapid swift of paradigms have created a series of challenges that are sensitive and unique in the Sri Lankan context. Further, they mentioned that the online learning environment has its strengths, obstacles and challenges, which are the major concern of this paper.

A review of existing literature further indicates that most of these issues are contemporary, and they are not confined to a single nation-state, thus a global phenomenon. The current scenario seems to be a common global issue and authors' pre investigations revealed that existing literature could not explain the methodological and empirical aspects related to the research topic. The tentative and formidable nature of the technologies integrated in the learning and teaching process created a substantial theoretical gap in the study. It seemed that still there is no theory or strategy that can comprehensively address certain sensitive issues pertaining to the target group. The lack of empirical evidence shows that the dearth of research on these concerns and the dire necessity for further investigation to explore the effectiveness of the online learning environment as well as its impact on both academic development and the behavioral change in young learners in pre-adolescence, especially in the Sri Lankan context. This shift provides a unique opportunity to explore the effect of online learning on the academic development of pre-adolescent children - a pivotal demography marked by critical cognitive and psychological growth.

Pre-adolescence, scientifically defined as ages 9 to 13, which in turn characterized by heightened curiosity, socialization and the formation of self-reliance and identity. The transitional period in which foundational learning experiences and certain behavioral traits are solidly established. As a result of this new learning environment, a dual impact is presented by opportunities and challenges, especially for pre-adolescent

children within the diverse Sri Lankan context. This thesis aims to navigate these complexities, providing insight into the intricate relationship between online learning environment and the academic development of those children. The study aims to explore the dual nature of this rapid transition, identifying both the challenges and opportunities it presents for the target group, pre-adolescent children. In addition, how online can be optimized for accomplishing future goals in education.

Literature Review

The literature review examines the transformative role of technology in education, with a specific emphasis on the evolution of online learning environments as a substantial alternative to traditional learning and teaching methodology gained insufficient and insignificant attention during the crisis. The reviews recognize the platform's capability to boost motivation and engagement among young learners by fostering independence and interactive exploration of new knowledge.

The analysis draws on key theories, constructive learning of Vygotsky's and ecological theory of Bronfenbrenner (1992), emphasizing the crucial role of social interaction in learning, a key aspect that online learning environment can effectively replicate. The reviews also acknowledge the challenges faced by young learners of pre-adolescence and their teachers and parents.

The increased accessibility of the internet and the World Wide Web have created multitudes of opportunities for non-traditional education through online learning platform (Karber, 2003). Technology has become an essential part of our social, commercial and educational life. The use of the internet has a vital role in disseminating knowledge via online classes (Silva and Cartwright, 2017). Karber (2003) mentioned that the online process has rapidly expanded due to the increased accessibility of the World Wide Web and the internet. The process has created a vast opportunity for non-traditional education which levels all sorts of physical or social crises.

Arthur (2017) argued that the online learning environment acts as an alternative tool to overcome the abrupt crises. An online learning environment is considered as an entertaining way to learn, and the process has a positive impact on both students and teachers alike (Bouhnik & Marcus, 2006). Online learning process plays a significant role in learning during the closure of schools and the lockdown period. Moreover, having properly maintained the technical infrastructure is required for its success at schools (Nikdel & Fardia, 2020). Research conducted by Zhang (2004) shows that the use of the internet and multimedia technology can change the way of imparting knowledge, and it can be an alternative to traditional classroom learning which Sri Lankan schools are engaging right now and projecting high academic development within the children of pre-adolescence.

At the initial implementation of the process, online learning requires various devices such as smartphones, laptops, computers, tablets or iPhones that facilitate access to information regardless of time and distance (Gikas & Grant, 2013). The annual report of the Central Bank of Sri Lanka (2021) mentioned that online learning process is a challenge for almost all the prospective learners and teachers due to the economic crisis resulted by the pandemic.

Piaget's cognitive developmental theory provides insight into the difficulties children face in online learning processes particularly in understanding abstract and hypothetical concepts (Thomas, 2000). In contrast, traditional face to face learning environment, teachers can provide constant assistance and guidance on students' learning process and that may help them to comprehend complex concepts. Hence, the amount of guidance significantly drops in online learning environment and often students often face challenges and obstacles independently. (Barbour, 2013).

In addition, digital learning can open new learning opportunities for creating outstanding students whilst considerably altering learning provision and the competitive surroundings. Virtual connectivity overcomes time and vicinity regulations by providing academic opportunities to distant students and permitting them to attain mastering of soft skills. The process also supports learner autonomy. It has additionally advanced and passed the distribution of fixed content to the use of dynamic, public-school rooms, and digital education stated de Souza Rodrigues (2021).

The improvement of prospective students will be decided whether online has effective or bad effects (Kirkwood, 2006). Students will hastily get bored if the demonstration of the gaining knowledge of content material isn't effectively designed or seems like a textual study. Moreover, the teachers who are not aware about the technology and their poor understanding of the digital era, may not be able to gain intended learning outcome while they engage in online teaching and it is certain that those teachers find the process a challenge (Madhubhashini, G. T., 2021). The role of the teacher is shifted to that a facilitator, whereas pupils need to enhance their ability to initiate autonomous learning and keep concentration on the lesson taught via online (Cozma, 2003). Regardless of substantial investments made by governments, universities, and service providers, the entire advantage and the cost of virtual mastering structures have yet to be realized (Barclay, 2018). This involves ongoing research into the factors that affect student satisfaction (Herrador-Alcaide, 2019).

Technological proficiency is a major factor determining the effectiveness of online learning (. Duncan, 1964) The research of Ogburn & Duncan (1964) claimed that change depends on the ability to utilize technology in learning and teaching. Salman (2000) argues that technology cannot be an independent factor, if the knowledge, concepts and skills are absent. Rogers (2003) mentioned that the use of technology is an individual decision.

Thus, Wahyuni & Latih (2018) argued that teachers must have a substantial knowledge of IT in order to produce quality human resources. Offir (2010) states that knowledge of IT and other electronic devices; electronic platforms allow teachers to achieve pedagogic goals. Offir (2013) also argues that it enhances quality of teaching. Freeman (1989) has mentioned that the new pedagogy helps teachers to reach teaching goals. Bloom (1956) mentioned that teaching goals indicate the performance of learners and the teacher's responsibility is to help learners to achieve academic goals. Moore (2003) also suggests that the most crucial role in online process is pedagogy and not the temporal or physical barriers that separate the respective participants.

However, there is a disparity between the intended outcomes and actual outcomes of online learning on students' academic achievements. This paper has investigated the above-mentioned gap formulating research questions.

Methodology

The study design adopted in this research is positivist, which is significant in comprehending the paradigms in the process of scientific discoveries through theoretical assumptions and obtaining empirical evidence to strengthen the effects of research constructs. The results are generated by a tested hypothesis. Quantitative method was employed to test the hypotheses statistically. Primary data was collected from pre-adolescent students who are studying in the bilingual stream. A survey questionnaire was used to collect data. The study used a multi-stage sampling to select the appropriate sample for the study. The initial sample of 30 students has been selected purposively to test the suitability of the questionnaire. Next, the selection was done randomly to form the target sampling group. A total of 120 students from 6 schools in the Badulla educational zone engaged in the final survey.

The study has designed a theoretical model with the integration of three dimensions of the online learning environment, adopting a deductive approach and aligned with testing intended hypotheses of the online learning environment. The study tested the following hypotheses.

H1. The online learning environment has a positive impact on the academic development of young children.

H2. The online learning environment has a positive impact on the behavior of young children.

H3. There is a correlation between behavioral change and the academic development of children in per-adolescence.

H4 Behavioral changes have a mediate effect on the relationship between the online learning environment and academic development.

A structural questionnaire with seven Likert scales was given to 120 recipients of the targeted group of children in -preadolescence. The data was analyzed using disruptive statistics using SPSS Statistics 25'

statistical software. Hypothetical relationships were tested employing Partial Least Square Structural Equation Modeling with the support of smart PLS version 4.

The study measured the effect of online learning environment using three dimensions, including technology, quality of teaching, and physical environment, as adopted from Chen (2018). Behavioral changes were evaluated with four dimensions, such as devices, motivational factors, level of learner autonomy and emotional management, applied by Wang (2022).

The academic performance of the target group was measured further by knowledge, skills and attitudes of students adopted by Usta (2016). A seven Likert Scale was used for the statistical evaluation of students' preferences towards each item in the survey questionnaire. PLS - SEM was used to analyse quantitative data with the support of Smart PLS software.

The variables were measured using a two-step hierarchical model, including measurement model and a structural model. The construct validity was evaluated using convergent validity and discriminant validity. Indicator reliability and internal consistent reliability were used to measure reliability. Structural model was utilized in case of satisfactory reliability and validity and the appropriateness of the research structure (model fit). The structural model evaluated the multicollinearity, the significance of path coefficients, coefficients of extermination and R - squared.

Results

The study analyzed data initially measuring variable's reliability and validity and then moved to the structural model to test hypotheses. In the measurement model evaluation, all the variables were evaluated using indicator reliability and composite reliability. The reliability and validity assessments confirmed that the measurement model was strong and appropriate for further analysis. The variables were measured by employing convergent and discriminant validity. After evaluating the reliability and validity of the variables, the study tested the hypotheses by considering path coefficients and their significance. The results are presented in Table 1. The results confirmed that all hypothetical relationships were statistically supported.

Table 1*Path Coefficient (Hypotheses Testing)*

Hypotheses	Path	T statistics	Decision
Direct Effect			
H1: Learning Environment -> Academic Performance	0.445	5.149	Accepted
H2: Learning Environment -> Behavioral Changes	0.884	36.903	Accepted
H3: Behavioral Changes -> Academic Performance	0.524	5.962	Accepted
Indirect Effect: Mediating Effect of Behavioral Change			
H4: Learning Environment -> Behavioral Changes -> Academic Performance	0.463	5.757	Partial Mediation

The indicator reliability was ensured that all outer loadings exceeded the recommended threshold of 0.7 indicating strong relationship between indicators and their constructs. T-statistical value above 1.96 confirmed statistical significance and it reinforced the reliability of the indicators. Further, internal consistency reliability is validated through composite reliability and Cronbach's alpha values, both exceeded 0.7 demonstrating that items within each construct are highly correlated and measure the same underline concept.

Also, the convergent validity was established with Average Variance Extracted (AVE) values above 0.5 which again indicated that each construction has a sufficient portion of variance in its indicators, further strengthening its validity. Subsequently, discriminant validity was also as each construct displayed a higher correlation with itself than others, ensuring that the constructs were distinct and they were measured in separate dimensions. These results collectively fostered the reliability and validity of the research model, which eventually indicated a strong foundation to test hypothetical relationships in this study.

The results of the study indicated that the independent variable collectively explained 88.3% of the variance in academic performance. The variance of behavioral changes shown 78.0% in overall performance in academic pedagogues. The overall findings of the study have proven the fact that there is a strong and greater effect of the tested learning environment online on the behavior of respective learners who were engaged in it.

Discussion

The study highlights the correlation between learners' behavioral changes and their academic performance within the process of online pedagogy. Thus, the study concludes that the learning environment positively affects behavioral changes and academic performance. The study has several theoretical implications as it advances the existing literature by studying the effect of moderating variables, behavioral change and its association with academic development of targeted learners. The study also provides a comprehensive framework for policymakers to develop strategies for advancing this new educational pedagogy and

enhancing quality output which ultimately provides direction for future studies. To achieve this, authors suggest that the process should be further industrialized in order to facilitate critical thinking and innovative learning platform for young learners in pre-adolescence. Hence, the online learning process should be closely monitored by all the responsible stakeholders, including teachers and parents in particular that will eventually reduce the negative impacts on young learners' behavior which has been the major expectation of this study. The improvement of this platform will certainly enable the entire community to accomplish 21st-century academic goals. The development of subjective research from these perspectives would be much more beneficial and they would absolutely bring about a greater and positive impact on the entire learning and teaching community in the country.

It is evident that the online learning environment which emerged during the outbreak of the global pandemic, has a strong effect on learners' development (cognitive, psychological and social) by creating a very supportive classroom environment that motivates young learners engaged in this study duly aligned with the theoretical findings mentioned by Bronfenbrenner (1970) in his theory of Ecology. The theory explained five major environment systems that influenced development of young learners in pre-adolescence, the target group in this study. The theory of 'micro system' in his study is directly related to the impact of immediate environment of the learners (the setting, people, activities and experiences) which in turn could directly align with the findings of the tested learning environment in the study, the effect of online learning environment on young learners. Accordingly, this study will certainly be an authentic example of the effect of prospective learning environment on children in pre-adolescence mentioned by Bronfenbrenner (1970).

The study has also revealed that healthy home environment and parental support can enhance the academic performance of these young learners and prevent them from being techno-savvy and being engaged in various digital malpractices, which seem to be a recurring phenomenon at present. Hence, this platform provides wider and quicker access to multitudes of resources to obtain information related to various subjects they intend to study to pursue better prospects in future.

Conclusion

This study extends the currently available literature from several perspectives through the tested hypotheses. The results generated by inferential analysis indicated that there is a positive and potent effect between the tested learning environment and the academic performance of the target learners, children in pre-adolescence (H1). The study also indicates that the impact of online learning environment on the behavior of the children (H2) and the correlation of two constructs, behavioral changes and academic development (H3) are statistically significant. A partial mediation is also found within the study, which indicated that online learning has an indirect influence on behavior change in acquiring academic achievements. (H4). Therefore, the main objective of this study, exploring the impact of online learning environment in response to the health crisis struck in the country has been achieved. The study further asserted that the process fosters learner-centered learning. The authors believe that this new approach will widen the avenue for learner autonomy in which every prospective learner becomes more responsible and critically decisive in their prospects. The emergence of this process greatly influences the educational pedagogy that meets the current demand for digital literacy required in the twenty-first century.

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