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The Importance of Stenographic Analysis in Inclusive Education

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Abstract: In the current era, demanding on stenographic writing for disabilities is increasing. This article discusses the importances of stenographic writing for students in need of inclusive education and how it can be applied. The accept of stenography writing has in the recent past been faced with challenges about how, where, and when it is appropriate to be used in teaching and learning fields. The cardinal purpose of stenographic writing is on examining the impact of stenography writing on students' writing skills and their academic performance. Furthermore, it can ease the teaching and learning process by facilitating the flow of communication and subsequently enhancing especially inclusive learning outcomes.

Keywords: Stenography, inclusive education, court stenography, machine stenography, real – time transcription, CART (communication access and real translation), enhanced academic equity, disabilities, legal stenography.

Introduction: Stenography is a method of writing quickly using symbols, abbreviations, or shorthand techniques to capture spoken words or ideas. It is often used in environments where fast transcription is required, such as courtrooms, meetings, or for transcription services. Stenographers use specialized machines or shorthand systems to write much faster than regular handwriting. Nowadays, stenographic writing system is getting used for diverse spheres.

It is true fact that this word "stenography" comes from Greece. Together, stenography literally means "narrow writing" or "compact writing," which aligns with its

purpose—writing quickly using shorthand symbols or abbreviations. The concept of stenography (shorthand writing) has existed for thousands of years, evolving alongside the need for rapid and efficient transcription. Ancient Greece (4th century BCE): The earliest known shorthand system was used by Xenophon, a student of Socrates, to record his teacher's speeches. However, little is known about the exact symbols or techniques used.

Ancient Rome (63 BCE - 14 CE): The first widely recognized shorthand system, Tironian Notes, was developed by Marcus Tullius Tiro, a slave and later secretary to the famous Roman orator Cicero. This system used symbols to quickly write down speeches and was in use for centuries, even into medieval times.

Machine stenography (e.g., using stenotype machines) has largely replaced traditional handwritten shorthand in professional settings. The most common form of stenography is court stenography, where a stenotype machine is used to record speech as it happens in real-time. The stenotype machine has fewer keys than a regular keyboard, each representing a sound or syllable, allowing the stenographer to type as fast as someone is speaking, sometimes reaching speeds of over 200 words per minute.

Stenography is also used for closed captioning in television and real-time translation. It's different from traditional typing or writing in that it's designed for speed, accuracy, and efficiency in capturing spoken language. New technologies like voice recognition software continue to evolve, but stenographers remain essential for fast and accurate transcription.

Stenography plays a crucial role in making education accessible to all students, especially those with disabilities or learning challenges. Many students with hearing impairments rely on real-time transcription to follow lectures, discussions, and videos.

Communication Access Real Time Translation (CART), provided by stenographers, ensures that students can read captions of spoken words instantly. This allows them to actively participate in classroom discussions, ask questions, and engage with the content at the same pace as their peers. Moreover, it is beneficial to Support for Students with Learning Disabilities. For instance, Some students with dyslexia, auditory processing disorders, or other learning disabilities struggle with note-taking. Stenographic services provide verbatim transcripts, allowing students to review and process information more effectively. This enhances comprehension and retention of educational material. Also, multilingual and ESL (English as a Second language) support have a huge impact on listening. Real-time stenography can assist English as a Second Language (ESL) students by providing written transcripts they can read while listening. This helps them develop language skills and bridge the gap between spoken and written comprehension. Live stenographers use specialized shorthand machines or software to transcribe spoken content into text in real time. The text is displayed on projector screens, personal devices, or captions on video streams.

Accessibility for Remote and Hybrid Learning

Many educational institutions now offer online or hybrid learning models. Stenographers help provide live captions and transcripts for virtual classrooms, making online education more inclusive. This is particularly beneficial for MOOCs (Massive Open Online Courses) and students with unreliable internet connections.

Enhanced Academic Equity

All students benefit from having accurate, real-time transcriptions of lectures, debates, and seminars.

Stenographic records can serve as valuable study resources for revision, research, and documentation.

It ensures that students with different abilities and learning preferences have equal access to information.

Legal Compliance and Institutional Responsibility

Many educational institutions are required by law (ADA in the U.S., Equality Act in the U.K., etc.) to provide accessible learning environments. Stenography services help schools and universities meet legal requirements and promote inclusive education policies.

Integrating Stenography into Modern Classrooms

Stenography can be effectively integrated into classrooms to enhance accessibility, promote inclusivity, and support diverse learning needs. Here are some key ways to incorporate stenographic technology and services in modern educational settings:

Courtroom and Legal Stenography Training Programs

How it Works:

Schools and colleges can offer stenography courses as a career path. Students can learn legal, medical, and corporate stenography for future professions. There are some benefits of courtroom and legal stenography training programs:

Creates employment opportunities in court reporting, media, and government sectors. Encourages students with strong writing skills to pursue a specialized career.

Example: Many institutions offer certifications in stenography, preparing students for high-demand jobs.

AI-Powered Stenographic Tools for Students & Teachers

AI-driven stenography tools provide instant speech-to-text conversion.

Mobile apps and AI-based tools help convert lectures into structured notes. There are some benefits of AI-Powered Stenographic Tools. Namely: Saves time for both students and teachers.

Helps neurodivergent students who need visual or text-based learning aids.

Enhances accessibility with multi-language transcription. Example: AI-based stenographic tools like Otter.ai, Ava, and Google Live Transcribe can assist in classroom settings.

Stenographic writing, such as shorthand and stenotyping, can significantly enhance inclusive education by improving accessibility, communication, and learning support for diverse learners.

1. Accessibility for Hearing-Impaired Students

Real-time transcription: Stenographic methods can be used to provide live captions for lectures, helping students with hearing impairments follow classroom discussions. Integration with assistive technology: Steno-generated transcripts can be paired with screen readers and other tools for visually impaired students.

2. Support for Neurodivergent Students

Customized learning: Stenographic notes can be tailored to different learning styles, such as summarizing key points or providing verbatim transcripts.

3. Enhanced Note-Taking for All Students

Faster and more efficient: Stenographic methods allow for rapid, accurate note-taking compared to traditional longhand writing. Improved comprehension: With accurate transcripts, students can focus on understanding rather than struggling to keep up with notes.

4. Language and Literacy Support

Support for ESL students: Real-time transcriptions help non-native speakers follow lessons and improve language skills. Multilingual capabilities: Steno tools can aid in translation and language learning by quickly transcribing and converting spoken words into different languages.

5. Promotes Universal Design for Learning (UDL)

Stenographic writing supports multiple means of representation, engagement, and expression, ensuring all students have equal opportunities to succeed. By incorporating stenographic techniques into education, institutions can foster a more inclusive and equitable learning environment for all students.

Some scientists conducted some researches on stenography writing for inclusive education in order to facilitate education system for disabilities and gave their offers. Research on the integration of stenography in inclusive education is a specialized field, and specific information about current scientists focusing on this intersection is limited. However, several scholars have made significant contributions to inclusive education and the use of technology to support diverse learners:

Jutta Treviranus: A prominent figure in inclusive education, Treviranus has emphasized the importance of designing systems and policies that are accessible to everyone. She advocates for tailoring web-based educational systems to meet individual learner needs, which aligns with the goals of integrating technologies like stenography to support inclusivity.

Missy Morton: A New Zealand academic specializing in disability studies and inclusive education, Morton has researched inclusive curricula, assessment, and pedagogies. Her work focuses on creating educational environments that accommodate diverse learners, which can encompass the use of assistive technologies such as stenography.

Additionally, the evolving field of artificial intelligence (AI) is influencing stenography and its applications in education. AI-driven tools are being developed to complement traditional stenography, offering real-time transcription services that can aid inclusive education by providing accessible content to students with varying needs.

While direct research on stenography within inclusive education may be limited, the broader focus on assistive technologies and inclusive pedagogies by these scholars and ongoing AI advancements contribute to the integration of tools like stenography to support diverse learners.

Nowadays, most countries are using stenography writing in inclusive education. Twenty-two million Americans have disabilities (blindness/low-vision, learning/cognitive disabilities) that prevent reading ordinary print (Census data on people with disabilities, 2002; U.S. Census Bureau, 2003). These individuals (a.k.a., print-disabled) are not competitive in today's high-tech, information-laden society. Fields of science, technology, engineering, and mathematics (STEM) are often closed to them. Due to this lack of access, the unemployment rate among print-disabled individuals is more than three times their non-disabled counterparts nationwide (U.S. Department of Health and Human Services, n.d.). Various reports (The Center for an Accessible Society, n.d.; In Unison2000, 2000) put the unemployment rate among disabled individuals between 30%-60%.

People with disabilities are, also, significantly underrepresented in STEM related fields (Burstahler, 1994; Malcom, S. M. & Matyas, M. L., 1991). Similar

under-representation is apparent in colleges and universities (National Science Foundation Committee on Equal Opportunities in Science and Engineering, 2000). Most unemployed disabled are receiving aid under both state and federal programs. In 2002, Indiana spent over $70 million to assist 33,257 people with disabilities to find employment, but only 3,980 were able to secure at least part-time employment (Indiana Family and Social Services Administration, n.d.). Unemployment/ underemployment is a huge government/taxpayer burden. Individuals with disabilities comprise 10.4% of the overall workforce, but only 2.7% of the science and engineering workforce. This gap is not necessarily indicative of a lack of interest in STEM careers. According to the American Council on Education (ACE), college freshmen with disabilities are equally interested in majoring in science as their non-disabled counterparts, however, this initial interest is rarely realized as an actual career in a STEM-related field (Henderson, 1999). Further evidence of the shortage of individuals with disabilities in STEM fields comes from a National Science Foundation study finding less than 320 persons with disabilities received Ph.D.s in Science/Engineering in 1997 (National Science Foundation, 2000).

Stenographic services, particularly Communication Access Real-Time Translation (CART), are employed in various countries to support students with disabilities, especially those who are deaf or hard of hearing. CART involves a trained operator using a phonetic keyboard or stenography methods to transcribe spoken words into text in real-time, which is then displayed on a screen or personal device for the recipient.

In the United States, the Americans with Disabilities Act (ADA) mandates auxiliary aids and services, including CART, to ensure effective communication for individuals with hearing impairments. This service is commonly utilized in educational settings to provide real-time transcription, aiding students in following classroom discussions.

While specific information about the use of stenographic services in other countries is limited, many developed nations have implemented inclusive education models that incorporate various assistive technologies to support students with disabilities. For instance, countries like Denmark, Germany, and the Netherlands have systems in place to support inclusive education, which may include the use of technologies like CART.

Additionally, countries such as Australia, Canada, and the United Kingdom are known for their efforts in supporting individuals with disabilities, which likely extend to educational settings. These nations have policies and resources aimed at inclusivity, potentially encompassing the use of real-time transcription services like CART to assist students with hearing impairments.

It's important to note that the availability and implementation of stenographic services can vary based on local policies, resources, and the specific needs of students within each educational system.

CONCLUSION

In conclusion Stenography is more than just a method of fast writing—it is a powerful tool for educational accessibility. By ensuring real-time transcription and captioning, it allows deaf, hard-of-hearing, and learning-disabled students to fully engage with their education, promoting a truly inclusive learning environment. Schools and universities should invest in real-time captioning, note-taking services, and AI stenographic tools to modernize classrooms. For this very reason, students in need of inclusive education should not be isolated but rather included as full members of society. By utilizing the aforementioned opportunities, their active participation in the educational process should also be ensured.

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