

Integrating Computer Technology in Handling Students with Special Learning Needs

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Abstract

Integration of computer-based technologies into the classroom for typically functioning students is known to many but fewer individuals recognize the great number of benefits that computer-based technologies may afford students with disabilities. This condition serves as the starting point of this paper. It aims to present how computer-based technologies can help meet the learning needs of these students with special learning needs when use to facilitate their educational activities.

Integrating technologies in educating students with special learning needs helps in preparing them to participate in a rapidly-changing world where work and leisure activities are increasingly transformed by technology. Just like any regular student, they are enabled to find, explore, analyze, exchange and present information. Consequently, the necessary skills for their education are developed and or enhanced. The skills developed are a major factor enabling them to be confident in dealing with other students without special needs. Social skills are learned as a side-effect of developing their technology skills. This happens when working takes place collaboratively between students with special needs and students without special needs inside an inclusive classroom or with other students outside the school or university. Through computers, the creativity of these students is also enhanced and they are helped to independent learners.

As experienced by the presenter in a regular classroom where students with hearing impairments and visual impairments are mainstreamed, use of computer technology for word processing, communication, research, and multimedia projects help them keep up with their nondisabled peers. For students with specific learning disability, the ease of revising text, producing clean and readable text, and feeling a sense of authorship as attributes of word processors leads to improve their writing.

Computer technology when utilized fully and appropriately can assist many students with mild or more severe disabilities in overcoming a wide range of limitations that hinder classroom participation—from speech and hearing impairments to blindness and severe physical disabilities. However, many teachers are not adequately trained on how to use technology effectively in their classrooms, and the cost of the technology is a serious consideration for all schools. Thus, although computer technology has the potential to act as an equalizer by freeing many students from their disabilities, the barriers of inadequate training and cost must first be overcome before more widespread use can become a reality.

Inclusive Education

Inclusive education is a policy which determines that learners with special learning needs should be accommodated in classrooms and not taken out and separated from mainstream learners.

This means that all teachers need to be able to provide for their needs. This might mean adapting teaching methods. In this way the material (knowledge and skills) that an educator offers will adapt to the needs of the learners rather than requiring the learner to adapt to the educational requirements.

Inclusive education is directly related to the country's constitution to prevent discrimination against persons with disabilities and give them the same educational rights and opportunities as everybody else. As an educator, this means that one should constantly seek more information and resources to help all learners better.

Principles of Inclusive Education

Right to Education. Inclusive education is based on the principle that every child has a fundamental right to education and should be treated individually and equally. All learners must be given the opportunity to achieve and maintain an acceptable level of learning.

Access. With inclusive education, all learners in a school, regardless of strengths, weaknesses and disabilities are part of a school community and can feel success. This includes giving all learners access to equal education, both through physical access and opportunities.

Learning Together. Every child has unique characteristics, interests, abilities and learning needs. Children who learn together are more likely to be able to love together.

Barriers to inclusion of learners with special needs and learning difficulties

Attitudinal Barriers. Attitudinal barriers may be the most difficult barrier to overcome as it involves altering people's mind-set. Stereotypes, labels and misconceptions often block people from embracing the implementation of inclusive education.

Administrative Barriers. Schools may feel that inclusive education poses certain administrative barriers, such as specialized staff, transportation, access or funding for specific forms of support.

Architectural Barriers. Unfortunately, many buildings do not cater for people with special needs, as they do not have curb cuts, ramps, automatic door openers, elevators, Braille signage or other similar assistance.

Programmatic Barrier. Serving people with different disabilities in an inclusive environment may also pose programmatic barriers. Staff may not have accurate information on the varying disabilities or even have experience in teaching diverse group of people with special needs.

Using ICT'S can help to reduce barriers to inclusion by allowing for more individual approach to learning. By using variety of ICT's such as audio/visual material or specific software on the computers, you can tailor lessons to meet a variety of needs. In addition, computers allow for individual settings, pace and experimentation. Computer work stations can also be adapted to accommodate people with special needs, while special software and hardware can make ICT's more accessible and user-friendly to people with special needs and learning difficulties.

Training Barrier. Institutions of higher learning do not really cater for learners with special needs, Braille – sign language, etc.

ICT's can help reduce barriers in the classroom and good examples of inclusion will help wear away at attitudinal and administrative barriers.

Use ICT's to reduce barriers to Inclusion

There are different categories of ICT's that can help inclusive education. Some involve using specialist equipment and some are simple uses of ICT's that every educational institution has now or will shortly have.

Assistive technology is used in improving “the functional capacity of the learner with disabilities.” It is used to emphasize the individual strengths of the learner, minimize the effect of the disability on the learner.

Instructional technology incorporates tools in teaching and is used in improving “functional capacity of the instructors/ teachers” in teaching learners with disabilities. Data mining allows for teachers to pick up the learner's patterns/challenges and thus making it possible to plan and teach accordingly,

Augmentative/Alternative Communication (AAC) - Is either an electronic or manual means of facilitating communication for persons who are unable to communicate effectively due to physical impairment, severe disabilities, or the various forms of communication disorders (speech or language). This form of communication, information sharing and socialising involves the use of high-technology (computerised speech selection and transmission, scanning, etc) or low-technology (Picture Communication Boards, Bliss Symbols, Reading Machines, head-sticks, electronic communication aids, using a certain body part such as pointing with hands, using head-sticks, eye movement, foot, tongue, etc.

Many of the ways to reduce barriers to inclusion involve increasing access, either physical, or through the use of various accessibility settings available on computers.

Access

As previously discussed, ICTs can help reduce barriers to inclusion.

Specifically, computers can be adjusted to accommodate specific needs. To change the settings on your computer:

1. click on the “**Start**” menu to view hardware and software options.
2. click on “**Control Panel**”. You will then see a list of options including, “Printers and other hardware”, “Add or Remove Programs”, “Sound, Speech and Audio Devices” and “Accessibility Options.”
3. Click on “**Accessibility Options.**”

Screen

There you will see a list of options including **Adjust the contrast for text and colors on your screen** and **Configure Windows to work for your vision, hearing and mobility options**. By clicking on either of these, you will be taken through an instalment wizard for configuring the screen settings to cater for specific needs. Below these options, you will find a link reading **Accessibility Options**.

4. Click on this to make adjustments to the keyboard, sound, display, mouse and general adjustments. By adjusting the computer settings to accommodate individual needs, you are making steps towards inclusive education by taking the available technologies usable for all learners. See figure below for an example of large text on the screen



Figure 1. A visually impaired learner of the university makes use of large text on large screen

There are also Braille displays available, which translate text on the screen into Braille. This device is flat and can be placed directly under the standard keyboard where the blind person can follow what is displayed on the screen. Similarly, Internet settings can be more accessible for the blind through software that reads the homepage to the reader for example the 'JAWS' reader that reads text aloud that is visible on screen.



Figure 2. Braille machines of the Institute for Inclusive Education of the University



Figure 3. A learner with visual impairment using computer with JAWS reader that speaks aloud when he moves over icons or text on screen

For learners with hearing impairment, the visual output of a screen can replace the speech in a classroom, which allows for the learner to follow along quite easily while the teacher is speaking.



Figure 4. Learners with hearing impairment follow text on screen

Figure 5 and 6 below are presentations of a classmate interpreter and private hired interpreter helping students with hearing impairment of the university by signing at the same time working on a computer. These interpreters are majors of Special Education of the University.



Figure 6. Classmate interpreting for a learner with hearing impairment



Figure 7. SPED major graduate of the university interpreting for the students with hearing impairment in all classes inclusive of their computer class

Keyboard



Figure 7. Keyboard with Braille letters

Settings on workstations can also be altered to assist learners with special needs. For example, students with visual impairment, who know Braille, are and beginners in using the keyboard can use standard keyboards with Braille labels. To train them to master the keyboard, the Braille labels should be removed just after introducing the different keys using the label.



Figure 8. Learners helped the teacher make Braille letter labels and stuck them on the correct keys

There is a wide range of hardware and software available to assist with making computers accessible and beneficial to all learners. The following are only a few samples. Some of these were purchased by the Institute for Inclusive Education of the University.

Screen Reader. Screen reader software represents what is known as a text-to-speech application, which analyzes letters, words, and sentences and converts them into synthetic or digital speech.

JAWS is one of the samples of screen reader program for Windows. This is what the Institute of Inclusive Education of Saint Louis University is using in teaching the students with visual impairments for the different computer applications.



Figure 9. JAWS software purchased by the Institute for Inclusive Education of SLU

Text Enlargement. Students with visual impairments who have some functional vision may be able to read printed texts by using hand-held magnifiers.

Textile Text Access. Braille has been used by persons with visual impairments for many decades. This system of various combinations of six raised dots is the only media for producing written material for those individuals who are unable to read printed text. Two levels of Braille, Grade I and Grade II, are used most often.



Figure 10. Braille Machine currently printing notes of students with visual impairment



Figure 11. Staff of the institute, with physical disability, in-charge in processing word document into Braille printout for the clients of the Institute of Inclusive Education coming from various places

Optical Character Recognition (OCR) Technology. This technology can scan and read text aloud, allowing individuals with visual impairments greater access to all types of print materials and enabling them to read the materials independently.



Figure 12. Staff of the institute, with hearing impairment, in-charge in scanning books or notes ready to for Braille print.

Auditory Text Access. The discovery of “Talking Books” gave people with impaired vision some independence in reading. When cassette tapes became popular with the general public, it was found that printed material could be recorded faster and much more economically than before.

Descriptive Video Services. This provides narrative verbal descriptions of visual elements and has proven useful in helping students who are blind or have low vision to use educational programs in regular classrooms.

Sign language software is available for translating English into sign language to help teach deaf learners how to sign, and also translate conventional learning texts into sign language.

Word Processing Software. The attributes of word processing that lead to its effectiveness as a learning tool for children with special needs are generally the same attributes that make it effective for children in general. For example, the ease of revising text, producing clean and readable text, and feeling a sense of authorship are frequently mentioned as attributes of word processors that lead to improved writing. These benefits are significant for the many students with mild learning disorders related to deficits in written language skills, who often need to spend a significant amount of time rewriting a passage to communicate an idea clearly (Graham, 1988). Word processing is also especially helpful for

those students who struggle with delays in fine motor skills that impair their ability to write legibly (Margalit, 1990).



Figure 13. Volunteer student with visual impairment assisting another student with visual impairment learn how to use the Microsoft Word

Electronic Spreadsheets. Just like any regular students, students with special learning needs can also maximize what spreadsheets may offer. With the assistance of screen reader software like Job Access with Speech (JAWS) for instance, visually impaired can utilize what MS Excel may offer. Spreadsheet is also called worksheets. Spreadsheets were the earliest application software available for microcomputers.



Figure 14. Student with visual impairment presently using MS excel on a wide screen monitor

Web Browser. The use of web browser for teachers handling children with special needs is very helpful because it offers vast information and materials needed in the field. This is specially so that only few resources like books, magazines and others are available for teachers to understand the needs of their students with special needs and how are they supposed to be handled or managed. Through the net, teachers can download free materials that they can use for instruction. This is to save time and to have opportunities in choosing best materials for the individual needs of their students.

Surfing the net allow students inclusive of those in special education to search for and view various kinds of information on the Web, such as web sites, video, audio, etc.

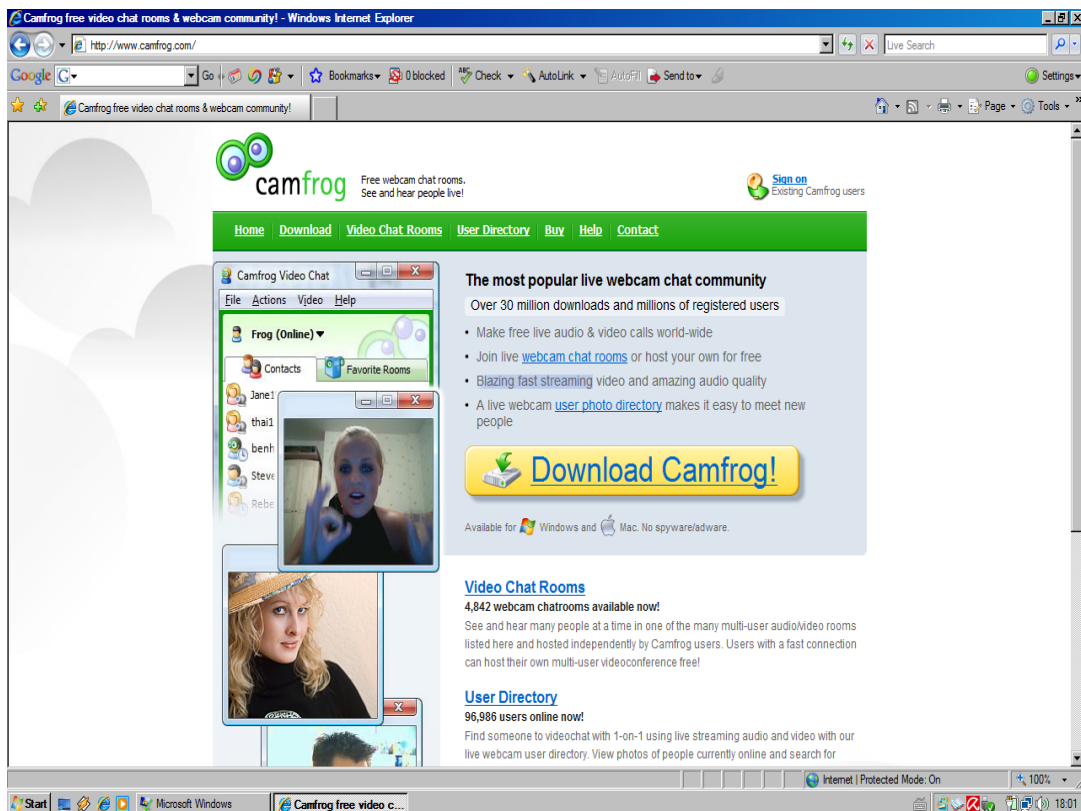


Figure 15. Chatroom usually used by students with hearing impairment. It has many members with hearing impairment all over the globe

Multimedia Presentation Tools. Multimedia presentations when manage properly engages students with special learning needs to construct and convey knowledge. They can be easily motivated to listen to the presentation when it is interactive and when its entire feature are utilized accordingly. The students may be are slow learners or gifted; multimedia presentations can serve to facilitate learning for them.

Multimedia applications also provide students with ways to express their knowledge other than in writing. The technology provides a tool for students with disabilities to express themselves, and an opportunity for them to showcase unique abilities and talents that generally are not revealed in traditional school assignments. Multimedia projects can be especially important for students with disabilities who seldom have the opportunity to demonstrate their strengths in school (Collins, 1991).

Publication. The feature of Publisher applications particularly MS Publisher is Person with Disabilities friendly. This is because it has ready templates. What the user will need to do is to modify the templates according to his needs.

Electronic Encyclopedia. At the most basic level, encyclopedias can be characterized as books about *things*, while dictionaries are books about *words*. Today, encyclopedia entries are no longer found in printed books only but also through electronic. There is no doubt about it - cuddling up with a good computer (even a small good computer) is not the same as cuddling up with a good book. Reading and learning from electronic books certainly have some disadvantages. Most obvious is the fact that the book can't be read without a computer and, most likely, a fairly sophisticated one. To read books on CD-ROM requires that the computer have a CD-ROM drive and often a relatively high-level operating system. Whatever their disadvantages, electronic books possess a number of important advantages, at least from special education point of view and instructional point of view. For students with special learning needs, the advantages of electronic books evolve from the specialized features inherent in almost any kind of electronic document. Specifically, electronic documents are usually searchable, modifiable, and enhanceable. This is user friendly too to people with visual impairment because with the use of screen readers, they can listen to its content.



Figure 16. A student with visual impairment using Microsoft Children's Encarta for his research activity

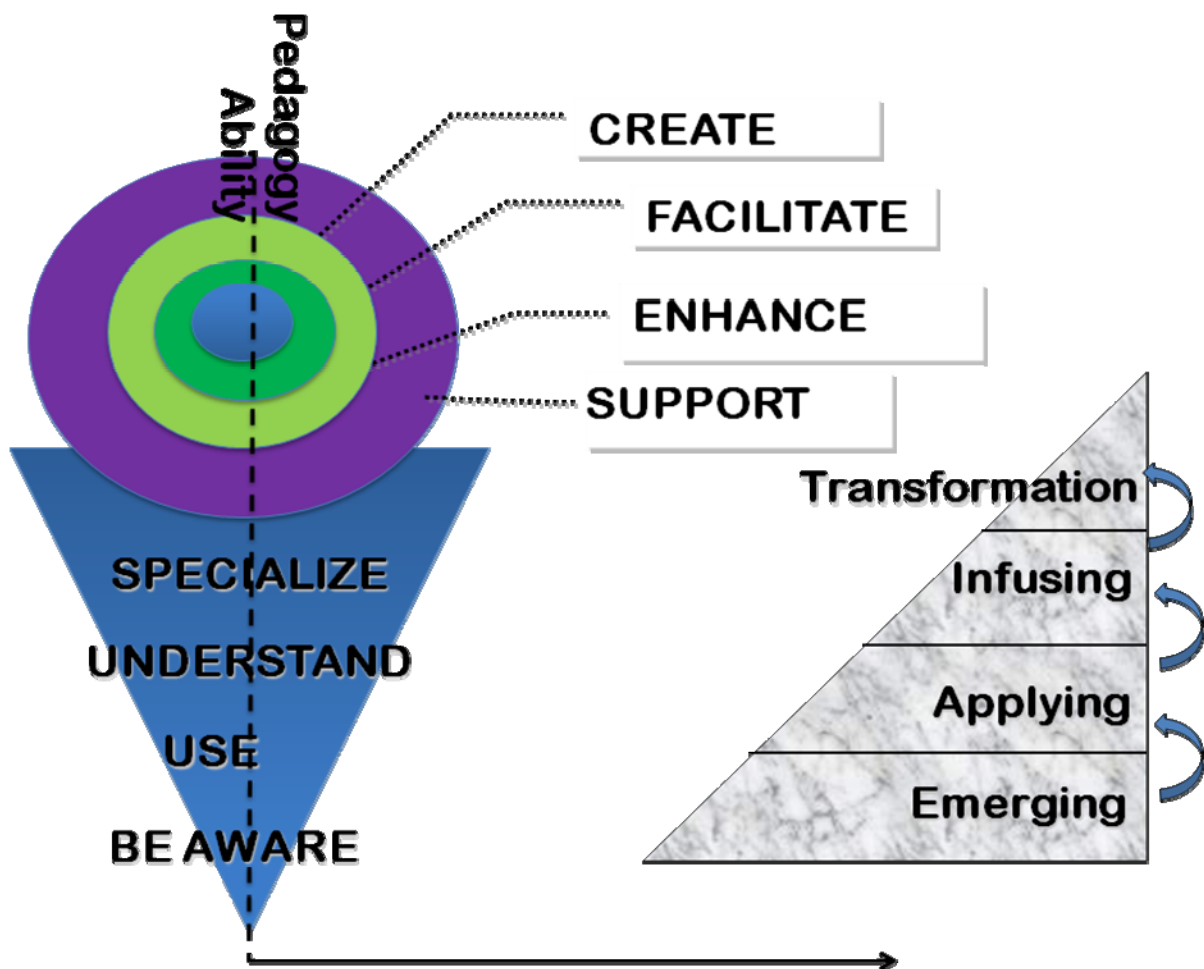
Physical barriers can also be eliminated by making provisions at computer work stations. For example, learners in wheelchairs need to be able to reach the workstation. This means that the desk legs need to be wide enough for the wheelchair to fit and low enough that the learner can easily reach the keyboard and mouse. Similarly, the layout of the computer room may have to be adapted to allow for access to all learners.

Finally, other ICTs can also help to reduce barriers. For example, while showing videos always make sure there are subtitles to read. Similarly, both hearing and visually impaired individuals might also benefit from information being presented on an overhead projector or on a computer projector.

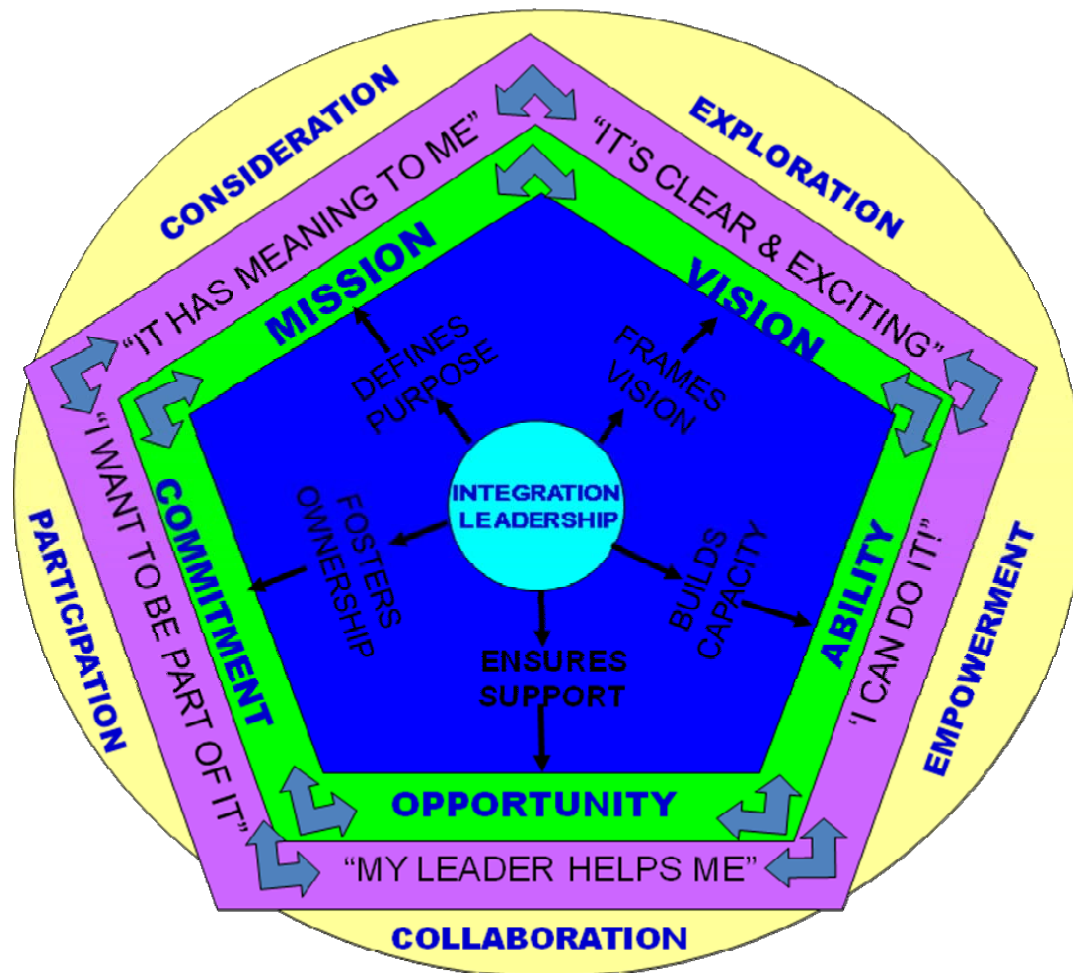
Clearly, there are numerous ways of using ICTs to reduce barriers and create inclusion.

Challenge in integrating ICT in handling students with Special Learning Needs

ICT-PEDAGOGY INTEGRATION MODEL



In institutionalizing ICT in helping students with learning needs, the succeeding model will help.



Conclusion

1. There are various software applications that teachers may utilize to help them facilitate the learning process of individuals with special learning needs.
2. Using ICTs can help reduce barriers to inclusion by allowing for a more individual approach to learning. It can be used to enhance teaching and learning and will allow an educator to move from a more traditional educational setting to a role of facilitation and guidance.
3. By using ICTs to search for more information about the special needs that teachers find in class, they will be better equipped to make appropriately and accommodate these learners. It is of great help to them also in preparing instructional materials when these are learned and utilize appropriately.
4. One cannot just get or use any information offered by some computer applications because there are legal and ethical guidelines that need to be observe in order not to infringe copyright laws.

Recommendation

1. The government and school administrators should see to it that there is adequate training provided for teachers to be equipped on how these computer applications can be utilized especially in catering to students with learning needs.
2. Classroom teachers must have a deep understanding of what they are trying to accomplish and how technology can help them achieve their goals. Thus, to meet the needs of students with disabilities within regular classrooms and special program classrooms, all teachers, need training in how technology can be used, and the technical skills to carry out a plan of action.
3. Funding for technology can be obtained from a variety of sources, thus, administrators, parents, teachers and the government should work together in sourcing funding from different agencies in and outside the country.
4. Computer application users should not ignore the guidelines and policies in the use of technologies. Employ technologies wisely.

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