

# Levels of Technology Implementation (LOTI) Framework

Level	Category	Description
0	Nonuse	A perceived lack of access to technology-based tools or a lack of time to pursue electronic technology implementation. Existing technology is predominately text-based (e.g., ditto sheets, chalkboard, overhead projector).
		<p>Classroom Observations: There is no visible evidence of computer access in the classroom or computers sit idle during the instructional day.</p> <p>Teacher Comments:            “I really don’t have the time to deal with computers anyway.”            “My computer crashed and burned on me a few years ago. I’m still waiting for someone to fix it.”            “Using computer is the least of my problems this semester. Seen the new TAKS?”</p>
1	Awareness	The use of computers is generally one step removed from the classroom teacher (e.g., it occurs in integrated learning system labs (i.e. Jostens, CCC, IDEAL, Plato), special computer-based pull-out programs, computer literacy classes, and central word processing labs). Computer based applications have little or no relevance to the individual teacher's instructional program.
		<p>Classroom Observations: Available classroom computer(s) are used exclusively for teacher productivity. Multimedia applications are used to embellish classroom lectures/teacher presentations. Curriculum Management tools are used extensively to generate standards-driven lesson plans.</p> <p>Teacher Comments:            “I basically send my kids to the computer lab where they learn how to use it. The kids love it.”            “My students go to the lab each Tuesday. This frees me to catch up on my grades or meet with parents.”            “Our staff attends a bimonthly computer camp with our technology coordinator. This month we’re learning how to design a web page.”</p>
2	Exploration	Technology-based tools serve as a supplement (e.g., tutorials, educational games, simulations) to the existing instructional program. The electronic technology is employed either for extension activities or for enrichment exercises to the instructional program.
		<p>Classroom Observations: Student projects (e.g., designing web pages, research via the Web, creating multimedia presentations, creating graphs and charts) focus on lower levels of Bloom’s Taxonomy (e.g. creating a web page to learn more about whale species). Greater emphasis on technology rather than critical content. Computer use serves as a reward or digital babysitter. Students gather weather data and keyboarding the information in a WAN database (e.g. GLOBE project).</p> <p>Teacher Comments:            “My students have built some very sophisticated and impressive multimedia application during the year. Some of their projects even look professional.”            “When students finish their packets early, they often go back to the computers and practice their computer skills.”            “My students created our school’s web page.”            “My kids graphed some data. They love the way the graphs look on the screen.”</p>
3	Infusion	Technology-based tools including databases, spreadsheets, graphing packages, probes, calculators, multimedia applications, desktop publishing, and telecommunications augment selected instructional events (e.g., science kit experiments using spreadsheets or graphs to analyze results, telecommunications activities involving data sharing among schools).
		<p>Classroom Observations: Students use tool-based applications such as spreadsheets/graphing, concept mapping, and databases are used primarily for analyzing data, making inferences, drawing conclusions from an investigation or related scientific inquiry. Students use the web for research purposes or interact with selected software applications that require them to take a position or role play an issue.</p> <p>Teacher Comments:            “My students just completed a research project investigating why many middle school students never use the school’s drinking fountains.”            “I designed a culminating performance task for my 4<sup>th</sup> grade students that required them to conduct web-based research and related data gathering to support their predictions for the upcoming election.”            “My students created a multimedia presentation that analyzed the issue of poverty among 18-25 year old adults.”</p>
4a	Integration (mechanical)	Technology-based tools are mechanically integrated, providing a rich context for students' understanding of the pertinent concepts, themes, and processes. Heavy reliance is placed on prepackaged materials and sequential charts that aid the teacher in the daily operation of the instructional curriculum. Technology (e.g.,

		multimedia, telecommunications, databases, spreadsheets, word processing) is perceived as a tool to identify and solve authentic problems relating to an overall theme or concept.
Classroom Observations: Students designed a school-based information kiosk to assist their classmates with various “safety” issues including map directions based on time of day, neighborhood watch sites, and “just-say-no” strategies to use with strangers. The information collected for the kiosk was supplied from student-generated surveys, field investigations, and personal interviews.		Teacher Comments: “The creation of the information kiosk idea was based on an existing unit that I borrowed from one of the 5 <sup>th</sup> grade teachers.” “I used an existing unit design published by a software company that provided an easy way to design my culminating performance task and the student experiences leading up to the fund raiser.”
4b	Integration (routine)	Teachers can readily create integrated units with little intervention from outside resources. Technology-based tools are easily and routinely integrated, providing a rich context for students' understanding of the pertinent concepts, themes, and processes. Technology (e.g., multimedia, telecommunications, databases, spreadsheets, word processing) is perceived as a tool to identify and solve authentic problems relating to an overall theme/concept.
Classroom Observations:		<ul style="list-style-type: none"> <li>Based on the rise in student violence on campus, students prepared a multimedia presentation highlighting their recommended mediation strategies using data synthesized from school-wide surveys and from the Internet.</li> <li>Students created a web site devoted to exploring solutions to the steady increase in solid wastes entering the local landfill.</li> <li>Students prepared a multimedia presentation highlighting the misconceptions and omissions in history textbooks concerning the contributions of their specific ethnic group. Presentation was later burn onto a CD for submission to various textbook publishers for consideration.</li> </ul>
Teacher Comments:		<ul style="list-style-type: none"> <li>“Our student mediation unit was prompted by the recent rise in fights on campus. Many students expressed concern for their personal safety and the safety of others at school.”</li> <li>“I first converted several digital images into a PowerPoint presentation to get my students thinking about the waste disposal issue and asking questions.</li> </ul>
5	Expansion	Technology access is extended beyond the classroom. Classroom teachers actively elicit technology applications and networking from business enterprises, governmental agencies (e.g., contacting NASA to establish a link to an orbiting space shuttle through the Internet), research institutions, and universities to expand student experiences directed at problem solving, issues resolution, and student activism surrounding a major theme or concept.
6	Refinement	Technology is perceived as a process, product (e.g. invention, patent, new software designed), and tool for students to use in solving authentic problems related to an identified real-world problem or issue. In this context, technology provides a seamless medium for information queries, problem-solving, and product development. Students have read access to and a complete understanding of a vast array of technology-based tools to accomplish any particular task.