

**Learning Technology and
Diverse Students: A
Classroom Resource
Guide for School Teachers**

Introduction

Learning technology could be a useful tool to help teachers meet diverse students' needs. With the establishment of a series of education acts for students with special needs, more and more students with special needs have opportunities to be involved in a regular classroom. In addition, there is an increasing tendency for English Language Learning students to account for a larger percentage of the student population in the classroom. These students, both male and female, have diverse physical abilities, diverse cognitive abilities, diverse intellectual abilities and diverse cultural backgrounds. Under such conditions, it is very difficult for one teacher to meet all of the students' diverse needs in classroom. Learning technology is an effective way to enhance excellence in education, to support curriculum requirements, to meet various needs, to help students learn to learning, and to ensure quality of education. It is also a good way to help teachers meet diverse needs in a classroom. The aim of this resource guideline is to help teachers receive a general understanding about how to use learning technology in order to meet diverse needs of students.

At the very beginning of this resource guideline, I will introduce some distinct needs which diverse students bring to a classroom. Then I will explain why learning technology is a good way to meet these diverse needs in classroom. Next, I will introduce the main learning technologies that can be used in classroom. Lastly, I will introduce how to use learning technologies in order for education to be effective. In the appendix, there is a learning experiment about how to use multi media to teach the cultural dimensions of science to English Language Learning students.

With this resource guideline, I hope I can help school teachers to receive a general understanding in a short time. I will try to introduce learning technology in an easy to understand(ing), and succinct way.

Diverse Students in the Classroom

In the classroom, students are diverse. They have different cultural backgrounds, different genders and different abilities.

Diverse Cultural Background

As one of the most open and multicultural countries in world, the population of the United States is formed of individuals from diverse backgrounds. There are two aspects that could be thought of as the expression of students' diverse cultural backgrounds: students' English language proficiency and students' socioeconomic status. On the one hand, students' English language proficiency may become a barrier for their learning, communication and usage of technology. Without a fluency in the English language, it is difficult for these students to read textbooks, to keep up with a teacher's lecture, to communicate with classmates and to understand English websites as well as technology. On the other hand, socioeconomic status has an influential impact on students' learning experience. The socioeconomic status of one's family has an impact on students' accessibility to technology.

Gender Status

Even though there are more and more female students using blog, facebook or other technology products, the issue is that female students still hold a less positive attitude on learning technology than male students. It is not hard for us to see that there are much more male students in college's computer science department.

Diverse Abilities

Learners with physical disability or impairments: Physical impairments affect mobility and limit student's interaction with the learning environment based on information processing.

Learners with cognitive impairments: Cognitive impairments can impede a student's ability to process information.

Learners with intellectual disability: Intellectual disability can lead to delay development, symbolic understanding, early cognitive milestone and fewer opportunities to interact.

A special learning group: Students who have special needs and speak a foreign language have more barriers to achieve communication in the classroom. Besides, female students with special needs also have different learning style.

Ensuring Students' Engagement in General Classroom

The Access to Equal and Appropriate Education for Every Student

Since the Education for All Handicapped Children Act in 1975, the U.S.'s education system begins to consider the equal education for every student in the classroom. The 3 milestone acts are The United States Congress enacted Education for All Handicapped Children Act, The Individuals with Disabilities Education Act and The

No Child Left Behind Act.

The United States Congress enacted Education for All Handicapped Children Act (EAHCA, or EHA, or Public Law (PL) 94-142) in 1975. This act improves the physical and mental disabled students' equal accessibility to free and appropriate public education.

The Individuals with Disabilities Education Act (IDEA) is a United States federal law that governs how states and public agencies provide early intervention, special education, and related services to children with disabilities.

The No Child Left Behind Act (NCLB, or Public Law 107-110) is proposed by President George W. Bush in 2001. It requires including all children in process monitoring and to insure that all children get access to a rigorous curriculum as well as to learn to full potential.

The Term of Universal Design Learning

Universal Design for Learning (UDL) is a framework for designing educational environments that enable all learners to gain knowledge, skills, and enthusiasm for learning. This is accomplished by reducing barriers to the curriculum and providing rich supports for learning.

Universal Design for Learning is mean to meet the widely diverse students' diverse needs for learning by diverse goals, materials, methods and assessments. Through Universal Design for Learning, teachers develop appropriate goals designed to address the needs of a wide range of students and implement instructional methods responsive to individual difference (Rose and Meyer, 2002).

The Term of Inclusion

The term "inclusion" means educating students with disabilities in regular classrooms. It is part of the least restrictive environment principal of IDEA. Inclusion in educational settings has several defining characteristics:

- The inclusion of students with a variety of abilities

- Students feeling that they are an integral part of the classroom
- Students sharing a common education experience
- Persons with and without disabilities equally sharing the setting
- Addressing the needs of the entire students

Why Choose Learning Technology

Making Education Visible. Learning technology could help teachers to improve their curriculum. Such improvement includes making curriculum more vivid and attractive.

Multi-media is one of good examples.

Engage Students in Learning Process. Learning technology could let students get more participation in class. Students could receive more communication between students with students and students with teachers.

From What I Know to What I Am Wondering. Learning technology can inspire students' learning. It can afford students a chance to explore and receive more information, thus students can conduct learning with continuous wondering instead of remembering knowledge.

Teach Students Learn to Learning. Learning technology affords students assistance as well as opportunities to learn by themselves.

Meet Students' Diverse Needs. Learning technology can help teachers to meet

students' diverse needs. For example, translation software can help teachers to communicate with ELL students and augmentative and alternative communication technology could help teachers to communicate with students with special needs.

Introduction to Learning Technology

Computer input devices. Input devices can be constructed to accommodate a wide range of abilities. Keyboard and mice are two of the most common computer input devices. These can be modified to accommodate diverse individuals. For example, bigkeys keyboard, which has extra large keys to facilitate locating and pressing the keys correctly.

Computer output devices. Just as input devices can help make computers more accessible to people with disabilities, assistive/adaptive output devices can help make computer output more understand and useful. For example, low vision accommodations, these devices assist people with visual impairment. They include: glare protection screens and large monitors with high resolution.

Internet based communication. Internet based communication is an inexpensive and generally reliable method of local, regional, and long distance communication.

Telephone systems. The newest telephony technologies have the potential to convert text to speech and speech to text to allow communication between text based and auditory mediums.

Hearing aids. The two most common types fit either behind the ear or father down the hearing canal. Another hearing aid used commonly in the classroom is the FM listening system. The system is structured so that the teacher wears a microphone into which he or she can speak normally; the sound is then broadcast to the student's

hearing aid.

Augmentative and alternative communication devices. AAC devices enhance a person's ability to interact. A simple version of an AAC is a pencil and paper for a person who cannot speak. Electronic AAC devices can produce text and synthesized speech through a variety of input options.

Translation software. Translation software is anything that converts the input or output from one communication mode to another.

Enhancement software. Enhancement software does not change the mode of communication; it supports that mode by offering a greater range of output options.

Learning Technology and Teaching Method

Technology for quality learning and teaching

Technology as the aid for learning and teaching.

Technology as assistance for self learning.

Technology and the inclusive classroom

Students with special needs: been isolated to least restrictive environment

Students receive all of their services in the regular education classroom.

Technology and the individual education plan

An IEP is the blueprint for how the education of students with exceptionalities needs to be carried out. It is the key of special education.

Teachers should plan what services students will receive and how to receive these services.

Teachers should plan what technology will use in the IEP.

Teachers should know does the specific technology been used.

Using technology with ELL students

ELL students lacking language skill.

ELL students have the difficulty in reading.

Using technology to help teachers to conduct communication.

Technology used in a large community and the active as well as engaging environment.

Teachers and parents' instruction and control

It is important for parents and teachers to afford necessary instruction and control for learning technology since it also may bring negative impacts on students' learning.

Such negative impacts include unhealthy information and overtime usage.

Assessment

Assessment is also very important for the implementation of learning technology. On the one hand, it can help teachers to decide which technology should be used. On the other hand, it could help to evaluate effects of learning technology. I list some online resources about assessment of learning technology.

Learning Technology Evaluation Center

http://www.mgtofamerica.com/pk_12_market/services/learning_technology_evaluation_center_ltec_service

Free Learning Technology Evaluation Tools

http://www.kmsi.us/free_eval.htm

Teacher Resources-Evaluation of Learning Technology

http://www.teach-nology.com/teachers/educational_technology/evaluation/

Books for Further Reading

John Siraj-Blatchford and David Whitebread. (2003). Supporting Information and Communications Technology in the Early Years

This book introduces how to use technology to help young kids to improve their learning.

Paula S. Cochran. (2005). Clinical Computing Competency for Speech Language Pathologists

This book introduces how to use computer to help speech therapist to conduct their communication therapy or speech therapy in an easy way.

Peter Gardenfors and Petter Johansson. (2005) Cognition, Education, and Communication Technology

This book introduces the basic theories about cognition, how to relate these theories to education and how to use communication technology to improve education.

David H. Rose, Anne Meyer, and Chuck Hitchcock. (2005). The Universal Designed Classroom-Accessible Curriculum and Digital Technologies

This book includes several essays about Universal Design of Learning. These essays include what is UDL, how to conduct UDL, how to use UDL to improve education.

Lawrence Tomel. (2007). Integrating Information and Communications Technologies Into The Classroom

This book introduces why technology is important to education and how to use technology in education.

Marty Bray, Abbie Brown and Timothy D. Green. (2004). Technology and the Diverse Learner

This book is a brief introduction about how to use technology to meet diverse learner's needs in education.

Cream Wright. (2000). Issues In Education and Technology

This book includes several essays about issues in education and technology. Every chapter also includes an case.

Useful Online Resources

http://en.wikipedia.org/wiki/Assistive_technology

Wiki page about assistive technology. It includes introduction of assistive technology and products.

<http://www.iallt.org/>

The international association for language and learning technology.

<http://www.brandon-hall.com/publications/learntechproducts/learntechproducts.shtml>

Free report about learning technology.

<http://www.tltgroup.org/>

A non-government organization about learning technology.

MIT OpenCourseWare
<http://ocw.mit.edu>

WGS.693 Gender, Race, and the Complexities of Science and Technology: A Problem-Based Learning Experiment

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