Research Brief

Vizzle Helps Improve Academic Performance for High School Students in Special Education

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Executive Summary

Most educational technology focuses on elementary school students, but technology holds significant value for high school students receiving special education services. Research demonstrates that technology can enhance academic outcomes and improve motivation, confidence, and engagement among these students. Moreover, teachers indicate technology streamlines planning and reporting efficiency while reducing stress and increasing job satisfaction. The Vizzle platform offers personalized solutions for math, ELA, science, and social studies for students in special education, and for students in general education who need additional practice or need to catch up in a particular subject. This brief evaluates Vizzle's impact for 472 high school students receiving special services across five states. Analysis of pre- and post-assessments reveals substantial gains across all academic areas. This study highlights the potential for using Vizzle to develop and build essential academic skills for high school students in special education.

Keywords

Special Education, Math, ELA, Science, Social Studies,
Differentiated Learning, High School

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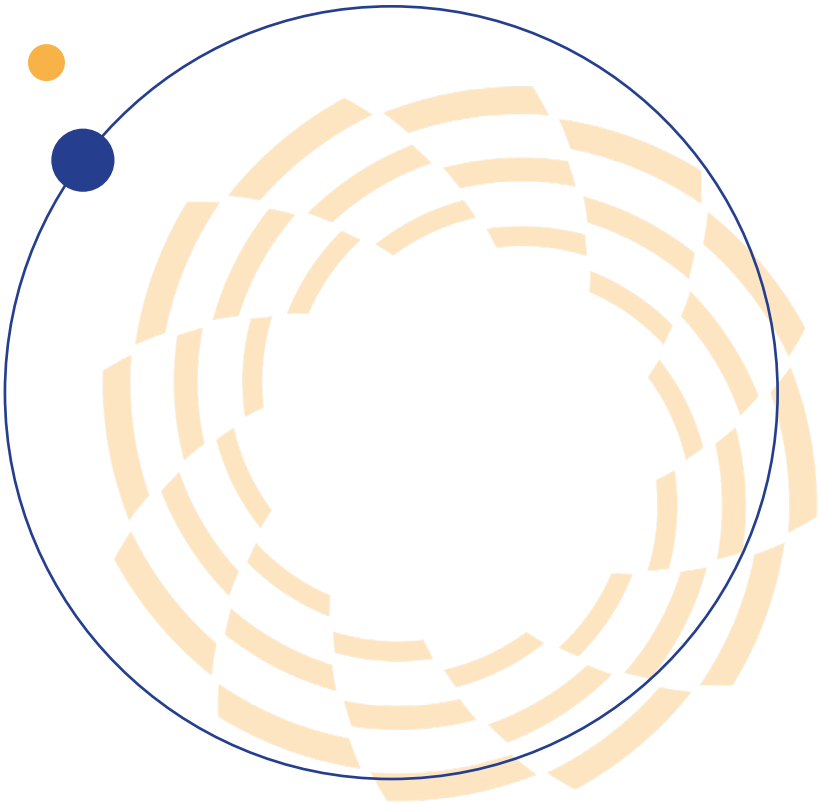

Special Education in the US

During the 2021–22 academic year, a significant number of students, approximately 7.3 million, aged 3–21, received special education and/or related services under the Individuals with Disabilities Education Act (IDEA). This figure accounted for approximately 15% of all students enrolled in public schools. Among these students, the most prevalent category of disability was specific learning disabilities, representing 32% of the total (National Center for Education Statistics, 2023).

Over the past decade, the number of students receiving IDEA services grew from 6.4 million in 2010-2011 to 7.3 million in 2021-2022, reflecting a rise from 13 to 15 percent of total public-school enrollment. However, the COVID-19 pandemic temporarily reversed this trend, with a 1% enrollment decline from 7.3 million to 7.2 million students receiving special education services in 2020-2021 (about twice the population of Oklahoma).

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Moreover, 40% of public schools with special education vacancies reported great difficulty filling these critical positions in 2020-2021, underscoring a nationwide teacher shortage. While the pandemic underscored a nationwide teacher shortage, it also illuminated the enduring struggle school districts have faced in recruiting and retaining special education personnel (Schaeffer, 2023).

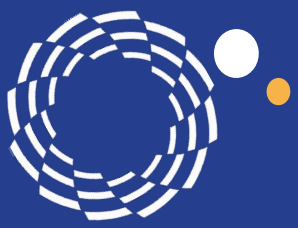
While the pandemic created challenges, it also demonstrated the resilience of students, educators, and parents in the special education community. Many schools swiftly implemented

remote learning and innovated new methods to deliver services to students with disabilities. This period of adversity likely spurred lasting benefits, including creative teaching approaches and the adoption of new educational and assistive technologies. As society moves forward, the commitment to inclusivity and supporting students with disabilities remains strong, reaffirming the dedication to ensuring that every child can reach their full potential in the educational system.

The Promise of Educational Technology

Research demonstrates that students in special education can benefit from educational technology, particularly to teach concepts and provide practice feedback instruction (Carter & Center, 2005). In addition, teachers often report that the use of technology improves academic outcomes, differentiation, formative assessment, and student motivation (Anderson & Putman, 2020).

Job satisfaction and reduced stress are often reported with the use of technology due to the reduction in planning and reporting time. In one study, 67% of teachers reported that they have insufficient time and 12% reported that they have no time at all for planning for special education students (Fowler, Coleman, & Bogdan, 2019). In this same survey, the #1 and #9 issues that teachers reported they need to help them be successful with their students was having “adequate resources to meet IEP requirements” and appropriate technology access.



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In the ever-evolving landscape of special education, emerging innovations like virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) are positioned to transform special education. These emerging tools are set to revolutionize the field by enhancing educators' capabilities to personalize learning experiences for students with diverse needs. Early screening powered by AI data analysis promises more accurate and timely disability identification. Moreover, VR applications are being developed specifically for children with autism, offering them a unique opportunity to practice navigating real-world challenges in a safe and controlled virtual environment. These innovations represent a promising shift in the way we approach special education, offering greater inclusivity and tailored support to students with various abilities and learning requirements (5 Expected Trends in the Future of Special Education Systems, 2021).

Technology's paramount role is emphasized by leaders like Randall Kincaid, Supervisor of Instruction for the Sevier County School System and State Coordinator of the Literacy Association of Tennessee, who urges developing students' critical thinking, conceptual grasp, knowledge application, and problem-solving abilities.

Numerous research studies demonstrate technology's efficacy in special education, further substantiating this imperative. For instance, recent research by Morris et al. (2021) demonstrates the benefits of combining point-of-view video modeling, explicit instruction, and augmented reality to improve mathematical word problem solving for students with disabilities.

Furthermore, assistive technology, such as specialized writing and painting tools and educational apps, has proven advantageous for children with disabilities, as highlighted in a study by Zilz and Pang (2021). However, this same study reveals teachers often lack technology integration training. Building upon these findings, Moreno (2022) discovered that providing longitudinal active training focused on active learner experiences significantly increases special educators' iPad adoption and classroom implementation. In aggregate, research clearly shows technology's immense potential to serve students receiving special services, provided teachers obtain comprehensive training.

Universal Design for Learning (UDL)

Inclusive educational practices are vital to provide equal learning opportunities for all students. Universal Design for Learning (UDL) comprises principles to guide curriculum development that includes all learners. The Every Student Succeeds Act (ESSA; 2015) and the Individuals with Disabilities Education Act (IDEA; 2004) mandate schools utilize this framework, with accountability for implementation and outcomes. A core UDL component is promoting engagement through diverse modalities to enable mastery. Since students perceive and comprehend information uniquely, materials and activities should offer multifaceted content representation. Educational tools must provide customization, accommodations, and modifications for inclusion.

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Serving High School Students with Special Needs

While educational technology has become increasingly popular over the years, most programs still focus on elementary school students and resource classrooms (Cheng & Lai, 2020). High school students receiving special services have distinct needs and may benefit even more from technology for building and practicing academic and life skills.

At this stage, practical skills, media literacy, and life preparedness are paramount, alongside supports to meet graduation prerequisites like Universal Design for Learning (UDL)-aligned courses. This entails making sure that all students have access to a UDL-aligned 4x4 (4 English Language Arts, Math, Science, and Social Studies courses). To ensure success, students should have access to learning in a way that meets their individual needs. Ensuring student success requires learning customized to individual needs, whether through visuals, supplementary materials, and/or additional practice. Content should be leveled and reflect diverse cultures and abilities.

Academic knowledge remains vital, but independence and post-graduation success skills are equally crucial. For instance, the acquisition of financial literacy skills for students in special education often leads to more success in adult life (Henning & Johnston-Rodriguez, 2018). Learning tools should concentrate on fostering self-sufficiency, with students working at appropriate levels to maximize independence. For instance, while some students need text-to-speech, others may require touchscreens or more repetition. The use of technology can not only build independence in high school students in special education, it can also improve motivation, confidence, and attendance (Yngve, Ekbladh, Lidstrom, & Hemmingsson, 2023).

Vizzle's Approach

Vizzle offers over 55,000 activities delivering differentiated instruction in academics, life skills, social competencies, and vocational training for grades K-12. Activities are also included for speech, art, and music. The platform features easy usage, robust authoring tools, automatic data tracking, and customizable student profiles.

Content aligns with U.S. state standards for core subjects:

- English Language Arts: English 1-4
- Math: Algebra 1, Geometry, Algebra 2, Financial Literacy
- Science: Biology, Earth Science, Chemistry, Physical Science
- Social Studies: Civics, U.S. History, World History, U.S. Government/Economics

Following Universal Design for Learning principles, Vizzle ensures accessibility and engagement across abilities. The student experience includes:

- prior knowledge checks
- instruction
- generalization through practice activities
- re-assessments

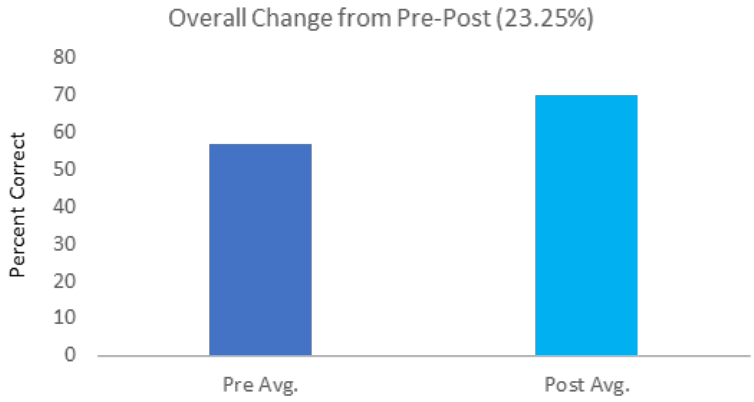
Engaging activity modalities include:

- instructional text
- vocabulary
- matching
- multiple choice
- true/false
- fill-in-blank
- sorting/categorizing
- sequencing
- short answer
- essay writing
- games.

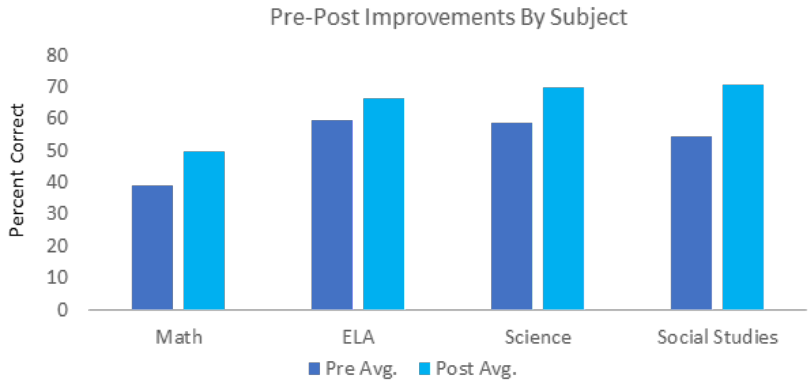
Multi-tiered curriculum scaffolds support from grade level down to the most intensive intervention needs (Tier 3). Formative and summative assessments allow students to track their own progress and provide educators with actionable performance data.

Research Study

The effectiveness of Vizzle for improving Math, ELA (English Language Arts), Science, and Social Studies was evaluated by looking at pre and post-test scores in all 4 core areas for 472 high school students across 5 states. Overall, students had a statistically significant ($p<.01$) increase with a 23.25% change from pre to post assessments across all content areas.



Students improved in all content areas from pre to post assessments. In math, students improved by 26.56%. In ELA, students improved by 11.54%. In Science, students improved by 18.87%, and in Social Studies, they improved by 29.39%.



Conclusions and Future Directions: A Promising Path Forward

While technology shows promise in elementary special education, high school applications remain limited, despite older students' greater needs. Research confirms technology can increase motivation, academic achievement, efficient planning, progress monitoring, and differentiation.

This study found improved outcomes across all content areas for high school students using Vizzle. While not definitive, this study offers promise for the use of Vizzle in high school special education classrooms.

Future directions involve evaluating Vizzle in all grades, particularly in less-targeted topics like financial literacy that impact real-world functioning. Research into the generalization of life, social, and vocational skills will be informative. Teacher perceptions, job satisfaction, stress levels, and self-efficacy with Vizzle integration also deserve attention.

Overall, technology holds immense untapped potential to serve high school students with special needs. Vizzle's alignment with research-backed practices indicates it could become an indispensable tool for this population. Additional research can guide optimal implementation to help unlock students' fullest potentials.

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