



Guiding School Improvement Through Emerging Online Resources

A Guide to Research-Validated Methodologies that Support Online
Learning Opportunities and Accountability Solutions with QuickMind.net

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EXECUTIVE SUMMARY

With the research-validated requirements of the *No Child Left Behind* legislation, schools believing that instructional technology is a vital part of their school improvement plan are now challenged by à priori substantiation needs of pedagogical effectiveness.

This document presents an overview of the effectiveness of online electronic resources in elementary and secondary classrooms with a view to evaluate Internet-based learning as elemental to:

1. Improving students' performances, thinking skills, and self-responsibility for learning
2. Harmonizing epistemological philosophies between technology programs and schools
3. Fostering mixed modes of students' learning and their ability to construct knowledge
4. Increasing collaboration among teachers
5. Developing professional practices by forwarding a teacher-as-researcher model
6. Improving openness with powerful communication tools that reach stakeholders in the learning community

This report builds upon related prior research and evaluation studies to validate the claims that emerging online technologies support these goals.

With the features and functions of **QuickMind.net** as an example, this study provides a rationale for the use of a particular research or evaluation approach to learning and teaching. This report identifies how **QuickMind.net** was constructed to incorporate proven best practices into instructional technology.

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INTRODUCTION

Introduction...

I hear and I forget.

I see and I remember.

I do and I understand.

- Confucius

New research points to technology's effectiveness in supporting students' academic achievement and intellectual growth. Key reports show that math and reading test scores can be improved through the use of the right technology and the effective integration of technology in the learning environment. Studies further claim technology can improve the school climate by renormalizing the learner's pursuit of skills and knowledge, and repurposing educators with collaborative goals.

Technology has served to change teacher-student relationships, the acquisition of higher-order thinking skills, the building of problem-solving and meta-cognition skills, and the ownership of knowledge transmission.

While the motivation of many pioneers in the educational technology movement focused on school change issues by migrating the center of instruction from the teacher to the student, a blended world of instructional technology is emerging that speaks more to personalization and less to individualization. A blended approach to learning technology accepts the tradition and organization of the typical school and designs powerful new media to serve and enhance it. Educators will recognize this approach to instructional technology by the hallmarks of scalability, adaptability, tractability, and structure.

Integrating Internet resources into the curriculum is an important aspect of teaching with technology. By citing investigations that parallel the methodologies of **QuickMind.net** to the research-validated requirements of *No Child Left Behind*, this paper shows how **QuickMind.net** satisfies the demands of this legislation.

Finally, as an evaluative tool, this paper provides a critical perspective to support decision-makers in determining if online electronic resources are "the right technology" for their schools.

EFFECTIVE USES OF TECHNOLOGY

People are getting beyond the idea that this thing is magic, and that like a fire, just by sitting near it, you can get some benefit.

- Christopher Dede,
Professor of Education and Information Technology, George Mason University

The growth of learning technology over the past decade has been exponential – almost explosive. Past the infrastructure issues of what hardware to purchase and what software to adopt, school technology leaders need to ascertain which learning models contribute to their students’ success. What are the effective uses of technology in schools?

An evaluation of research shows that the best practices in learning technology combine technology with appropriate pedagogy and appropriate delivery of content. Throughout this paper key research studies will be examined and related to **QuickMind.net**.

Effective Technology Directly Supports Learning Goals

Effective technology for schools does not necessarily depend on owning the latest technology; it depends on selecting instruments that support and enhance identified teaching and learning goals.

An evaluation of research shows that best practices combine technology with appropriate pedagogy and appropriate delivery of content. Among scores of research reports about technology in the classroom, the most gains in student performances existed when standalone technology models were not used.

A study among ninth grade algebra students in Pittsburgh, Pennsylvania by Kodinger, Anderson, Hadley, and Marks in 1999, demonstrated that students who used a multimedia algebra tutorial that focused on real-world problem-solving performed better than peers.

“On average, the 470 students in the experimental classes using software outperformed students in comparison classes by 15% on standardized tests and 100% on tests targeting the curriculum–focused objectives.”

Favorable outcomes were achieved in reading with *The Little Planet Literacy Series: Vanderbilt Classroom Assessment*, where, in 1997, two first-grades classes in an inner-city school were studied. Similar pre-test scores on the *Tennessee Comprehensive Assessment Program (TCAP)* allowed researchers to randomly assign students into experimental and control groups. Teachers in the experimental group received technical and curriculum development training in the program.

Over the course of the year, children in the experimental group engaged in the multimedia language learning program with a stated methodology of developing reading through writing and critical-thinking skills. When mid-year fluency tests were administered, children in the multimedia class outperformed children in the control group by 30%.

When the content of a computerized learning system is attached to outcome expectations, the benefit of the technology is optimized.

Effective uses of Technology...

Conclusion: The right technology builds skills

A cognitive tool with computer-based instruction, remediation, and support, **QuickMind.net** is decidedly designed to develop students' performances and self responsibility for learning. Created by educators and a credentialed staff of content experts, **QuickMind.net** is built firmly on a pedagogical foundation and research-based approach.

QuickMind.net provides a range of core curriculum applications that teachers can select, modify, target, and assign to students to meet specific learning outcomes. While their work can be targeted to outcome expectations, students learn in a professional-led technology-based environment.

Available exclusively to the school market, **QuickMind.net** meets and exceeds the validity of this research by delivering teachers and students core curriculum content. The content material, learning design, and delivery system demonstrated by **QuickMind.net** meets this component of effectiveness.

Effective Technology Promotes Higher-Order Thinking Skills

A 2002 report in the **Journal of Research on Technology in Education** entitled *Using a Technology-Enriched Environment to Improve Higher Order Thinking Skills*, three Texas-based university-level researchers presented evidence that a technology-enriched classroom fosters the development of higher-order thinking skills, and, by extension, bolsters overall student performance.

The study involved a sample of 80 sixth-graders and 85 fifth-graders tested on the *Ross Test of Higher Cognitive Processes*. A technology-enriched classroom correlated directly to the students' acquisition of higher-order thinking skills. The most notable factor that contributed to student success was the level that the classroom design facilitated supervised learning.

On a larger scale, a statistical meta-analysis of 35 studies was released by Yeun-kuang Cliff Liao at the National Hsinchu Teachers College, and reached a strikingly similar conclusion. His study, entitled *Effects of Traditional Instruction on Students' Achievement: A Meta-Analysis*, statistically concluded that the use of hypermedia in instruction significantly improved the results of student performance as compared to the results of students working solely under traditional instruction. The mean of technology-assisted groups performed in the 69th percentile over the students in the traditional group.

Three factors that most influenced the shift in mean, and the improvements in students' performance, were identified by Yeun-kuang Cliff Liao as the teacher's attitude toward technology, the program's design, and the method of delivery.

These studies show an effective use of cognitive media depend upon an instructional model that offers a high-quality design, direct curriculum integration, and extensive teacher training.

Conclusion: The development of higher-order thinking skills can be fostered through cognitive media tools

A common thread in these studies is the role of the teacher in guiding the development of student's higher-order thinking skills with learning technology.

The design of **QuickMind.net** fully keeps the teacher in charge as a facilitator for and director of learning. The teacher assigns work based on standards, learning goals, and personal needs. A rich database serves as the backbone to cull and organize student data.

With various delivery systems – online, email, and print – teachers can select the venue that works best for their students' needs and personal resources. Finally, many applications in **QuickMind.net** are open-ended for students to explore in their quest for knowledge creation.

Effective Technology Aligns to Standards

With a strong pedagogical foundation as the critical gate for evaluating the effectiveness of an educational technology program, the next evaluative gate should be the connection of content and approach to the performance and knowledge standards the learning community has agreed upon.

Technology programs are ideally suited to match standards and curriculum in a mechanical sense. On a larger level, the use of standards as a driving force behind teacher's content selection for students has been proven to raise students' performances.

An eight-year state-wide study in West Virginia called the **Basic Skills/Computer Education** program (BS/CE) showed a 14% average gain increase in scores on the **Stanford 9** test as a result of implementing customized software aligned to *West Virginia Instructional Goals and Objectives*.

Program implementation began in elementary grades in 1990 and rolled out bottom up as students progressed through the grades. The three basic components of the program were:

- software alignment to state learning standards
- student equity to computer access
- teacher training

The findings of this study showed:

- significant gains in reading, writing, and math
- special success with low income, rural, and female students
- a cost-effectiveness over other intervention models including class-size reduction

The foremost factor in success was attributed to software computer availability that featured standards-aligned coverage of basic skills. The study states:

“In contrast to the ordinary laissez-faire local selection of software, the state provided two sources of software – IBM or Josten – between which local jurisdictions could choose...Each software package was mapped onto West Virginia's statewide instructional goals and objectives.”

Effective uses of Technology...

Conclusion: Achievement in content areas is most apparent when the application directly supports learning standards

This long-term study connects technology effectiveness to standards-alignment.

QuickMind.net directly supports this research finding because it is a standards-based program. All activities in the Curriculum Activities are directly correlated to individual state and national learning standards. Similarly, activities in many of the other applications are also correlated.

An integrated and easy-to-access tool allows teachers to search for activities in **QuickMind.net** by specific learning standards. For hard-to-teach concepts, this tool assists instruction with introductory and reinforcement materials.

With **QuickMind.net**, teachers can create, store, and share standards-based material and streamline record-keeping tasks about students' progress. Additionally, teachers and administrators can be more secure with their students' future performances as they are providing materials to students that contain content that they must master.

Effective Technology Provides Feedback on Student Progress

Software programs that provide feedback about students' progress help them learn, and learn with confidence.

A 1988 study by White and Frederickson showed that seventh, eighth, and ninth grade physics students using a software tool (*ThinkerTools*) that enabled them to know where they were in the course of their inquiry, and provided them with a mechanism to evaluate their own and peer progress, were better able to apply Newtonian mechanics to real-world situations over eleventh and twelfth grade students who had not used the software.

In language arts, a 2003 study by James Kulik concluded that student's writing can be improved through software that includes prompts and suggestions as students worked. Extra gains were noticed when students were prompted rather than requesting help.

Embedded communication tools, where technology allows students and teachers to send and receive their messages over network systems have served to help students improve their level of discourse, focus on content, and take better control of their learning.

Conclusion: Interactivity Promotes Meta-Cognition Skills, Collaborative Learning and Depth of Understanding

QuickMind.net provides subjective and objective communications and feedback to students as they work in specific applications. Within the context of the curriculum programs, errors are gently corrected with instant feedback on the concepts and mechanics of the task.

Additionally, all instructions are voiced (with multilingual options) and instruction can be personalized. Teachers can view curriculum work as it is being performed, and send notes and task reminders.

Teachers and students can also initiate discussions via email throughout the program. Student progress reports are password protected and are always available for personal self-assessment and goal-setting.

QuickMind.net surpasses the interactivity benefits concluded in this important research.

Effective Technology Motivates Learners

A sweeping review of contemporary studies by Reeves concluded that there is abundant evidence that the use of technology as a cognitive-based tool aids in the development of self-regulating student behaviors, especially when employed in the context of a constructivist classroom.

Reeves' analysis supports the conclusion that cognitive learning tools:

- Improve measures on standardized tests
- Increase rates of learning
- Increase student motivation
- Promote the development of reflective thinking
- Build time management, organizational, and presentation skills

A study review in 1992 by Cotton corroborates these findings by suggesting that computer-assisted instruction improves students' attitudes about learning, computers, and themselves. Schools with a functioning technology program tend to have:

- Higher levels of self-efficacy
- Higher attendance rates
- Increased time on task
- Increased positive behaviors

Effective uses of Technology...

Anecdotally, teachers report that students find computers are attractive tools. In a **New York Times** article, entitled *The Blackboard Jungle: Tamer Than You Think*, teacher John Beam concludes that:

“Schools with higher computer rates tend to have lower rates of suspensions, major crimes and police incidents. Schools with fully functioning libraries and modern computers have better than average attendance.”

This professional observation and these two reports document that improvements in the school climate can be achieved with an effective technology program.

Conclusion: Effective Technology Programs Promote Positive Learning Environments

Watchwords for **QuickMind.net** are relevancy, privacy, and customization.

Teachers can select appropriate activities and allow students to work at their own pace at their optimal level of performance. With flexible learning strategies to meet the diverse needs of learners, the content system of **QuickMind.net** concurs in fact with the research conclusion that “one size fits all” instruction can serve to disaffect students.

For example, in the early literacy programs, teachers can select from two different teaching modalities – one is a heavily supported direct instruction with Spanish-language options; the other is a three-tiered exploration of phonics in a balanced literacy environment.

With a rich variety of applications that cover core content through numerous tactics and strategies, **QuickMind.net** exemplifies this research conclusion.

Effective Technology Involves Professional Development

Instructional technology depends on comprehensive professional training and development.

The landmark statistical study by Harold Wenglinski, *Does it Compute? The Relationship Between Educational Technology and Students Achievement in Math*, demonstrated that eighth grade math students who learned in classrooms with technology integrated into the curriculum consistently outperformed peers on *National Assessment of Educational Progress*.

Wenglinski make a vital distinction in the use of technology in his study showing that students who experienced technology in a format associated with lower-order thinking skills (“rote and practice”) fared worse overall. The role of the teacher to enhance and interpret the technology experience is vital.

Students with the opportunity to develop higher-order thinking skills used technology for conceptual exploration through simulations, had access to a variety of learning modalities, and were presented with the opportunity to construct knowledge.

Further findings illustrated that the students of teachers with professional development in technology integration outperformed students of teachers who did not. How teachers used their resources was decisive. Students who spent extreme amounts of time on the computer did not score higher than their peers, they performed slightly lower.

Summarized Wengliski, “Technology, indeed, may have benefits, but those benefits depend on how the technology is used.”

Conclusion: Effective technology speaks to teacher’s needs

QuickMind.net has extraordinary support to guide teachers to its effective use.

Internally, **QuickMind.net** provides robust management tools to help teachers incorporate its use into their daily curriculum. A *Teacher Management Tool*, newly redesigned by Sunburst engineers and designers, contains features that are consistent with NCLB compliance issues. Allowing quick import of data from SIF applications, this centrally organized center saves time for those with a large number of students.

Once classes are organized, The *Assignment Manager* allows teachers to quickly and easily develop activities and assign them to individual or groups of students. This area supports statistical analysis and long-term record keeping on students’ work, supporting the concept of “teacher-as-researcher.”

A *Standards Guide* helps correlate teacher-created activities to state, local (IEP), and national standards. Communication tools help teachers work with colleagues in their building or district. Teachers can share work within the larger swath of the **QuickMind.net** learning community.

Wengliski’s research posits that without training and support, technology programs lose momentum. **QuickMind.net** includes initial and ongoing training that carries with it learning community-building goals.

ONLINE RESOURCES TO IMPROVE STUDENT PERFORMANCES

Each problem that I solved became a rule which served afterwards to solve other problems.

- René Decartes, Discours de la Méthode. 1637.

Building on Success

Identifying the “right technology” is a process that schools can accomplish by first addressing pedagogical goals and then seeking resources that support those goals.

Deciding on school technology is a difficult task as the tools continually evolve. In the preface for **The West Virginia Story**, Cheryl Lemke, Executive Director of the Milliken Exchange on Educational Technology, a collaborator in that study, states, in retrospect:

“BS/CE is based on an instructional learning system designed over a decade ago and limited to the then- available technology. For example, easy access to the Internet was just a dream in 1989.”

From this we can infer that a network community and Internet community provides stronger working models for schools seeking to improve their learning and teaching environments.

In the majority of U.S. schools, the curriculum area where the Internet made a debut is the library. Because of his or her information management training, the school librarian has frequently been the stealth technology leader in schools and an often overlooked contributor to a school’s academic success.

A December 2002 article in the **School Library Journal**, by technology editor, Walter Minkle, revealed a study of K-12 Colorado school libraries that showed:

“...students in schools with technologically advanced libraries performed up to 18% higher on statewide tests than peers in schools with poorly equipped libraries.”

Furthermore, the study revealed that the more assets the students had, the more likely they would succeed.

With libraries as a springboard for the integration of online resources in schools, the e-rate subsidy was the final impetus to wire the learning community. A California study on the e-rate by Goolsbee and Guryan concluded that 66% more Internet classrooms existed in the state than would have been without the subsidy.

Improve Student Performances...

In 1998, as American classrooms were becoming connected, a Canadian study was published by a team of researchers at Université Laval in Montréal which reached the conclusions that online classrooms that:

- Combined educational technology with appropriate pedagogy were most successful
- Integrate technology into the curriculum demonstrated an increase in student interest, more student-centered activities, and more opportunity for authentic learning

In other words, an online classroom with integrated technology is the key to improvements in both teaching and learning.

Developing Online Learning Communities

A report by Gilbert Valdez, and a team from the North Central Regional Educational Laboratory, entitled *Computer-Based Technology and Learning: Evolving Uses and Expectations*, offers the vision that instructional media goals revolve around:

“technology [that] offer opportunities for learner-control, increased motivation, connection to the real world and data-driven assessment tied with content standards that, when implemented systematically, enhance student achievement as measured in a variety of ways, including, but not limited to standardized tests.”

The goal of creating a “data-driven virtual learning environment” points to indicators that necessitate the use of Internet services and Web-based learning portals.

The Valdez study identified variables that influenced instruction. Accordingly, the effective-use of technology is demonstrated when students:

- Use technology to explore diverse information inside and outside the school
- Produce information for real-world tasks
- Enhance learning working with others inside and outside the classroom
- Have access to real-world sources through the Internet or other telecommunications resources

Similarly, for teaching professionals to work optimally with instructional media, the research goal puts forth the idea that educators shall:

- Have access to a multimedia and global tele-communications network infrastructure that enables unlimited information transfer and online collaboration
- Have and provide students with access anywhere to experience learning opportunities as they need them

- Access Websites and interactive electronic systems that are used to provide multi-tiered collaborations among educators, students, parents, and community members
- Use technology to create data-driven practices
- Have technology data tools that are used in the classroom to provide both formative and program information to teachers, parents, students, principals, curriculum directors, and policy makers for their individual and collective needs

With its findings and a survey of other quality research, this study concludes that:

“Technology use is most successful when used for strategic purposes in particular contextual settings and content areas. Additionally, such uses of technology are successful when teachers and students function in engaged teaching and learning relationships that focus on data-driven content decision-making and accountability.”

QuickMind.net fits the proven paradigm of best practices

The design of **QuickMind.net** is fully grounded in the research-driven vision articulated by Gilbert Valdez of the North Central Regional Educational Laboratory in the report called *Computer-Based Technology and Learning: Evolving Uses and Expectations*.

QuickMind.net is a Web-based portal that helps educators reach their goals by scaffolding online resources into their curriculum, instruction, and assessment. This subscription Website augments the Internet learning experience with original standards-based applications and school-friendly tools.

Containing premium content, the original applications provide a self-paced, mastery-based, learning environment with the flexibility and accessibility associated with pure-play online programs, without forfeiting teacher control and management. Reporting features provide teachers and administrators with data for needs-assessment, planning, and evaluation.

Instant assessment to teacher-created or automatically generated activities saves time for educators and permits students to engage in personalized learning opportunities. All activities, both online and offline, can be correlated to state and national standards.

With databases, presentation tools, and curriculum resources that support teaching and learning, **QuickMind.net** fully supplements direct group instruction in the classroom. Students access activities assigned by their teacher - taking tests, engaging in WebQuests, performing research, finishing homework, creating Websites, reinforcing material – online, via email, or in print. Teachers can save their created activities for future use or to share with others – including parents.

CONCLUSION

*Do not confine your children to your own learning,
for they were born in another time.*

- Chinese Proverb

QuickMind.net allows students to receive a guided, teacher-prepared prologue to the authentic learning resources of the Internet. Fostering mixed mode of student learning, this learning tool supports students' ability to construct knowledge under the auspices of a teaching professional. By extending the teacher's influence outside of the traditional domain of the classroom, **QuickMind.net** helps improve the quality of student learning and strengthens the home-school connection.

Research fully demonstrates instructional technology's effectiveness in supporting students' academic achievement and intellectual growth. **QuickMind.net** fits the proven paradigm of best practices by:

- Focusing on standards-based core curriculum presentations
- Relying on a research-based design
- Improving the school climate in terms of teaching, learning, and student affect
- Integrating a design to ensure equity and utility
- Including staff training and an internal tutorial module to allow teachers to refine their technology skills
- Providing mechanisms to track and report student progress
- Opening doors for parental and community involvement in school improvement planning goals
- Facilitating change management by providing systematic and measurable data on performances

QuickMind.net uses Internet technology to maximize the interaction between standards and core learning objectives, electronic and print resources, and the teachers' ability to directly interact and support student learning.

MEETING NO CHILD LEFT BEHIND FUNDING OPPORTUNITIES

“Learning is not attained by chance; it must be sought for with ardor and attended to with diligence.”

- Abigail Adams, 1780

QuickMind.net. helps schools maintain accountability standards and contributes to improvements in the school learning environment. Upon the passage of *No Child Left Behind*, school improvement planning came under new scrutiny. The requirements of documentation, details, and proof have charged the atmosphere of accountability with higher standards.

Specifically schools must establish a framework to meet rigorous learning standards as developed by their state, establish assessment systems to measure students’ progress towards these goals, and communicate results to parents and the larger community. Schools failing to meet these requirements face consequences with funding, public perception, and governance implications.

QuickMind.net. provides a wide range of specific features to uphold the school improvement planning demands and programmatic functions that meet *No Child Left Behind* requirements.

Specific titles where **QuickMind.net** meets funding requirements:

Title 1: Improving the Academic Achievement of the Disadvantaged

Part A: Improving Basic Programs Operating of LEA

The remediation portion of this program can meet the supplemental target learning requirement as work can be extended outside of the typical school day.

Part B: Student Reading Skills Grant: Reading First State Grants

The phonics and reading modules in this program support the requirements of the Reading First provision.

Title II -D Educational Technology State Grants

Intended to improve student achievement through the use of technology, this is a key grant area for **QuickMind.net.** With integrated training, districts can partially meet the requirement for the 25% of spending to revolve around professional development. Within the program is a robust Technology Training module for teachers and paraprofessionals, which could offset the cost of this requirement.

No Child Left Behind...

Title III Language Instruction for Limited Proficient and Immigrant Students

Part A: Language Acquisition, Language Enhancement, and Academic Achievement.

The multi-lingual component and the shell to add more languages option gives this program utility among students developing English language skills. It is a useful tool for students with low literacy at home when their first language is not English.

Title IV: 21st Century Schools

Part A: Safe and Drug Free Schools

Other research demonstrates that learning technology improves the school climate.

Title V: Promoting Informed Parental Choice and Innovation Program.

Part A: Parental Communications

By design, **QuickMind.net** accomplishes these goals.

Part D: Gifted and Talented Students

QuickMind.net is a project-based learning tool that allows teachers customizing options to meet the needs of all students – including high performers and achievement-oriented students.

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GLOSSARY OF TERMS

A

alternative assessment: A measurement in which students respond to a task or question, other than by means of traditional standardized tests. Examples include demonstrations, exhibits, portfolios, or oral presentations. (Compare to traditional assessment.)

authentic assessment: An evaluation of performance based on real-world tasks that demonstrate meaningful application of essential knowledge and skills.

authentic task: A student assignment designed with real-world challenges, expecting students to apply a broad range of aptitude and understanding.

B

benchmark: Criterion that describe a specific level of student performance at specific grades, ages, or developmental levels. Benchmarks are often used to assess students' progress toward specific goals or standards. (See standards.)

benchmark performances: Student performance examples against which other performances may be measured.

C

coaching: A model of instruction in which the teacher acts as a guide and collaborator in students' learning.

cognitive science: An area of study focusing on how people think and learn. Children actively construct or make meaning of their world based on prior knowledge; teachers use this foundation to create effective instruction.

cognitively guided instruction: A method of instruction in which a teacher assesses what students already know about a subject and then builds on students' prior knowledge.

collaborative learning or **cooperative learning:** A method of instruction that encourages students with varying abilities and interests to work together in small groups to complete a project, or achieve a common objective.

constructivism: A theory suggesting that students learn by building their own knowledge, especially through hands-on exploration and incorporation of new information into what they already know.

D

data-driven decision making: A process of making decisions about curriculum and instruction based on the analysis of classroom data and standardized test data.

distance learning: The use of technology to broadcast instruction from one site to another. A typical situation is a two-way, interactive television, where teacher and students in different locations may communicate with one another as in a regular classroom environment.

Glossary of Terms...

E

equity: The state of educational impartiality and fairness in distribution of funding, technology, facilities, services and equal opportunities are available for all children; including minorities and non-minorities, males and females, students with special needs and students in high-poverty schools.

F

facilitator: The classroom teacher who allows students to take a more active role in their own learning.

H

higher-order thinking skills: Comprehending complex concepts and applying conflicting information to solve a problem, which may have more than one correct answer.

I

Internet: A worldwide public computer network that allows participants in different computer networks to share information and communicate with one another on a global scale.

L

learner-centered classroom: A classroom environment in which students are encouraged to decide on their own learning objectives and assignments. This approach focuses on instructional design sensitive to individual student needs, abilities and interests.

M

meta-analysis: A quantitative approach in which results of previous research is systematically combined in order to arrive at a conclusion about a body of literature.

metacognition: The process of considering and regulating one's own learning. Activities include assessing or reviewing one's current and prior knowledge, identifying strategies to build upon that knowledge, and determining the relevance of new information.

N

National Assessment of Educational Progress (NAEP): “The Nation’s Report Card”, as it is often referred to, is a congressionally mandated project of the National Center for Education Statistics, the federal entity responsible for collecting and analyzing data related to education.

O

open-ended question: A question that has many avenues of access and allows students to respond in a variety of ways, having more than one correct answer.

open-ended task: A performance task in which a student is required to generate a solution or response to a problem when there is no single correct answer.

open-response task: A performance task in which a student is required to generate an answer rather than select from several possible answers, as in multiple choice, but there is a single correct response.

outcome-based education: An integrated system of educational programs that supports specific student goals, instructional methods, and assessment.

P

performance assessment: A systematic and direct evaluation of a student's performance or performances and grading according to pre-established performance criteria; Also known as authentic assessment.

portfolio assessment: An evaluation process that is based on the collection of student work (such as written assignments and presentations) that represents ability, exemplary work, and/or student's developmental progress.

S

scaffolding: An instructional technique in which the teacher presents a complex task that is already partially completed so that students can more successfully complete the task by focusing on only several elements while trying to assimilate new information. In this manner, a teacher enables students to accomplish as much of a task as possible without adult assistance. Partial solution also allows instructors to regulate the level of difficulty when students first attempt the application of a new idea or skill.

standards: Subject-matter benchmarks set to measure students' academic achievement.

standardized tests: Assessments that are administered and scored in exactly the same way for all students. Traditional standardized tests are typically mass-produced and machine-scored; they are designed to measure skills and knowledge that are thought to be taught to all students in a fairly standardized way

T

technology: In education, a branch of knowledge based on the development and implementation of computers, software, and other technical tools, and the assessment and evaluation of students' educational outcomes resulting from their use of technology tools.

traditional assessment: An measurement approach in which students choose answers from a multiple-choice list, a true/false list, or a matching list, where there is usually one correct answer. (Compare to alternative assessment.)

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