

Part 2

International Organizations and Education

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Technology as an External Determinant of the Education Systems of South Africa and India: A Comparative Study

Abstract

The framework of the education system can be defined as an effective educational environment where learners are prepared for different roles in society. It also contributes to providing for the learners' existing needs in society (Steyn et al., 2017, p. 15). The functioning of the education system can be influenced by different internal and external determinants (Steyn et al., 2017, p. 23). External determinants are external contextual factors that influence the education system such as geography, demography, and technology. In this research study, the emphasis was placed on technology as an external determinant of the education system. Technology is a very important external determinant because it influences the nature, content, and delivery of the educational programs and the curriculum. This research aimed to compare technology as an external determinant on the education systems of South Africa and India.

Keywords: technology, technology in India, technology in South Africa, external determinant, education systems

Introduction and problem statement

Technology is not only one of the most important external determinants but also impacts the way we communicate with each other. Given the advanced level of technology, and the amount of technology exposure to learners in today's climate, it is important to ensure that it will be promoted, not only in our daily lives but also at the school level. The problem with technology as an external determinant on the education system is that technology puts teachers under pressure because it changes daily, and teachers cannot always keep up with it. The traditional way of teaching and learning must be revised and adapted to improve the efficient use of information communication technology in the education system. India is one of the countries with very advanced technology. Teachers, organizations, and schools use technology in different ways to develop learners' progress across India (Southwell, 2017). India is one of the world's top countries when it comes to implementing technology, especially in teaching learners. Learners encounter technology at a very early stage. Compared to South Africa, which only uses technology in certain schools and education systems, India has better access to technology than South Africa. Each

generation learns with the type of technology with which they come into contact or at least with which they grow up. Technology offers many benefits to the school systems but the systems are not yet in place so they can be advanced or partially replaced with technology. Yet there are modern technological tools we can use to help in the current school system. Modern technology allows learners to take ownership of their teaching and learning. With this type of technology, learners can be actively involved in the teaching and learning phase and they also no longer have excuses for not being able to obtain information (Jackson, 2016). Modern technology is essential to stay competitive, it already prepares you at the school level to keep up in the professional environment (Jackson, 2016). Using digital tools can lead to lower costs in the long run. It is cheaper to buy digital textbooks online than it is to buy printed textbooks in a bookstore. Technological education can positively impact the achievement levels of academia. In today's world, young teachers are expected to use digital aids in the curriculum. Technology is part of today's children; they are raised with technology in the background. By implementing technology in school systems, it forms part of the everyday, ongoing awareness among children (Jackson, 2016).

Theoretical conceptual framework

Technology

Ramey (2013) explains that technology is a collection of information devoted to the creation of tools, processing actions, and the extraction of materials. The technological theory seeks to explain the factors that shape technological innovation, as well as the impact of technology on society and culture. Broadly speaking, technology is how people change the natural world for their purposes. Technology means the act of manufacturing, but more generally it refers to the diverse collection of processes and knowledge that people use to expand human capacity and to satisfy human needs and desires (ITEA, 2001, p. 1).

Technology in South Africa

In a country where our basic education system is deficient and the gap between the third world and the first world is very large, educational technologies such as computer skills can be very beneficial for the child at the education level, especially for those from low-income families and public schools (Political Analysis, 2018). Due to a lack of access to technology, many local schools are suffering. The gap can arise due to too few trained teachers who have the right qualifications to use technology as a medium of instruction in classrooms. There is also not the necessary finances to implement technology in all classrooms in South Africa. There is therefore a great lack of knowledge and resources.

Technology in India

India has the necessary funds and knowledge to implement technology effectively in its classrooms. Technology is used to such an extent that learners' self-study ability improves ability. India has put in place various technological models such as Virtualization and Cloud to ensure that learners in rural schools and disadvantaged schools also have access to technology (Dinesha & Agraval, 2011).

External determinants

Determinants influence the nature and functioning of the education system (Steyn et al., 2017, p. 23). The factors that influence the education system can be internal or external. For this research, there will be a specific focus on technology as an external determinant of the education system.

Education system

Steyn et al. (2017, p. 15) define the education system as “the framework for effective education to meet the real educational needs of the target group”. Steyn et al. (2017, p. 23) believe that an education system consists of education administration, education policy, support service for teachings, and a structure for teaching.

Research aims and objectives

The primary research aim was to determine the nature of technology as an external determinant of the education systems of South Africa and India. The research questions were as follows:

- What are the similarities in the education system about technology as an external determinant between South Africa and India? and
- What are the differences in the education system about technology as an external determinant between South Africa and India?

Research design and method

This qualitative interpretative study employed the comparative method to identify and analyse the data generated from applicable documents. In this research, the education system of South Africa as well as that of India is compared to be able to identify the similarities and differences regarding the influence of technology as an external determinant on both countries' education systems. The following phases are described by Steyn and Wolhuter (2008, p. 1) which can be used to compare the different aspects of different education systems. It is a linear process that identifies themes, describes themes, record similarities and differences and explain the identified similarities and differences. Best practice is then highlighted and presented.

Sampling

Purposeful sampling is one of the characteristics of qualitative research. This sampling method was used. For this study, the following two BRICS countries were selected as topics for the study: South Africa and India.

Data collection

To gather the necessary data for the comparative studies, document review is the most relevant technique that was applied. For this study, different forms of human communication, official policy documents, newspapers, academic articles, books, journals, and videos will be collected to investigate and compare the influence of

technology as an external determinant on the education systems of South Africa and India.

Data analysis

The relevant documents will be examined utilising content analysis. Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic (Bowen, 2009, p. 27). Content analysis is a research method that systematically and reliably analyses the qualitative data collected in the research. Content analysis can be applied to all written forms of human communication. In this study, the different documents were identified, data were collected from the different documents and then compared with each other to obtain the most accurate information. By comparing the documents, clear similarities and differences were identified regarding the influence of technology as an external determinant on the education systems of South Africa as well as India. The following themes were identified from the data. They were Technology in schools, Technology as a teaching tool, Accessibility of technology, and Effectiveness of technology.

Findings

Technology in education

Technology in education is defined as a variety of tools that are useful to promote student learning as well as to measure individual learner behaviour. Educational technology is the study and ethical practice of e-learning. It consists of appropriate technological processes and resources to improve the learning and performance processes. Educational technology relies on a broad definition of the word “technology” which is the instruments from meaningful sources to the improved and meaningful skills to develop education (Goswami, 2014, p. 6).

India’s Draft National Education Policy aims to ensure that technology is appropriately integrated into all levels of education for (i) the improvement of teaching, learning, and evaluation processes; (ii) supporting the preparation of teachers and their continuous professional development; (iii) improving educational access to disadvantaged groups; and (iv) streamlining education planning, administration, and management (MHRD, 2019, p. 43).

The Draft National Education Policy of India (MHRD, 2019, p. 43) focuses on the following points within education:

1. The National Forum for Educational Technology, which is an autonomous body, will be set up to share and consult on decisions on the induction, deployment, and use of technology within educational institutions, state, and central governments.
2. Technological integration in educational processes (Support translation, serve as pedagogical assistance, facilitate continued professional development, online courses, etc.) will be optimized through digital repositories. The optimization will also help prepare teachers to use technology so that they are qualified. It also serves as support for research. Centers of Excellence in Educational Technology will be set up to undertake research and support the use of technology.

3. The national repository for educational data will keep all records related to institutions, teachers, and students in digital form.

According to Mdlongwa (2012, p. 5), there are some administrative advantages of technology in South Africa that can also be implemented in South African education:

- Routine tasks: access to the school for learners, records are entered much faster than was done without technology (previously records would be kept in a file with pupils' school records, which had to be searched manually to look up information);
- Record keeping: through technology, records are kept orderly and reliable (manual records used in the past could be lost due to poor filing);
- Administration costs: printing costs, waste of paper, and costs of photocopying are reduced by technology;
- Information and communication within a school: due to technology, information and communication can be disseminated much faster and more efficiently through e-mails or by using PowerPoint to give presentations in class, rather than making copies of the same information for everyone.

Technology as a teaching instrument

Educational technology relies on a broad definition of the word “technology”, which are the instruments from meaningful sources to improved skills in education with the help of technological instruments (Goswami, 2014, p. 6). There are different types of technologies currently used as instruments in Indian classrooms (Goswami, 2014, p. 7):

- Computer in the classroom: having a computer in the classroom is an asset to any teacher. With a computer in the classroom, teachers can demonstrate new lessons, present new materials, illustrate how to use new programs, and display new information on websites;
- Class blogs: there are a variety of Web 2.0 tools currently implemented in the classrooms. Blogs enable students to have easier dialogues, blogs are also available for students to keep diary entries and to share their thoughts. Blogs help students to present their ideas and to complete assignments;
- Wireless microphones: noisy classrooms are a daily problem, with the help of microphones students can hear their teachers more clearly. Students learn better if they can hear the teacher clearly;
- Mobile devices: mobile devices such as tablets or smartphones can be used to expand the field of experience of learners and allow professors to give feedback to learners;
- Interactive whiteboards: wit interactive whiteboard that n provides touch control for computer applications. It enhances the classroom experience by showing everything on a computer screen. Not only does it help visual learning, but it is interactive so that students can draw, write or manipulate pictures on the interactive whiteboard;
- Digital video on demand: digital video eliminates the need for hard copies in the classroom and sets up teachers and students able to instantly access video clips and not ensure that there is no need to use public internet;

- Online media: streamed video sites can be used to enhance a classroom lesson;
- Online study tools: the tools that motivate the study by making the study more fun or personal for the student;
- Digital games: the field of educational games and serious games has grown significantly over the last few years. The digital games are offered as tools for the classroom and they offer very positive feedback including higher motivation for students.

These are just a few of the types of technological tools used in India. There are many other tools used depending on the local school board and the funds available.

According to the National Integrated ICT Policy White Paper (RSA, 2016, p. 109) of South Africa, digital and mobile infrastructure, as well as technologies, are tools to enable all citizens to obtain information and services from a variety of sources within a short time.

ICT is relevant in education as a way to support a process of teaching and learning and is best used to support a value creation process. It is not a focus in itself. Besides, technology has a separate and distinct role in enabling the management and governance of education. Reflection on the appropriate role of technology in teaching is therefore essential, as it is instrumental in defining a clear objective, and as such in directing both macro-level strategy and micro-level tactics and implementation.

- Instructive approaches: teachers integrate technology in a passive and teacher-centered way (teaching technology);
- Cognitive approaches: the use of technology as a mind tool (e.g. the use of technology to represent authentic contexts and activities in learning – learning with technology);
- Mediative approaches: the use of technology to mediate the construction of knowledge (e.g. the use of tools to solve problems).

Accessibility of technology

In India, technology makes education at every level affordable by offering courses and content for free or at a very reasonable cost. The number of internet users in rural areas is nearly 293 million. In 2019, India's internet user base estimated at approximately 627 million. Education will be more accessible and affordable for the masses of technology users in the country made available through the internet through high speed and low-cost devices. The biggest beneficiaries of the easier access to academic learning and data were students from level 2 and level 3 cities who no longer have to rely on institutes in the area. With the advent of this digital age, education is no longer limited to the four walls of a classroom. An interactive platform ensures that a student can understand, share, discuss and practice a lot in the same way as he/she would do in a real-time study class.

The Information and Communication Technology industry in South Africa's growth perspective, as well as the accessibility of technology, is supported by the following sectoral and national policy objectives (RSA, 2016, p. 141):

- Defining the ICT sector and its value chain;
- Position the ICT sector in the industrialization and reindustrialisation of South Africa;

- Stimulate the demand for ICT goods and services;
- Important government interventions such as the development and regulation of ICT policy, research, and development, funding, efforts to promote direct local and foreign investment;
- The coordination between important state institutions as well as to strengthen the private sector;
- Promoting research and development, innovation, and local manufacturing;
- The introduction of a new skills development dispensation.

Efficiency of technology

The effective use of ICT and the implementation of personal education programs in India can ensure significant changes in the learning process in schools and it can subsequently lead to a better education system. By focusing on both the training of teachers for the effective use of ICT, as well as the implementation of programs that offer personal education to students, significant improvements in the learning process and the test results can be ensured.

The Department of Telecommunications and Postal Services in South Africa is, among other things, involved in reforming the country's skills development agenda in line with the work landscape of the country's future. This department is also involved in the prioritisation of digital skills in the country (RSA, 2016, p. 43). The education authorities must be aware of the important role of ICT in our lives, especially in educational activities, and must be sufficient to implement the strategies to empower ICT to facilitate the teaching and learning process in the classroom support.

Conclusion

Technology can reduce the tremendous effort involved in collecting printed books and magazines to focus students on a more important process, knowledge acquisition. Technology can further represent education in ways that help students understand the latest concepts and ideas. Technology in teaching also enables teachers to integrate project-based learning. Under the guidance of effective teachers, students at different levels can use these tools to construct knowledge and develop skills needed in modern society such as presentation skills and analytical skills.

The use of ICT may not be the cure for all the problems currently in the education authorities. There are still many challenges facing our country with the implementation and introduction of technology in schools. It is especially based in today's global world because our economy has changed so much. The country is going to have to look more dynamically at individuals who can show up with solutions to take our country to better heights. The use of ICT in South African schools will not only improve learning and teaching in education in the long run but will also promote the advancement of knowledge across the country for all learners. As a result, South Africa is still far behind India in terms of technology as an external determinant, but this does not stop the country from broadening research in this field.

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