

The Effect of Demographic Factors on Students' Virtual Environmental Support in Learning

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Abstract

The virtual environment provides the platform where a learner acquires knowledge, attitudes and skills, leading to lifelong learning. This research aimed to determine the level of students' virtual environmental support for their learning, mainly taking into account demographical factors that affect students' virtual environment for their learning. The design of this study is a survey and a questionnaire instrument used for data collection. A total number of 1350 secondary school children has been selected based on a stratified random sampling technique. Data are analyzed using the Statistical Package for Social Sciences (SPSS) Version 23. The descriptive such as mean, standard deviation and inferences analysis such as MANOVA used to analyse the data. The descriptive research shows a moderate level of virtual-environmental support (mean = 3.467, S.D = 1.022) for student learning. The results demonstrate that the virtual environmental support was at moderate levels. The inferences analysis show significant differences in virtual platforms based on gender, mother's education and parent income. Accordingly, the analysis shows that virtual environmental support significantly decreases while parental income and the mother's educational level decrease. The implications of the study show that the Ministry of Education can provide tablets and mobile devices for needy students and Internet facilities for the lower classes of society. Parents should maximize their earnings to provide the necessary devices that can improve their children's wellbeing. Parents and teachers can encourage students to use devices for education.

Keywords: Virtual environmental support, learning, gender, parental income, parent education.

1.0 Introduction

This study adopts ecological theory by Urie Bronfenbrenner (Bronfenbrenner 1979), who believes that the social context of individual interactions and experiences determines the degree to which individuals can develop their abilities and realise their potential. The socio-ecological theory (Bronfenbrenner 1979) asserts that the socio-environment consisting of home, school, community, media and virtual environment, occupation, government, and culture all contribute to improving a child's development. Bronfenbrenner (1979) asserts that the environment, such as the community, society and virtual environment contributes to improving children's development and psychological capability. This model incorporates both the idea of bidirectional influence, which considers both the influence of the environment on the person and vice versa and the notion of indirect influence (Gurtner, Monnard et al. 2001). The virtual environment positively influences student learning by enabling them to study their lessons and local and global issues (Köse 2016). Social network platforms provide opportunities to enhance discussion and communication among students and with their teacher (Bouhnik, Deshen et al. 2014). The usage of social media by students for collaborative purposes results in interacting with their teachers and peers and sharing online knowledge behaviour that influences student participation in learning that results in students' academic achievement (Ansari and Khan 2020). Through social media platforms, students and teachers can upload educational images, videos, audios, pdf or other kinds of documents. Virtual environmental support refers to those for student involvement in learning through educational posts in social media, engaging in academic forums, using the Internet for educational information and obtaining faster feedback from teachers for student learning.

The microsystems layer in the Ecological theory (Bronfenbrenner 1979) underlying that the socio-economic status will shape one's life, particularly that of children and adolescents (Bronfenbrenner, 1979). Household income and the education of both parents is directly and positively associated with the children's education and learning (Huang 2009, Ogur 2014, Benner, Boyle et al. 2016, Singh and Choudhary 2018, Yunus and Hamzah 2018) because parents with limited income and education fail to provide the educational materials and digital devices for their children education (Ahmad and Naima 2013).

The present study identifies the level of virtual environmental support and how gender and socio-economic statuses such as parent income and education affect the virtual environment for student learning among secondary school children in Sri Lanka. Accordingly, the results of the study are expected to give parents, teachers, schools and other stakeholders an idea to plan and formulate initiatives that enhance student virtual environment for learning and encourage student usage of digital devices in learning that lead to student wellbeing. The findings immensely help the government bridge the gap between the level of educational wellbeing of students from various socio-economic statuses backgrounds by planning and providing digital devices and educational policies to enhance and improve the standard of the virtual environment for student learning in Sri Lanka.

2.0 The Problem of the Study

In providing good education, many factors have been considered where virtual environment along with demographic factors are found to play an essential role in students' involvement in learning, which leads to student well-being (Casas, Bălăţescu et al. 2013, Ratnik and Rützel 2017, Careemdeen, Awang et al. 2020). Although the Sri Lankan government has implemented free education for the last seven decades, student access to education remains an issue among school children in Sri Lanka. The main reasons found for not attending school are that do not value education, financial difficulties, school environment, and help in household enterprise (Department of Census and Statistics 2017). Very little attention has been given to examining the virtual environment for student learning along with demographic factors in the Sri Lankan context. Such research remains limited even though Sri Lanka has implemented educational policies to provide universal access to education, thereby ensuring equity and equality in education for all and aiming to produce skilled citizens.

3.0 Literature Review

Naturally, the virtual environment has offered teachers and students a giant leap forward unequal to any other phenomenon barring the printing press. Nowadays, the virtual environment makes education more child-centred by providing many alternative paths with various resources so that learning can take place based on learner's study performance (Abass and Ayo 2012). Students were using the Internet to search for academic information to play and download music, to browse for fun, to play and download games, to visit different websites and to read online newspapers and magazines (Dogruer, Eyyam et al. 2011, Tarimo and Kavishe 2017), student recourse to Facebook social network for educational purposes, and to check class-related information and activities and homework assignments and to access relevant learning materials (Faizi and El Fkihi 2018).

Additional, social networking is that it can be used as a collaborative platform (Suwannatthachote et al. 2012), leading to discuss various topics with a classmate, teachers and getting assistance on academic-related materials (Faizi and El Fkihi 2018) for online educational discussions, knowledge sharing, and file sharing consequently resulting in students' academic achievement (Eid and Al-Jabri 2016). Student involvement was influenced by interactivity with peers, teachers, and online knowledge sharing behaviour, which resulted in academic achievement (Ansari and Khan 2020). Students who participated in more collaborative revisions on the wiki produced more writing output Fields(Chu, Capio et al. 2017). Social network platforms give opportunities to enhance discussion interaction and communication between teacher and student, student and student (Bouhnik, Dshen et al. 2014).

At present, there is a speedy development of computer tablets in schools and households. Tablet computers can be used to run educational apps, allowing students to engage in learning. Students' use of math apps tends to increase student engagement in mathematics learning while decreasing achievement disparities between typical and struggling students (Zhang, Trussell et al. 2015). Teachers may be able to use effective pedagogical strategies in the classroom when they use Show and Tell apps, which lead to students' engagement at a higher level. (Ingram, Williamson-Leadley et al. 2016).

On the other hand, socio-demographic factors such as gender, parent education and household income strongly influence children's learning and wellbeing. Wealth and social status can influence learning and well-being (Urdan and Pajares 2006). Apuke and Iyendo (2018) found that undergraduate students in Nigeria believed that internet use helps them do homework, read, learn, improve their self-learning, improve peer learning, and prepare for students' examinations. However, they demonstrated that lack of electronic library facilities, inadequate cybercafes, inadequate digital readiness of their institutions and staff, and lack of internet facilities affect the utilization of the internet. Udida, Ukwayi et al. (2012) asserted that parents can take total responsibility for their children's education when they earn a high salary. They further emphasized that when parents support their children financially by providing necessary devices and materials such children can perform better than their age groups. Ibrahim (2017) revealed that parents with a certain standard of educational level had the skills to know the educational materials and devices they want to be provided to them. Mangan, Leavy et al. (2018) reported that family income significantly contributed to excessive device digital use among children. Typically, high-income parents can afford to provide digital devices together with internet access for their children. Availability and accessibility to a digital device and the internet make children more vulnerable to excessive use of digital devices (Rudi, Dworkin et al. 2015). However, Abdullah, Mohamed et al. (2022) found their study using binary logistic

regression that household income did not significantly contribute to excessive digital device use among children in Putra Jaya Malaysia.

4.0 Aim of the Study

This study attempted to identify the level of virtual environmental support for student learning and differences of virtual environmental support based on demographics such as gender, parent income and parent education among secondary school children in Sri Lanka.

5.0 Objectives

The present study aims to:

01. Investigate the levels of virtual environmental support among secondary school children in Sri Lanka.
02. Identify the differences in virtual environments based on student gender.
03. Examine the differences in virtual environments based on parent income.
04. Determine the differences in a virtual environment based on parent education.

6.0 Research Methodology

This survey used a quantitative research design. The population of the study consists of secondary schoolchildren in Sri Lanka. A total of 1350 secondary schoolchildren were selected for the study using a stratified random sampling technique to select the study sample.

6.1 Instrument and Procedures

The questionnaire tool was developed in line with the needs of the survey. It included two sections, one section to identify students' demographic backgrounds and the next section to measure students' perception of virtual environmental support. The respondents were given five choices for virtual environmental support construct based on the Likert Scale (1–5): Never (1), Rarely (2), Occasionally (3), Often (4) and Always (5). The opinions of experts from the sociology of education and educational technology were used to establish the validity and reliability of the questionnaire. The instrument's internal consistency was based on the report of Cronbach's alpha coefficient values (0.981).

6.2 Data Analysis

Descriptive and inferential statistics were used in analysing the data. The Statistical Package for the Social Sciences (SPSS) Version 23 was used for the data analysis. Descriptive analysis was used to obtain the mean and standard deviations, to determine the overall level of virtual environmental support for student learning. MANOVA analysis is used to determine any significant differences in virtual environmental support based on gender, parent income and parental education amongst Sri Lankan secondary school children

7.0 Results

7.1 DEMOGRAPHIC PROFILES OF THE SURVEYED RESPONDENTS

Frequency and percentage were used to analyze the respondents' demographic information. The demographic factors investigated were gender, father's education level, mother's education level and parents' income. Demographic profiles of the respondents surveyed for this study are shown in detail in Table 1

Table 1 Demographic Profiles of the Students

Profile	Demographic	Frequency	Percentage
Gender	Male	675	50.0
	Female	675	50.0
Parent Income	Less than Rs. 15,000	487	36.1
	Rs. 15,001 -46,000	609	45.1
	Rs. 46,001- 150,000	215	15.9
	More than Rs. 151,001	39	2.9
Father's level of Education	No schooling	56	4.1
	Primary	332	24.6
	G.C.E O/L	565	41.9
	G.C.E A/L	307	22.7
	Tertiary education	90	6.7
Mother's level of Education	No schooling	47	3.5
	Primary	292	21.6
	G.C.E O/L	613	45.4
	G.C.E A/L	320	23.7
	Tertiary education	78	5.8

Table 1 shows that a total of 1350 secondary school children were involved in the survey, which had equal gender representation, by having 675 male students (50.0%) and 675 female students (50%). As for the respondents' parental income, the majority (609 or 45.1%) revealed that their parents' income was between Sri Lankan Rupees 15,001 to 46,000. 487 or 36.1% of respondents stated that their parents' income was below Rs.15,000. 215 or 15.9% gave their parents' income as falling between Rs.46,001 to 150,000. Only 39 or 2.9% indicated that their parents' income was more than Rs.150,000.

Regarding fathers' level of education, most respondents (565 or 41.9%) informed that their fathers had passed the G.C.E 'O' Level. However, a minority of respondents (56 or 4.1%) stated that their fathers did not have the benefit of any school education at all while a considerable number of respondents (332 or 24.6%) admitted that their fathers had only received primary education. Nonetheless, other respondents informed that their fathers possessed better qualifications, namely G.C.E 'A' Level (307 or 22.7%) and Tertiary Education (90 or 6.7%). In the case of mothers' level of education, most respondents (613 or 45.4%) claimed that their mothers possessed G.C.E 'O' Level certificates. On the other hand, a minority of respondents (47 or 3.5%) admitted that their mothers did not have any school education at all while a considerable number of respondents (292 or 21.6%) stated that their mothers had only obtained primary education. The rest of the respondents had mothers who possessed better qualifications, namely G.C.E 'A' Level (320 or 23.7%) and Tertiary Education (78 or 5.8%).

7.2 Level of Virtual Environmental Support for Student Learning

The descriptive analysis values, such as mean and standard deviation, are used to determine the level of virtual environmental support for learning as indicated in Table 2.

Table 2 Level of Virtual-Environmental Support

No.	Item	Mean	S. D	Interpretation
B. 1	Social media (WhatsApp / Viber/ Facebook) posts on education help me to engage in my learning	3.652	1.330	Moderately High
B.2	Engaging in academic forums on social media increases my understanding of topics discussed in class	3.509	1.299	Moderately High
B.3	I get faster feedback and comments from my teachers via social media which enables me to improve my learning	3.509	1.316	Moderately High
B.4	I use materials obtained from social networking sites to	3.051	1.331	Moderately

	learn more than what I have been taught in class				High
B.5	My internet usage helps me to search for information (pictures / music/ videos / content) which enables me to get involved in lesson activities	3.562	1.336		Moderately High
B.6	I use Internet communications technology tools when I want to learn about something new.	3.616	1.326		Moderately High
B.7	The usage of social media for my studies has helped to improve my grades.	3.3704	1.335		Moderately High
	Overall	3.4675	1.02276		Moderately High

Table 2 shows the level of items in the virtual environmental support category with the overall mean of 3.467, overall S.D. of 1.022, and the interpretation as moderately high. The highest item in this category is item B5.1 that is about social media (WhatsApp/ Viber/ Facebook) posts on education that help students to engage in their learning; the mean for this item is 3.652 (S.D. =1.330) and the interpretation for this is moderately high. The second highest item is students' engagement in academic forums on social media, which increases their understanding of topics discussed in class (B5.2), which has a mean of 3.509 (S.D. =1.299) and moderately high interpretation. The next item (B5.3) is about getting faster feedback and comments from their teachers via social media, which enables them to improve their learning; this has a mean of 3.509 (S.D. =1.316). and moderately high interpretation. The lowest item is about students' usage of materials obtained from social networking sites to learn more than what they have been taught in class (B5.4) with the mean of 3.051 (S.D. =1.331) and moderately high interpretation. The results show that students have a moderately high level of educational support from the virtual environment, thereby enhancing their learning involvement.

7.3 Virtual Environmental Support Differences Based on Gender

Table 3 shows the MANOVA analysis for the difference in mean scores obtained for virtual environmental support based on gender.

Table 3 MANOVA Difference of Virtual Environmental Support based on Gender

Variable	Gender	N	Mean	S. D	Type III Sum of Squares	Df	Total Square	F	Sig.
Virtual Support	Male	675	3.305	1.045	35.573	1	35.573	34.861	0.000
	Female	675	3.629	0.973					

Table 3 shows there are significant gender-wise differences in the virtual environmental support [$F = 34.861$ and $\text{sig} = 0.000$] for student learning as virtual environmental support is significantly higher for female students than for male students among secondary school children in Sri Lanka.

7.4 Virtual Environmental Support Differences Based on Parent Income

Table 4 shows the MANOVA analysis for the difference in mean scores for virtual environmental support based on parental income.

Table 4 MANOVA Difference of Virtual Environmental Support based on Parent Income

Variable	Income Level	N	Mean	S. D	Type III Sum of Squares	Df	Total Square	F	Sig.
Virtual Support	>Rs. 15,000	487	3.275	1.095	42.295	3	14.098	13.86	0.000
	Rs.15,001-46,000	609	3.494	0.979				4	
	Rs.46,001-150,00	215	3.756	0.909					
	< Rs.151,001	39	3.857	0.822					

There are significant differences in virtual environmental support [$F = 13.864$ and $\text{sig} = 0.000$] based on the parental income level. Virtual support (mean = 3.857 and S.D. = 0.822) is highest among the students whose parental income is more than 150,000 Sri Lankan Rupees, each with the highest mean value compared to others. Virtual support among the students whose parental income between Sri Lankan Rupees Rs.46,001-150,000 is lower than upper-class children but greater than other classes. Moreover, Table 4 shows there is a significant difference between the parental income of Rs. 46,001-150,000 and parental income below Rs. 15,000. This means that children from Upper-Middle-Class families get more virtual support than children from poor families. On the other hand, virtual support (mean = 3.275 and S.D. = 1.095) is lower among the students whose parental income is less than Rs.15,000, each with a lower mean value than others.

7.5 Virtual Environmental Support Differences Based on Parent Education

Table 5 and Table 6 show the MANOVA analysis of the difference in mean scores for virtual environmental support based on parental education level.

Table 5 Two Way MANOVA Difference of Virtual Environmental Support based on Parent Education

Variable	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Father's Highest Educational Level	Virtual Support	1.491	4	0.373	0.372	0.828
Mother's Highest Educational Level	Virtual Support	24.712	4	6.178	6.173	0.000

Table 6 Mean Scores Difference of Virtual Environmental Support based on Parent Education

	Father's Highest Educational Level	Mother's Highest Educational Level	Mean	Std. Deviation	N
Virtual Environmental Support	No Schooling	No Schooling	3.44	1.02	21
		Primary	3.26	1.13	19
		G.C.E(O/L)	2.83	1.16	14
		G.C.E(A/L)	5.00	0.00	2
		Total	3.28	1.13	56
	Primary	No Schooling	3.39	0.73	17
		Primary	3.22	1.02	183
		G.C.E(O/L)	3.20	1.16	116

	G.C.E(A/L)	3.38	1.00	15
	Tertiary Education	5.00	0.00	1
	Total	3.24	1.06	332
G.C.E(O/L)	No Schooling	3.68	0.46	5
	Primary	3.14	1.05	77
	G.C.E(O/L)	3.47	1.01	357
	G.C.E(A/L)	3.64	1.00	113
	Tertiary Education	3.67	0.90	13
	Total	3.46	1.02	565
G.C.E(A/L)	No Schooling	3.71	0.40	2
	Primary	2.62	1.33	10
	G.C.E(O/L)	3.53	0.97	114
	G.C.E(A/L)	3.76	0.88	159
	Tertiary Education	3.65	1.01	22
	Total	3.63	0.96	307
Tertiary Education	No Schooling	3.57	0.00	2
	Primary	2.80	0.32	3
	G.C.E(O/L)	3.76	0.88	12
	G.C.E(A/L)	3.90	0.89	31
	Tertiary Education	3.92	0.64	42
	Total	3.85	0.77	90
Total	No Schooling	3.47	0.82	47
	Primary	3.18	1.04	292
	G.C.E(O/L)	3.42	1.04	613
	G.C.E(A/L)	3.72	0.93	320
	Tertiary Education	3.82	0.81	78
	Total	3.46	1.02	1350

Table 5 shows there are no significant differences in socio-environmental support in terms of virtual support [$F = 0.372$ and $\text{sig} = 0.828$], based on the father's highest education level. Based on the mother's highest education level, the table shows there are significant differences in terms of virtual support [$F = 6.173$ and $\text{sig} = 0.000$]. In terms of mothers' virtual support, students with mothers with tertiary education have the highest mean compared to other students.

Post Hoc Analysis of Difference Aspects of virtual environmental support shows based on the Father's Highest Educational Level a significant difference in socio-educational support in terms of virtual support between students who have fathers without school education and students who have fathers with tertiary education. There are also significant differences in socio-educational support by way of virtual support between students who have fathers with primary education only and students who have fathers with G.C.E (O/L), G.C.E (A/L) and tertiary education. There are also significant differences in socio-educational support by way of virtual support between students who have fathers with G.C.E (O/L) and students with fathers who have tertiary education. Post Hoc Analysis of Difference Aspects of virtual environmental support shows based on the mother's highest educational level a significant difference in socio-educational support in terms of virtual support between students who have mothers with only primary education and students who have mothers with G.C.E (O/L), G.C.E (A/L) and tertiary education. There is also a significant difference in socio-educational support in terms of virtual support between students who have mothers with G.C.E (O/L) and students who have fathers with G.C.E (A/L) and tertiary education.

8.0 Discussion and Conclusion

Virtual support for student involvement is moderate-high level, indicating that students may often, but not always, receive support from the virtual environment for their learning. Undergraduate students in Nigeria believed that Internet use helps them do homework, read, learn, improve their self-learning, improve peer

learning and prepare for examinations. However, this utilisation is affected by the lack of electronic library facilities, insufficient cybercafes, inadequate digital readiness of their institutions and staff and shortage of Internet facilities (Apuke and Iyendo 2018).

Results of this study show that female students show higher virtual environmental support than male students. Sri Lanka faces notable gender disparities in academic performance as girls are outperforming boys at every level of the educational system (Vengadeshvaran, Licht. et al. 2108). This study elaborates that virtual environmental support towards students learning significantly increases as the mothers' highest educational level increases. Students whose parents obtained a high level of qualification use it extensively for their children's careers and support them in all aspects of their lives (Al Darwish 2016). Parents with higher educational levels tend to provide needed devices and learning materials, are curious about their children's learning (Ibrahim 2017).

Moreover, the results of this study revealed that virtual environmental support towards students learning significantly increases as the parent income increases. Parents who earn high income support their children by providing all necessary materials and devices to help them perform well in the school (Aliyu 2018). On the other hand, parents with limited income fail to provide the educational materials and devices, which consequently, leads to the poor performance of their children in schools (Ahmad and Naima 2013). Financial and social background determines the opportunity structure through which parents can positively affect children's educational development (Sirin 2005). By contrast, virtual environment in all aspects is lowest among students whose parents are poor or have incomes under the poverty line.

9.0 Implications of the Study

Secondary school children's demographic backgrounds in Sri Lanka determine the virtual environmental support they receive, which cannot be undermined. This study shows a significant difference as female students receive greater virtual support than male students. Similarly, parental background such as parent income and parent highest academic levels determine the virtual environmental support towards secondary school children in Sri Lanka. Accordingly, virtual environmental support towards students learning significantly increases as the parent's highest educational level increases, and as the parent income increases. The results support the theory of ecological systems (Bronfenbrenner 1979) wherein the microsystems layer explains that the socio-economic status shapes one's life, children and adolescents.

The implications of the study show that the Ministry of Education can provide tablets and mobile devices for needy students and Internet facilities for the lower classes of society. Parents should maximize their earnings to provide the necessary devices that can improve their children's wellbeing. Parents and teachers can encourage students to use devices for education. Thus, parents and teachers can encourage and provide necessary digital devices and assistance for students' learning in the virtual environment. In the case of the Covid-19 pandemic, teachers can create a virtual environment to implement the teaching and learning process. Schools should make the necessary arrangements to provide sufficient educational resources such as ICT facilities, digital devices, internet facilities and other needed materials.

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