

Assistive Technology for Inclusive Education: Evidence from Indonesia

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Abstract

Now, students with special needs educate in an inclusive environment that is more feasible than before. Unfortunately, many teachers complain that they are not ready to work with these students. This complaint is clearly a problem because the teacher is related to student learning outcomes. Web-based technology offers a solution to this problem, but not all web-based resources are reliable. Percik Insani Therapist Education Center, a community of parents of children with special needs, provides free online resources for those who work with students with special needs. This resource was developed to work with researchers and improve education, and is widely used to improve the quality of teacher education. With this, it is hoped that the change of motion and mindset of educators is expected in seeing students with special needs.

Keywords: digital transformation, Percik Insani, web-based learning, assistive technology.

1. Introduction

Students with special needs must be included in general education classes is not a new concept. Even more than a century, some students with special needs have received most of their education in general education classes. The Scottish Education Act, for example, requires students with visual impairments to be educated in a public education environment with their friends [1]. A century later, the law was extended to guarantee the right of all people to receive education in accordance with free fees; for many people education must be with their peers without exception. In the United States, the law is the Individuals with Disabilities Education Act (IDEIA 2004). The Special Education Needs and Disability Act of 2001 in the UK encourages schools to provide inclusive education for all their students. India passed a similar law, the Persons with Disabilities Act of 1995. Furthermore, the collaborative efforts of the United Nations and other educational organizations around the world sought to improve the education of students with special needs.

In further development, in the United States, the Law on Primary and Secondary Education, well-known as the No Child Left Behind Act of 2001, establishes rules for all general education student education, and will soon be reauthorized. Policy makers are considering writing a new clause to ensure that diverse students, including those with special needs, receive an inclusive education [2]. At present, the concept of inclusive education, although not universally reached, extends to all children and adolescents, not only those with special needs. For example, internationally, the concept even includes children from non-citizen migrant and immigrant families. Such ideas are brought to national forums, even international conferences.

Meanwhile, in Indonesia, inclusive education has been going on since the 1960s marked by the receipt of blind SLB graduates in Bandung going to public schools [3]. Then, in the late 1970s, the government began to pay attention to the importance of inclusive education in order to help students with special needs to adapt to their new

environment [4]. Subsequently, in 1990, new efforts were promoted to develop inclusive education through a partnership between the Ministry of National Education and the Norwegian government under the coordination of Brailo Norway and the Directorate of Special Education. In 1994, the reinforcement of Salamanca's Statement in the UNESCO Framework for Action emphasized the importance of Education for All and the importance of providing opportunities for students with special needs to attend school in regular schools with an inclusive orientation, opening the bright spot for the future of Indonesian children [5], [6].

However, if it only encourages, or even mandates, the application of inclusive education practices does not guarantee better results. Around the world, school leaders and teachers continue to show that they feel they are not sufficiently prepared to assume the responsibility of educating diverse students, especially those with special needs [7]–[9]. When students learn and work in environments where teachers do not have positive attitudes about diverse students, and where they lack confidence and are not ready to teach students with various learning needs, even serious students cannot achieve their social or academic potential.

We strongly believe that simply placing students with special needs in an inclusive school environment is not enough for them to achieve their educational goals. In contrast, authentic inclusive education requires teachers to have the skills needed to use effective practices and that school leaders have the tools needed to support teachers and students. We know that educational opportunities for students who struggle can increase when their teachers are adequately prepared with the skills and knowledge of research-based teaching practices. Our belief stems from our work preparing for the next generation of teachers and practicing professional education to meet the needs of all students studying in an inclusive classroom environment.

2. Offering Solutions through Technology

Educators must have more skills than before if supportive and responsive educational environments can be achieved. They must be trained to adapt their instructions to the latest research-based methods, they must learn to work with a broader range of student achievements and interests, and they must be prepared to improve or re-evaluate those instructions when they implement them in response to their students' needs. We believe that technology provides a new dimension for teacher professional development. We think that the use of technology has many advantages. This makes it easier to add content to the teacher education curriculum, facilitates access to the latest teaching resources on effective practices, and allows for greater sharing of resources in various countries around the world. New information and skills acquisition must be included in the licensing and certification program that is packaged and the next professional development agenda [10], [11]. Our experience shows that one part of the solution is to use online training materials and resources to add and improve courses for personnel preparation and professional development. Incorporating technology into personnel preparation efforts can overcome curriculum burden and other similar problems. Technology has been demonstrated to foster student collaboration and communication [12], ensuring consistent presentation of important content [13], allow access on demand. Students tend to choose technology-based teaching because of its flexibility, responsiveness, and interactivity [13], [14]. In the following, we review some of the strengths and weaknesses of technology-based learning platforms for use in the context of teacher preparation and professional development.

2.1. The advantages of web-based learning materials

The web is an important part of our daily lives. Of around 6.9 billion people worldwide, more than two billion have Internet access. In 2012 alone, one out of every seven people on the planet will have a Facebook account [15], [16]. Although the Web is widely used, its resources are not yet fully used, especially in the field of teaching in tertiary institutions. College instructors can use online resources for two purposes: to enhance the classroom-based learning experience [17], [18]. Some research shows that students who take online courses perform better than those who take courses in traditional classrooms. It also shows that those who are taught using a combination of online and direct instructions perform better than those who receive instructions using only one of the two. The positive results of online learning have been verified with scholars, graduate students, and practitioners [17], [19]. Another reason, the use of web-based teaching materials lies in the characteristics of learning [13]. The advantage for educators is that the content presented is consistent, ensuring that all students receive a standardized set of information.

2.2. Access for Students with Special Needs

Making some web-based teaching resources more interesting than traditional educational materials. Because, this source combines audio, video, animation, graphics, games, interactive activities, and links to additional sources of information. A well-developed and high-quality web-based training resource utilizing interactivity and multimedia presentations, producing very interesting formats and content. Web-based instruction can foster active communication and collaboration between students through chat rooms, online group projects, and collaborative learning communities [20], [21]. The use of such interactive and diverse instructional design features has the potential to attract the interest of digital society.

Web-based teaching materials can create learning environments that limit, reduce, or eliminate information barriers for individuals with special needs. This is a goal that is not only true in the context of social justice; this is also a mandate in countries where the law protects the rights of individuals with special needs to live, work and study in a barrier-free environment. However, for many people, barrier-free access to materials used in university courses and professional development activities is difficult. Web-based resources can reduce some of these obstacles. For example, individuals with mobility challenges can access resources from their own home computer. People with visual disabilities can convert portions of text from web-based resources to larger printouts, translate printouts to Braille or to sound output, or change fonts and backgrounds to colors that contrast with higher visibility. Text readers and various specialized software programs allow individuals with print disabilities to extract information more easily than they can with traditional text. In addition, web-based video can provide alternative forms of access through audio descriptions, closed text, and transcripts that can be accessed.

2.3. Some Disadvantages of Web-Based Learning Materials

Only reviewed small resources and other information items posted on the Internet including information that has been obtained or approved by the review panel. When material is not reviewed and corrected to reflect current research findings, inaccurate information can be disseminated. When these materials cannot be accessed, potential users can exclude unnecessary and unfair. Some online sources do not have questionable class discussion which is a more traditional consideration feature [21]. It is also important to note about the transition from face-to-face or group learning to online learning asking

for substantial assistance by the instructor. Material delivery online. In addition, online classes require substantial support from technology experts, which may not be available in full in colleges and university departments or schools. In addition, not all students have the software or computer hardware to take a model from the funds provided. The lack of available technology and technical expertise can be a major obstacle to implementing a web foundation, especially in times of financial difficulties.

3. Sharing Technology-Based Resources

In all parts of the world, significant time and financial investments are being made to create and develop teaching enhancements for use in teacher preparation. Although not all of these resources apply universally to the context of every country. Instead of wasting effort by producing excessive material, we suggest making serious efforts to raise awareness of learning units in any educational institution via the Internet. Such wide spread has many benefits. Educators can choose resources from perhaps thousands of high-quality products that have been developed, and instead spend their valuable time filling gaps or producing teaching resources that meet specific contextual situations. In the following sections, we acknowledge the challenges we have described here, but also take advantage of the broad accessibility and availability of technology.

Responding to challenges and accessibility, the Ministry of Education translates research into practice and disseminates that information through online resources. Percik Insani for Therapist Education Center provides users with free, online materials about teaching practices and effective evidence-based behavior for students who have learning difficulties, including those with special needs. The aim is to promote current research findings on effective teaching practices and behaviors for students with special needs who learn in an inclusive school environment. While developed for teacher preparation in Indonesia. Many of these resources can be applied anywhere, and they are free for anyone throughout the world through the website: <https://percikinsani.wordpress.com/>. Audiences can find several resources that are useful for teacher preparation or professional development activities. Furthermore, these resources can serve as a model for educators in other countries who need to develop materials to meet their own needs. We also hope that raising awareness of Percik Insani's resources will initiate intensive discussions where others who do similar work around the world will share their resources. This collaboration will enable a more efficient exchange of knowledge.

4. Learning Materials from the Percik Insani Therapist Education Center

Percik Insani Module is an interactive instructional unit, based on technology on discrete topics, such as the perception of special needs, peer guidance, and assistive technology. The case study series is a printable resource. It also provides activities for use in college courses and professional development activities, a summary of information that provides an overview of many topics related to special needs, and podcasts on key issues. These are organized into topic or flow fields. Complete and annotated resources can be found online at <https://percikinsani.wordpress.com/>.

Furthermore, assistive devices can provide a variety of educational opportunities so that they are very helpful in enjoying rapid technological advances. For example, large writing and Braille translation with the help of computers can help communication for students with visual impairments. Braille translation software can convert text into the proper Braille format. Screen-enlargement software increases the size of text and

graphics, similar to captioning and displaying real-time graphics on television, which broadcast dialogues and actions on television shows or films through printed text. Computer speech synthesizers can produce verbal words artificially. Speech recognition software can help students who can only say a few sounds to do various tasks. Individuals are taught several "token" sounds that can be responded to by specially programmed computers. The computer recognizes sound and performs various daily functions and school-based functions, such as turning on the TV, playing video recordings, or accessing the school curriculum on CD-ROM.

A special website developed and promoted by the Center for Applied Special Technology (CAST), an organization whose mission is to expand opportunities for people with disabilities through the use of computers and assistive technologies. CAST offers a Web site and web-based tools that analyze the accessibility of various web pages as a bridge for children with special needs to access an unlimited amount of information in space and time. In addition, it makes it easier for them to access various news and other information that does not interfere with their constraints in terms of motion.

Percik Insani provides information about validated practices or current education policies. Module content is developed through a collaborative process with researchers who developed and validated instructional methods. These researchers worked with the developer of the Percik Insani module to ensure the research findings were faithfully approved into the agreed units. They worked with the Percik Insani development team to create content to download modules about supporting readers who discussed difficulties and about fixing reading problems. Researchers played an important role in establishing the basis for responses to interventions, asking for work to support and improve those that are more widely used in Indonesia because of the educational problems required in national special education laws. Applications for these modules, case studies and activities are complemented by collaborative work with these researchers, developed by Percik Insani's team with the guidance of researchers, and supported through suggestions and testimonials from users who use this method in school relations.

The available modules have been reviewed, and posted on the website. Then, observations are made in the field to assess customer satisfaction and receive feedback for evaluation purposes. Faculties, students, providers of professional development, and agree to use modules and then assess them, the method that is suitable for the first level of training evaluation is student satisfaction. Students and teachers who use resources report that they learn a lot and benefit from these resources. Most users report they prefer the presentation of this content from standard textbooks and printed manuals [28].

To evaluate the actual learning, the Percik Insani Center conducted two research studies. The first is done which introduce special education to students who have not majored in special education. This research concludes that the module is very effective to be used to improve the course and is also used to replace the course. Other studies found that the use of independent modules for homework produced learning outcomes that were commensurate with those using integration modules in traditional classroom development. These results can convince instructors their students will access content from the Percik Insani module.

5. Conclusion

Teacher educators and professional training providers are assigned to produce new teachers and improve professional skills that are responsive to individual needs. They must ensure that all educators know about effective teaching practices and can apply them well. Through adequate preparation, teachers begin a career path where they are expected

to choose and implement effective practices based on the individual needs of students. Web-based technology is one vehicle for the latest information on evidence-based practice that can be disseminated to future teachers. Web-based resources offer many advantages. Then, the instructor must consider important things. Web-based material users must use these resources carefully. However, compilation of high quality and carefully selected resources is an invaluable asset. We believe, teacher competence combined with effective web-based teaching materials will strengthen future teachers to educate each student effectively.

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