

Culturally Relevant Teaching in the Digital Age: Student-Centered and Personalized Learning in Developing Countries

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Abstract

The significance of digital technology and personalization in educating digitally underrepresented students is nowadays paramount. Various documents from developed countries, with the aim of transforming teaching and learning practices in underdeveloped nations mentioned the importance of conforming education in underdeveloped countries with the one in developed countries. The purpose of this study was to find out the importance of culturally relevant teaching (CRT) and personalized learning in underdeveloped countries in this digital age, to contribute towards achieving quality education in underdeveloped communities worldwide, and to preconize effective teaching and learning of concepts. Research published on these specific topics indicated that digital technology associated with CRT and personalized learning positively impacts the lives of digitally underrepresented communities. Teaching strategies such as Adaptive Learning Technologies (ALT) and Universal Design Learning (UDL) enhance teaching and learning in digitally marginalized communities and equip technologically marginalized students with the necessary skills to thrive in the digital age. The importance of adapting the curriculum and instruction of school systems to these unique educational environments, considering the importance of culture, individualized teaching and learning emphasizing digital era application has been found indispensable. The result of this work may inform and encourage educators, policy makers and Government officials about instructional strategies to implement in the classroom to meet the learning needs of every student. This calls for adopting personalized learning and culturally responsive teaching practices for the overall performance of all students. Recommendations are included.

Keywords

Culture, Teaching and Learning, Curriculum, The Digital Age,

1. Introduction

We are living in a digital age. To survive, learners in this era must manage to update their skills, the skills of the 21st century world. Underdeveloped and emergent countries do not have all the necessary infrastructure to educate their students for the digital age. To prepare their students for the challenges of the digital age, teachers must understand the current teaching conditions and ensure that students are actively engaged in their learning, just like their peers in developed countries. It is important that educators of this era connect the digital age culture with the culturally relevant teaching of underdeveloped countries in applying personalized learning. This means applying the teaching practices that take into account students' cultures and personalization.

How can educators in developing countries lead their schools to educate their students in this ever-changing digital age? How can teachers make sure every student is learning at his or her own pace to meet the skills and overcome the challenges of the digital era? How can culturally relevant teaching and personalized learning contribute to learning efficacy in developing countries?

2. Literature Review

2.1. Background

Culturally relevant teaching refers to an instructional approach that considers students' cultural backgrounds, experiences, and perspectives to provide an inclusive and effective learning environment. Culturally responsive teaching is an evidence-based method that acknowledges the essential role of culture in the learning process. It facilitates the integration of students' cultural backgrounds and life experiences into the educational process. According to Will & Najarro (2022), culturally responsive teaching combined with personalized learning ensures that instructors and the education system effectively address the diverse needs of all students. CRT fosters a sense of easiness and relaxation among students in the educational setting. However, teachers often fail to recognize the tribal cultural differences that impact their students in the classroom.

2.2. Culturally Relevant Teaching

2.2.1. Theoretical Framework for Culturally Relevant Teaching

Culturally relevant teaching, also known as culturally responsive pedagogy, offers numerous benefits to students. This pedagogical approach improves each student's social, emotional, and academic growth and eliminates frustrations. This approach achieves success by:

- 1) Enhancing cognitive function, as neuroscience research reveals that culture significantly shapes the cognitive processes of the brain. The book "Culturally Re-

sponsive Teaching and the Brain” by Hammond (2015) explores how to effectively engage and challenge culturally and linguistically diverse students. This understanding does not mean that educators must master all the cultural differences in their communities.

2) Nurturing the development of critical thinking and problem-solving abilities; Acknowledging and appreciating the varied experiences and cultural viewpoints that students bring to the classroom helps establish the groundwork for fostering student cultural behavior.

3) Fostering a feeling of inclusivity and security; research has indicated that establishing a sense of connection and safety among students is a crucial factor in facilitating the learning process. Center for Disease Control (CDC) (CDC, 2019) opines that School connectedness refers to the perception that students have of adults and peers at school, demonstrating genuine concern for their academic progress and personal well-being. This encompasses a feeling of receiving care and assistance, as well as a sense of belonging in the school environment. Schools play an important role in improving children’s health and development, and they can take measures to foster a sense of connection among students. Sharing students’ own culture with their peers and even with educators enhances cultural learning.

4) Enhancing and reinforcing ethnic and racial identities: Implementing culturally responsive education fosters and encourages students’ sense of ethnic and racial pride. When students experience a sense of belonging and easiness within the educational environment, they will cultivate the capacity to communicate with tranquility and assurance. Students will freely express their opinions and ideas without fear of exclusion or marginalization (Rivas-Drake et al., 2014).

2.2.2. Research on Culturally Responsive Teaching

A comprehensive analysis of recommendations has identified culturally responsive techniques in five crucial domains: discourse, cooperation, visual representation, explicit teaching, and inquiry. It continues to encourage teachers to apply these suggestions with a critical and responsive approach that integrates students’ cultural knowledge and real-life experiences. Establishing classrooms that foster culturally responsive and efficient teaching is based on the concept of literacy as a social activity, resulting in fairer learning opportunities across all subjects (Piazza, Rao, & Protacio, 2015).

Three academics from a university in the Midwest, USA, worked together to compare research publications in the areas of teaching English as a second or other language, special education, and multicultural literacy education. Although the analysis was methodical and focused on academic journals that provided information to United States educators in their disciplines of education, it was not a thorough evaluation of the literature. The qualitative synthesis and review of publications were guided by a sociocultural theoretical framework (Au, 2011; Luke, Woods, & Dooley, 2011; Perry, 2012). The convergence of instructional ideas shows that viable instructional techniques that will successfully support di-

verse learners are becoming increasingly accepted across disciplines.

According to some academics, there isn't much data supporting culturally responsive instruction for students from varied cultural, linguistic, and cognitive backgrounds (August & Shanahan, 2006). Nonetheless, there are academic studies that offer insightful information about teaching strategies that promote better student outcomes when teachers focus on students' identities, linguistic and cultural backgrounds, and outside-of-school literacies (Anderson & Sadler, 2009; McIntyre & Hulan, 2013; Piazza et al., 2015). Based on qualitative research, the study offered insights into evidence that could subsequently assist additional research on convergence in other domains with respect to diverse learners and culturally responsive literacy training.

Studies of literature are by no means comprehensive. The results do, however, draw attention to the commonalities in suggested teaching strategies that support fair and culturally sensitive literacy education for every student. When trying to design relevant learning experiences for a variety of student populations, teachers cannot rely solely on commonly used methods. To adapt these instructional guidelines to work for different student populations, teachers will need to take a critical and culturally sensitive approach (Piazza, Rao, & Protacio, 2015).

Gay (2010) suggests that opportunities for teachers to adjust for learner variations are included in the five resources in which instructional methods are listed in the examination of academic publications. In all three disciplines, it is strongly advised to design classrooms that encourage student participation and communication since this reflects the idea of literacy as a social practice.

Teachers must dedicate time to familiarizing themselves with pertinent documents about students' cultures to successfully follow guidelines. Teachers must navigate cultural and digital disparities to establish connections with students and create effective and meaningful instruction, given the changing student demographics and widespread use of technology throughout the world. This qualitative study examined how a middle school teacher and his students in two summer school English classes engaged with and reacted to a novel technology-based instructional approach. Culturally responsive teaching (CRT) guided the approach, which aimed to connect the students' lives outside of school to the classroom. The results indicated that engaging students in a culturally responsive teaching method using student-created videos enhanced the involvement of both the instructor and the students in integrating the home and school environments within a CRT framework (Mackay & Strickland, 2018).

According to research, instructors should create a place in their classrooms for students' preferred forms of communication so that their digital and physical identities can develop to be culturally sensitive in their increasingly varied adolescent classrooms. When teachers open up about themselves in the classroom, they set an example for students about how important it is to bring their lives into the classroom and help them make a clear connection between their lives outside of school and the classroom (Palfrey & Glasser, 2008).

Three themes surfaced because of culturally responsive teaching, which encourages purposefully appreciating students' settings during instruction. Initially, the teacher's and students' goals to link the home and school environments were made public. Second, connections were made public. Relevance was defined third. Additionally, the intricate process of culturally responsive teaching—which incorporated students' perspectives and knowledge—emerged when the findings were challenged by the study questions (Mackay & Strickland, 2018).

Students displayed and discussed their favorite pastimes, activities, personal collections, and material possessions, as well as the destinations they like to visit. By rejecting what the students decided to share, teachers demonstrated their desire to be relevant to the pupils. The teacher-student exchanges uncovered different conceptions of relevance, or the linking of classroom subjects to their lives outside of school, regardless of race, ethnicity, or home conditions. This was done because adolescents are accustomed to using digital technology to communicate their social lives (Bartholomew & Reeve, 2018). To further improve relevance in the middle school classroom, teachers indicated that relationships and relevance in the classroom needed to be further investigated to successfully connect kids' home and school contexts. As students and teachers strive for relevance in their educational environment, the next challenge is to prepare teachers to convert home-school disconnections into practical comprehension of their students' settings and lives (Mackay & Strickland, 2018).

Culturally relevant education, as a potent approach, enhances student accomplishment and engagement. However, the evidence supporting its effectiveness is mainly based on case studies of exceptional classrooms. Furthermore, most of the research neglects to consider the viewpoints of students. This study examined the effectiveness of culturally relevant teaching by analyzing student views of classrooms with different levels of culturally relevant activities. The inclusion of culturally relevant instructional elements has a strong correlation with both academic achievement and the formation of ethnic-racial identity. The results offered evidence for the efficacy of culturally appropriate instruction in regular classrooms (Byrd, 2016). This efficacy can augment students' performance when teachers practice personalized learning, specifically with students from underdeveloped countries. Digital age brings novel knowledge to underdeveloped countries' education environments. Those changes and challenges cannot be ignored; instead, they should be considered seriously.

One effective strategy for raising student engagement and accomplishment, as well as closing achievement gaps, is culturally appropriate teaching. However, case studies of excellent classrooms make up most of the research showing their efficacy. Furthermore, most of the research ignores the viewpoints of the students. Academic results and the formation of ethnic-racial identities were substantially correlated with aspects of culturally relevant instruction. The results lend credence to the efficacy of culturally sensitive instruction in regular classroom settings (Byrd, 2016).

Some scholars contend that culturally relevant instruction, which emphasizes academic success by appreciating students' interests and prior knowledge, is simply "good teaching." However, students of color are less likely to experience these types of effective instruction, which contributes to the persistence of achievement gaps (Ladson-Billings, 1995; Sleeter, 2012). There is proof that culturally appropriate instruction enhances student involvement and academic success in academic performance (Christianakis, 2011; Ensign, 2003; Rodriguez, Jones, Pang, & Park, 2004).

Notwithstanding these encouraging results, the current body of research has three significant limitations (Sleeter, 2012). Nearly more than 40 published papers and dissertations examined in a recent study (Aronson & Laughter, 2015) were qualitative case studies examining the teaching methods in classrooms chosen for their emphasis on culturally relevant instruction. Only one study and only two research included pre- and post-tests to gauge improvement in student academic outcomes (Bui & Fagan, 2013; Rodriguez et al., 2004). Comparing classrooms that use more and those that use less cultural teaching is necessary to estimate the genuine effects of this approach. Research must consider the viewpoints of students since appreciating their experiences is a key component of culturally relevant instruction (Byrd, 2016).

According to the current study, the answer to the question of whether culturally relevant instruction is effective is positive. Better academic results are linked to teaching strategies that foster understanding of diverse cultures and make connections to students' interests and real-world experiences. Additionally, the development of students' ethnic-racial identities is linked to promoting their awareness of racism and prejudice as well as their comprehension of their own culture. The results suggest several practical suggestions (Byrd, 2016).

2.3. Student-Centered Learning

2.3.1. Student-Centered Learning in the Digital Age

Traditional classrooms assume that all students have the same learning styles and abilities without considering their unique qualities, such as their individualized learning styles, strengths, limitations, and past knowledge. Consequently, some students may require more time and repetition to comprehend things, while others absorb them easily and make progress. Unfortunately, those who have a slower learning pace or restricted comprehension skills encounter challenges in keeping up with their classmates, leading to emotions of frustration, inadequacy, demotivation, and disengagement. This situation may lead to a perception of insufficient stimulation or excessive complexity, which can create negative attitudes towards school and hinder academic advancement for adolescents with untapped skills (Ginting et al., 2024). Adaptive instruction, commonly referred to as Adaptive Learning Technologies (ALT), has emerged as a viable approach to tackle this challenge. This practice covers the meaning of personalized learning, which is an instructional approach that tailors the educational experience to meet the specific needs and abilities of each student. The concept is based on the idea that every

student learns in a distinct way and at their own pace. Therefore, teachers should customize instruction to suit the unique learning styles, interests, and skills of each student.

Despite the widespread recognition of adaptive education, instructors encounter challenges when implementing it effectively in their classrooms. A study revealed that educators from various countries rarely modify their teaching methods to cater to the individual needs of each student. To improve student outcomes, it is crucial to have access to supplementary knowledge on how to effectively utilize strategies (Ginting et al., 2024).

2.3.2. Student-Centered Learning Benefits

One significant benefit of the student-centered learning (SCL) approach is that it provides students with more opportunities for decision-making, allowing them to take a more active role in their education. This allows students to cultivate essential and pragmatic abilities such as analytical reasoning, problem-solving attitude, creativity, and efficient leadership. Student-centered learning offers improved flexibility for small groups or virtual learning, a factor that has been more important in recent years (Fox, 2022). These benefits can be enhanced when teachers use personalization approach that means focusing on individual student interests. SCL can play a crucial role in introducing complex technology to indigenous communities for the first time. The key to success lies in the approach taken.

2.3.3. Teaching Styles for Student-Centered Learning

According to Vahey (2022), a student-centered classroom, sometimes referred to as learner-centered instruction, provides a greater level of personalization in comparison to typical classrooms. Student-centered educational techniques may seem less structured and less formal in comparison to traditional instruction. Collaborative student work, research, and the production of non-traditional assignments can all contribute to a chaotic and noisy classroom environment. Adaptive Learning Technologies and Universal Design Learning, these tools and this concept, can be used methodically to focus on one-on-one teaching and learning. Nevertheless, it is crucial to acknowledge that there are still limitations in effect.

The teacher's primary duty is to ensure that students actively engage in the learning process rather than passively listen to the teacher's lecture in a silent classroom. This entails actively engaging with complex subjects and collaborating with fellow students while also fulfilling their educational obligations. The teacher may also realize that in a student-centered classroom, they may not have the answer to every question that arises. This is beneficial as it allows the instructor to showcase the process of learning in an authentic setting. SCL can make the introduction of digital learning easier for students who are new to it. It can provide students in underdeveloped countries with two ways to learn: learning content and immersion in new technologies.

In a student-centered classroom, genuine learning occurs when students actively engage with subject matter such as mastering difficult concepts, the learning

process through methods such as group work or classroom debates, and the demonstration of their competence. Student-centered instruction is defined as an approach that emphasizes placing students at the heart of the educational experience. Vahey (2022) notes that a wide variety of learner-centered classrooms commonly employ certain techniques, such as:

1) Fostering and cultivating the articulation of students' viewpoints and the capacity to exercise judgment: Facilitating student involvement in classroom decision-making, such as choosing the structure of a learning product, is essential for implementing a student-centered approach. Students can receive increased autonomy as they gain a deeper comprehension of their role in classroom decision-making and acknowledge their responsibility to uphold academic rigor. Digital technologies and personalized learning as learning opportunities of the moment can help students consistently improve their skills.

2) Offering distinctiveness or uniqueness approach: Every child is unique, and student-centered educational techniques acknowledge and utilize this reality. A student-centered approach to teaching acknowledges the range of talents and experiences that students bring into the classroom as valuable assets, rather than viewing them as weaknesses that require fixing. The Universal Design for Learning (UDL) methodology establishes criteria for fostering student involvement (the rationale for learning), presenting information (the content of learning), and facilitating student participation and demonstration (the methods of learning). Several mediums, such as text, simulations, and animations, convey information and concepts, and these teaching practices can greatly improve personalization in teaching and learning and every student's performance. Without immersion in digital technology and consideration of student culture and personalization, students in underdeveloped countries may fall behind in adapting to the new era.

3) Providing relevant skills: A learner-centered approach necessitates learners' active participation, fostering collaboration and cooperation as they engage in shared problem-solving activities. As students acquire the skill of collaboration, certain individuals who typically remain silent in class may demonstrate unforeseen abilities while working together with their classmates. Digital technologies are novel tools and attractive to students and can facilitate and reinforce teaching and learning practices.

4) Encouraging students to participate in active, constructivist learning with digital technologies such as Adaptive Learning Technologies. Evidence suggests that students acquire knowledge through active engagement and understanding construction. Teachers can actively involve students in their learning in a profound and significant way by:

a) Assisting them in accessing and utilizing their existing knowledge and personal experiences.

b) Motivating students to expand on their interests, such as by empowering them to determine how to utilize their knowledge in a project or task.

c) Anticipating students to face challenges during the learning process.

d) Guiding students through their constructive challenge with a novel thought or idea, without explicitly revealing the correct solution.

e) Delegating initiatives that require creative thinking and problem-solving rather than simple, step-by-step activities.

5) Utilizing diagnostic and formative assessments: Although summative exams are sometimes required to assess students' knowledge and skills after learning has taken place, they are only one type of evaluation. In a student-centered classroom, it is advisable to employ a variety of evaluation methods, including diagnostic tests to identify student strengths and areas requiring support before introducing new concepts or skills. Applying digital technologies can enhance teaching and learning processes of students in underdeveloped countries.

6) Utilizing technology to implement strategies that prioritize the needs and interests of students and to enhance and support the implementation of various initiatives aimed at creating a truly student-centered classroom. Technology possesses the ability to customize assignments based on students' areas of need or areas where they can find motivation to enhance their learning.

2.4. Adaptive Learning in the Digital Age

In the digital age, adaptive learning has become a potent instrument that is transforming education by providing learner-centered and individualized experiences. Adaptive learning is a powerful tool that can improve learner engagement, mastery, and lifetime learning by customizing training, offering ongoing feedback and evaluation, and utilizing data-driven insights. Adaptive learning has enormous potential to influence education going forward by guaranteeing that each learner has a truly unique and significant educational experience as technology develops (Johnson, 2023).

Adaptive Learning: What Is It?

Adaptive learning is a methodology that automatically modifies students' learning experience according to their performance and behavior using data and analytics. Put differently, each student's needs are catered to by the system, which makes individualized recommendations for activities and learning materials based on each student's strengths and shortcomings.

1) Typical Tasks

Students may participate in various activities in an adaptive learning environment to advance their knowledge and abilities. Games, quizzes, multimedia presentations, and interactive simulations are a few examples of these.

2) Sample Tasks

In an adaptive learning environment, assignments may be created to give students rapid, focused feedback on how they performed, enabling them to see where they need to improve and concentrate their efforts. For instance, to gauge their comprehension of important ideas and abilities, students may be required to finish several tests or quizzes.

In addition, they can be expected to finish a series of practice tasks meant to

help them become proficient in a particular skill or a diagnostic test meant to pinpoint their strengths and shortcomings.

3) Sample Evaluations

In an adaptive learning setting, assessments might be made to give students instant feedback on how they performed, enabling them to see where they still need to grow. For instance, to gauge their comprehension of important ideas and abilities, students may be required to finish several tests or quizzes.

2.5. The Benefits and Drawbacks of Adaptive Learning

2.5.1. Benefits

It offers individualized suggestions for educational resources and activities based on the needs of specific pupils. It can assist students in determining where they should concentrate their efforts, enabling them to advance their knowledge and abilities more rapidly. It has the potential to be more participatory and interesting than standard classroom instruction.

2.5.2. Drawbacks

Effectiveness necessitates a large volume of data and analytics, which can be difficult to establish and maintain. Students who prefer a more traditional or regulated learning environment could find it less successful. It may be costly to create and implement.

2.6. Personalized Learning

According to the [Department of Education \(2014\)](#), the term “personalized learning” describes training where each learner’s needs are considered while determining the speed and method of instruction. This sounds exactly like adaptive learning in action.

2.6.1. The Following Define the Goal of Individualized Learning

By adjusting the teaching environment—what, when, how, and where students learn—to each student’s unique requirements, abilities, and interests, personalized learning aims to enhance student learning. This is essentially the same as adaptive learning ([Department of Education, 2017](#)).

2.6.2. Look at the Common Elements

Education is a dynamic process. Learners are not required to follow a set pace; they are free to go swiftly through the material or take their time. Stated differently, the learner actively participates in customizing their educational journey according to their interests and requirements.

2.6.3. Typical Tasks

Students may participate in a variety of activities intended to support them in pursuing their interests and goals in a personalized learning environment. These could consist of self-paced learning modules, group projects that need collaboration, independent research projects, and experiential learning exercises.

2.6.4. Sample Tasks

In a personalized learning setting, assignments could let students research subjects they're interested in or work toward personal goals and objectives. For instance, students may be required to create their learning module on a certain subject or skill or to conduct research on a given topic.

2.6.5. Sample Evaluations

In an environment where instruction is tailored, assessments may be created to provide students with the opportunity to show that they grasp a particular subject or ability in a way that makes sense to them. Students may be required, for instance, to construct an assessment tool that is specific to their learning needs or to produce a multimedia presentation or film on a subject that piques their interest.

2.7. The Benefits and Drawbacks of Personalized Learning

2.7.1. Benefits

In comparison to typical classroom-based learning, it can be more interesting and encouraging for students to follow their interests and aspirations.

Compared to traditional classroom-based learning, it can be more flexible and adaptive, enabling students to learn at their own pace and in their own style.

It can improve one's capacity for creativity, critical analysis, and problem-solving.

2.7.2. Drawbacks

Putting it into practice in large courses or with little funding might be difficult.

It needs to be carefully planned and prepared to guarantee that students have access to the tools and assistance they need to achieve their learning objectives.

It might only be appropriate for certain pupils, especially those who would rather learn in a traditional or more structured setting.

2.8. Comparing Personalized and Adaptive Learning: Important Distinctions

While there are some similarities between customized and adaptive learning, there are also some significant distinctions between the two strategies. The primary distinction is how the student influences their educational process. In an adaptive learning environment, the system adjusts to the needs of the student by making individualized recommendations for activities and learning materials based on their strengths and shortcomings. Students actively design their educational experience in a personalized learning environment according to their needs and interests.

The analytics and data needed for each strategy's support represent yet another important distinction. Personalized learning materials and activity suggestions are provided via adaptive learning, which mostly depends on data and analytics to monitor student behavior and performance.

However, from a design perspective, it's difficult to tell the difference between

the two at this point. These approaches are almost certainly combined. However, interest in “personalized learning” in K-12 education is expanding.

Since computers make it easier to give one-on-one training—the single biggest barrier to adjusting instruction to meet the requirements of individual learners—personalized learning has gained enormous traction in this digital age of education (Johnson, 2023).

2.9. The Difficulties

The way education is set up (with lots of kids in a single classroom). The stakes (There is no shortage of opinions on how best to teach, from parents, teachers, administrators, and the public, since schooling influences children’s college and career choices). To effectively implement adaptive learning, it is useful to look at the difficulties teachers encounter while implementing personalized learning in the classroom (Johnson, 2023):

1) Providing Tailored Education to a Packed Room of Learners

The majority of schools are set up with set class periods, during which a teacher and a group of students—sometimes as many as thirty—share a room. Given that every student is unique, how are their requirements met? Some of the solutions include combining teacher-led whole-class instruction, solo study, and small-group activities. However, because they must ensure that every student receives the instruction they need, teachers find the logistics to be exceedingly challenging.

2) Providing Just and Equitable Guidance

When students are provided with a variety of learning opportunities, how can one group be prevented from using an excessive number of instructional resources at the expense of other populations? Many of the tactics in K-12 personalized learning involve extensive data collection and diagnostic analysis to show that it provides equitable chances for all students. It takes up a great deal of work. It is inevitable, however, that the topic of equity and fairness will come up.

3) Deciding Which Directions to Provide

In a K-12 context, instruction is typically assigned following an assessment of students’ skills and knowledge. But this is still art, and determining what someone needs to reach a certain, arbitrary level of proficiency is often difficult. Is it accurate to say that this test gives an adequate indication of how well each person understands the material? There will always be some subjectivity. Moreover, it is ineffective to let students make the choice because so few of them possess the requisite information

4) Assessing Achievement

Since a child only completes K-12 schooling once, unrestricted experimentation is dangerous. The risk is too high to teach a group of third graders full-time for a single semester. How do we generalize from our test chamber, considering the Hawthorne effect that comes with tiny populations and few interactions?

Furthermore, even if we manage to give everyone individualized instruction, how can we be sure that every educational experience is fruitful? How do we link

students' scores to their education when testing appears to be universal, such as the Scholastic Aptitude Test (SAT), yet every learning route is unique? Furthermore, results may be correlated with our classification of the pupils rather than the training.

2.10. Digital Age Learning

2.10.1. Digital Learning Approach to Teaching

The pandemic has emphasized the advantageous impacts of incorporating digital learning throughout the curriculum. In addition, numerous instructors have discovered strategies that have enhanced the engagement and achievement of students who face economic disadvantages and belong to minority communities. These practices include using asynchronous digital tools to remove obstacles to student participation and improving content modularization to enable the customization of learning paths based on desired learning goals.

A student-centered learning approach is an educational methodology that prioritizes the student's role in the learning process, highlighting their active involvement and commitment to obtaining knowledge and skills. Discussions within the educational sector often revolve around measures that instructors might employ to improve their instructional efficacy. Although there is constant discussion regarding the benefits and drawbacks of traditional versus non-traditional schooling, it is undeniable that some students require different teaching methods. Many educators are incorporating the student-centered approach to learning into their curriculum through various methods. Student-centered learning is an instructional technique that focuses on connecting students' interests with the educational content they gain in a learning environment. The main goal is to amplify the importance of the educational process for students. A highly effective strategy to accomplish this is to offer courses that cater to individuals' specific interests, promoting greater involvement with the material and encouraging improved learning results (eSchool News, 2024).

2.10.2. Importance of Effective Teaching, Teacher Training, and Student Learning

Digital technology theories assist educators in comprehending the process of student learning and the optimal integration of technology into the learning process, specifically when utilizing digital technologies to enhance teaching and learning. Various influential learning theories have been modified or extended to suit the demands of the digital era (eSchool News, 2024):

- 1) Constructivism is an educational approach that emphasizes collaborative and inquiry-based learning bolstered by technology in the digital age.
- 2) Connectivism suggests that learning is a process that occurs through networks.
- 3) Universal Design for Learning (UDL) focuses on offering a variety of ways for different types of learners to understand information, participate actively, and demonstrate their knowledge.

2.10.3. Five Essential Competencies for the Digital Era

The following lists the five fundamental digital abilities required in the digital era:

1) Digital literacy refers to the proficiency in using and maneuvering digital instruments, such as computers, software, and online platforms, effectively. Furthermore, digital literacy encompasses the essential skill of critically assessing information obtained from the internet.

2) The ability to effectively find, evaluate, and use information from a variety of sources is known as information literacy. Knowledge literacy encompasses the capacity to differentiate reliable sources, assess facts, and integrate knowledge to make well-informed decisions.

3) Critical thinking is the ability to examine, assess, and combine information to make logical and well-founded conclusions. In the digital age, critical thinking is crucial for effectively solving problems, making decisions, and comprehending intricate matters.

4) Creativity is the cognitive capacity to engage in inventive thinking, produce novel concepts, and tackle difficulties with a unique outlook. Creativity holds significant value in the realms of problem-solving, creative thinking, and the ability to adjust to change in dynamic contexts.

5) Communication skills are the ability to effectively convey information through various digital mediums, including written, oral, and visual communication. This skill involves the capacity to articulate concepts, cooperate with peers, and participate in virtual dialogues. These competencies must be taught to students in underdeveloped countries to bring them closer to the digital abilities of their peers in developed countries.

2.10.4. Effective Teaching in the Digital Age

This refers to the current era in which technology and digital communication play a central role in several aspects of society, including business, education, and personal life. The Digital Age, often known as the Information Age, pertains to the increased focus on electronic manipulation of information that has a significant impact on the global economy, like how the production and trade of physical items influenced countries during the industrial age. The introduction of personal computers closely links the Information Age, also known as the Computer Age, the Digital Age, and the New Media Age. The concept of the Information Age posits that the current era in human civilization is primarily characterized by the ability to access and manipulate information, as proposed by [Tucci \(2014\)](#).

The precise concept of digitalization refers to the process of transitioning a corporation into the digital era by adopting technology that enhances the organization and increases its competitiveness in the market. Digitalization in education refers to the utilization of digital technologies to enhance and facilitate the process of teaching and learning ([Thomas, 2019](#)).

From a pragmatic standpoint, it would be erroneous to exclusively prioritize the educational attributes of technologies. Additionally, there are social, organizational, financial, and accessibility factors that must be considered. Specific cir-

cumstances, personal values, and beliefs primarily influence the choice and implementation of technology for educational purposes, rather than solely relying on empirical data or rigorous theory (William, 2015).

Individuals can delve into a wide range of topics, carry out investigations, and interact with educational materials that go beyond the typical resources found in a classroom setting. K-12 students can engage in global collaboration and communication with their peers and educators through online platforms, which helps cultivate a feeling of interconnectivity. They are educated on digital citizenship, emphasizing responsible and ethical use of technology. This includes imparting knowledge on different topics.

2.10.5. Challenges and Constraints

Selecting appropriate technology for educational instruction and learning presents a significant challenge. In the era of digitalization, we find ourselves fully engrossed with technology (William, 2015). Helping educators and trainers thrive in the digital era is crucial. In an era of digital technology, educators and trainers have the challenge of educating children from diverse cultural backgrounds with varying learning styles, skills, and capacities. The emphasis is shifting from viewing knowledge as static information to viewing it as a dynamic and ongoing process. To cultivate the necessary skills and competencies for a society that relies on knowledge, it is essential to select teaching methods that are suitable. Additionally, due to the ever-evolving nature of technology, instructors must possess analytical frameworks to aid them in effectively choosing and utilizing technologies for educational purposes (William, 2015). These assertions equally concern teachers of both underdeveloped and developed countries.

Like any pedagogical method, there are advantages and disadvantages. A crucial topic concerns the decrease in the teacher's responsibilities and power within the classroom. By granting students decision-making authority, there are apprehensions that they may veer away from the prescribed curriculum or pursue expedient methods, which could potentially result in diminished course quality and academic achievement. While acknowledging the legitimacy of this anxiety, it is important to note that a well-executed student-centered and personalization plan would not lead to this situation. Teachers are not only delegating all work to students, but instead broadening the dialogue to involve them more actively, and digital learning offers further possibilities. Furthermore, the challenge lies in identifying the factors that distinguish a rigorous and advantageous project from an easy and less challenging one. Pedagogical approaches can overcome challenges and constraints.

2.11. Limitations

This investigation had certain limitations, most of which had to do with the dearth of preliminary studies on individualized learning conducted globally. Research on developed countries is the only source of documentation and scientific output related to digital learning, student-centered learning, and individualized learning.

All we could do was speculate as to how these studies' findings may apply to the real world of developing nations.

3. Conclusions

It may appear that a student-centered classroom entails a teacherless and casual encounter, but a student-centered or personalized learning approach does not imply the absence of a teacher. Instead, the teacher's role becomes even more significant and influential. The teacher becomes a coach and a learning guide. Nevertheless, it implies a shift in the teacher's position. Instead of being the main source of knowledge, the teacher takes on the roles of a coach and a guide. Teachers serve as sources of information, and their primary role is to guide students towards other sources of knowledge. They assist students in making informed choices about their learning and acknowledge their own limitations by admitting areas of uncertainty.

Equal education for all is the only way to make the world's environment more conducive to mutual understanding. To equip students for a workforce that is rapidly changing and heavily reliant on technology, we need to ensure that education aligns with the demands of the 21st century. And these demands can be satisfied through consideration of student cultures and personalized learning. K-12 digital age learning recognizes and embraces the profound influence of digital technologies on education to offer students a contemporary, pertinent, and efficient learning experience.

In the digital age, social learning theory focuses on the concept that learning occurs through social interactions. Once students benefit from personalized learning, they will be able to socially interact with their peers all over the world because this recommended practice reinforces students' confidence.

Ultimately, learners in the digital era represent a fundamental change in the educational paradigm, as they demonstrate the incorporation of technology in every aspect of their learning process. Students in underdeveloped countries can only benefit from the demands of the generation if their educators become aware of the necessity to reconsider their teaching approaches culturally and technically as well as personalize learning to meet the digital era requirements.

4. Recommendations

Despite the challenges posed by large classrooms, teachers must possess a thorough understanding of their students' cultures to educate them in a culturally appropriate manner.

According to [William \(2015\)](#), and we agree, teachers must know that personalization refers to the process of customizing educational experiences to meet the specific needs of each student. Adaptive learning platforms and personalized learning routes facilitate this process.

Teachers must apply data-driven instruction strategies, which are the use of data analytics to evaluate student performance in real time.

It is important for teachers to be cognizant of various obstacles ([William, 2015](#)).

Some of these obstacles are the digital gap, excessive focus on screens, cybersecurity, widespread use of digital devices, and technological dependency.

It is imperative for educators to continuously modify their teaching methods to fully utilize the capabilities of technology.

It's crucial to avoid participating in cultural practices that other cultures might find offensive. Doing so could cause confusion and distrust in the education system.

Governments in underdeveloped countries should consider the necessity of upgrading their infrastructure to educate students in the digital age. Therefore, they must finance the educational transition to the digital era.

The result of this work may inform and encourage educators, policy makers and Government officials about instructional strategies to implement in the classroom to meet the learning needs of every student. This calls for adopting personalized learning and culturally responsive teaching practices for the overall performance of all students.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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