

School Heads' Perceptions about Electronic Teaching Technologies in Secondary Schools of Peshawar, Khyber Pakhtunkhwa

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This paper reports on the perceptions of school heads concerning the provision and integration of electronic teaching technologies in classrooms in the secondary schools of District Peshawar, Khyber Pakhtunkhwa. Using survey research methodology, the data were gathered from 20 school heads via a questionnaire. The questionnaire had two parts: part one sought participants' demographic information, whilst part two explored technology related practices, competencies, and responsibilities of secondary school heads. The data were analysed using frequencies and percentages. The study found that school heads could serve as guide for school personnel in developing technology competencies, implementation of professional growth plans and provision of mentorship and advocacy. It was concluded that, there is wide variation in the use of technology in secondary schools of Peshawar.

Key words: electronic teaching technologies; school heads; secondary school; role, responsibilities, Peshawar, KP

Over the past decade, electronic teaching technologies have become commonplace in Pakistan. The current elementary and secondary education department, government of Khyber Pakhtunkhwa (KP) mandates that all elementary and secondary schools grade 6 to grade 12 students must be prepared to understanding, using and applying technologies in ways that are effective, productive, useful and ethical (KPESE, 2015). Therefore, electronic teaching technologies (ETT) in schools are getting a great deal of attention. In this connection, school heads and teachers need to have awareness about new ETT and possess the skills to effectively use and integrate them into school and classroom settings. Thus, for dealing effectively with challenges of the modern world, knowledge of technologies is one of the basic requirements of education. The present KP government, therefore, proclaims to have been spending and investing more in schools and education; thus, schools need to embrace technologies earnestly in all their aspects, without which prosperity and development would not be possible. Accordingly, electronic teaching technologies – like overhead projectors, multimedia presentations, computers, Microsoft surface/boards, Internet, video conferencing, pod-casting programs, web-based education programmes, mobile phones, movies, e-learning, and tablets – are required for use in the schools. These devices and their underlying software platforms provide opportunities for effective teaching and learning experiences for students.

School heads have an important role in providing teaching technologies for classroom learning as well as facilitating the process of setting goals, reforming curriculum, encouraging the use of effective new pedagogy materials, and evaluation. Using technology in teaching entails projected and non-projected teaching aids, and influencing the achievement of educational objectives, learning group size, sequences of learning, methods of teaching and type of media selection. It is in acknowledgement of this that, this study aimed to explore some suggested approaches that has influenced the traditional role and responsibilities of school heads for assimilating electronic technologies for teaching and learning in schools. Flanagan and Jacobsen (2003) stressed that principals have an important role in technology integration in schools and they must give meaningful opportunities to students for developing knowledge skills and attitudes important for leadership in the present educational settings.

Electronic Teaching Technologies and Education

Given the continual development and advancement in science and technology, new learning aids have become important part of a child's education and life, (Roger, 2002). Indeed, in many respects, learning via information technology (IT) has been revolutionized, which has provided potential for mass education. The use of technology contributes to the effectiveness and development of the teaching-learning process and of the entire education system. However, in the context

of Pakistan, integrating technologies in schools and education seemed to be going through a transitional phase. In this regard, Dieuzeide (1970, p. 11) eloquently wrote:

The transition from technology in education to the technology of education involves a thorough reappraisal of the existing educational system, of its objectives and of the means used to attain them, before any decision is reached to employ these new techniques for specific teaching purposes. The teacher-turned-technologist can then gradually assume the functions of an "educational engineer" whose job it is to increase the output of the entire scholastic machine.

It is commonly understood that in formal learning opportunities, advancement is expedited by using technology. Anandan (2010) for example emphasized that Computer-Assisted Instruction (CAI) is a potential, potent tool for classroom learning. The author argues that these technologies have the potential for benefitting various levels of education, subject areas, instruction styles and learning levels from simple practice to solving complex problems. However, Rivlin and Schueler (1943, p. 222), have argued that, "today's generation is living in the period of transition and confusion," suggesting that schools have a more difficult and much larger role than previously estimated. The primary and pressing duty in schools is organising activities and cultivating the spirit of loyalty and cooperation to the group. On the other hand, Kelly (2013) reported electronic teaching technologies as development tools that are powerful, used in the global endeavour for promoting children and youth-focused goals and targets in worldwide education, livelihood and health. In this regard, ETT has an important role towards inculcating qualities of good citizenship, earning livelihood through fair means, and becoming a respectable member of society. In relation to this, Flanagan and Jacobsen (2003) contend that the introduction of digital technologies in schools has impacted on the role and responsibilities of principals in significant ways; thus principals need to be in leadership positions of student learning, student entitlement, resource management, and in roles of community and capacity building etc. The school heads can be considered as the pivot for developing school-based technology leadership. However, Trucano, Iglesias and Hawkins (2012, p. 4) argue that, "where a school head is not perceived to be supportive of uses of new technologies in a school, they often tend not to be used productively in new ways by many teachers."

The Impact of Educational Teaching Technologies on Classroom Learning

Successful experience with ETT can offer important lessons for educational leaders, who are desirous of attaining similar results in their schools. There is empirical literature that suggests that under specific conditions, ETT can positively influence student learning and school performance. ETT has a substantial influence on student achievement in all subject areas, like science, mathematics, and languages, across all level of schools (i.e. pre-primary, primary, middle and secondary). It can have a significant impact on instruction, structuring it more student-centred, fosters cooperative learning and invigorates increased teacher/student interaction.

However, classrooms with traditional teaching-learning environment are regarded as teacher centred and less interesting. In this regard, Cohen (1997) found that classrooms rich in technology differed from conventional and traditional classrooms. Similarly, Thomas and Knezek (1991, p. 269) argue that, "Learning environment that are student-centred, placing increased responsibilities for learning on the learner." Successful technology-rich schools not only promote quality skills and experience-based learning but also improve students' basic and advanced skills and test scores. In a similar vein, Kearsley and Lynch (1992) suggest that the technology user must have a basic belief in the worth of innovation. It increases the capacity to monitor school progress and develops the attitudes, enthusiasm and engagement of the students. Through this, they develop a variety of immeasurable competencies. The students thus become more able to communicate effectively about complex processes. However, school effectiveness and students' technological competence cannot be achieved unless there is well-articulated school and learning vision and mission. Regarding this, Bennett (1996, p. 60) highlighted the importance of a "well-defined mission that describes technology's place in education". School heads "communicate their vision by how they spend their time, what they talk about, what problem they solve first, and what they get excited about. In every act, leaders reinforce the value they hold and the vision they hope to achieve" (NCREL, 2000, p. 5).

As indicated above, the importance of technology in schools is widely accepted but actual details of its usage have not been always known. Therefore, in the local schools of Peshawar, Khyber Pakhtunkhwa, this research sought to identify and explore school heads perceptions and experiences of technology use at the secondary school level. The following study objectives guided the study:

1. To identify the usage of electronic teaching technologies in classrooms/schools.
2. To investigate the impact of electronic teaching technologies on students' performance.
3. To gather head-teachers' perceptions about the problems they face in incorporating electronic teaching technologies in their schools.
4. To explore the latest electronic teaching techniques for the teaching-learning process.
5. To suggest some remedial measures for the improvement of electronic teaching technologies.

Method

Using a mixed-methods research design, both quantitative and qualitative tools were utilized to gather data from the research participants. A list of schools was obtained from the District Education Management Information System (EMIS) (2013-2014), which included 35 Government high schools in District Peshawar. The sample consisted of 20 male and female heads of schools from District Peshawar.

The principal author visited all the selected schools and administered the questionnaire personally to collect first-hand information from the head teachers about their knowledge and understanding of techniques of teaching and looking at records for existing materials. A questionnaire was developed based on closed questions and having Likert scale for enabling the respondents to show their level of agreement with the statements. The questionnaire had two parts. Part one sought personal information about the respondents (e.g., age, gender, work experience and professional qualification) while part two, having 26 items, collected data about curriculum, availability of projected and non-projected audio-visual (AV) aids, awareness about new emerging technologies, and head teachers' training programmes. A one-sample test was employed for testing significant statistical differences within the results.

Results and Discussion

The findings show that the current curriculum of secondary schools ensured the use of ETT, the course subject matters had conceptual clarity and aligned with the learner needs. The results show that the heads were of the view that educational technology was not available and accessible to secondary school students. However, while, a majority of the head-teachers shared that non-projected aids – charts, models, laboratories and libraries – were available and used in schools, most of the schools were not having or provided with well-equipped laboratories for computer-mediated communication and instruction as school heads were unable to conduct video conferencing and web based education programmes. Moreover, the findings show that there was no systematic use of ETTs in secondary schools and the school heads did not apply these technologies for conventional school activities. The results also show that most school heads did not allow the teachers or the students to use the computer laboratories for other technical subjects apart from computer study classes, partly because of the lack of IT trained teachers in secondary schools. Moreover, the findings show that due to school heads' lack of coordination and inaction, projectors, multimedia and computers had been lying idle and some equipment needed repairs. Similarly, a majority of the school heads was uninterested in attending in-service training programs and did not send recommendations about the subject to the authorities.

Looking at Table 1 it appears evident that the majority of respondents (i.e. 65%) viewed that the present school curriculum ensured the use of ETT in the classrooms. Besides, 60% respondents agreed that this curriculum provided conceptual clarity regarding the course material and other 50% respondents accepted that the present curriculum coincided with the learner needs. About 60% heads stated that their faculty staff utilized models and charts for effective teaching and classroom learning. Table 1 also shows that only 45% schools have library facility, with more than half of the respondents (i.e. 55%) reported that there were no well-equipped laboratories for computer-mediated communication; again, a majority of the respondents (i.e. 60%) shared that they had no internet facility for the teaching-learning process. Moreover, a majority of the respondents (80%) were of the opinion that there were no overhead projectors and multimedia for facilitating the teaching-learning process. Thus, it is clear from the given responses that, school heads expressed their dismay over the non-availability of material equipment for facilitating the teaching-learning process. It is a challenge for the school heads to provide flexible and responsive professional development prospects, focusing on technology integration and design. However, when asked about capacity building of teachers and attending workshops for improving teaching methodologies, a majority of the school heads (i.e. 65%) replied that they conducted activities for capacity building of the teaching staff and allowed the teachers to attend workshops for improving their teaching methodologies.

Table 1
School Heads' Responses Regarding Electronic Teaching Technology

Item	Statements	5	4	3	2	1	n
		f	f	f	f	f	f
		%	%	%	%	%	%
1	Present curriculum ensures the use of ETT	7 (35)	6 (30)	4 (20)	2 (10)	1 (5)	20 (100)
2	Conceptual clarity of course materials	4 (20)	8 (40)	4 (20)	2 (10)	2 (10)	20 (100)
3	Present curriculum coincides with the learner needs	2	8	4	2	4	20

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4	Availability and use of the following non- projected aids	(10)	(40)	(20)	(10)	(20)	(100)
4.1	Charts & Models	10	2	1	3	4	20
		(50)	(10)	(5)	(15)	(20)	(100)
4.2	Laboratories	7	2	2	4	5	20
		(35)	(10)	(10)	(20)	(25)	(100)
4.3	Library	7	2	5	3	3	20
		(35)	(10)	(25)	(15)	(15)	(100)
5	Provision of well-equipped labs for the use of computer mediated communication	3	2	4	4	7	20
		(15)	(10)	(20)	(20)	(35)	(100)
6	Provision of computer labs according to the number of the students	8	2	1	1	8	20
		(40)	(10)	(5)	(5)	(40)	(100)
7	Provision of proper internet facility for teaching-learning process	4	1	3	4	8	20
		(20)	(5)	(15)	(20)	(40)	(100)
8	Facilitate the teaching staff to utilize the computers for science subjects	2	3	1	2	12	20
		(10)	(15)	(5)	(10)	(60)	(100)
9	Availability & use of following IT equipment						
9.1	Computers	6	1	1	4	8	20
		(30)	(5)	(5)	(20)	(40)	(100)
9.2	Overhead projector	1	1	1	1	16	20
		(5)	(5)	(5)	(5)	(80)	(100)
9.3	Multimedia	1	1	1	1	16	20
		(5)	(5)	(5)	(5)	(80)	(100)
10	Use multimedia for the teaching-learning process	1	1	1	3	14	20
		(5)	(5)	(5)	(15)	(70)	(100)
11	Use of overhead projector for the teaching learning process	1	1	1	1	16	20
		(5)	(5)	(5)	(5)	(80)	(100)
12	Use of mobile phone for teaching-learning process	4	2	2	2	10	20
		(20)	(10)	(10)	(10)	(50)	(100)
13	Conduct activities for the capacity building of the teaching staff	6	4	4	4	2	20
		(30)	(20)	(20)	(20)	(10)	(100)
14	Allow the teaching staff to attend the workshops to improve the teaching methodology	10	2	3	3	2	20
		(50)	(10)	(15)	(15)	(10)	(100)

Note: 5=Always; 4=Often; 3=Sometimes; 2=Rarely; 1=Never. Figures given within parentheses represent percentages.

For analysing the data effectively, Table 2 is categorized into three parts (i.e. high, average and low). A one-Sample Test was applied for analysing the data. The findings shown in Table 2 highlight that, the score of all 20 school heads fall in between 1.2888 and 5.857; the result yielded significant differences within the respondents. This means that the test value is 0 (zero), which showed 95% of the confidence interval of the difference.

Table 2
Result of One Sample-Test

Item	High	Average	Low	N	T
	f %	F %	f %	F %	
1	13	4	3	20	2.097
	65	20	15	100	
2	12	4	4	20	2.5
	60	20	20	100	
3	10	4	6	20	3.78
	50	20	30	100	
4.1	12	1	7	20	2.097
	60	5	35	100	
4.2	9	2	9	20	5.857
	45	10	45	100	
4.3	9	5	6	20	5.547
	45	25	30	100	
5	5	4	11	20	3.05
	25	20	55	100	
6	10	1	9	20	2.341
	50	5	45	100	
7	5	3	12	20	2.443
	25	15	60	100	
8	5	1	14	20	1.734
	15	5	80	100	
9.1	7	1	12	20	2.097
	35	5	60	100	
9.2	2	1	17	20	1.288
	10	5	85	100	
9.3	2	1	17	20	1.288
	10	5	85	100	
10	2	1	17	20	1.288
	10	5	85	100	
11	2	1	17	20	1.288
	10	5	85	100	
12	6	2	12	20	2.294
	30	10	60	100	
13	10	4	6	20	3.78
	50	20	30	100	
14	12	3	5	20	2.443
	60	15	25	100	

Test Value = 0 95% Confidence interval of the difference

Table 3 presents findings regarding head-teachers' views pertaining to availability and preference for using teaching technology. Writing boards and textbooks are the primary tools and technologies for use in classroom learning in District Peshawar. Anandan (2010) recommends for school heads that the next step after selecting suitable alternatives is to prepare teaching materials (e.g., chalkboard, charts, models) and develop other techniques such as questioning for providing appropriate learning experiences. The findings of this study suggest that models should be prepared or a chalkboard summary be made (i.e. points on the chalkboard with questioned listed). As can be seen from the results of Table 3, all the respondents were strongly in favour of the statements, which lead to effective classroom learning. All school heads showed their agreement with the statements about the use and availability of writing boards and textbooks for involving students in learning activities. They favoured the use of electronic teaching technologies as educational development tools for classroom learning such as multimedia devices. Siddiqui (2004) also strongly recommends multimedia learning materials with asynchronous and synchronous conversations among faculty and students for enriching the learning environment of traditional classrooms.

Table 3
Availability and Preference for using Teaching Technology

Item	Statements	5	n
		f	f
		%	%
1	Availability & use of writing boards	20 (100)	20 (100)
2	Availability & use of text books	20 (100)	20 (100)
3	Prefer to use ETT in classroom Learning	20 (100)	20 (100)

Note. 5=Always; 4=Often; 3=Sometimes; 2=Rarely; 1=Never. Figures given within parentheses represent percentages.

Table 4 depicts respondents' views about attending ETT related activities and application of ETT in school and classrooms. The results show that the school heads equally favoured the responses. Forty percent of the respondents expressed that they attended activities regarding ETT; while another 40 % of them thought that, they would apply and share the experience of ETT to guide the teaching-learning process in their schools. This suggests that the schools heads must have a chance to study, observe, reflect on, and discuss their practices regarding the use of ETT for developing an environment conducive for learning in their schools.

Table 4
Equipment and application of Electronic Teaching Technology

Item	Statements	5	4	3	2	1	N
		f	f	f	f	f	f
		%	%	%	%	%	%
1	Attend activities regarding ETT	4 (20)	4 (20)	4 (20)	4 (20)	4 (20)	20 (100)
2	Apply such experience to guide teaching	4 (20)	4 (20)	4 (20)	4 (20)	4 (20)	20 (100)

Note. 5=Always; 4=Often; 3=Sometimes; 2=Rarely; 1=Never. Figures given within parentheses represent percentages.

The findings in Table 5 show that all the respondents were in full agreement (100%) with the statements about classroom learning. The responses indicate that due to non-availability of Microsoft surface and tablet computers, the school heads were unable to meet contemporary challenges. Due to the lack of successful integration of ICT (information and communication technology) in the KP schools, the head teachers were unable to take advantage of development in education. Compared to this, in developed countries, development and success in education is because of the effective integration and use of ETT. Thus, technology has intricately been embedded in almost every imaginable aspect of people's lives – including classrooms and schools – in the developed world (Cairncross, 2001; Quan-Haase and Wellman, 2004). However, it would appear that a majority of the developing countries have also recently started reaping the benefits of technology by applying it to various spheres of life (Donner, 2008). Siddiqui (2004) in discussing Europe and America argues that they have developed new curriculum standards that encourage or require computer literacy as a basic skill. For many schools, this increased their significance regarding ETT, which is seen as a major goal in school improvement plans. Anandar (2010) argues that e-learning in the context of India is referred to as learning through instruction, TV, interactive video, computer assisted instruction (CAI), computer mediated instruction (CMI) and all net-oriented education. Trucano *et al.* (2012) contends that in the industrialized countries, there are scores of iPad in education projects; in the developing countries, discussion is around using low cost Android tablets or simple e-book readers. In Russia, Turkey and Thailand, large projects are underway for purchasing hundreds of thousands, and in some cases millions of low cost tablets, for enabling children to have access to and benefit from them. Similarly, Kouki and Wright (1999) argue that many school systems are aggressively moving to take advantage of the World Wide Web as state wide network, and in Florida, a state-wide network was established for linking educators throughout the state.

In this study, KP school heads shared non-availability and use of Microsoft surface and tablet computers for classroom learning. More recently, the present KP government is delivering 2,527 tablets (pre-loaded with modern and innovative materials regarding mathematics, science and English language subjects) among district schoolteachers (Mashriq, June 24, 2015). Most of the secondary school heads accepted that they have well equipped laboratories of computer-mediated communications but they did not arrange web based education programmes and video conferences for enhancing students' performance.

Table 5
Declined responses regarding Electronic Teaching Technology

Item	Statements	1 f %	n f %
1	Availability & use of Microsoft surface	20 (100)	20 (100)
2	Availability & use of Tablets	20 (100)	20 (100)
3	Share i-movies in classroom learning	20 (100)	20 (100)
4	Encourage students with web-based education programs	20 (100)	20 (100)
5	Conduct the video conferences for the teaching-learning process	20 (100)	20 (100)

Note. 5=Always; 4=Often; 3=Sometimes; 2=Rarely; 1=Never. Figures given within parentheses represent percentages.

Table 6 depicts responses and percentages regarding the availability of projected and non-projected AV aids. As can be seen from the Table, in most cases, conventional teaching resources predominate. The results show that primarily the use of non-projected AV aids in classroom learning is common almost in all district schools. However, due to the lack of IT equipment and other projected AV aids, the learners are unable to further their learning. Even, if these equipment were available, then due to other factors – such as shortage of power, unwillingness of IT experts and non-cooperative attitude of head teachers – these teaching aids were not properly utilized. Research suggests that the successful application of ETT improves students' engagement and personal-academic development. Siddiqui (2004) adds his observation and argues that telecommunication technology is the tool to support, enhance and extend learning through challenging, real life tasks.

Table 6
Provision of teaching and AV aids in Secondary Schools

S.No	AV aids	Heads				Total
		Yes	%age	No	%age	
1.	Writing Boards	20	100	0	0	20
2.	Text Books	20	100	0	0	20
3.	Mobile phones	20	100	0	0	20
4.	Library	13	65	7	35	20
5.	Charts	12	60	8	40	20
6.	Laboratories	11	55	9	45	20
7.	Models	10	50	10	50	20
8.	Internet	10	50	10	50	20
9.	Computer	8	40	12	60	20
10.	CAS	8	40	12	60	20
11.	Multimedia	5	25	15	75	20
12.	Overhead Projector	4	20	16	80	20
13.	Videos	4	20	16	80	20
14.	CDs	3	15	17	85	20
15.	DVDs	3	15	17	85	20
16.	Television	1	5	19	95	20
17.	Educational Television	1	5	19	95	20
18.	Microsoft surface	0	0	20	100	20
19.	Tablets	0	0	20	100	20

Table 7 shows findings related to suggestions of the school heads regarding ETT. The results indicate that there is an agreement of the school heads about the statements pertaining to provision, benefits, and purchase of ETT for secondary schools. Kelly (2013) argues that young people are natural adopters of new technologies and the potential for such media to be a force for innovation, education and change is just beginning to be realized. Our head teachers agreed with Kelly's arguments. All head-teachers (i.e. 100%) unanimously agreed that budget should be allocated for ETT. Similarly, most respondents (i.e. 95%) considered that there should be more opportunities for the teachers to attend refresher courses, because they wanted to adopt the information and communication technology (ICTs) as a learning tool in classroom learning. Most respondents (90%) in this study believed that ETT improves performance of students and efficiency of teachers and 75% respondents agreed that ETT has a vital impact on lifelong learning. About 50% respondents claimed that KPESE should take interest in the promotion of the ETT. Some of the head-teachers (45%) suggested that they should be authorized to purchase IT equipment according to their school needs.

Table7*Suggestions of the School Heads*

S.No	Suggestions	f	%age
1	Budget should be allocated for ETT	20	100
2	Teachers refresher courses should be enhanced	19	95
3	ETT can greatly improve efficiency of the teacher and performance of students	18	90
4	ETT has a great impact on lifelong learning	15	75
5	It makes the learning process effective & attractive	12	60
6	High authorities should take interest in the promotion of the ETT	10	50
7	Head of the institution should be authorized for the purchase of ETT	9	45

Conclusion

As the results and discussions have shown, the present curriculum of secondary schools has conceptual clarity and coincides with the needs of the learners. The heads were of the view that educational technology was not available and accessible to secondary school students. In addition, teachers did not properly prepare models, charts, and other non-projected audio-visual aids for classroom learning. The research indicated that most of the schools were lacking in the provision of well-equipped laboratories for the use of computer-mediated communication as school heads were unable to conduct video conferencing and web based education programmes. For example, they were unable to share movies for classroom teaching purposes with their students. It became apparent through the data that there was no systematic use of ETTs in secondary schools and only half-hearted attempts were made by school heads to apply these technologies for conventional school activities. The study showed that most of school heads did not allow the teachers or the students to use the computer laboratories for other technical subjects apart from computer study classes – partly due to the lack of IT trained teachers in secondary schools. It became evident that due to lack of coordination and inaction of the school heads, projectors, multimedia and computers had been lying idle and indeed some equipment needed repairs. It was noted that the majority of school heads were uninterested in attending in-service training programs and did not send recommendations about the subject to the authorities.

Recommendations

Based on the findings and conclusion of this empirical study, the following recommendations are offered for improving teaching and learning effectiveness in schools and for enhancing the competencies, professional development, and mentorship of secondary school heads:

1. School heads in all secondary schools in District Peshawar, Khyber Pakhtunkhwa, must ensure the availability of ETT. The provision of overhead projectors, multimedia, computers and computer-assisted instructions are a necessity in these schools and the principal must ensure the use of these in all subjects for classroom learning.
2. Head teachers should effectively inspire, lead and involve the staff in integrating technology across the curriculum and provide sufficient space for the instalment of these technologies.
3. It is important that the head teachers take a lead in improving consultation and communication between key members of the staff in relation to IT (e.g. technology lead teachers).
4. Head teachers should promote professional development programs and provide meaningful opportunities for developing IT skills and knowledge of all teachers.
5. Head teachers should strive for the inclusion of ETT in school curriculum and hold meetings with the relevant authorities.
6. The school authorities should demand sufficient budget and jurisdiction for the purchase of IT equipment to improve students' performance and employ trained/specialist teachers.
7. There should be well-equipped laboratories with ETT and these should utilize web-based education programmes, i-movies and video conferences for enhancing students' performance.

8. ICT should be part of a deeper school reform movement with frequent faculty refresher courses.
9. School leaders need to facilitate regular maintenance of IT equipment.
10. Ongoing research should be undertaken (including other parts of the province) to investigate the evolving role, competencies and temperaments of head teachers towards technology.

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