# Principals, Teachers, and Student's Perception of the Information and Communication Technology in Kuwait Secondary Schools (Rhetoric and reality)

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**Abstract**

ICT integration has been advocated to provide opportunities to improve students' achievement and engagement through transforming the educational setting. A valuable tool that contributes in enhancing and developing students' cognitive skills for lifelong learning, ICT integration has introduced a new educational philosophy, shifting the role of students into a more central position in the pedagogical processes. Kuwait, as with many other countries, has recently planned ICT integration to develop its citizen's capacities. This study sought to capture the principals', teachers', and students' perceptions of ICT integration in pedagogical activities, as well as how ICT is being used for learning and teaching activities in three ICT leading Kuwaiti secondary schools. Interviews with principals, teachers, and students were conducted, along with an open-ended questionnaire for the teachers, researcher observations, and document analysis. The findings revealed that ICT integration in Kuwait needed to be reinforced to accomplish the ICT integration objectives. A call for further support for teachers, and a reconsideration of the ICT integration strategies were also recommended.

**Keywords**: ICT integration, ICT based learning, Learning and teaching, ICT in school, Kuwait.

## 1.   Background

New social and economic priorities have refocussed the purpose of education, moving it from educating students for highly specific jobs, to equipping students with knowledge and skills that foster flexibility and lifelong learning (Pendergast, & Wilks, 2007). The transformation of the education system has become a necessary action to prepare students for those valued and globally sought careers in the knowledge age (Hepp, Hinostroza, Laval, & Rehbein, 2004). Such action targets the development of human capital for alternative industries (Elloitt, 2004; Kozma, 2005; Lee, 2006; Selinger, 2000). To this end, the educational transformation requires a series of interdependent processes in which behavioural and practical changes are involved (Elliott, 2004; Szabo, 2002), in addition to a long-term commitment from different levels within the field.

Given the importance of knowledge and creativity as commodities, new modes of communication and knowledge management are essential components of the modern world. Globally, technology has played a major role in fostering change in the way business, communication and information are managed (Kramer, Jenkins, & Katz, 2007). To keep pace with the new development, the Kuwaiti Ministry of Education (MoE) promoted the use of ICT in schools (Ministry of Education, 2002). However, this recent policy has posed new challenges for schools. For example, ICT has influenced the traditional approaches of managing daily-tasks, thus enabling a change in the methods of education administration and teaching processes (Yuen, Law, & Wong, 2003; Birinci & Kabakci, 2007). Hence, the crucial purpose of ICT integration is to facilitate the effective transformation of the educational process, to satisfy the new generation's needs, and to promote lifelong learning (Flecknoe, 2002; Gronow, 2007).

At one level, schools and organisations accept that there is a policy space with which they are expected to conform. While the policy is accepted and enacted, it tends to be enacted in ways that attempt to suit the context and convenience of the circumstances (Buenger, 2006; Creighton, 2003; Fullan, 2001). As a consequence, some distortion of the policy and practices being adopted, or not, are at odds with the policy (Alharbi, 2012; Lau & Sim, 2008). Therefore, this study provides rich descriptive information of the ICT integration in Kuwait schools

by seeking: A) to document the principals', teachers', and student' perceptions of the ICT in pedagogical activities; and B) to describe the actual use of ICT for learning and teaching activities in three ICT leading Kuwaiti secondary schools. These schools had well established ICT programs and were nominated, by the Ministry of Education, as the leading schools in integrating ICT.

## 2.   Literature Review

In recent times, the term ICT has been adopted to describe the range of technologies related to computers. ICT can be defined as any electronic tool that facilitates to access, manipulates, simulates or stores information, and shares this information with others to manage the work flow (Thatchenkery & Stough 2005). At present, ICT, in the form of computers, electronic whiteboards, multimedia and the Internet, are seen as essential educational classroom tools. Additionally, it has been argued that ICT supports learning through a number of approaches (Beastall, 2006; Scrimshaw, 2004; The World Bank, 2008). As ICT facilitates communication and increases access to information, there is greater access to learning for students, especially those with special educational needs. Further, ICT also motivates students to develop problem solving capabilities (Selinger, 2000). However, without competent users or an effective instructor who facilitates ICT change in schools, most of the advantages of ICT integration will not be achieved.

Within a range of fields, the effectiveness of ICT in educational improvement has been extensively researched. Also, it has been shown to have had a positive influence on teaching, learning, and administrative procedures in schools (Beastall, 2006; Jung, 2001; Lee, 2006; Miller, Naidoo, Van Belle, & Chigona, 2006). Indeed, governments in some countries were the early adopters of computers designed explicitly for education, such as the *BBC Computer Literacy Project* (Salkeld, 1982). Recently, researchers have shown that ICT both supports and promotes teaching and learning activities (e.g., Keenan & Rovcanin, 2003; Selinger, 2000). Importantly, ICT offers "new ways of teaching and learning that are underpinned by constructivist theories of learning and constitute a shift from a teacher-centered pedagogy in its worst form characterized by memorization and rote learning to one that is learner-centered" (Tinio, 2003, p. 9). However, the role of the teacher or facilitator is also critical, and must not be ignored. Osborne and Hennessy (2003) argued that the role of the teacher is significant role, as they create the conditions for effective ICT integration. Therefore, ICT is considered a tool that creates and facilitates change in the practices and behaviours of teachers and students.

The potential advantages of ICT are its ability: to help, develop, and create new economic growth opportunities; to decrease the technological gap between the developed and emerging countries; to reduce poverty; and to facilitate communication and knowledge sharing (Kelles-Viitanen, 2003; The World Bank, 2008; Tinio, 2003). In education, ICT is seen as a valuable tool to enhance student engagement and to transform conventional teaching and learning methods (Balanskat, Blamire, & Kefala, 2006; Strigel, Ariunaa, & Enkhjargal, 2007). Accordingly, ICT in teaching helps the students to: (a) operate using ICT (Curriculum Corporation, 2006; Mumtaz, 2000); (b) inquire using ICT (Curriculum Corporation, 2006; Reid, 2002); (c) create using ICT (Alharbi, 2012; Selinger, 2000); and (d) communicate using ICT (Baumgartner, Denz, Oberhauser, & Hoffmann, 2001; Curriculum Corporation, 2006). For these reasons, students should be supported to develop cognitive skills related to ICT use. Further, the integration of ICT facilitates the traditional approaches of teaching and learning. More importantly, however, ICT is used to reform the ways of doing teaching and learning by empowering students to participate in problem solving and inquiry based learning, and to be critically able to develop lifelong learning capacities (Tinio, 2003).

To accurately understand the ICT integration movement, Bidarin, Bidarian, and Davoudi (2011) determined that the integration movement flowed through four stages (based on attitudes), namely:

a.    Arising attitude: Schools are yet to adopt ICT; the traditional ways of teaching are employed. Staff and students have basic skills for using ICT.

b.    Applicable attitude: Schools explore and apply basic ICT seeking to increase the use of ICT, with the potential for the use of special tools and software to gradually occur.

c.    Combined attitude: Schools start to apply and integrate ICT in some classrooms, laboratories, and managerial offices. Teachers start to re-consider their teaching methods and look for new methods using ICT, which changes their professional method of teaching.

d.    Changing attitude: Schools start to concentrate on ICT through reviewing and innovative renovation of school curriculums and practices. "ICT will change into a constructive but non-specified daily personal & professional utilization" (Bidarin, Bidarian & Davoudi, 2011, p. 1038). ICT applications focus on learning and the use of ICT in the real world. ICT is taught at an advanced level.

Thus, ICT integration is seen to transfer through the four stages to impact on ICT integration into pedagogical practices, over time. Significantly, users' attitudes and perceptions about ICT integration are a vital component in documenting the impact of ICT. Therefore, this study sought to capture the principals', teachers', and students' perceptions of the ICT integration in pedagogical activities, and to determine how ICT was being

used for learning and teaching activities in three of Kuwait's ICT leading secondary schools.

## 3.    Aims of the Research

Three ICT leading Kuwaiti secondary schools were investigated:

      1- To document the principals', teachers', and student's perceptions of ICT in pedagogical activities.

      2- To describe the actual use of ICT in learning and teaching.

      3- To identify the current stage of ICT adoption.

*3.1. Research Questions*

The study sought answers to the following questions:

1.   What are the perceptions of the Kuwaiti school principals, teachers and students in relation to ICT pedagogical uses?
2.   What sort uses of ICT do the Kuwaiti secondary schools employ?
3.   What is the current stage of ICT adoption in these schools?

*3.2. Design of the Study*

The current study adopted a multi case studies approach (Bogdan & Biklen, 1998; Johnson & Christensen, 2008) of three Kuwaiti secondary schools with well-established ICT programs. The schools, nominated by the Kuwaiti Ministry of Education, were leaders in embedding ICT. As recommended by Yin (2009) to obtain rich sources of data, three data sources were used in the study, namely: (1) interview; (2) open-ended questionnaire; (3) observation; and (4) documents analysis. Hence, three school principals were individually interviewed, while focus group interviews were conducted with five teachers and five students randomly selected from each school (A, B & C). A content analysis approach was employed in analysing the textual data. The data base comprised transcribed interview data, researcher notes taken during observations, and relevant school documents.

    The qualitative data were analysed and coded for the three schools, and an internal approach was used to analyse each case to search for cross case patterns. Also, the research notes were used during the analysis. Each case became a stand-alone entity, with specific patterns being discovered for each school. A cross-school analysis then constructed patterns that fit all three schools (Merriam, 1998). This outcome was achieved by examining the data, line by line, to highlight similarities and differences between the three schools.

    In the analysis processes, codes were applied to each informant, along with a letter indicating the data method used to collect the data, namely: 1) focus group interview, and 2) open-ended questionnaire. Table 1 captures the participants' coding system.

## 4.Findings

The current ICT implementation situation is described in this section. The data provided a rich descriptive source to serve as an ICT-educational benchmark that captured current position of ICT use in Kuwaiti secondary schools. Such descriptions assist to identify opportunities for more ICT improvement. Overall, the extent of ICT infrastructure in schools A, B, and C was at an advanced level compared to other schools in Kuwait. For example, the computer-student ratio in secondary schools in Kuwait was 1:7 between 2009 and 2010; whereas, the average computer-student ratio in schools A, B, and C was around 1:3 (Ministry of Education, 2009/2010). Further, schools A, B and C had approximately four computer labs each. In contrast,, the average number of computer labs in other secondary schools was approximately 2, which was less than in schools A, B, and C.

Both the principals and the interviewed teachers agreed that ICT usage was an important development within their schools. Indeed, according to Principal A, a number of ICT applications were used on a daily basis, in a variety of ways. For example:

    P/A:    We have some teachers who were able to develop interactive CDs as questions and answers (Lines: 73-74.P/A...All our records are digitally stored (Lines: 95-96.P/A)...Computer science department developed database CDs for each subjects in cooperation with all departments (Lines: 236-237. P/A)...we have a site dedicated to school and this site is intended for exchanging educational materials and explanations that benefit the students (P/A/Q).

    These comments indicate the extent of the ICT implementation efforts being undertaken in the school. Indeed, evidence from the teachers'(A/A) interviews confirms that the ICT applications reflect Principal A's commitment to advancing ICT uptake, such as the use of interactive CDs. Additionally; his   strategies included the important decision to delegate, to the Computer Science Department, an ICT support role in ICT matters, in addition to their teaching responsibilities. ICT activities were also implemented through the school's website, devoted to the sharing of knowledge within the school community, as well as the school activities database, and the teaching practice enhanced through ICT. Consequently, in the first semester, 2010, each teacher in the English Language Department taught an average of eight lessons using ICT tools, including projectors, white boards, PowerPoint, linguistic programmes, and audio. According to Principal A, this number of lessons represents an increase on the previous year (2009). Such implementation efforts provide a further indication of

the actual use and development of ICT in school A.

From the teachers' perspectives, the ICT implementation was enhanced and modeled through communication with the parents using SMS texting, as well as the development of the knowledge sharing database. Overall, according to Teacher C/A, teaching and learning had improved with the use of ICT, a change ranging from 60 to 70%. Additionally:

> C/A:    I observed that quality changes are very strong in teachers and learners' attitudes toward ICT. I noticed that the percentage of change is advanced, around 60 or 70% of the total improvement, and this is due to the introduction of the ICT strategy taken by the Ministry...In the past, teachers did not have the control to learn about ICT and its use. But today, the situation has been rapidly changed; there is not a day goes by without seeing ICT activities (Lines: 190-194. C/A).

As acknowledged by Teacher C/A, ICT was used by the teachers on a daily basis. He described teachers as having the control and freedom to learn about ICT, which deomonstrates that teachers were not deterred from benefiting and learning about the ICT. Similarly, Principal B identified a number of ICT implementation examples, for instance: the establishment of a school website; databases for both staff and students; a school forum; the use of email to improve communications within the school; a texting system for all events; and a database of emergency contacts in the school. Further, an email system was established for each department, which the teachers checked regularly.

Moreover, Principal B described his communication with the parents through the development of the students' database:

> P/B: I'm eager to communicate with parents; in addition to the school's website; we have a database for students which is used to communicate with parents. I distributed passwords to all parents; allowing them to directly access the database to follow their children's latest developments. I appointed a teacher to follow this database and to update it. Through this database, I directly posted educational messages for the parents regarding the learning activities. This database was developed for our school by school staff without any support from the Ministry of Education (Lines: 126-130. P/B).

Hence, Principal B provided an example of ICT implementation in school B, as well as the benefits of implementing ICT to communicate with the parents. Further, the principal reported the provision of statistical software to many teachers, whom she encouraged to also exchange teaching materials. These examples provide evidence of the ICT advances being made by school B, especially when compared to other Kuwaiti schools. Implementing the texting system and establishing a Media Centre were important indicators of the advancement of the school's ICT engagement. Document 80/1/B, a newspaper article, documented the establishment of the Media Centre at school B. The article also mentioned that the school had been awarded first place, at the level for the Hawalli district, in the competition for the best Computer Laboratory and Educational Technology. Teacher C/B outlined a practical example of the integration of ICT in learning activities when she mentioned that:

> CG/B:  Now, the use of the Internet allowed students to learn about the concept of two-way trade between countries and the nature of international commercial relationships. They now are able to identify opportunities of global trading. They also gained an understanding about commercial components for a large number of countries. I remember I asked the students to submit reports about these topics, I encouraged them to get information from the Internet (Lines: 656-659. C/B).

Teacher C/B acknowledged the benefits of integrating ICT (e.g. easily gathering information about commercial relationships among countries), which would have involved great effort to obtain in the past. The teacher also highlighted the benefits of engaging students in such activities to develop their skills in ICT use. Moreover, the activities record for school B (e.g. documents 41/1, 2, 3/B) includes a large number of ICT related activities; they highlight the part played by ICT in the Mathematics Department's activities. The documents reported on three student training workshops on how to use Excel to create a database, to obtain percentages, and to display the data in an effective manner. For example, document 43/1/B showed that the students were taught to coordinate the geometry of a circle with the use of ICT tools; while 50/1/B documented a workshop on the applications of ICT in the teaching of French. Each activity reflected the capability of the school staff to implement ICT to facilitate their teaching practices.

Further, Principal C asserted that ICT usage in his school was at a reasonable level stating that:

> P/C: A good number of teachers in our school use ICT devices in their teaching approaches, for example, science teachers always urge students to use the Internet to complete research and to better understand subject lessons through exploring related materials available in the Internet. Mathematic teachers often use mathematical and visual programs to raise student engagement (Lines: 864-871. P/C)

Hence, Principal C identified teaching staff engagement with ICT in their teaching practices and approaches. While, he claimed that science teachers encouraged students to use the Internet to increase their understanding of given lesson, he did not described the students' role as being central to the activity. One possible explanation for this omission was alluded to by teachers A/C, B/C, and D/C, who confessed that ICT usage was limited in the school. For example, teacher E/C claimed that ICT usage was at the bottom of the school priorities:

> E/C    Integrating ICT in teaching depends mainly on the efforts and the potential of the individual teacher... but is ICT a priority in our school or for the Ministry of Education? Of course not, ICT integration is at the end of the school priorities...this directly affects the performance of teachers and the ICT integration efforts...there is insufficient financial, and professional supports...we need sophisticated hardware and software and the school cannot provide each needs without the support of the Ministry of Education (Lines: 1204-1213. E/C).

Thus, Teacher E/C highlighted that ICT integration was not being given priority in his school. Further, he emphasized the Ministry of Education's role to facilitate the ICT integration processes by providing the needed support. Additionally, he drew attention to the negative impact of the lack of priority being given to ICT by the school and the Ministry, and that the lack of direct attention to the provision of basic ICT requirements had the potential for teachers to switch off their interest in ICT implementation.

In exploring the principals' and interviewed teachers' views of ICT, and its impact on the teaching and learning practices, both groups described ICT as a useful tool that could change pedagogical practices, as well as the learning environment through ICT facilities. There was also an acknowledgement that student engagement had improved with the use of ICT. For example, Teacher B/A acknowledged the benefits of using ICT in teaching:

> B/A:    From my personal experience, ICT has allowed us many benefits and has become an effective tool in the development of teaching methods. Now, it became possible to give examples of some scientific phenomena through the use of video and images available on the Internet which engage students more effectively. A very important note I wish to mention here is that the students significantly engage in lessons that use ICT compared to traditional methods of teaching. As well as, it is possible now for the students to search the Internet to get information and explanations of some topics which help to improve students' understanding of these topics (B/A/Q).

From teacher B/A's view, the benefits of ICT implementation lie in the transformation of a number of pedagogical approaches. Hence, ICT devices and the use of the Internet have changed the way staff engage in their teaching practices. For example, the students were observed to engage more effectively in lessons that used ICT when compared to the traditional methods of teaching, such as 'chalk and talk'. Such an engagement also improved the students' understanding and absorption of the scientific content.

Similarly, Principal B expressed her view that:

> P/B: In the present day, the role of ICT is important and vital for both the students and teachers. There are many examples of ICT benefits to improve the performance; some of them are speed of completion of work for teachers. As well, the use of the ICT devices offers a number of practical options for teachers to improve their teaching methods, [for example,] the use of PowerPoint and the Internet. Previously, the lessons were boring, but today lessons become more attractive for students. In the past, communication was difficult, but today it has become easier and more effective, whether between teachers and the administration or between teachers and students. Today students are lucky; this technology has allowed them various educational approaches and has changed the shape of the entire educational process (Lines: 1059-1083. P/B).

Hence, Principal B acknowledged the impact of ICT implementation on teachers' and students' engagement and performance. The principal also recognised the extent of the potential offerings available by the use of ICT in supporting educational learning. Moreover, she noted that ICT has changed the shape of the entire educational process. Principal B and her teachers also described ICT implementation as a powerful strategy to prepare and equip students with essential ICT skills. Hence, it can be concluded that ICT is perceived as a powerful tool that causes positive change in teaching and learning practices.

The interviewed students were asked about their ICT access, either in school or outside school for private and homework purposes. Their response was at least seven ICT applications on a regular basis. When rating their ICT abilities on a 1 to 10 scale ('1' = low level, and '10' = high level) their responses range from 4 to below 9 (see Table 2). As shown in Table 2, the students described the ICT adoption status in their school as basic or minimum. Indeed, though the principals were enthusiastic supporters of the advanced level of ICT implementation in their schools, the data confirmed that the ICT use was at a basic level, especially when compared to other Western schools. Further, while most students wanted more opportunities to engage with ICT, they were positive about the ICT embedding efforts undertaken in their schools.

## 5. Discussion

This study provided insightful, corroborative information about the extent of ICT use in three schools (A, B, and C). The data from the interviews with the principals, teachers, and students showed agreement that ICT devices were used by many teachers in their teaching practices, as well as on a regular basis by both the students and teachers. However, most teachers seemed to use ICT in association with, or to facilitate, traditional teaching approaches to the delivery of information. For example, PowerPoint presentations were used instead of overhead transparencies; or CDs were used at a basic level (e.g. to replace encyclopaedias). Such use failed to positively integrate ICT and, consequently, failed to develop students' cognitive skills and to allow students to take central roles in the learning and teaching activities (Alfarr, 2002). Significantly, the teaching practices with ICT indicated that the teachers misunderstood the ICT integration philosophy underpinning the action. Additionally, teachers still play a major role in the teaching and learning activities, with students rarely encouraged to advance their cognitive skills through the use of ICT. Further, they were not allowed to develop independent learning strategies, which are the main objectives of ICT integration.

The overall goal of introducing ICT in Kuwaiti schools was to transform classroom teaching into being more student-centered. This study, however, shows that teachers consider ICT as a tool to enhance their students understanding of certain concepts instead of considering it a learning medium. That perception appears to reflect the first step of adopting technology by the teachers, that is, teachers start to apply ICT resources as a substitute for existing teaching practice where technology is not used (for example, teachers' lectures were accompanied by electronic presentation; students used word processing software to replace their hand writing; and teachers posted their course syllabi online). This situation was also identified by Alharbi (2012), that is, Kuwaiti teachers used ICT devices primarily to enhance their old teaching approaches. However, this outcome appears to result when teachers do not receive adequate professional development or are not given clear instructions on how to use ICT in the classrooms. The interviewed teachers also gave voice to their need for greater instructions and training

The second step involves the teachers experiencing new technologies, which leads them to move beyond the adaptation of simple applications. With these developments, the transformation of the classroom pedagogy starts to occur, which tends to lead to a shift towards more learner centred approaches. The current findings also reveal that the teachers followed the integrated approach while using ICT resources (UNESCO, 2004). Thus, the teachers planned their use of ICT within the subject being taught to enhance certain concepts and skills, and improve their students' achievement. Accordingly, teachers using that approach need to carefully review their teaching curriculum to select the appropriate ICT resource, which will contribute to the aims and objectives of the curriculum and scheme of work, and assist them to integrate their use in relevant lessons.

In addition, UNESCO described two other approaches to use ICT resources: the enhancement approach, which requires teachers to plan the use of certain ICT resources to enhance the teaching of a topic (such as using an electronic smart board for presenting topic's theory); and the complementary approach, where ICT resources are used to empower students' learning (by enabling them to improve their class work through taking notes on the computer or sending their homework to the teacher by email (UNESCO, 2004).

These two approaches have implications for Kuwait's MoE. For example, the Ministry needs to consider how to increase their teachers' use of ICT resources, as well as the teachers' perceptions of their needs and readiness to utilize such resources. The needs include feeling confident in their ICT ability to facilitate student learning and to successfully integrate technology into their teaching. This outcome requires specialized professional development to enhance teachers' skills in utilizing ICT resources, as well as to provide teachers with the practical knowledge of how to utilize ICT in teaching various disciplines. These developments will increase the teachers' motivation to try ICT sources, which will raise their self-efficacy when facilitating learning with ICT, so they feel ready for moving forward (Deci & Ryan, 2002). Alharbi (2012) also recommended that teachers need to be provided with continuous professional development (PD) support. Moreover, Mohammad, Manssour, and Wegerif (2011) called for teachers to be offered continuing professional development activities to prepare them to, and enhance their skills to, effectively incorporate ICT within their teaching and learning approaches.

Such preparation is expected to ensure that teachers will be more enthusiastic to learn, to practice their learning, and to migrate from traditional classroom practices to new ICT integrated practices. Once the teachers feel the need for ICT integration in their teaching, they start to utilize it in their teaching. Thus, the teachers will perceive ICT resources as a driver to change their existing traditional teaching practices (Partnership Development Schools, 2008). However, if teachers do not feel that their traditional teaching practices are inadequate, then their level of motivation to integrate ICT into their teaching will be low. That conclusion was strongly stated by Spillane (1999):

''To attend to the core [policy] ideas, most teachers would have to appreciate the inadequacies of their current understanding about instruction relative to the reform proposals–thereby seeing a need to learn'' (p. 154).

However, if teachers are motivated, and have received appropriate instructions and training, they will still need to receive sufficient support and encouragement to enable them to take risks and experiment with the ICT resources (Ward and Parr, 2010). Such support will help them overcome their fears, as well as show new ways of teaching using ICT, especially if they can continue to feel in control, while facilitating student learning.

## 6. Conclusion

Based on this study, it appears that the teachers are increasingly knowledgeable about using ICT in education. Providing those teachers with continuous professional development and support will significantly encourage them to try different kinds of ICT in their classes. These professional development programs needs to model the use of different ICT resources and their pedagogical use in different educational fields. Future studies may focus on the effectiveness of these specialized forms of professional development on both teachers and students.

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Table 1 . Participants Coding System

| Teacher | School A | School B | School C | Focus group interview | Open-ended questionnaire data |
|---|---|---|---|---|---|
| Teacher A | A/A | A/B | A/C | F | Q |
| Teacher B | B/A | B/B | B/C | F | Q |
| Teacher C | C/A | C/B | C/C | F | Q |
| Teacher D | D/A | D/B | D/C | F | Q |
| Teacher E | E/A | E/B | E/C | F | Q |

Table 2. Participants' Perspectives

| ICT Use In | School A | School B | School C | Perspectives |
|---|---|---|---|---|
| Administration | Website, emails, personnel database, student database, digital records, SMS texting system | Website, internal communication system, emails, school forum, personnel database, student database, computerised administrative records, SMS texting system | Website, emails, personnel database, student database, digital records, computerised administrative records | Principals and Teachers |
| Teaching and learning practices | Increased use of projectors, white boards, Excel, PowerPoint, Internet, word processing, linguistic software, audio, Photoshop, interactive CDs, websites (as knowledge sharing database), statistical software | Media centre; Increased use of statistical software, mathematics activities, Excel, PowerPoint, Internet, word processing, audio, linguistic software, Image Manager | Increased use of projectors, white boards, PowerPoint, Excel, Internet, word processing, audio, linguistic software, Image Manager, Skype | Principals, Teachers, and Students |
| Curriculum | Basic level | Minimum level | Basic level | Students |
| Average lessons per week | Between 3 to 6 | Between 3 to 14 | Between 3 to 12 | Students |
| Abilities of students #1-10 | Above 5 and below 8 | Above 5 and below 9 | Above 4 and below 7 | Students |