ICT-INTEGRATED CLASSROOMS: AN IMPETUS FOR CHANGE

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Educational effects are greatly dependent upon the perception about teaching, the methods a teacher has and the use s/he makes of equipment (NCERT, 2005). Recent developments in information and communication technologies (ICT) have changed the way people live, communicate and play. These developments have also affected the lives of our students, both at home and at school (NCERT, 2005). As we enter into the era of globalisation, there is universal recognition of the need and importance of integrating ICT in education for preparing the future generations, enabling them to develop competence based skills as per global standards. The current study aims to identify the status of ICT integration in the school context and also explore some of the innovative practices used by these schools for integrating ICT in their teaching, learning and assessment practices. For this, a sample of four schools (government, private-public, international and government aided, one each) of Delhi were selected using stratified random sampling technique. The study adopted a qualitative case study approach to examine the extent and nature of ICT integration for teaching, learning and assessment processes at the sample schools. An item checklist and non-participant classroom observations were conducted to understand the ICT availability and usage patterns and purposes by the teachers. The results present differences in teachers' patterns and purposes of ICT usage among the four types of schools. Three types of ICT-integration strategies, (a) teaching only strategy; (b) teaching-learning, but not assessment strategy and; (c) the balanced strategy, also emerged from the study. Finally, the results also highlight simple yet innovative ways for integrating ICT-based technologies in school's everyday functioning. The current paper further encourages present teachers, school administrators and prospective teachers to adopt, test and validate these practices in their own respective school contexts, hence furthering/contributing towards the national vision, as seen by MHRD (2012), for improving access, quality and efficiency in school system through ICT-enabled activities and processes.

Keywords: Assessment, ICT, Innovation, Integration, Teaching, Learning, School

Introduction

The recent explosion and proliferation of ICT over the past few decades have brought significant changes in the nature of jobs in many fields and also the life of people (Alazamet al., 2012). In line with these rapid changes, and as a main vehicle for human resource development, education also needs to upgrade its' game so as to prepare the current generation of students for the demands of the increasingly technology-oriented, capitalist world. This, according to OECD (2001), can be done through including ICT based knowledge and skills in the school curriculum. This importance of ICT-enabled classrooms and schools is also recognised and highlighted by the National Curriculum Framework (2005). The inclusion of technology in education is becoming increasingly feasible as ICT becomes increasingly accessible, reliable and mature (MHRD, 2012). According to Alazam et al. (2012), in many countries, ICT has become an important component of education today. Also, in recent years, the processes of integrating ICT in schools is one of the major areas in educational research (Area, 2006 as cited Area et al., 2016).

Thus, the focus of this paper is to present the findings from a research study conducted in different schools of Delhi trying to integrate ICT in their classroom procedures. But what exactly is ICT? Research has suggested that often people understand ICT as devices and activities related to computers or computing (Salmons and Wilson, 2009). Fortunately, this is not entirely what ICT means and what it is all about. The next section throws some light on the meaning of ICT.

What is ICT?

The acronym ICT stands for information and communication technology. The term ICT comprises two constituent terms, namely IT (information technology) and CT (communication technology). On the one hand, according to Pandey (2015), Information technology deals with all the hardware, software methods required for acquiring, processing, storing and displaying information in the form of data. Communication technology, on the other hand, includes all the hardware, software methods required for ensuring correct, efficient and cost-effective transmission of a message or information (Pandey, 2015). Collectively, ICT includes all those technical means used for handling and facilitating communication (Celebic and Rendulic, 2001). According to Turner (2008), ICT stands for all those systems and devices that allow the user to manipulate, store, transmit, retrieve information in digital formats.

The concept of ICT extends beyond computers, internet or even telephones. In fact, according to Tongia, et al. (2005), ICT can be understood as being built on 4 Cs, namely (a) Computing, (b) Content, (c) Communications, and (d) Human Capacity. Also, the applications of ICT can be broadly categorised into two categories (Tongia, et al., 2005). First category of ICT applications is that of traditional telecommunication networks, such as the internet, that enables the user have the full control to use, communicate, exchange information as per their need and convenience. In other words, this category is dependent upon the human capital. Second category of ICT applications is the human independent category, wherein human intervention is not required for carrying out of information processing and decision making, which indeed is achieved through pre-set criteria. For instance, sensor based networks, artificial intelligence. However, many of the ICT applications used in education belong to the first category. Therefore, the challenge to design and build ICT applications, in both the categories, appropriate for their effective applicability in education. According to the National Policy on ICT, education enabled with ICT aims to improve the efficiency and quality of the teaching-learning processes which encompasses a variety of resources, tools, techniques and content for the teacher to utilize for effective pedagogy (MHRD, 2012).

Models of ICT-Integration in Schools

Various studies trying to assess the integration of ICT in schools of developing countries have found that the level of integration range only from low to moderate levels (Paryono and Quito, 2010; Sukri, 2010; Wahab and Kaur, 2006). In spite of the abundant amounts of researches available in this field, little researches are available that draw inferences upon the different models of integration of ICTs in education (Area, et al., 2016) and classroom processes, by teachers and students. Of those little researches available, the work of Barron et al. (2003)

suggests four types of ICT use by students, namely the use of computer as: (a) an instrument of research; (b) an instrument for production such as reports, papers, etc.; (c) a tool for problem solving and decision making, and (d) a resource for communication. Similarly, another study identified (Russell, et al., 2003) six main categories of use of ICT by teachers: (a) for lesson plan preparation; (b) recordings and registers; (c) material preparation and production; (d) emailing; (e) guiding students, and (f) for special education. Likewise, in schools, ICTs are used for two purposes: (a) as a resource for teaching development, and (b) as a support for teaching processes (Braak, et al., 2004). A study by Area, et al., (2016), reported two distinct models of ICT use in classrooms: (a) weak, and (b) strong-integration models as per the frequency and type of tasks assigned to students. According to a study conducted by Reid (2002), use of ICT enables teachers to not just have more control over resources used in the classroom but also enables them to create their own material, thus requiring teachers to be more creative than before.

However, the adoption of ICT into school environments is not free from some potential problems or barriers. The next section presents the research highlighting the existing and plausible barriers to integration of ICT in schools.

Barriers to ICT – Integration in Schools

Bingimlas (2009) classifies barriers to successful integration of ICT in teaching-learning environments into two main categories: (a) teacher-level barriers that includes lack of teacher competence, confidence, resistance to change and negative attitudes; (b) school-level barriers that includes lack of time, lack of effective training, lack of accessibility and lack of technical support. Several researches have also cited different extrinsic and intrinsic barriers to successful ICT-integration, however, their meaning of extrinsic and intrinsic differs. For Hendren (2000), extrinsic barriers referred to barriers related to organisations and not individuals while intrinsic barriers referred to barriers related to individuals, teachers and administrators (as cited in Al-Alwani, 2005). Another perspective, by Balanskat, et al., (2006) presents these barriers as micro-level barriers (such as teacher's attitude, and approach to ICT); meso-level barriers (pertaining to particular institutional context) and macro-level barriers (pertaining to the system-level barriers such as the wider educational framework level barriers). Studies conducted by Inan, et al., (2010); and Unal and Ozturk, et al., (2012) highlight the possible barriers such as internal organisational issues; inappropriate equipment and its difficult access; and or lack of technical and maintenance support that effects an effective integration of ICT in teaching processes.

Objectives

The current study aims to:

- identify the status of ICT integration in the school context in terms of availability, purposes, usage patterns and of ICT-based equipment.
- explore innovative practices used by different types of schools for integrating ICT in their teaching, learning and assessment practices.

Methodology

A sample of four schools (government, private-public, international and government aided, one each) of Delhi were selected using stratified random sampling technique. The study adopted a qualitative case study approach to examine the extent and nature of ICT integration for teaching, learning and assessment processes at the sample schools. The tools of the study included an item checklist and non-participant classroom observations over a period of seven days. The item checklist only focused on those ICT-equipment that are and can be used for teaching-learning purposes and not on the ones used for other administrative purposes such as a biometric device or CCTV cameras. Informal discussions with the teachers were also used occasionally to clarify doubts and gather more information. The tools helped in understanding the ICT availability and usage patterns and purposes by the teachers and also identify some innovative practices. The data so obtained was presented in the form of case studies and also in a comparative framework comparing all the four cases. The data was analysed thematically to come up with three main strategies followed by the schools.

Delimitations of the Study

The present study was limited only to four schools of Delhi and that too only to the primary grades of the sample schools and hence makes no attempts for generalisation of results.

Results

The results so obtained are presented in the form of four cases.

Case 1: Government School

This school is a central government school situated in central Delhi. The school runs classes from Class I to XII and has an enrolment of around three-thousand students. The primary wing of the school has a headmistress who manages all academic matters in the primary classes, i.e., from Classes I to V having two sections per class and around fifty students in each section. The classrooms have only blackboard facility available and does not have any ICT-equipment available. There is one computer lab for the elementary, secondary and senior secondary students. Primary class students do not have an access to this computer lab, not even are primary teachers allowed to conduct any class in this computer lab. There exists a separate music-cum-computer room for the primary classes wherein one part of the room is dedicated to musical instruments and the other part stores around fifteen desktop computers out of which only three or four were working. No other ICT-equipment such as printer, projection unit, display unit, recorders were observed. Also, it was observed that these computers were all dusty and, as confirmed by a teacher, these computers were rarely used by the teachers for conducting any class. Most of the time, the room was used only to conduct music classes for students. Also, one could observe teachers usually using their personal smartphones in the school to connect to each other, share information on social media platforms, such as WhatsApp groups, or search for any online information required for teaching, making assignments, worksheets or during lesson planning.

Case 2: Government-aided School

This school is a private school situated in north Delhi. The school is a senior secondary school starting from kindergarten. It has an enrolment of around three-thousand students. The entire school is divided into wings: kindergarten; primary; middle; senior and senior secondary, having separate buildings. Students from one wing are not allowed any access to the other wing. The primary classes have around forty-five students in each of the five sections. Each class has only one main teacher. Details of the availability of ICT-infrastructure are available in Table 1. Computer lab of the primary wing is fully functioning, however, only the upper primary students are allowed access to the computer lab and that too during their computer lab period. During the observation period, teachers rarely used any ICT-based technology for teaching, learning or assessment purposes in the class. However, the school's website allows students and their parents to get access to worksheets of the month, syllabus, monthly highlights of the content taught, safety guidelines, examination date sheet and primary students council. Only the upper primary students (i.e., Classes III, IV and V) had computer as a subject for which they had a lab period once every week. Teachers regularly used the available ICT-infrastructure to take out prints of worksheets, homework assignments prepared for students. For accessing any information available on the internet, they usually use their mobile phones in the staffroom or visit computer lab during their free time. Overall, one could see that ICT was used mostly to make available, develop and plan for teaching activities and to make available resources to students through the school's website. The available ICT-infrastructure was occasionally used for teaching-learning purposes and majorly it was used by upper primary students in the school for the computer subject.

Case 3: Public-Private School

This school is a private school situated in north-west Delhi. The school is a senior secondary school starting from Class I. It has an enrolment of around two-thousand students. The primary classes have around thirty-five students and two teachers (one main and the other assistant teacher) in each section. Each classroom had a computer with an internet connection, a display unit, a projector and speakers. Every morning, these ICT-equipment are used to conduct class assembly, meditation sessions, song/poem learning and also for other subjects as and when required. Teachers used videos available on YouTube to teach lessons especially for digital story telling during their language classrooms. Apart from these, there were also two computer labs for primary students' use. Each of the computers in the lab were updated to the latest software and connected to internet. Students working on some project could take out printouts from the two printers (coloured and black and white) available only with their teacher's written permission. Apart from the computing device available in the classrooms teachers were also provided with three desktop computers in the staffroom. Some teachers who had their own laptops carried to the school every day, required for lesson planning and resource development. A DTH cable connection and a TV unit was also available in the Principal's office usually playing the news channel. However, this was out of student's reach. For the purposes of documenting

classroom activities, teachers used their own smartphone cameras to click pictures and record videos of students engaged in different activities such as drama, performance in weekly school assembly, field excursion, writing, classroom extempore and other individual or group activities. Teachers, at this school, are required to maintain e-portfolios of students, which are used towards the end of the academic year for assessing individual student's growth over a period of time. While observing one of the weekly teacher's meeting for developing lesson plans and resource material for the upcoming weeks, teachers showed their intent to use ICT in their teaching. One example of this was when teachers planned to assess student's listening and comprehension skills by planning to use digital audio-book and making a paper test for students to response on the questions based on the audio-story. When this plan was actually conducted in the class, each of the students was provided with a tablet having an audio-file already downloaded on it and students were instructed to listen to the audio file carefully and answer the questions (paper test) appropriately. Teachers also used these computing devices such as tablets to enhance e-reading skills of students. However, during the entire observation period, it was observed that the use of ICT was most prominent in English language classes, followed by Hindi language classes, followed by mathematics classes, followed by science, environmental education and least for art, drama and physical exercise classes. Hindi language classes also ran on the same lines as that of English language classes but the frequency of ICT usage, as confirmed by a teacher, was relatively less due to the unavailability of 'good quality material' on the internet. Teaching of mathematics using ICT was limited to using YouTube videos of poems for introducing and memorization of mathematical concepts such as forward counting, backward counting, mathematical operations such as addition, subtraction, multiplication and division. ICT was not used for the assessment of mathematical skills. Teachers used WhatsApp, emails, google groups to connect only with colleagues and occasionally with parents. Also, the school's website has a student's corner wherein each student or his/her parent is required to log in and access the available extra learning material, holidays homework and their personal e-portfolio uploaded by the teacher. On an overall basis, ICT-equipment were observed to be used for planning and preparation of teaching, in classroom practice to facilitate teaching and learning, sometimes for assessment practices and finally, using social media such as WhatsApp groups, emails, google groups for connecting with fellow colleagues and occasionally with parents.

Case 4: International School

This school is situated in South Delhi having a multicultural, multinational student population of around two-thousand five hundred from Class I to XII. The primary classes have around thirty to thirty-five students and two teachers (one main and the other assistant teacher) in each section. Each classroom had a computer with an internet connection, an interactive whiteboard unit and supporting projector and speakers. Every morning, these ICT equipment are used to conduct mind stretchers, meditation sessions and community singing wherein the students engage themselves in community singing. These songs are from different nations and communities depending upon the student population of that class. Apart from using

videos, audios, e-reading material, activities, games from different platforms such as 'Google', 'BrainPOP' and 'Abacus Learning Lab' for every lesson and every subject, the school uses flip chart for active learning through the interactive whiteboards installed in each classroom. A program called as 'ActivInspire' allows the teachers to plan their lessons by creating slides wherein they write lesson objectives and activity upon which the entire lesson goes on. It is a program that enables the teachers to bring lessons to life, i.e., conduct active learning sessions allowing student interaction, collaboration on and through the interactive whiteboards and panels. This happens with the software's dual-user input, pen and multitouch functioning, integrated math tools, clock, magic ink, spotlight and so on that encourages students to work together, interact, and engage in a much more active learning. It also enables the teachers to send quizzes, polls, worksheets, activities to students using iPads (individual) student's 'ClassFlow' account, to which a student can have twenty-four-seven access. It also empowers the teachers to send feedback on student's work in the form of performance and behaviour badges to students and parents. It also enables teachers to collaborate with educators around the world and get access to their interactive lessons, resources and activities. For mathematics, specifically, teachers use the 'Mangahigh' platform which is a blended learning resource for primary and secondary school mathematics. It offers various challenge-based, competitive math activities and game-based lessons that drive through greater student engagement and understanding. The teachers at this school use this platform to give homework to students, wherein the entire class goes online and do various levels of homework.

Students' performance is displayed in terms of ranks which helps students to identify their own performance with respect to their classmates and also allows teachers to track students' progress, and understand which student understood the concept and which needs more help. This in turn helps the teachers to personalize instruction by assigning appropriate task and challenges to individual students or a group, track and formatively assess student's performance across curriculum and hence further differentiate instruction.

As far as connecting with parents and community is concerned, live streaming in the school is rare, however, monthly updates are sent to the parents through another social media output platform called as the 'firefly'. This enables the teachers to also involve parents in their child's learning journey, complete formalities such as permission for school excursions or trips, and receive notices and other updates from the school. Apart from this, students also engage in making their own videos on various content or interest areas such as dessert, grassland, moon and so on, using the green screen and various IOS applications available for video-making, editing and sharing. Finally, all of the work done by students, individually or in collaboration, forms a part of their e-portfolios shared with students and their parents.

Table 1

Availability of ICT infrastructure for primary classes in different school cases

	Government school	Government aided school	Public-private school	International school
Computing Devices (PC, laptops, tablet, mobiles)	Only 3–4 fully functioning desktop computers available in the music-cum-computer room	Fully functioning desktop computers available in computer lab	Yes, computer labs and one desktop computer in each classroom	Yes, (laptops, computer available for teachers and iPads for each student in the class)
UPS/Inverter	Yes	Yes	Yes	Yes
Set-top Box (Satellite T.V.)	No	Only available in principal's office.	Only available in principal's office. Students' access is not allowed there.	Yes, in common room accessible to all students and in staffroom.
Printer	Yes (1 printer and 1 photocopier machine) available in principal's room.	Yes (in computer lab and wing coordinator's room), accessible only to teachers	Yes (in staffroom and in computer lab)	Yes, in every classroom
Braille printer	No	No	No	No
Internet connection (USB/ Cable/Wi-Fi)	Yes, cable internet connection. only for administrative work	Only in selected computers (2) of computer lab	Yes, in all classrooms and computers in the computer lab	Every student and teacher is provided a username and password to use the internet.
Interactive Whiteboard	No	No	No	Yes, every classroom
Projector with television screen connectivity or projector screen	Projector is available but is not in a working condition	Yes, only in computer lab	Yes, every classroom	Yes, every classroom
Presentation clicker	No	No	No	Yes

Visualiser or document camera	No	Available on issuance basis only for school functions, cultural activities or workshops.	Available only during school functions or picnics	Yes, in every classroom
BYOD	Teachers usually use their own smartphones in the school to connect to each other or search for any info required for teaching, making assignments, worksheets or during lesson planning	Both teachers and students are not allowed to use any mobile device inside the school premises. Teachers can bring their laptops as required.	Optional for teachers. Not for students.	No, each student is provided with an iPad
Recording hardware/software for podcasting (e.g., Speakers, Headphones, Microphones, etc.)	only three functioning speakers are available in primary computer room. Microphones are used only for school assembly.	Only in computer lab.	Yes, speakers in every classroom. Limited number of microphones available from computer lab on issuance basis.	Yes, one in every classroom
Gizmos (data logging; remote control robots/ vehicles/buzzers/lights)	No	Not available for primary students	Available in robotics lab on issuance basis.	Yes (e.g., Sphero robotics—an app-enabled robotics ball)
Social media output channel to connect with students, parents and fellow classrooms	Teachers use WhatsApp chat group to connect and share information, media among themselves.	WhatsApp, emails, google groups to connect only with colleagues and occasionally with parents.	WhatsApp, emails, google groups to connect only with colleagues and occasionally with parents.	WhatsApp, Google groups, emails being shared between teachers. Daily Blogs, pictures and videos of each classroom are uploaded and shared with parents through 'firefly' platform to engage families in their children's learning.

Discussion

From the case studies mentioned above, one could identify different patterns or strategies, in terms of the task at hand, of integrating ICT into education. These strategies are:

1. **Teaching only Strategy:** This strategy includes both planning for classes with the help of ICT and also using ICT as a pedagogical tool for teaching. From the cases of government and government-aided school we could see that the teachers there used ICT-based resources such as the internet, WhatsApp to ease their planning for lessons to be taught in the class. Through the cases of the public-private and international school, we could see how teachers used ICT-equipment not just for planning the lessons but also for better engaging students into the content being taught. For instance, using videos available on the internet to better explain a concept such as addition, plant life and so on. Another instance can be the use of audio material to teach the sounds of different animals during a science lesson. In this strategy only included the most basic use of ICT-equipment, i.e., to use it for planning of and teaching of concepts. Also, herein the teacher's task is to deliver the content material from one end to the other, i.e., from the teacher's end to the students' end. Such a strategy does allow teachers to plan for and use multimedia resources and hence tap onto Montessori's (1912) multi-sensory learning approach which reiterates that learning experienced through multiple senses reinforces memory.

2. **Teaching-learning but not Assessment Strategy:** This strategy includes integrating ICT in different subjects while teaching and also while assigning learning tasks to students but not for assessing their progress, despite availability of appropriate resources. Such a strategy wherein ICT-equipment are used not just to make teaching of a content area more effective, efficient and attractive for students but also integrating it in the student's self-learning tasks. For instance, giving homework of searching information on a content area and making a report out of it, or uploading extra learning material on the school's websites, enabling students to access the material to further their knowledge. Another instance for such a strategy is to allow students to learn from the plethora of learning material available on the Virtual Learning Environments (VLE). The most basic use of VLE allows teachers to post their worksheets and other resources online for students to access electronically. However, a more effective way of using VLE to their fullest potential is by using them for personalising student's learning experience, thus allowing the learners to go through unique pathways of learning the content, as and when they like, through the use of hyperlinks enriching the content material available to the learners (Simmons and Hawkins, 2009). This helps the teacher to again tap onto the multi-sensory learning approach (Montessori, 1912) but it

also allows for initiating self-directed learning habits among students. These self-directed learning habits encourages the students to become responsible owners and managers of their own learning process (Bolhuis, 1996; Garrison, 1997).

ICT-based learning materials, which is inherently attractive in nature, play a significant role in motivating students and their volition for initiating and continuing efforts of self-learning. Here, the control gradually shifts from teachers to the learners working either individually or collaboratively or cooperatively. Such an approach paves way for students developing domain specific knowledge as well as developing the ability to transfer that knowledge from one situation to other newly encountered situations, thereby bridging the gap between home, school and real-world knowledge (Temple and Rodero, 1995).

3. **Balanced approach:** It is called as the balanced approach because the ICT use is not invariantly dedicated to any one or two particular activities of the educational process but is balanced in all the activities of the educational process. It included the use of ICT-equipment for planning, teaching, learning, assessing and also connecting with the community of teachers, students and parents. For instance, using Flip chart, ActivInspire, BrainPOP, Abacus Learning Lab, interactive white boards, YouTube and Google material available for planning and conducting lessons. Using audio files for assessing student's listening skills and language comprehension, ClassFlow, Mangahigh to compete with fellow classmates, track student's progress and also help students to self-assess their performance in relation to their classmates. E-portfolios was another technological way of keeping records of student's progress. Here the term assessment can be understood as both assessment for and of learning; and assessment for record keeping. Firefly, WhatsApp chat groups, Google groups, emails are other cheap, yet effective ways for connecting with a community of people.

Although during this discussion, the use of ICT in schools has been divided into different strategies being followed, however, by no means does the current paper aims to suggest or generalise isolated use of any one of these approaches by the different kinds of schools. Each school appeared to, at one point or the other, use a mix of these approaches and not a single isolated strategy. However, one could clearly identify the predominant use of teaching only strategy in the government, the predominant use of teaching-learning but not assessment strategy in government-aided and public-private school. The innovative practices used by each school cases were also revealed and it is by the means of this paper that the present teachers, school administrators and prospective teachers are encouraged to adopt, test and validate these practices into their own respective school contexts, hence furthering/contributing towards the national vision, as seen by MHRD (2012), of improving access, quality and efficiency in school system through ICT-enabled activities and processes. Finally, the predominant use of balanced strategy in the

international school under study. This study also revealed that the mere availability of ICT-infrastructure does not in itself ensure its efficient integration in the teachers' pedagogy (as seen in the case of government school). Other factors such as teacher's attitude and skills; process of adoption (single or ongoing); technical support; professional development of ICT use; student's background, competencies and other issues of equity also play a significant role in helping ICT bring educational change (Venezky, n.d.). Hence, the ICT linked to change in some schools but not in others. Thus, with a right balance of ICT-infrastructure and these factors, ICT is sure to play its role of an impetus for educational change.

Conclusion

The stories that emerged from the four case studies presented in this paper provided insights into the styles and strategies of integration of ICT in primary education and also provided insights into the issues surrounding it. However, it cannot be presumed to represent all the schools of Delhi, but these can be illustrative of the patterns and strategies of ICT-use among the schools. The conclusions that emerged from the study are: firstly, that the mere availability of ICT-infrastructure does, indeed, impacts the effective adoption and integration of ICT in all the educational processes, however, its mere presence does not always necessarily ensure its integration, various other factors have their own significant roles to play. Secondly, it is the teacher who plays a central role in the adoption of ICT-based technologies in the educational process and hence bring change and innovation. The same technology in the hands of different teachers produced different results, hence, the importance of understanding how the available technology is being used. Hence, emerged the three kinds of strategies of ICT-use by teachers, i.e., (i) Teaching only strategy; (ii) Teaching-learning but not assessment strategy; and (iii) the Balanced strategy. Finally, adoption of ICT once a while is not enough for bringing innovation and educational change, rather, it has to be an ongoing process.

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