

The Integration of Modern Technologies in Geography Teaching at Educational Institutions

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ABSTRACT

The late 20th century witnessed a significant shift in the education sector with the introduction of modern technologies. This led to a quantum leap in the use of these technologies in educational institutions, which began to compete in their implementation. These technologies play a major role in elevating the purely educational level to the level of creativity and innovation.

Some of the technological tools that have been introduced into the field of education include computers, audio-visual aids, and the internet. The internet is one of the most important technologies that has contributed to this leap, as it provides students with information in the required format and at all times. Due to the importance of this topic, this study addresses the uses of modern educational tools in teaching geography.

Keywords: Education, Algerian School, Technological Developments, Modern Means, Geography

Introduction

The information revolution has transformed the world into a global village, where time and space barriers are diminishing. This technological advancement has led to the emergence of new teaching methods and concepts such as open education, distance learning, and e-learning. However, the effectiveness of these methods depends on each country's technological infrastructure, such as the national internet coverage rate and the individual's share of smart electronic devices, both fixed and mobile (computers and tablets). Additionally, the economic, social, and cultural level of families plays a significant role. It is worth noting that some countries have implemented distance learning policies in their public or private schools, where students and their parents are accustomed to the tools and requirements of this method, such as printers and other equipment.

the world is currently facing challenges due to the COVID-19 pandemic, which has imposed new trends and methods to meet educational needs. Consequently, educational curricula must be revisited to keep pace with modern requirements and available technologies, such as online distance learning, to ensure the continuity and completion of the educational process. Therefore, educational institutions must have a forward-looking vision and pre-plan for distance learning to effectively address crises as they arise.

Literature Review

The slow and almost non-integration of ICT into teaching and learning in Algeria college Schools has been blamed on either inadequate or lack of proper ICT resources, poor expertise of teachers and unavailability of the desired ICT tools in schools (Boadu et al., 2014). algerien's education policymakers have attempted to encourage the use of ICT in the classroom through educational reforms and other policies over the years, but these attempts seem to have lost their substance partly because of the aforementioned factors (Amenyedzi et al., 2011). A close look at the college Schools level shows that apart from the introduction of ICT as a subject, most teachers do not infuse technology into their classroom instruction (Boadu et al., 2014; Ababio&Dumba, 2014). Despite the massive investment in the integration of ICT into many college Schools, the practical use of these ICT tools by teachers remains in a preliminary stage with little significance in the educational outcome (Agyei, 2013). The incorporation of ICT into the teaching and learning of geography has been given little attention and investigation, especially in the algerien context (Antwi et al., 2018; Boadu et al., 2014). Most studies have proven that geography teachers college Schools in algeria focus mostly on the traditional methods of teaching the subject: lecture, discussion, fieldwork, project and questioning method (Kocalar&Demirkaya, 2017; Ababio&Dumba, 2014). It is important to iterate that integrating information technologies into the teaching and learning process goes beyond the availability of ICT tools in a school. The users of these tools must possess some facets of knowledge spelled out in the Technological Pedagogical Content Knowledge (TPACK) model (Mishra & Koehler, 2006). For instance, studies have shown that the mere presence of technology in the classroom does not guarantee its effective integration into the teaching and learning process, but rather, dependent on teachers' ability to repurpose the available tool to meet the needs of the learners (Kereluik et al., 2011; Mishra & Koehler, 2006). For effective technology integration, teachers are expected to possess technological knowledge, technological content

knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge (Mishra & Koehler, 2006). Meanwhile, like many other subjects, it is difficult to teach certain topics in geography without the integration of information technology applications such as Google Earth, computer simulation programs, interactive compact discs, Global Positioning Systems (GPS) and Geographic Information Systems (GIS) among others (Geographical Association, 2004; Antwi et al., 2018). Some topics in geography, especially in physical geographies such as longitudes and latitudes, may appear abstract and difficult for students to relate to (Antwi et al., 2018). The use of technology helps remove abstraction from teaching and learning of all aspects of geography. It is, therefore, incumbent on geography teachers to be innovative in their teaching, making the subject more interesting and real, rather than a presentation of a mere collection of names of places and rivers and mountains, as others have perceived the discipline over the years (Opoku, 2019; Fatima, 2016). In the light of this, using the TPACK model as a framework, the study assessed the extent to which geography teachers possess technological pedagogical content knowledge. Niess (2005) suggests that these aspects of TPACK research are worth probing since it provides the basis to predict whether teachers will be able to integrate information technologies into their teaching or not. Although the concept of teaching with technologies has been explored by several authors within the Algerian education landscape (Antwi et al., 2018; Afari-Kumah & Tanye, 2009; Boadu et al., 2014; Ababio & Dumba, 2014), less attention has been paid to assessing teachers' TPACK which is key to determine whether instructors will be able to integrate available technological resources into classroom teaching. It is against this background that the current study was carried out to assess teachers' technological pedagogical content knowledge in the teaching and learning of geography.

Topic

Digital Platforms and Electronic Maps for Teaching Geography

Electronic maps are an integrated technological system that represents an evolutionary state of the second generation of internet tools. They represent an interactive learning platform characterized by readiness, permanent availability, modernity, spread, and interactivity. They are available through the internet, mobile phone applications, and tablets. Their effectiveness and functionality in various life fields are increasing day by day, particularly in developing interactive teaching in various educational fields, the most prominent of which are geography curricula.

Various experiments and studies have indicated the ability of electronic maps to develop a love of exploration, motivation for learning, retention of learning, development of map reading and understanding skills, field experiences, growth of scientific concepts, the ability to imagine history, and spatial thinking. They also promote positive attitudes towards learning the subject and linking it to solving life problems.

Hence, the importance of focusing on electronic maps and advocating for their spread in classrooms and geographic education activities.

Through this research paper, we noticed a great interest among school students in using electronic maps such as Google Maps and Google Earth as a teaching tool. These maps are effective in achieving geographic standards and developing their cognitive and skill aspects in different educational stages in national school

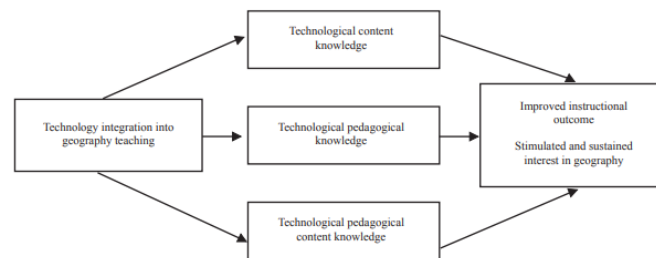
Sub topic

1. **Pay attention to developing geography curricula in general and teaching methods in particular** in a way that integrates information technology applications with the goals, content, methods, and activities of teaching and evaluating geographical topics.
2. **Train and prepare those involved in and interested in teaching geography** on how to use modern information technology applications in teaching geographical topics. This may lead them to discover new functions and areas in which information technology tools and applications can be used to achieve the goals of teaching and learning many other geographical topics.
3. **Teach college students of education** courses on using information technology tools and applications in teaching and learning the geographical topics they are preparing to teach after graduation.
4. **Prepare databases related to different types of educational topics and publish them on the internet.** This will allow teachers and learners to use them in teaching and learning topics from their homes.
5. **Pay attention to achieving geographical skills** such as Geographic Information Systems (GIS) skills.
6. **Activate distance education** in using some modern information technology applications such as electronic encyclopedias in teaching and learning geography.
7. **Evaluate the educational programs** prepared by the Ministry of Education in terms of their efficiency and the possibility of developing them to be compatible with modern information technology applications, and develop digital books available on all geographical media, represented and empty, for adoption in applications.

8. **Evaluate the students' and pupils' benefit from using the internet** as one of the modern information technology applications in teaching and learning some geographical topics.

Methods

Geography is an integral and influential part of social studies due to its significance in shaping students' cognitive, social, and personal dimensions. It focuses on studying human beings, their activities, and their relationship with the environment they live in, emphasizing their interaction with it as both affected and influencers. Additionally, geography is concerned with studying the environment and preserving it in light of urban growth and human development (Qandeel Ahmed Ibrahim, 2006).



Source: Adapted from Koehler and Mishra's (2005) TPACK model

Figure 1. Technology integration into teaching geography model

Géographies Educationnel Value:

Geography, as a unique and valuable educational subject, plays a pivotal role in developing students' personalities and equipping them with knowledge, concepts, ideas, skills, theories, and generalizations across various educational levels. In an era of continuous knowledge acquisition and modern advancements, educational technology empowers learners with geographic knowledge, information, and skills while overcoming their aversion to the subject. Natural geography, a major component of science education, covers topics such as the Earth's crust, its composition, and various minerals. Moreover, it delves into natural disasters, particularly earthquakes and volcanoes, explaining complex concepts that might otherwise overwhelm learners and hinder their understanding. However, by utilizing modern tools, downloading documentaries, and viewing videos of diverse natural phenomena, and virtually transporting learners to different geographical locations on Earth, learners can acquire knowledge and skills that no teacher, regardless of their expertise, can provide.

Methodology (Times New Roman, bold, 12)

This study was conducted in the middle schools of the commune of Khroub, wilaya of Constantine. It targeted all middle school geography teachers and adopted a descriptive survey method. According to data published by the Directorate of Education of the wilaya of Constantine (2020), there are 12 public middle schools in the commune of Khroub. Each of these middle schools is supposed to have three geography teachers to deal with the physical, human and practical aspects of the discipline, for a total of 36 teachers. The researchers made great efforts to reach all middle school geography teachers in the region using both face-to-face and online questionnaire administrations. However, after the one-month data collection period, 30 teachers representing almost fifty percent (83.33%) of the target population participated in the survey. The teachers responded to a survey instrument. A survey was used because it allows a large sample to be obtained for a study, thus laying the foundation for valid generalizations helps to describe the nature of an existing phenomenon allows to obtain information on attitudes which are difficult to measure by observation and finally, has the strength to provide all respondents with a standardized stimulus and reduce researcher bias.

Data Analysis

Distance learning is a type of education that uses technology to deliver instruction to students who are not physically present in a traditional classroom setting. It can be used to provide educational opportunities to students in remote areas, students with disabilities, students who are unable to attend school for other reasons, and students who want to learn at their own pace.

Distance learning can also be defined as a type of education that relies on the use of modern and contemporary communication mechanisms, including computers and their networks, multimedia (voice, image, and graphics), search engines, electronic libraries, and internet portals. These tools are used for communication, receiving information, acquiring skills, and facilitating interaction between students and teachers, students and schools, and even between

schools and teachers. This type of education does not require the existence of educational institutions or classrooms, but rather eliminates all physical components of traditional education (Mohamed Ibrahim Al-Dosouqi, 2012)

Distance education is also one of the modern forms of education. Its main idea is to get out of the traditional mold of education, as its principle is the separation between teachers and students and the use of the latest technological techniques to facilitate communication, especially for students who cannot commit to a specific schedule due to their full-time or part-time work. It is also called e-learning (Ragheb Nasser, 2019)

Types of Delivery in Distance Education:

Distance education can be divided into two main types based on the mode of delivery:

1. Synchronous Delivery:

- Real-time interaction: Synchronous delivery involves real-time communication and interaction between the instructor and students.
- Examples: Live lectures, video conferencing, online discussions, and chat rooms.

2. Asynchronous Delivery:

- Independent learning: Asynchronous delivery allows students to learn independently at their own pace.
- Examples: Pre-recorded lectures, online modules, e-books, and discussion forums.

Benefits of Synchronous Delivery:

- Real-time interaction: Synchronous delivery allows for immediate feedback and clarification from the instructor.
- Collaborative learning: Synchronous delivery promotes collaborative learning through group discussions and activities.
- Enhanced engagement: Synchronous delivery can be more engaging for students than asynchronous delivery.

Results

The most important of these challenges are:

1. **Social challenges:**

- Difficulty for some teachers to deal with distance learning due to social factors.
- This hinders interaction and thus the failure of the distance learning process.
- Some parents are not convinced of distance learning and refuse to deal with educational institutions.
- This is due to a lack of awareness of the need to continue the educational process by all means.

2. **Foresight planning:**

- The frequent confusion and fluctuations in political decisions affecting the educational process are due to the lack of long-term planning.

3. **Technical challenges:**

- These include the lack of technological and technical skills among many teachers and students.
- This makes it difficult to carry out the tasks assigned to each of them.

4. **Economic challenges:**

- These include the existence of many poor families.
- This means they are unable to provide the devices that enable their children to follow the educational process remotely.
- In addition, there is weak spending on research and development in the field of educational technology.
- Without this, the reality of education would be much better.

Conclusion

- The necessity of continuous attention to the development of digital competencies among teachers in light of the current circumstances.
- This is in order to keep pace with all the developments of the technological era in the educational field.
- It is also to employ technology in the service of the educational and learning process.
- This cannot be achieved without the presence of competent teachers.
- The low technological skills of many teachers and their students.
- This has negatively affected the distance learning process.
- Benefiting from the model of electronic educational platforms in developed countries.
- This is to activate the principle of exchanging experiences and benefiting from different educational models in the world.

Recommendations:

To achieve flexible and effective access to the digital world, the Algerian government must consider a number of points, the most important of which are:

- **Providing the communication infrastructure** so that it does not hinder the implementation and application of the distance learning project in times of crisis.
- **Working on developing long-term educational plans for education and adopting electronic platforms.**
- **Working on training both teachers and students on how to use modern technologies in education.**
- **Training teachers in distance education.**
- **Encouraging learners to use electronic maps and process data electronically.**

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