

TECHNOLOGY-BASED EDUCATION IN THE 21ST CENTURY

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Abstract

The 21st century requires technology-based education to keep up with the rapidly globalizing world. The global government employs a variety of strategies to get pupils ready for the 21st century, which includes critical thinking, problem-solving, communication, teamwork, creativity, and innovation. The related topic area places a strong emphasis on developing competence in both personal and professional skills. 21st century skills include life planning, flexibility, adaptability, entrepreneurship, productivity, leadership, critical thinking, communication, and digital literacy. The use of instructional technology has advantages and disadvantages, just like any other advancement. With more and more tools being developed by educators and developers to raise educational standards, technology is already finding its way into classrooms.

Keywords: Technology-based education, critical thinking, problem-solving.

Introduction

Currently, educational systems are incapable of providing students with job opportunities and the necessary skills (Skills gap, including digital literacy gap). The teacher recognized that the existing educational standards are unsatisfactory in the business and industrial worlds. In the 21st century, teachers lack the skills to teach their students skills other than reading and arithmetic. The education system in Indonesia needs to be revised so that teachers can revise the curriculum and conduct workshops for teachers to teach students broader skills other than reading and arithmetic skills, such as the ability to analyze, think critically, solve problems, be able to work together in teams, communicate and be able to adapt to technology.

In 2015, students are encouraged to have many skills in order to face the future. According to a report by the Economist Intelligence Unit, an individual's knowledge, skill at solving problems, and workplace environment all have an impact on their capacity for

creative thought. Uncertainty surrounds the teacher's method for developing the learning exercises. Which teaching strategy will work best with this group of students?; How can a teacher get the younger population ready for the workforce? Nevertheless, currently educational systems struggle to provide job opportunities and skills, leading to skills gaps. Curriculum time allocation and tight educational authorities hinder 21st-century skills teaching. Teaching 21st-century skills like critical thinking, problem-solving, communication, cooperation, creativity, and innovation can be done in a variety of methods. (https://resources.finalsite.net/images/f_auto,o,q_auto/v1574706569/hunschoolorg/hzcheg9hjroaji9xeviv/HunResource-21stCenturyEducation.png)

Technology's influence on business and industry in the twenty-first century is growing rapidly. Due to the advancement of technology and the shifting kinds of skills and skill structures we encounter every year, it is difficult to know what skills will be in the future. To satisfy the 21st-century skill requirements, we are

unable to predict the difficulties graduates will face or the kind of employment they will need when they enter the workforce. A skill has many facets and is highly influenced by context.

Education is a process of learning or providing knowledge, aiming to develop one's own potential for future life. The problem is that in the future skills will become very important and needed. The idea of skills for the twenty-first century has acquired increased popularity as a result of shifting employment requirements and the changing role of education.

Due to the demand for quick access to information and the fulfillment of skill expectations that vary from those of the past in the twenty-first century, technology-based education is becoming more and more important and calls for transformation in the educational sector. A quality education energises change because it equips students with the abilities and information they will need to handle difficulties both now and in the future.

A. Technological Integration in Education

Technology integration is the process of incorporating technological resources and technologically oriented practices into daily tasks, labor, and school administration. Technological resources include hardware, infrastructure, software, and tools.

Common practices include collaboration, communication, internet research, remote access, and data transfer. Integration must be routine, seamless, efficient, and effective. (National Center for Education Statistics, 2002).

The efficacy of technology integration should be monitored for a variety of reasons. Technology is a tool to increase productivity and instruction, so its integration into a school is similar to that of any business environment in many ways. Effectiveness must be quantified,

but some of the most important effects can be challenging to quantify. Technology can increase worker efficiency for administrative tasks by eliminating tedious parts of complicated tasks or by enhancing system communication. The use of technology in the classroom has the ability to further significant educational objectives. It has been claimed that technology fosters project-based learning, encourages teacher-student relationships to change. It encourages the development of abilities like "Higher Order Thinking," research, and problem-solving. The most important rationale for monitoring, however, is the awareness that the impact of technology on schools depends on how well it is incorporated (National Center for Education Statistics, 2002).

B. Advantages and Disadvantages of Technology in Education

Education must adapt to technological advancements, incorporating information and communication technology in teaching and learning to enhance student learning and development. (Shatri, Z.G., 2020).

Through the sharing of knowledge and experiences, technology gives pupils the chance to learn and work together joint problem solving. Teachers should create focused plans and choose resources that adhere to the fundamentals of teaching when preparing for lessons that use information technology. Teachers need to be knowledgeable about different software, including how to use it, in what situations, how to arrange students' work, and what purposes it can accomplish. They must be proficient with computers to be able to design and handle effective learning environments that benefit students in these settings (Postholm, 2007).

Additionally, according to Borysiuk (2013), using information technology has benefits such as: 1) making an experience more interactive; 2) offering unlimited resources; 3) assisting in the development of skills that will be useful in the future; 4) conserving precious resources; 5) updating

information instantly; and 6) taking up little space (Borysiuk, 2013).

Borysiuk (2013) highlights the benefits of using information technologies in education, including increased motivation, individualization, objectivity, and creative development. They also promote information culture, decision-making, and online learning opportunities. Information technology offers teacher credibility, resource access, automation, collaborative learning, modern classrooms, data centralization, and flexibility (Galle, 2018). Technology may hinder class planning, delivery, cheating, and skill development. (Borysiuk, 2013).

Rintaningrum (2023:5–14) stated a number of benefits that students enjoy when learning English with technology, including the following: boosting the speed at which you respond to questions, raising test scores on the English language exam, developing and preparing online examinations, opportunity to write in English, practicing speaking in English, practising listening, practising reading, the use of e-mail, multi media presentation, online learning, online references, technology literacy, the use of computer application, learning another language, uploading and downloading materials, watching movies, obtaining the latest information, translation, coding, demonstrating new method of teaching, encouraging independent learning, encouraging collaborative learning, efficiency, becoming a member of a community or forum, improving vocabulary, searching new words, default setting, playing online game.

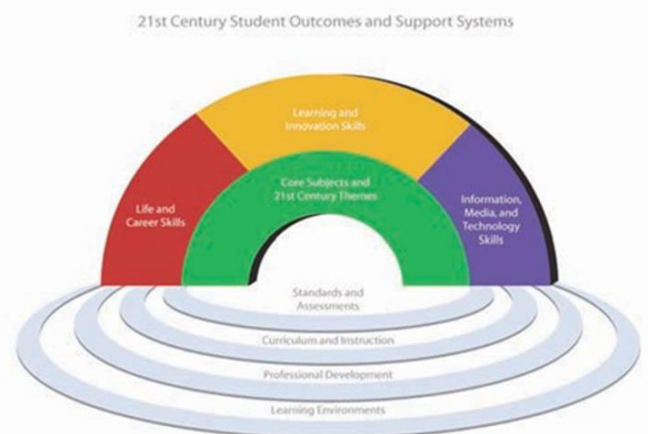
There are a number of disadvantages to information technology in the classroom, including: Distractions, cutoffs, cheating, unreliable resources, curriculum planning difficulties, teacher replacement, privacy concerns, medical issues, time loss, and dependence are potential disadvantages of information technology in the classroom. (Galle, 2018).

Students who misuse information technology by wasting hours on the computer playing games and engaging in meaningless activities like Facebook are a serious worry. There are no clear guidelines to guide these children toward appropriate behavior. Controlling children's internet use is largely the responsibility of the family. With their directions, teachers can encourage students to use for educational purposes, which is another crucial role they play.

C. 21st Century Skills in Some Sections of Life

21st-century abilities in several areas of life, such as creativity, problem-solving, communication, cooperation, and invention.

21st century knowledge-skills rainbow
(Source: Trilling dan Fadel, 2009)



21st-century transdisciplinary themes are similarly significant in improving knowledge of academic information at far higher levels than academic topic areas are (Trilling dan Fadel, 2009). These themes consist of:

- Global awareness, including knowledge of world concerns, different countries, and other cultures.
- Financial, economic, business, and entrepreneurial literacy, including the ability to make sound financial decisions and a grasp of how the economy affects

society.

- Civic literacy, or knowing how to exercise one's rights and responsibilities as a citizen and participate successfully in civic life.
- Understanding preventative measures for both physical and mental health is a component of health literacy, which also involves being able to receive, interpret, and grasp basic health information and services.
- Environmental literacy, which entails taking individual and collective action to address environmental issues; showing awareness of the environment and the conditions and circumstances affecting it.

Learning and Innovation Skills

21st-century abilities include critical thinking, problem-solving, communication, collaboration, creativity, and innovation, distinguishing students who are prepared for the complex world.

Information, Media and Technology Skills

Information literacy involves managing information flow, accessing, evaluating, and using technology for information gathering, management, and communication.

Life and Career Skills

If students want to navigate the challenging environments of both work and life, they must pay particular attention to learning the necessary life and career skills.

- Flexibility and adaptability; initiative and self-direction; productivity and accountability; leadership and responsibility; social and intercultural abilities.

D. Skills are needed in the workplace

As time goes by students life is formed

very differently because of the education system. It demonstrates a lack of concern for the knowledge and abilities required to comprehend the perspective that is now in place. A variety of crucial talents for the student's future are suggested by teachers, pupils, and authorities. A good example is that schools teach students to solve problems and understand perspectives according to the context of problems to deal with the real world.

According to Harvey in Wrahatnolo & Munoto (2018), graduate students need to possess a variety of talents in order to find employment, including: 1) have good communication skills, good at analyzing and good problem solving skills that help to get the job done. 2) Have high integrity at work. 3) Have skills appropriate to the job. 4) People who are willing to learn many new things.

According to Overtoom in Wrahatnolo & Munoto (2018), employees require abilities to increase the company's production, employees must be able to handle their own affairs, teamwork, problem solving and critical thinking.

E. Construct The Educational Systems:

Soule (2009) stated that "students need to be provided with hands-on learning that reflects real-world problems and possible careers in an interdisciplinary style" in Wrahatnolo & Munoto (2018). Each course needs to incorporate 21st-century abilities so that skill development is seamless. By using two languages, it can help oral communication skills. It promotes critical thinking, writing, network building, and public speaking among students. Students that are better in teamwork, communication and many other skills that make them successful anywhere, either in schools or in society.

F. Technology-Based Education in The 21st Century

Technology is now seen as an effective

tool for facilitating learning in the digital age, which is a growing worldwide trend (Ahmadi, 2017; Ahmani, 2019); (Zhang & Yu, 2021). It is a time when technology permeates every aspect of our lives. Additionally, according to Mohamad et al. (2020), Generation Z students are the majority of students in the 21st century who use information and communication technology (ICT) for their studying. These generations, who were born in the digital period, are typically adept at using and participating in social media games because they do not want to miss the newest, most popular information. These generations, also known as the "net-generations" (Tapscott, 2009), are referred to as multitasking digital generations because they can carry out multiple tasks at once. For instance, they can chat with friends on Zoom while doing their homework, talk on the phone, answer messages, listen to music, check and respond to emails, and so forth. However, in this instance, the information being received is not beneficial for pupils when they are studying or completing coursework. Students usually lose focus due to their constant online activity, which might result in incomplete homework. (Adams, 2007). This demonstrates the need for technology users to exercise caution when utilizing the resources at their disposal to prevent experiencing unanticipated results.

The term "digital natives" refers to a generation that was born and raised in an era of widespread digital technology or rapid technological change (Creighton, 2018; Yong & Gates, 2014; Janschitz & Penker, 2022). EFL (English as a Foreign Language) students fall under this category. As newbies to the electronic world, EFL instructors and the parents of these students are viewed as digital immigrants (Kurniawati et al., 2018; Riegel & Mete, 2018; Hoffmann et al., 2014).

G. Digital Users

To keep up with the trends and stay relevant in the digital age, it is crucial for a digital immigrant to react positively to technological innovation. Using new technologies can increase one's productivity, efficiency, and social interaction. Furthermore, being open to new technology can improve one's ability to comprehend and interact with younger generations who are raised in a digital environment. Several applications that students could use such as: Duolingo, English central, Grammarly, BBC World, etc.

Learning about the most recent technical developments and innovations online through blogs, forums, and social media can be the first step towards becoming a technology lover or techno geek. To obtain practical experience and meet other tech aficionados, s/he might also go to technology conferences, workshops, and seminars. However, if s/he reacts negatively to technological improvements, it may result in technophobia, which can impede both his/her personal and professional development. It is crucial to get over this anxiety by learning about technology and how it affects society and the environment.

Additionally, some people might have had bad digital experiences in the past, such as losing crucial data, running into technological issues, or running into online threats like hacking or identity theft. These bad experiences can make people reluctant to utilize technology or afraid of the dangers it might pose. Technophobia can also be exacerbated by media coverage of detrimental effects of technology, such as cyberbullying or social media addiction. This causes people to equate technology with unfavorable outcomes.

Methodology

This study is a qualitative descriptive or library study, utilizing literature such as books, notes, and research papers. Documentation study uses documents,

such as diaries, private letters, reports, and minutes, to collect data. The importance of documentation depends on its relevance to the study's core subject (Iqbal Hasan, 2002).

1. Information and Data Sources

According to Iqbal Hasan (2002: 11) Documentation study is a data collection method using documents, such as diaries, private letters, reports, and meetings, to gather information. The importance of documentation depends on its relevance to the study's core subject.

2. Data Collection Methods involve gathering information from various sources, including notes, transcripts, books, letters, articles, and research papers on technology-based education in the 21st century. The author then analyzes this data through the internet and other sources to draw conclusions about the issue being investigated. The process involves gathering existing data and examining the facts to draw conclusions about the topic.

3. Data Analysis

The study used descriptive analysis to gather and compile data, focusing on words, images, and qualitative methodologies Lexy J. Moleong (2006: 11). Data processing and quotes will be included in the research report to provide a general overview of the presentation. Content analysis was employed to examine descriptive data in terms of its content, as it is often examined in terms of its content. Both techniques were employed to provide findings and provide a comprehensive understanding of the research.

Finding and Discussion

We must establish educational systems if we want to create technology-based education in the twenty-first century (Soule, 2009). Each course needs to incorporate 21st-century abilities so that skill development is seamless. The use of dual language, local and foreign

language, in the learning processes of all disciplines can help to develop oral communication abilities. It promotes critical thinking, writing, network building, and public speaking among students. Students that are better in teamwork, communication, critical thinking, problem-solving, creativity, and innovation in relation to their subject matter will typically succeed more in school, at work, and in society.

Implications for teachers are:

(1) Teachers can develop communication skill, collaboration, critical thinking, problem solving, creativity & innovation, and change their pedagogical aspects.

(2) Teachers need to improve skills to enable them to effectively teach content & skills.

(3) Teachers should teach students how to work effectively.

Language training tools enhance individualized experiences, improving student acquisition. The opportunities for using technology into language training are numerous, ranging from language learning apps to virtual language exchange programs. It is crucial for educators to stay current with these technologies and incorporate them into their teaching techniques in order to give their students the best learning experience possible as technology advances and becomes more widely available.

In the twenty-first century, education is more crucial than ever to make sure that students can learn and innovate, use media and technology, and work and survive by applying life skills.

The first step in implementing the 21st-century education concept is to adopt a curriculum structure that includes required subjects designed to develop students' competency in technology and information media as well as their learning and creativity skills.

The accompanying subject area is focused on developing competency in life and job skills.

Conclusions

According to the definition above, it can be concluded that 21st century talents include digital literacy, entrepreneurship, leadership, flexibility, and adaptation in addition to life planning. It is clear from the text above that 21st-century education encourages students to pursue a degree as well as acquire the necessary life skills to get by in the world. Students also receive supporting subjects in addition to the required ones. Supporting courses are designed to help students develop abilities that will be valuable in the future. For instance, in the workplace, having the above-mentioned 21st century student outcomes and support systems is necessary in addition to being academically intelligent.

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