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Fostering 21st Century Skills Development in Specially-Abled Learners: Teachers' Strategies and Approaches

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Abstract: *This study examines how to equip specially-abled learners with the 21st-century skills needed to thrive in today's rapidly changing technological landscape. Guided by four objectives, it explores the impact of technology on student participation, teaching strategies to improve interpersonal, problem-solving and critical thinking skills independent of technology, learning resources like creativity and cooperation to develop 21st-century abilities, and professional development for instructors on promoting teaching skills beyond technological competence. The goal is to enable students of all abilities to reach their full potential through inclusive education that goes beyond mere technological aptitude. This transformative research points the way toward successfully equipping learners with special needs with the skills required to prosper in our globally connected, fast-paced society.*

Key Words: 21st Century Skills, Specially-abled Students, Strategies, Approaches, Teachers

Introduction

The recent times are recognized as highly synched with advancements in technology and back-to-back technological breakthroughs, evolving landscapes, and the constant pursuit of inventiveness, developing 21st-century skills has been recognized as a critical educational necessity. These qualities include, among other things, critical thinking, problem-solving, creativity, interpersonal skills, collaboration, computer literacy, and flexibility. It is commonly acknowledged that mastery of these qualities requires individuals to navigate and thrive in today's complicated, interrelated, and constantly shifting environment (Trilling & Fadel, 2009).

However, while educational systems worldwide attempt to instill 21st-century skills in their students to compete with the upcoming technological challenges, one fundamental obstacle remains the equal inclusion of students with special needs. This group, composed of people with various talents and impairments, demonstrates the rich fabric of human diversity. Specially-abled students have a wide range of abilities, strengths, and problems, each of which necessitates special attention to ensure that the education they receive is inclusive and empowered (Slavin, 2015).

This study thoroughly examines the complicated strategies of developing 21st-century for specially-abled students. We suggest the importance of providing these

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students equal access to the skills and abilities needed to prosper in the modern world. We hope to discover inventive methods and techniques that educators, legislators, and interested parties can use to promote the comprehensive development of impaired learners, guaranteeing they have the resources they need to face the challenges ahead and seize opportunities that are part of the twenty-first century.

Recognizing the larger environment of inclusive education is critical for contextualizing our study. Inclusive education places a premium on providing high-quality educational opportunities for all students, regardless of their skills or limitations. It argues for reducing obstacles to learning and engagement in educational settings and promotes a culture of respect, acceptance, and understanding (United Nations Educational & Organization, [2009](#)).

Nevertheless, while inclusive education ideas have received global acceptance, their successful implementation remains a complicated problem. It necessitates a sophisticated understanding of students' different demands and the creation of methods to deal with this variability. This includes accommodating impairments and identifying and leveraging the unique qualities of specially-abled students (Florian et al., 2016; Tomlinson, [2001](#)).

The convergence of inclusive education and the emergence of 21st-century skills synched with technology is a rapidly evolving field of research and practice. Scholars have claimed that developing 21st-century skills within the context of inclusive education can positively impact students with disabilities. Developing these skills can be a robust way of independence and inclusiveness when customized to individual needs and capabilities (Trilling & Fadel, [2009](#)). Another researcher, Darling-Hammond ([2017](#)), argues for the relevance of an all-encompassing education in cultivating 21st-century abilities. She stresses the need for hands-on learning, technological integration, and real-life problem-solving

experiences to improve learners' critical thinking, communication, and teamwork.

In the following sections of this study paper, we aim to study and go through the subtle strategies and methodologies that have shown promise in supporting skill development, especially in the 21st century. We hope to add to the expanding body of literature around inclusive education and methods of learning customized to meet the unique requirements of this varied population by examining empirical evidence and case studies.

Finally, this study seeks to reveal the route toward an inclusive academic landscape that recognizes the long-term potential of specially-abled individuals and provides them with the necessary skills to flourish in the complexity of the twenty-first century.

Literature Review

Innovation has become a vital aspect of the educational system in the twenty-first century, potentially significantly improving the educational experience of differently abled students. The purpose of this literature review is to investigate the studies on the impact of information technology on the participation of students and the attainment of critical 21st-century skills in this unique classroom context. Considering how technology plays a role, its impact on differently abled students, and the kind of assessment techniques used is crucial for improving inclusive education.

Technology Integration in Special Education

Technology offers a wide range of possibilities for use in special education classes. Assistive technology, including aids such as screen readers, phones, tablets, and adaptable software, has expanded accessibility options. Multimedia and web-based tools enable individualized learning experiences that adapt to each learner's needs. Edyburn ([2010](#)) underlines the significance of adapting modern technology to fit a wide range of tastes and requirements.

Impact on Student Engagement

Technology has the potential to improve student participation in special education greatly. Interactive learning apps, gamification, virtual reality, and collaborative online tools provide innovative educational experiences. Blumenfeld et al. (1991) emphasize the importance of efficient technological interventions in increasing enthusiasm and active involvement, both of which are the most important elements of engagement.

Development of 21st-Century Skills

Students with special needs must learn fundamental academic skills and 21st-century skills such as analytical thinking, problem-solving, interaction, and the use of technology. Technology is critical in developing these skills. Rose and Meyer (2002) underline how computers can help with the progression of these fundamental abilities in a situation that accommodates a wide range of learning requirements.

Assessing the Impact

It is difficult for scholars to assess the impact of technology on student engagement and 21st-century skill development. To measure the success of technology interventions, researchers have used a variety of approaches, including surveys, observations, standardized exams, and qualitative evaluations. Savery and Duffy (1995) offer insight into the difficulties and potential solutions connected with analyzing the impact of information technology on children's educational experiences in this environment.

Challenges and Future Directions

While technology's long-term potential in special education has been made apparent, obstacles remain. Concerns about accessibility, teacher training, and equal access to technology facilities are among them. Future studies should address these issues while investigating future technologies such as artificial intelligence and adaptable learning

systems. Longitudinal studies can shed light on the long-term consequences of technology integration on differently abled students.

Traditional Teaching Methods and Specially-Abled Learners

Conventional educational methods possess a long history in schooling, emphasizing face-to-face engagement and experiential learning. When adjusted to the needs of specially-abled students, these strategies can be extremely helpful in developing analytical thinking, problem-solving, and interpersonal skills. Slavin (2015) found that socialization and mentoring are important in acquiring skills for impaired learners.

Inclusive Classroom Strategies

Collaborative learning, peer tutoring, and small-group teaching have been extensively studied for their positive impact in helping students develop critical thinking and problem-solving skills. Black and Wiliam (1998) emphasize the importance of cooperative learning strategies in encouraging the development of social and cognitive skills in a variety of educational settings and classrooms.

Differentiated Instruction

Differentiated education, which customizes teaching approaches according to each learner's needs and skills, can be especially beneficial for kids with special needs. Teachers may adequately challenge each student by altering the content, process, and product. Tomlinson (2001) states that differentiation can improve communication and critical-thinking abilities while supporting varied types of learning.

Problem-Based Learning (PBL)

Problem-based education is a teaching method in which students are presented with real-life scenarios and encouraged to use critical thinking and problem-solving abilities to identify answers cooperatively. PBL has shown potential in cultivating these abilities in inclusive contexts. Savery and Duffy (1995)

advocated problem-based learning and supported developing problem-solving abilities in students through this technique.

Socratic Dialogue

The Socratic technique involves collective conversations and open-ended questions. This technique has been used to develop students' interpersonal skills, which also encourages active engagement and analytical thinking. Winner (2000) considers utilizing this technique to improve effective interaction in the inclusive education environment is beneficial.

Strategies for Effective Assessment

The development of critical thinking must use effective assessment techniques as they aid in enhancing communication abilities and problem-solving among the students. Evaluations in formative, peer, and performance-based forms are quite helpful for stimulating introspection and good feedback. (Black & Wiliam, 1998) has argued that the formative evaluation is crucial for developing the above abilities.

A Key Educational Resource: Collaboration

21st-century education is based on collaboration and has proved successful at various levels of students' learning time. Cooperative learning techniques, where students make alliances to complete the tasks and projects, inculcate teamwork among students and help to assist in tailoring different types of learning. Slavin (2015) narrated the benefits of collaborative learning in inclusive classrooms and highlighted its role in developing social skills and participation.

Adaptability through Differentiated Instruction

Among all other traits that help students to adjust to varying scenarios, adaptability is a significant characteristic, specifically in 21st-century learning, as the learning demands change with the situations. Diverse education

requires various teaching techniques that tailor the content to individual capabilities. In this way, adaptability can be enhanced among the learners. Tomlinson (2000) suggests that through differentiated teaching, teachers can create and give appropriately challenging content according to every student's physical and cognitive capabilities according to their needs.

Inclusive Arts Education and Creativity

In the twenty-first century, it is imperative to emphasize creativity in students through inclusive arts education programs. These programs support a plethora of tools to promote creativity in students with different abilities. Through these arts programs, children can be provided with a wide range of options to express themselves and present their imaginations in their own way. According to Winner (2000), learners with impairments can be influenced at a much larger scale when education is given through arts and innovation.

Universal Design for Learning (UDL)

Universal Design Learning is an instructional system that caters to varied learner requirements by utilizing adaptable learning environments and numerous modes of interaction, participation, and expression. When used correctly, UDL principles foster cooperation, flexibility, and innovation. According to Rose and Meyer (2002), UDL is especially important in inclusive contexts since it guarantees that educational materials are available to all learners.

Project-Based Learning (PBL) for Skill Integration

Project-based learning is an educational technique that encourages students to engage in long-term, real-world projects to integrate 21st-century skills. PBL may be tailored to meet the requirements of differently-abled students, providing possibilities for cooperation, flexibility, and innovation. Blumenfeld et al. (1991) emphasize the advantages of PBL in

developing problem-solving abilities and autonomy in learning.

Inclusive Teacher Training

Effective application of these proposed actions necessitates well-trained instructors who can foster inclusive and supportive environments for learning. Integrated teacher education programs, such as those focusing on inclusive education and UDL, provide teachers with the expertise and understanding needed to foster 21st-century competencies among differently-abled students.

Various successful plans may be used to optimize educational resources for specially-abled learners while cultivating 21st-century capabilities. Cooperation, flexibility, and creativity may be fostered through cooperative learning, differentiated teaching, inclusive arts instruction, UDL principles, project-based learning, and inclusive training for educators. These methods enable educators to establish equal and welcoming learning environments where students with special needs can develop the skills required for success in the twenty-first century. As inclusive education evolves, further study and practice may further develop and broaden these techniques, ensuring that all learners have the chance to succeed.

Research Objectives

1. To evaluate the impact of technology on student engagement and the development of essential 21st-century skills in the classroom of specially-abled learners.
2. To explore how diverse teaching methods can improve specially-abled learners' critical thinking, problem-solving, and interpersonal skills without depending on technology.
3. To search out the best strategies for maximizing educational resources (such as collaboration, adaptability, and creativity) while nurturing 21st-century skills for specially-abled learners.

4. To assess the effectiveness of professional development programs for instructors of specially-abled students in promoting a variety of 21st-century teaching abilities rather than merely technological proficiency.

Research Questions

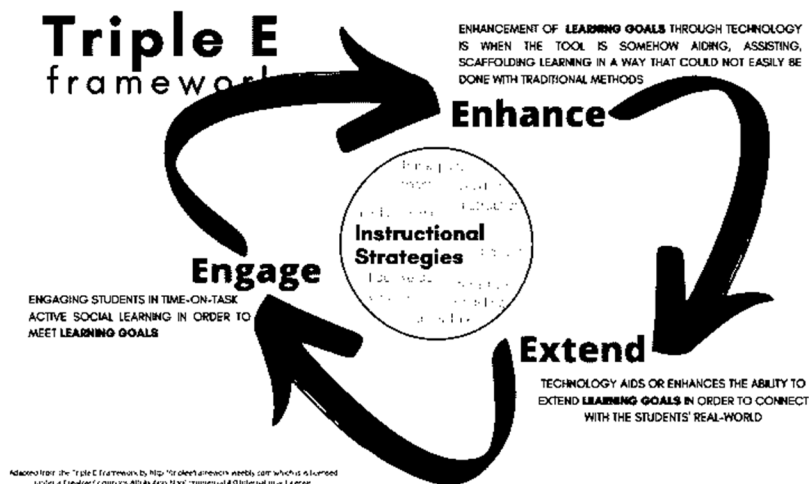
The following research questions are proposed for the current study:

1. How can the impact of technology on student engagement be evaluated and develop critical 21st-century skills in the classroom of specially-abled students?
2. How do diverse teaching techniques improve specially-abled learners' critical thinking, problem-solving, and interpersonal skills without depending on technology?
3. What best strategies could be for maximizing educational resources (collaboration, adaptability, and innovation) while developing 21st-century skills for specially-abled students?
4. How can we assess the success of professional development programs for instructors of specially-abled students in promoting a variety of 21st-century teaching abilities rather than merely technical proficiency?

Research Framework

Kolb (2020) established the Triple E concept in 2011. In opposition to previous technological integration structures, the Triple E Framework emphasizes what students do with computers. The framework's purpose is to guarantee that the use of technology encourages engagement among learners and that technology then enhances and extends learning when students are focused. Using a simple assessment, teachers may self-assess, and admins can offer meaningful feedback on an instructor's decisions for integrating technology.

Figure 1



Ed Tech's Primary Coaching Content

Research Methodology

This research aims to investigate and improve teachers' methods to help learners with special needs develop 21st-century learning skills. An action research methodology is used in this study to look into the difficulties, possibilities for change, and current practices in this area. The study focused on 26 teachers specializing in instructing students with special needs and was conducted at the Government In-Service Teacher Training Institute for Specially-abled Children in Lahore, Pakistan.

Participants

Twenty-six educators with specialization in teaching students with disabilities participated in the study. Participants were selected from the various institutes of Punjab that work under the aegis of the Government In-Service Teachers Training Institute for Specially-abled Children, a well-known public sector teacher training facility in Lahore. They were chosen based on their experience, teaching levels, subjects, and expertise in working with special needs students.

Data Collection Procedure

The Government In-Service Teachers Training

Institute for Specially-abled Children, Lahore, hosted a full-day capacity-building session to give participants fresh perspectives and ways for their methods of instruction. Updated and leading-edge plans and strategies were provided to the educators so that the students with disabilities could be helped efficiently.

Interviews

After conducting the training session, participants had to go through in-depth interviews. These interviews aimed to collect information from educators about their experiences, perspectives, and challenges while assisting students with impairments to develop 21st-century skills. Several methods opted to record the interviews, such as taping, writing down, and extracting important information.

Questionnaire

A standard questionnaire was presented to the participants before the interviews and group discussions. From their views, expectations, and plans, seven specifically designed broader questions were adopted to develop 21st-century abilities in students with impairments. The gathered responses were based on quantitative

analysis to supplement the qualitative information collected through interviews.

Group Discussions

Group discussion was also arranged along with questionnaires and interviews where the participants actively participated. The central discourse of these sessions was the teachers' current methods for teaching and implementing their strategies for the future to foster 21st-century skills in students with special needs. Through these interactive sessions, an in-depth insight was gained, which is assumed of much importance to get a better grip on the topic.

Data Analysis

Qualitative data collection methods were used to assess the information through qualitative open-ended surveys, semi-structured interviews, and collective group discussions. A thematic analysis of the qualitative data was conducted to find trends, shared difficulties, and recurring themes.

This study assumes to contain the potential foundation for providing suggestions to educators to facilitate the students with special needs to develop 21st-century skills in them. Its foundation lies in active research, surveys, group discussions, and interviews. This study aims to furnish more insightful information to help teachers and the authorities make better policy-making decisions and improve the quality of education for this population.

Analysis

Basic knowledge and understanding of the 21st Century Learning skills

Due to technological advancements, 21st-century skills are observed as the most required skills nowadays for students to succeed in this rapidly changing world. These skills are creativity, teamwork, analytical and critical thinking, communication, and problem-solving with advanced tools and technologies. Students require these abilities to solve complicated issues, think critically about the material, and collaborate with others to accomplish shared

objectives. Students with impairments may face challenges in learning 21st-century skills. Individuals can and do acquire these abilities with the correct assistance. Attaining a fine grip on 21st-century skills and learning to modify these skills according to the needs and backgrounds of students is the initial step in this journey.

It is necessary to be aware of the various interpretations of 21st-century educational capabilities and the methods and techniques that can be applied in learning places. It is imperative to understand the distinct obstacles that learners with disabilities can encounter while acquiring these abilities and the various approaches that can be employed to assist them.

Methods for developing 21st-century skills among specially-abled learners

Specially-abled learners can be taught 21st-century skills through a range of approaches. Among the efficient techniques are as follows:

Differentiated instruction: It is a teaching method adapted to meet each student's unique requirements. This may be achieved by giving various ways of support to demonstrate learning, utilizing a range of teaching techniques, and delivering varying degrees of support and challenge.

Learning using Universal Design (UDL): UDL is a framework for creating effective and accessible learning opportunities for all students. Several methods of representation, involvement, and assessment are among the UDL concepts.

Technology-rich learning environments: There are several ways in which technology may help develop 21st-century learning abilities. Students can utilize technology, for instance, to produce and share their work, communicate with others, and get information.

Project-based learning: This instructional strategy involves students in relevant tasks that call for the application of 21st-century abilities. Students might, for instance, collaborate on a project to plan and construct a wheelchair

ramp or make a PSA on a disability awareness issue.

Methods for improving learners' critical thinking, creativity, collaboration, and communication skills

There are several ways to help students become more creative, collaborative, critical thinkers, and communicators. Among the efficient techniques are:

Critical thinking: By posing open-ended questions, pushing students to think critically about many viewpoints, and allowing them to assess material, teachers may support students in acquiring critical thinking abilities. Teachers could assign projects like creating a strategy for resolving a real-world problem, researching contentious topics, and presenting the results to the class.

Creativity: By allowing students to explore novel concepts, try out various strategies, and express themselves in a range of ways, teachers may support their development as creative thinkers. Teachers could assign writing a poem, designing a new product, or creating an artwork, for instance.

Collaboration: By allowing students to collaborate on projects, solve issues, and make decisions, teachers may support students' development of cooperation abilities. Instructors may assign group projects, such as creating a presentation for a parent-teacher conference or finishing a class assignment.

Communication: By giving students the chance to express their ideas and opinions to others both orally and in writing, teachers may aid students in developing their communication skills. For instance, educators may assign writing assignments, PowerPoint presentations, or participation in class talks.

Methods for checking the impact of Information, Media, and Technology in the classroom of specially-abled learners

To make sure that all students are benefiting from and that information, media, and

technology are being used successfully in the classroom for students with special needs, it is crucial to assess their effects. Several efficacious techniques to assess the influence of data, media, and technology encompass:

Student Surveys: Instructors can ask students to provide input on how they use technology, media, and information in the classroom and how it affects their learning. For instance, educators may ask students to rank the value of various technologies or explain how they use technology to enhance their education.

Observation: To gauge students' interest and learning, teachers might watch them as they use media, information, and technology. Teachers could see, for instance, how students use technology to finish homework or work together on group projects.

Analysis of student work: Instructors can examine student work to see how they demonstrate their learning via media, information, and technology. Instructors may, for instance, check for proof that their students are utilizing technology for information research, making presentations, or problem-solving.

Interviews: Instructors can speak with students to gain their perspectives to know in what ways media, technology, and information are affecting their skills and perceptions.

Techniques for nurturing FLIPS / Life skills among specially-abled learners

FLIPS refers to Flexibility, Leadership, Initiative, Productivity, and Social skills. The abilities needed for learners to successfully and freely navigate society are known as life skills. Several methods exist for developing FLIPS and life skills among learners with specific needs. Several useful methods are as follows:

Direct instructions: There are several methods that teachers may directly train students in FLIPS/life skills, including individual teaching, group projects, and classroom sessions. For instance, a teacher may instruct pupils on the value of navigating without following the absolute plan since

situations could demand a deviation, and being flexible could enhance their success rates.

Roleplaying: Teachers may arrange roleplays to apply FLIPS and life skills in their interactions with pupils. For instance, a teacher might model good problem-solving by going over the stages required, or they can model effective communication by paying close attention to what others are saying and reacting kindly. Other than being productive, such techniques greatly help trigger their initiative-taking skills.

Real-world experiences: Instructors can allow students to use FLIPS and life skills in authentic settings. For instance, to help students with their initiative-taking, productivity, and leadership skills, a teacher can assign them to run the class store or to work on a community service project to help them with their social skills. By combining these strategies, teachers may assist learners with special needs in acquiring the FLIPS/life skills necessary for success in education, the workforce, and everyday life.

Teachers' development to stay upgraded for teaching 21st-Century skills for specially-abled learners

Educators must remain updated with the most recent research and optimal methodologies for imparting 21st-century learning skills to learners with special needs. Teachers can do this in several methods, including Conferences and seminars for professional development. Educators might attend conferences and seminars for professional development to learn about new teaching techniques and technological advancements. Several organizations provide opportunities for professional development for educators who work with students with special needs.

Online resources: Teachers may learn a lot about teaching 21st-century learning skills to learners with special needs by using the variety of online resources available. Some of these options are online classes, webinars, blogs, and articles. *Networking with other teachers:* To exchange ideas and gain insight from one

another's experiences, educators can network with others who work with students with special needs. Social media, online discussion boards, and in-person social gatherings can all be used for this.

Instructors may ensure they give their students the most effective training possible by keeping up with the most recent research and best practices. This is crucial for educators working with students with special needs since they might require more assistance to acquire 21st-century skills.

Potential challenges for teachers in developing these skills among their learners

Teachers may encounter several obstacles to help students, particularly those with special needs, acquire 21st-century learning skills. Several of these difficulties consist of:

Lack of resources and time: Teachers frequently lack the time and means to instruct students in fully acquiring 21st-century learning abilities. This might make it challenging to practice efficient teaching strategies and provide students with the assistance they require to acquire these abilities.

Lack of support and training: Some educators may lack the necessary tools to help students acquire 21st-century learning abilities. This may confuse the best ways to impart these abilities and gauge the advancement of students.

Difficulties in Differentiating Instruction: Teaching 21st-century learning skills can make it particularly difficult to differentiate instruction to suit the requirements of all learners. Due to the complexity of these talents, students must possess a wide range of knowledge and aptitudes.

Resistance from Students: It is possible that some students do not want to acquire 21st-century learning abilities. They could be having difficulty learning certain abilities, or they might not perceive their importance. This may be particularly valid for students who are already having academic challenges.

Although having these obstacles, educators must never give up trying to help students acquire 21st-century learning abilities. These abilities are necessary for success in the modern world, and every student should have the chance to develop these skills.

Recommendations

The following recommendations can help educators overcome the difficulties involved in imparting 21st-century skills to students with special needs:

1. To begin with, teachers need to work on their own comprehension of 21st-century learning, literacy, and life skills. What are these skills? How can one cultivate them? What particular needs do your students have?
2. Look for possibilities for professional development to acquire knowledge on teaching 21st-century learning skills. Many organizations provide professional development opportunities to educators who work with students with special needs. It is important to network with such organizations as most of these provide free teaching material.
3. Work with other educators to teach students 21st-century learning capabilities: exchange concepts, tools, and tactics. Collaborative efforts have more potential to give new ideas and techniques. A holistic approach is therefore required at every institute where all educators are aligned with the same purpose.
4. Customize and adapt the education to each student's unique requirements. Give learners varying degrees of assistance and difficulty, as well as a

variety of options for showcasing their knowledge.

5. Make education applicable to students' daily lives. Link the skills you teach to issues and obstacles in the real world.

Conclusion

In conclusion, this study has highlighted the need and importance of developing 21st-century skills in specially-abled learners. The research has emphasized creative methods and tactics to help accomplish this crucial objective. During this study, we evaluated the efficacy of teacher professional development programs, varied teaching strategies, optimized educational resources, and investigated the effects of technology on student engagement and skill development. It is perceptible that the advanced education embraced with 21st-century skills needs time and is crucial for all students, including specially-abled learners. They can also learn and improve these essential 21st-century abilities with the right assistance and inclusive teaching methods. As we live through an ever-changing global terrain and since technology is changing the pace of advancement, our educational institutions must acknowledge the range of talents among our students and provide them with the latest tools and techniques necessary to succeed in the contemporary world. We propose that this research will provide the basis for teachers, students, all the stakeholders, and especially the policymakers engaged in the line of special education by offering scientific knowledge and practical suggestions for developing an inclusive, skill-oriented, and equal education system that enables specially-abled learners to thrive in the 21st century and beyond.

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