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Use of Information and Communication Technologies by School Teachers in Sri Lanka for Information Seeking

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Abstract

The study examines the use of ICT by school teachers in Sri Lanka for information seeking and using the internet for communication. The survey method was adapted and the questionnaire was used as the main data collection tool for the study. The results revealed that the level of school ICT capacity in Sri Lanka is not satisfied because only the half of schools survey had ICT labs. The teachers are more confident in using word processor such as word programs and the basic ICT skills than other applications. It was found that even though a substantial amount of ICT resources are available in schools, teachers usage are very much low. Most of the teachers used the internet for searching information and they accessed the internet from privately either from home, mobile phone or cyber café. Most of the teachers used Google.com as the search engine and the majority said they had ever searched on the internet for a particular topic and they felt the information retrieved from the internet was relevant to their topics. Even though the half of the respondents had received training on how to use ICT, most of them believe that ICT can have a

positive impact for their teaching. Finally it was found that a statistically significant positive relationship between ICT skills confidence and the gender, age and work experience of the respondents.

Key Words: Use of ICT, School teachers, Information seeking, Teaching, Sri Lanka

1. Introduction

Information & Communication Technology (ICT) has become the state of the art technology of the modern world and the ICT is seen as a superhighway on which information is transmitted and shared by people across borders. The field of education has been affected by the penetrating influence of ICT. Therefore the advancement of ICT made revolution in the education sector by making teaching and learning flexible. Despite the challenges associated with ICT integration in education, ICT has provided flexibilities in teaching and learning. (Kopcha, 2012)

On the other hand, technological advancement in this digital age requires teachers to integrate state- of –the- art technology and use ICT in teaching and learning across the curriculum. However, the perceptions stakeholders such as teachers hold towards the use of ICT in teaching and learning are the key determining factor to the success or failure of use of ICT in education. Moreover, educators at all levels (primary, secondary, tertiary and professional) have been exerting efforts to enhance information literacy among all ages by developing strategies and policies that enable efficient use of ICTs , which in turn would make learners experience more effective information practices (Bruce 2004).

When ICTs are used appropriately, it helps enlarge access to education, fortifies the importance of education to all and sundry and raises the quality of education by helping make teaching and learning active and more engaging. Therefore this study examines the use of ICT by school teachers in Sri Lanka for information seeking. It is a step towards understanding the ICT knowledge of school teachers and the use of ICT in process of teaching and has broader implications for how they acquire new knowledge in information seeking process.

2. Research Objectives and Questions

The main purpose of the study is to examine the level of Sri Lankan school teachers' ICT skills for information seeking and using the internet for communication. It also plans to investigate the relationship between teachers' work experience and their computer skills, and the effects of ICT use on teaching. In addition, the study plans to find out whether there are any significant associations on the level of ICT skills use for teaching between male and female teachers and between teachers from different age groups.

In this study, five research questions were addressed.

1. What are the teachers' levels of confidence on ICT skills that need for information seeking?
2. What are the ICT facilities available in schools and are used by the teachers?
3. How do teachers use the internet as source of information?
4. Are there any relationships between the teachers' years of service and confident on ICT skills?
5. Are there any significant associations in terms of level of confident on ICT skills between male and female teachers, and between teachers in different age groups?

3. Review of Related Literature

A number of studies have conducted to examine ICT use by school teachers. Findings revealed that, the use of ICT in teaching is very advantageous. Teachers are not excluded from these benefits. ICT helps teachers to share information amongst themselves, to their students and even amongst those in the rural areas with the help of then ICT tools.

Ajayi and Ekundayo (2009) posits that the role of education in nation building and the population explosion in the secondary schools these days has made the use of ICT in the teaching-learning process vital. This is because the adoption of ICT by the teachers will enhance effective teaching in terms of good course organisation, effective class management, content creation, self-assessment, self-study collaborative learning, task oriented activities, and effective communication between the teachers and research activities will be enhanced. This effective

teaching results from the fact that teachers will be well informed so their confidence level will be high thereby making them able to deliver.

In order to clarify the teacher's role in implementing ICT in the classroom, some researchers considered the teacher's competencies related to ICT, for example, Nico, Ruttena and Wouter (2012) demonstrated that the use of computer simulations while teaching in the classroom will not be successful unless teachers have the necessary skills and information to implement them effectively. In addition, they reported that if teachers do not have the skills, the potential learning from computer simulations will remain out of reach.

Some researchers investigated the difficulties that teachers may encounter while implementing ICT. They revealed that the difficulties in the use of ICT are related to the weakness of a teacher's knowledge about what technologies are available and how they can be used in the educational process in the classroom. In addition, teachers should know how to use ICT in relevant ways to help them in the delivery of the curriculum (Morrison, 2011). As solution for this problem, it is necessary that teachers need to feel confident in their skills to assist student learning with technology, to incorporate technology into their classrooms. Therefore this needs to become a more qualified development to increase a teacher's ICT skills (Ward and Parr, 2010).

With respect to ICT environment, Chen and Wu (2012) note that the teachers should provide opportune help which should focus on how the students can learn and explain to them that making mistakes in the lessons is part of the learning process. Furthermore, the ICT environment should focus upon how erudite the material is in relation to reality so that the students learn how to improve their skills and achieve the knowledge. Similarly, Mukama & Andersson (2008) point out that learning in ICT environments is similar to a journey and teachers newly entered into the profession often provide new visions. Likewise, in a study by Su (2011) suggested that ICT-integrated environmental learning can support students to achieve a greater understanding of a chemistry lesson and improves their attitude and approach to chemistry learning. However, these studies emphasise the importance of providing effective ICT environment for students by teachers.

The Internet has become an indispensable requirement for every teacher because it gives them the ability to work with multimedia, and thus enhance interactive activities in the classroom environment. The Internet is also the fastest growing educational tool. It is therefore important for teachers to embrace this new technology by acquiring basic and advanced skills of information literacy (Singh & Jindal, 2009:430). It is clear that the internet technology has become an effective means for widening educational opportunities, but most teachers neither use the technology as an instructional delivery system, nor integrate the technology into their curriculum (Afshari, et al., 2009).

Madden and other (2005) conducted a survey on practicing teachers' conceptions of using the internet in teaching. The results show that younger teachers had more experience in using the internet than older teachers. The older teachers found it difficult to use search engines, were less confident in their ability to use the internet, less convinced of its importance in teaching, used it less with classes, felt under more pressure to use the Internet and believed that students know more than they do about the internet. In the study conducted to examine the levels of Malaysian teachers' ICT skills for information seeking, found that the teachers are 'highly skilled' in Internet skills such as such as email, chat-rooms, and social networking sites and Basic ICT skills such as using word processor, spreadsheet, and slide presentation. It was further established that there was no correlation between the respondents' computers skills and the impact of ICT on students learning. Furthermore, the findings indicate that male teachers use ICT in classroom significantly more frequent than their female counterparts for teaching and learning as well as for creating presentation or delivery materials. (Umar, and Yusoff, 2014)

Similarly, in a study conducted in Namibia found the use of ICT by male teachers is significantly higher than their female colleagues. Disparity is associated with sociocultural belief of taking ICT use as mannish, inborn stigma of male superiority, female inferiority complex and technophobic. (Malakia & Jatileni, 2018) Tella (Tella et. al, 2007) conducted a study on Nigerian secondary school teachers on uses of ICTs and implications for development of ICT use in schools. The findings revealed that the most teachers considered ICT as a very useful tool since it makes teaching and learning easier. Therefore current literature shows that many countries are moving towards a new paradigm, yet evidence continues to be mixed in terms of its impact.

In the Sri Lankan context, very few studies conducted on the topic and will be analysed three of them which are mostly relevant for the present study. The study conducted to investigate individual and organizational factors affecting the effective use of ICT among secondary schools in the North Central Province of Sri Lanka by Palagolla (2009) found that low level of ICT integration of teachers. Majority of the respondents show low level of ICT competency, which highlights the lack of training opportunities on task-technology fit. The results revealed that ICT infrastructure, leadership support, and school planning as major constraints of this scenario. In contrast, respondents' fairly positive attitudes towards ICT have been a positive remark on future developments. (Palagolla, 2009)

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In a study carried out (Suraweera *et al*, 2017) to examine teachers' perspectives on factors contributing to ICT integration in teaching in Sri Lankan schools found that ICT skills and attitudes of teachers and organizational factors as critical factors that mainly affected to the ICT integration in Sri Lankan schools. In another research study conducted to explore the educational challenges and opportunities for ICT education in Sri Lanka found that the lack of computer laboratory, cost of devices, lack of qualified ICT teachers, less motivation towards ICT among school children, lack of funds for the implementation and maintenance of computer laboratories and inadequate knowledge in English as major hindrances of teachers. (Ilmudeen, 2014)

4. Methodology and Procedure for Data Collection

The study population was in- service graduate school teachers in the government schools in Sri Lanka and it was decided to use the multistage cluster sampling as sampling method for the study. In the first stage, out of nine provinces in the country, four provinces such as Central, Western, Southern and Eastern are selected randomly. In the next stage, one district from each province is selected and the four districts such as Colombo, Kandy, Galle and Ampara which has the highest number of graduate teachers were chosen. In the next stage, 105 schools that have more than hundred teachers of the four districts were selected randomly to administer the questionnaire which was the main data collection tool for the study. By using a formula, it was calculated the sample size for each district proportionately based on graduate teacher population of the district.

A self-administered survey questionnaire which was specifically designed to collect the required information from the respondents was distributed among 3200 teachers in one hundred and five schools in the four districts. The data collection was carried out from September 2018 to January 2019 and collected data was analyzed by using SPSS (21.0).

5. Results and Discussion

5.1 Demographic characteristics of the respondents

Out of the 3200 questionnaires were distributed among school teachers, 2236 returned, and this gives a response rate of 69.87%. Table 1 summarized the demographic characteristics of the respondents, i.e., gender, age and work experience. As it can be gleaned from the Table 1, the majority of the sample (72 %,) was female and male comprised only 28%.

With regard to the age, more than half of the respondents were 31-40 years of age, with the remainder being 41-50 (24%) or 20-30 (19.5%,) . Nearly six percent were more than 50 years of age. It is further evident from Table 1; nearly forty percent reported having been teaching profession for 1-5 years and 35% had more than 10 years' experience as teachers. Teachers who had been in the profession for 6-10 years made up 22.7% of the sample and only 59 respondents reported that they have been working in the profession less than 1 year.

Table 1: Demographic and professional characteristics of the respondents

1	Gender	Frequency	Percentage
	Male	629	28.1
	Female	1607	71.9
2	Age		
	20-30 years	435	19.5
	31-40 years	1126	50.2
	41-50 years	546	24.4
	More than 50	133	5.9
3	Work experience		
	Less than 1 year	59	2.6

	1-5 years	883	39.5
	6-10 years	508	22.7
	More than 10	786	35.2

5.2: Use of ICT by Teachers in Information Seeking

The first research question of the study is: What are the teachers' levels of confidence on ICT skills that need for information seeking? Before go into the question, the respondents were asked to indicate whether their schools had ICT laboratories as to obtain general information about school ICT capacity of the country. Fifty percent of the respondents (N=1110) indicated that they had ICT laboratories while 900 respondents, representing 40% said there were no ICT laboratories in their schools and 10% (N=226) refrained to respond.

Then the respondents were asked to mark their level of confidence in terms of computer skill which teachers possess. Table 3 shows the results associated with teachers' ICT confidence, where they were invited to rate that confidence on Likert scale of 1-5, from (1) 'Very unconfident' to (5) 'Very confident' for a range of ICT skills or applications. The results of calculated Likert scores for the ICT confidence statements are listed in the descending order.

It is notable from the Table 3; the level of teachers' confidence in using ICT and its applications is varying among different applications. The results also show that the highest skill or application in the teachers' responses was using word processor such as word program etc. where the mean score was 3.90. The basics of operating the ICT (such as using the keyboard, mouse, etc.) was the second, where the mean score was 3.79 which implying a higher degree of convergence among teachers at this level. Downloading files from the internet, managing files, use spreadsheet processor and using Email (reading and sending emails) were ranked 3rd, 4th, 5th and 6th respectively with mean scores of 3.70, 3.65, 3.62 and 3.58 respectively.

Table 3: ICT Confidence of School Teachers

	Computer	Not confid	Not confide	Uns	Confid	Very confide	Total	Mean	SD*
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	Application/skills	ent at all	nt	ure	ent	nt		scores	
1	Using word processor	00	156	331	1075	440	2002	3.90	.829
2	Basics PC operations	108	107	382	898	507	2002	3.79	1.049
3	Downloading files from internet	66	158	510	797	430	1961	3.70	1.007
4	Managing files	18	214	484	1025	263	2004	3.65	.871
5	Use spreadsheet processor	13	203	633	830	320	1999	3.62	.893
6	Using Email	83	200	533	762	367	1945	3.58	1.041
7	Using chat rooms and forums	136	167	545	750	387	1985	3.55	1.103
8	Searching for information on internet	97	170	800	537	307	1911	3.41	1.023
9	Using PowerPoint software	69	387	600	722	197	1975	3.30	1.006
10	Creating or using database processor	66	474	584	707	160	1991	3.21	1.002

The results further established that using chat rooms and forums (Facebook, Twitter), searching information from the internet and using PowerPoint software were ranked 7th, 8th and 9th where the mean scores were 3.55, 3.3.41 and 3.30 with medium level of confidence. Creating or using database processor such as Access program etc. was the least confident computer skill of the teachers

5.3: Availability and Accessibility of ICT Resources

The second research question of the study is: What are the ICT facilities available in schools and are used by the teachers? In order to get in depth analysis of ICT resources usage, the teachers were asked to indicate whether listed ICT resources are available at school and whether they have used them for teaching practices.

Table: 4: Availability and Accessibility of ICT Resources at School

	ICT Resource	Resource available		Resource Accessible	
		Freq.	%	Freq.	%
1	Desktop/laptop computer	1361	60.9	878	39.2
2	Internet	1070	47.9	672	30.0
3	Printer	1030	46.1	435	19.4
4	School intranet	725	32.4	267	11.9
5	Digital projectors /interactive whiteboards	804	36.0	679	30.4
6	Digital cameras	557	24.9	326	14.5
7	Technical support	462	20.7	179	8.0
8	Specialist software applications	220	9.8	86	3.84
N=2236					

As revealed in Table 4, more than 60% of the respondents indicated the availability of computers (desktop/laptop) for their personal use in school but from them only 878(39%) of them have accessible for the computers. The results further revealed that 48% reported that the availability of the internet in the school but only 30% had accessed. Regarding printers and school intranet, 1030 (46%) and 725 (32%) of the respondents respectively mentioned availability of these resources in the school, but usability is quite low.

It is notable that 36% of respondents mentioned the availability of digital projectors or interactive white boards in school but only 30% have the accessibility which should be

considered critically. It was apparent from the Table 4, that even though substantial amount of ICT resources are available in schools, their usage or accessibility is very much low.

5.4: Using the Internet when Seeking Information

The third research question of the study is: How do teachers use the internet as source of information? Firstly, the respondents were asked to mark whether they had been accessed to the internet for searching information and results established that 76% (1701) had access while 14.5% (N=324) had no access and the remaining (9.5%, N=211) had not responded. Those who had access to the internet were asked to indicate the way of access to it and the responses are shown in Table 5.

As it can be gleaned in Table 5, 40% accessed to the internet from their home (through Dial up connection or ADSL) while 29% accessed through their mobile phones and only 10% accessed from school ICT lab. Nearly ten percent (9.7%) of them accessed to the internet from private cyber cafes whereas only 5% of the respondents access from school library.

Table 5: Ways of Internet Access

	Place of access	Frequency	Percentage
1	From home	894	40.0
2	From mobile	656	29.3
3	School ICT lab	223	10.0
4	Private café	218	9.7
5	School library	111	5.0

Then the respondents were asked to mark the search engines that used for accessing the internet. In addition to the search engines, the respondents were asked whether they had ever searched on the internet for information on a particular topic and the responses obtained are also presented in Table 6. The study further examined the degree of relevance of the information retrieved from the internet and the respondents were asked to mention the relevance and these responses also are presented in the same Table 6.

As shown in Table 6, the majority (85.7%, N=1917) indicated that they used Google.com, followed by 49% (N=1102) used Yahoo.com and only 6% (N=141)) used Ask.com as search engine for their internet search. It can be deduced from the analysis that, majority of the respondents used Google.com as their search engine. In respect for searching information from the internet, 84% (N=1879) of respondents, said they had ever searched on the internet for a particular topic and received results while 5.5% (N=123) mentioned that had not searched in the internet and 10.5% (N=234) had refrained to respond.

With regard to the degree of relevance, 48% (N=1075) indicated that information retrieved from the internet was very relevant to their topics while 37% (N=828) said it was relevant and only 15% (N=333) indicated the information retrieved from the internet was irrelevant.

Table 6: Descriptive statistics of Search Engines & Relevance of Information

	Search engine used*	Frequency	Percentage
1	Google.com	1917	85.7
2	Yahoo.com	1102	49.3
3	Ask.com	141	6.3
4	Ultra Vista	120	5.4
5	Webcrawler.com	75	3.4
	Searching from internet		
1	Yes	1879	84.0
2	No	123	5.5
3	No response	234	10.5
	Degree of relevance or irrelevance		
1	Very relevant	1075	48.1
2	Relevant	828	37.0
3	Irrelevant	333	14.9
	Total	2236	100.0
	Impact of ICT for teaching		
1	High impact	1177	52.6

2	Somewhat high	665	29.7
3	A little	54	2.4
4	No change	33	1.5
5	No response	307	13.7
	Total	2236	100.0

Source: Survey data* *Note: Multiple responses allowed*

5.5: ICT Training of School Teachers and Impact of ICT for Teaching

As a follow up question, the respondents were asked whether they had had any training on ICT as to how to search for and retrieve relevant information that require for teaching. The results established that 53.7% (N=1201) mentioned that they had training on the use of ICT while 33.8% (N=756) mentioned that they had no any training and 12.5% (N=280) refrained to respond. It could be deduced that more than half of the respondents had received training on how to use ICT to access relevant information and it should be considered seriously about the remains half who had no any training on ICT.

In order to examine the teachers' perception towards the impact of ICT for teaching, they were asked to indicate at what extent the use of ICT would change their teaching. The results showed that more than half of the respondents (52.6%, N=1177) said that use of computer made high impact for teaching while 29.7% (N=665) said that impact was somewhat high and only 2.4% (N=54) said that there was a little impact. (See table 6)

5.6: Relationship between Teachers' Work Experience and ICT Skills

The fourth research question of the study is: Are there any relationships between the teachers' years of service and confident on ICT skills? In order to determine any relationship between ICT skills confidence and the work experience of the respondents, Pearson chi- square test was performed and the results are presented in Table 7. The results found that a statistically significant positive relationship between ICT skills confidence and the work experience of the respondents. (p- Value less than 0.05) The findings further indicate that teachers who had between one to five year teaching experiences in the profession are more confident on ICT skills

than teachers who had more than five year or less than one year work experience in the profession.

Table 7: Results of Chi-square Test between Experience and ICT skills Confidence

	Computer Application/skills	Pearson X^2 Value	Df	P value
1	Using word processor	275.441	12	<0.001 Significant
2	Basics PC operations	213.975	12	<0.001 Significant
3	Downloading files from internet	454.220	12	<0.001 Significant
4	Managing files	223.250	12	<0.001 Significant
5	Use spreadsheet processor	368.725	12	<0.001 Significant
6	Using Email	542.725	12	<0.001 Significant
7	Using chat rooms and forums	213.470	12	<0.001 Significant
8	Searching for information on internet	248.380	12	<0.001 Significant
9	Using PowerPoint software	241.805	12	<0.001 Significant
10	Creating or using database processor	160.415	12	<0.001 Significant

**significant at 0.05 level*

5.7: Relationship between Gender of Teachers and ICT Skills

The fifth research question of the study is: Are there any significant associations in terms of level of confident on ICT skills between male and female teachers, and between teachers in different age groups? In order to determine any relationship between ICT skills confidence and the gender of the respondents, Pearson chi- square test was performed and the results are presented in Table 8. The results found a statistically significant positive relationship between the ICT skills and the gender of the respondents. (p- Value less than 0.05) The findings further indicate that female teachers are more confident on ICT applications than their male counterparts.

Table 8: Results of Chi-square Test between Gender and ICT skills Confidence

	Computer Application/skills	Pearson X^2 Value	Df	P value
1	Using word processor	50.468	4	<0.001 Significant
2	Basics PC operations	54.630	4	<0.001 Significant
3	Downloading files from internet	21.565	4	<0.001 Significant
4	Managing files	66.603	4	<0.001 Significant
5	Use spreadsheet processor	81.609	4	<0.001 Significant
6	Using Email	23.863	4	<0.001 Significant
7	Using Social Media (chat rooms and forums)	18.798	4	0.001 Significant
8	Searching for information on internet	46.675	4	<0.001 Significant
9	Using PowerPoint software	18.187	4	0.001 Significant
10	Creating or using database processor	50.217	4	<0.001 Significant

**significant at 0.05 level*

5.8: Relationship between Teachers' Age and ICT Skills

In order to determine any relationship between ICT skills confidence and the age of the respondents, Pearson chi- square test was performed and the results are presented in Table 9. The results found that a statistically significant positive relationship between ICT skills confidence and the age of the respondents. It was further established that the teachers who aged between 31-40 years are more confident on ICT skills than those aged between 20-30 or more than 40 years old.

In general, teachers who are less than 40 years old have more confident on ICT skills than those aged between 41 – 50 years old and those above 50 years old. This finding is established that younger generations of teachers are more confident in using ICT for teaching practices. This

finding is consistent with the study conducted by Abdullah and Bujang (2007) who found that teachers' age will affect the ICT integration.

Table 9: Results of Chi-square Test between Age and ICT skills Confidence

	Computer Application/skills	Pearson X^2 Value	Df	P value
1	Using word processor	380.989	12	<0.001 Significant
2	Basics PC operations	115.918	12	<0.001 Significant
3	Downloading files from internet	272.402	12	<0.001 Significant
4	Managing files	293.716	12	<0.001 Significant
5	Use spreadsheet processor	371.450	12	<0.001 Significant
6	Using Email	367.529	12	<0.001 Significant
7	Using chat rooms and forums	294.189	12	<0.001 Significant
8	Searching for information on internet	133.521	12	<0.001 Significant
9	Using PowerPoint software	389.278	12	<0.001 Significant
10	Creating or using database processor	121.877	12	<0.001 Significant

**significant at 0.05 level*

6. Conclusion

The results proved that the level of school ICT capacity in Sri Lanka is not in satisfactory level because only the half of schools that were surveyed had ICT laboratories. The results found that 40% schools had no ICT laboratories; it means that they were not well-resourced in terms of ICT infrastructure facilities while the level of ICT capacity is doubtful for the rest of schools as 10% refrained to respond. With regarding the teachers' confidence on ICT skills, schools teachers are more confident in using word processor such as word program, the most basic ICT skills, downloading files from the internet and managing files ranked top with high mean scores. However, they still lack some competencies in searching the internet, using PowerPoint software

and creating or using database processor. With regarding availability and accessibility of ICT resources at schools, it was established that even though a substantial amount of ICT resources are available in schools, their usage or accessibility is very much low.

In terms of using the internet, majority of the teachers used the internet for searching information while either 15% had not used or 10% refrained to respond. The results found that most of the teachers accessed the internet from private ways either from home, mobile or cyber café and only 15% accessed from school either ICT lab or school library. The results further found that majority of the respondents used Google.com as the search engine. In respect for searching information from the internet, the majority said they had ever searched on the internet for a particular topic and received results only 6% had not searched. With regard to the degree of relevance, majority of the respondents felt the information retrieved from the internet was very relevant to their topics or relevant and only 15% indicated the information was irrelevant. Despite teachers' ability to search online for information, it was revealed that only the half of the respondents had received training on how to use ICT to access relevant information. The findings clearly revealed that teachers believe that ICT can have a positive impact on teaching and learning

The results further found that a statistically significant positive relationship between ICT skills confidence and the work experience of the respondents. In addition, female teachers are more confident on ICT applications than their male counterparts. Finally, the junior teachers have more confident on using ICT skills than their senior colleagues for teaching and learning. Thus, senior teachers should be trained to use ICT in their teaching and learning purposes more frequent so that they will not be left behind in terms of ICT skills.

A general conclusion can be made that inadequate ICT facilities and the lack of training on how to use ICT to access information for school teachers could be affect adversely for school education in the country. Therefore educators and policy makers in the field of education should consider this matter as seriously since it has been affected negatively for the education of the country as well.

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