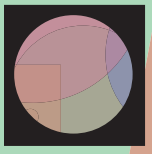


Prepared by
Learning Quest
on 07/13/2004

LoTi Technology Use Profile

New Hampshire Department of Education

Introduction

- Recently, a technology use profile was conducted for New Hampshire Department of Education to ascertain each participant's current level of technology implementation. Such information will enable questionnaire sponsors to target funding sources and provide professional development opportunities directed at moving participants to a higher level of technology implementation in the classroom, and in doing so, better prepare students for the challenges facing them in a highly competitive, technology-oriented society.
- This profile focused on the use of technology as an *interactive learning medium* because this particular component has the greatest and lasting impact on classroom pedagogy and is the most difficult to implement and assess. A 50 item survey referred to as the Level of Technology Implementation (LoTi) Questionnaire was administered to 7595 participants from New Hampshire Department of Education.
- The questionnaire generated a profile for each participant in three domains: Level of Technology Implementation (LoTi), Personal Computer Use (PCU), and Current Instructional Practices (CIP). The Level of Technology Implementation (LoTi) profile approximated the degree to which each participant either supports or implements the instructional uses of technology in a classroom setting. The Personal Computer Use (PCU) profile addressed each participant's comfort and proficiency level with using computers (e.g., troubleshooting simple hardware problems, using multimedia applications) at home or in the workplace. The Current Instructional Practices (CIP) profile revealed each participant's support for or implementation of instructional practices consistent with a learner-based curriculum design (e.g., learning materials determined by the problem areas under investigation, multiple assessment strategies integrated authentically throughout the curriculum, teacher as co-learner/facilitator, focus on learner-based questions).
- The creation of the LoTi Questionnaire and the identification of a LoTi profile for individual participants were based primarily on the work of Moersch (1995) and his identification of specific levels of technology implementation (see Table 1). These levels range from Nonuse (Level 0) to Refinement (Level 6). As a participant progresses from one level to the next (Level 3 to Level 4) of the LoTi framework, a corresponding series of changes to the instructional curriculum is observed. The instructional focus shifts from a teacher-centered to a learner-centered orientation while the use of computers shifts from an emphasis on isolated uses (e.g., drill & practice applications) to an expanded view of technology as a process, product, and tool to help students find viable solutions to real-world problems. Current research has found strong links between student academic achievement and the manner in which technology is used in a classroom. According to a National Assessment of Educational Progress (NAEP) study, eighth grade students whose teachers used computers primarily for higher-order thinking performed better than students whose teachers used computers primarily for "drill and practice"—generally associated with lower order thnking skills.

Introduction

Table 1: The Levels of Technology Implementation (LoTi) Framework

Level O - Nonuse
Technology-based tools (e.g., computers) are either (1) completely unavailable in the classroom, (2) not easily accessible by the classroom teacher, or (3) there is a lack of time to pursue electronic technology implementation. Existing technology is predominately text-based (e.g., ditto sheets, chalkboard, overhead projector).

Level 1 - Awareness
The use of technology-based tools is either (1) used almost exclusively by the classroom teacher for classroom and/or curriculum management tasks (e.g., taking attendance, using grade book programs, accessing email), (2) used to embellish or enhance teacher-directed lessons or lectures (e.g., multimedia presentations) and/or (3) is one step removed from the classroom teacher (e.g., integrated learning system labs, special computer lab pull-out programs, central word processing labs).

Level 2 - Exploration
Technology-based tools supplement the existing instructional program (e.g., tutorials, educational games, basic skill applications) or complement selected multimedia and/or web-based projects (e.g., internet-based research papers, informational multimedia presentations) at the knowledge/comprehension level. The electronic technology is employed either as extension activities, enrichment exercises, or technology-based tools and generally reinforces the content under investigation.

Level 3 - Infusion
Technology-based tools including spreadsheet and graphing packages; multimedia and desktop publishing applications; and the internet complement selected instructional events or multimedia/web-based projects at the analysis, synthesis, and evaluation levels. Though the learning activity may or may not be perceived as authentic by students, emphasis is placed on using a variety of thinking skill strategies (e.g., problem-solving, decision-making, experimentation, scientific inquiry) to address the content under investigation.

Level 4a - Integration (Mechanical)
Technology-based tools are integrated in a mechanical manner that places heavy reliance on prepackaged materials, outside resources, and/or interventions that aid the teacher in the daily management of their operational curriculum. Technology is perceived as a tool to identify and solve authentic problems as perceived by the students relating to an overall theme/concept. Emphasis is placed on student action and/or on issues resolution that requires higher levels of cognitive processing and in-depth examination of the content.

Level 4b - Integration (Routine)
Technology-based tools are integrated in a routine manner whereby teachers can readily design and implement learning experiences (e.g., units of instruction) that empower students to identify and solve authentic problems relating to an overall theme/concept using the school's available technology with little or no outside assistance. Emphasis is placed on student action and/or on issues resolution that requires higher levels of student cognitive processing and in-depth examination of the content.

Level 5 - Expansion
Technology access is extended beyond the classroom. Teachers actively elicit technology applications and networking from outside sources to expand student experiences directed at problem-solving, issues resolution, and student activism. The complexity and sophistication of the technology-based tools used are now commensurate with (1) the diversity, inventiveness, and spontaneity of the teacher's experiential-based approach and (2) the students' level of complex thinking and in-depth understanding of the content at hand.

Level 6 - Refinement
Technology is perceived as a process, product, and/or tool for students to find solutions related to an identified "real-world" problem or issue of significance to them. Technology provides a seamless medium for information queries, problem-solving, and/or product development. The classroom content emerges based on the needs of the learner according to his/her interests, needs, and/or aspirations and is supported by unlimited access to the most current computer applications and infrastructure available.

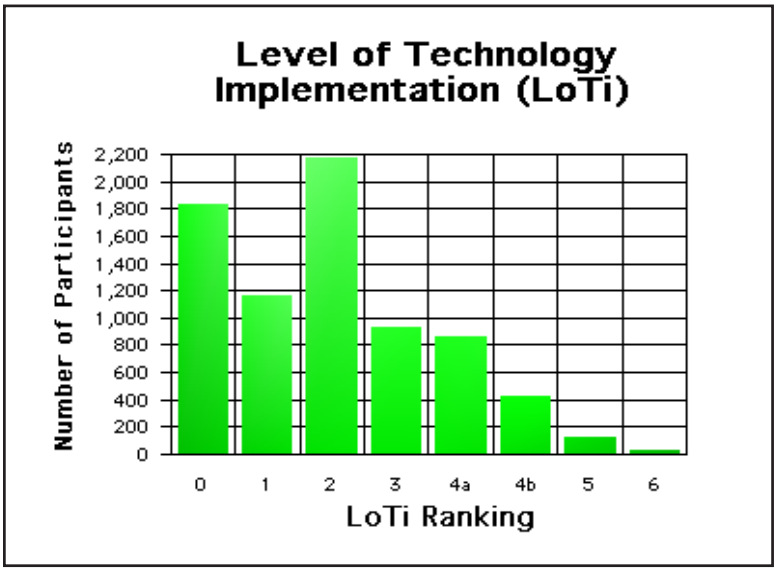
Introduction

- The questionnaire did not consider the complexity of software applications used at the site or the frequency of their use. The information provided below was based exclusively on the perceptions of the LoTi Questionnaire participants. A total of 7595 participants from New Hampshire Department of Education completed the survey. The subsequent data analysis including all findings, goals, and recommendations are based on these returns.

LoTi Profile

- Figure 1 displays the Level of Technology Implementation (LoTi) ranking for the 7595 participants from New Hampshire Department of Education. The LoTi profile approximates the degree to which each participant is either supporting or implementing the instructional uses of technology in a classroom setting. Based on their responses, 29% of participant's highest level corresponded with a Level 2 (Exploration) implementation of technology in the classroom while 24% of participants recorded their highest level of technology implementation at a Level 0 (Non-Use).
- A Level 2 implies technology-based tools supplement the existing instructional program (e.g., tutorials, educational games, basic skill applications) or complement selected multimedia and/or web-based projects (e.g., internet-based research papers, informational multimedia presentations) at the knowledge/comprehension level. The electronic technology is employed either as extension activities, enrichment exercises, or technology-based tools and generally reinforces the content under investigation. A Level 0 implies technology-based tools (e.g., computers) are either (1) completely unavailable in the classroom, (2) not easily accessible by the classroom teacher, or (3) there is a lack of time to pursue electronic technology implementation. Existing technology is predominately text-based (e.g., ditto sheets, chalkboard, overhead projector).

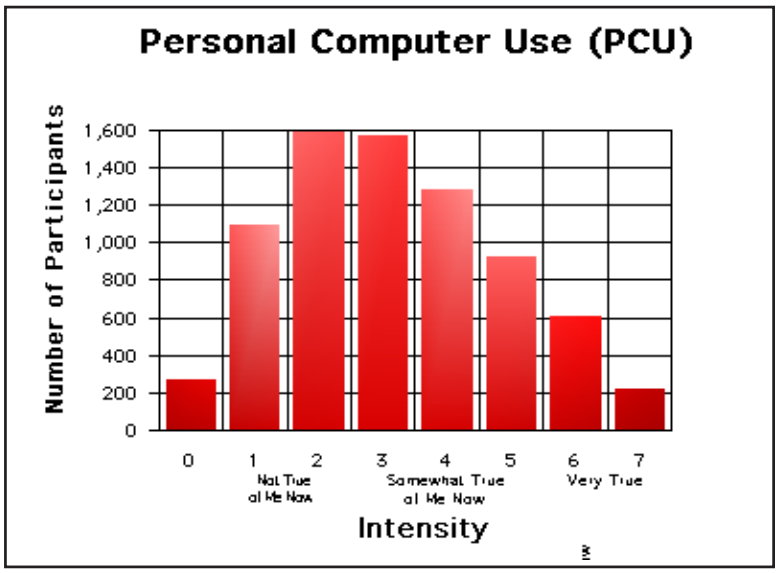
Figure 1



LoTi Profile

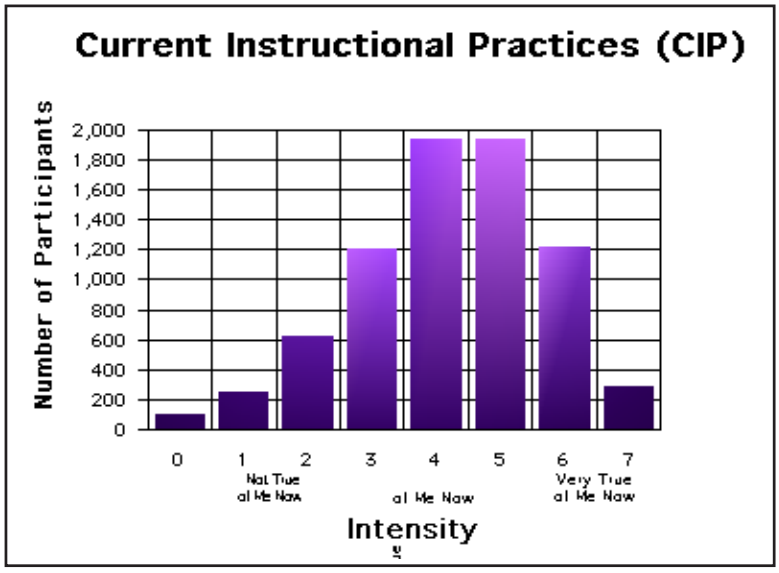
- Figure 2 displays the perceptions of the New Hampshire Department of Education participants toward questions involving their personal computer use. The PCU profile addresses each participant's comfort and proficiency level with using computers (e.g., troubleshooting simple hardware problems, using multimedia applications) at home or in the workplace. Approximately 50% of the 7595 participants (3790 participants) perceived their ability to use basic software applications or troubleshoot routine computer problems as "Somewhat True of Me Now." Approximately 39% of the participants (2972 participants) perceived their ability to use basic software applications or troubleshoot routine computer problems as "Not True of Me Now." At New Hampshire Department of Education, 833 participant(s) perceived their ability to use basic software applications or troubleshoot routine computer problems as "Very True of Me Now."

Figure 2



- Figure 3 displays the perceptions of the New Hampshire Department of Education participants toward questions involving their current instructional practices. The CIP profile reveals each participant's support for or implementation of instructional practices consistent with a learner-based curriculum design (e.g., learning materials determined by the problem areas under investigation, multiple assessment strategies integrated authentically throughout the curriculum, teacher as co-learner/facilitator, focus on learner-based questions). Based on the 7595 participants from your group, approximately 67% (5106 participants) perceived their instructional practices as aligning with a learner-based design as "Somewhat True of Me Now" while 20% of the participants (1519 teachers) perceived their use of a learner-based curriculum as "Very True of Me Now." At New Hampshire Department of Education, 970 participants perceived their instructional practices as aligning with a learner-based design as "Not True of Me Now". These participants consistently employ or support a subject-matter based instructional approach.

Figure 3



LoTi Findings

Percent of participants at LoTi Level 0 There is no visible evidence of computer access or instructional use of computers in the classroom.	24%
Percent of participants at LoTi Level 1 Available classroom computer(s) are used primarily for teacher productivity (e.g., email, word processing, grading programs).	15%
Percent of participants at LoTi Level 2 Student technology projects (e.g., designing web pages, research via the internet, creating multimedia presentations) focus on the content under investigation.	29%
Percent of participants at LoTi Level 3 Tool-based applications (e.g., graphing, concept-mapping) are primarily used by students for analyzing data, making inferences, and drawing conclusions.	12%
Percent of participants at LoTi Level 4a The use of outside resources and/or interventions aid the teacher in developing challenging learning experiences using available classroom computers.	11%
Percent of participants at LoTi Level 4b (Target Technology Level) Teachers can readily design learning experiences with no outside assistance that empower students to identify and solve authentic problems using technology.	6%
Percent of participants at LoTi Level 5 Teachers actively elicit technology from outside entities to expand student experiences directed at problem-solving, issues resolution, and student action.	2%
Percent of participants at LoTi Level 6 Computers provide a seamless and almost transparent medium for information queries, problem-solving, and/or product development.	0%
Percent of participants indicating they HAVE access to computers for instructional purposes	98%

Goals for the Current School Year

Provided below are sample goal statements for New Hampshire Department of Education to implement during the current school year:

a. Move 14% of the staff member(s) positioned at a Level 2 implementation of technology to a Level 4a during the current school year. This recommendation is based on the relatively high Current Instructional Practices (CIP) scores of these staff members toward a learner-based approach in the classroom and their relatively high Personal Computer Use (PCU) scores.
b. Move 86% of the staff member(s) positioned at a Level 2 implementation of technology to a Level 3 during the current school year. This recommendation is consistent with these staff members current scores for Current Instructional Practices (CIP) and Personal Computer Use (PCU).
c. Move 17% of the staff member(s) positioned at a Level 0 implementation of technology to a Level 4a during the current school year. This recommendation is based on the relatively high Current Instructional Practices (CIP) scores of these staff members toward a learner-based approach in the classroom and their relatively high Personal Computer Use (PCU) scores.
d. Move 7% of the staff member(s) positioned at a Level 0 implementation of technology to a Level 3 during the current school year. This recommendation is based on the relatively moderate Current Instructional Practices (CIP) scores of these staff members toward a learner-based approach in the classroom and their relatively high Personal Computer Use (PCU) scores.
e. Move 76% of the staff member(s) positioned at a Level 0 implementation of technology to a Level 2 during the current school year. This recommendation is consistent with these staff members current scores for Current Instructional Practices (CIP) and Personal Computer Use (PCU).

Additional goal statements that target other participants at their respective level of technology implementation should be considered based on available financial and personnel resources.

Recommendations for the Current School Year

Consolidate the group's technology, instruction, and assessment courses and inservices into a single staff development program based on the Levels of Technology Implementation framework. This will enable participants to visualize the symbiotic relationship among instruction, assessment, and technology implementation. Simply knowing how to use a specific technology application does not automatically push a participant to a higher level of technology use. Moving participants to a higher level of technology implementation requires a personal commitment to changing one's paradigm about existing instruction and assessment practices (e.g., moving from traditional paper and pencil forms of student assessment to alternative, multidimensional forms of assessment) regardless of one's skill level with software applications.

Ensure that each classroom teacher from your group has at least one functional computer and printer *in their classroom* for instructional purposes. Within your group, 98% of participants indicated that they have access to computers, but even participants who indicated they have computer access may not have a functional computer and printer *in their classroom*. According to the LoTi Questionnaire, "computer access" means that a staff member and/or student can use or borrow a computer within the school building for instructional purposes; including computers in the classroom, computer labs, computers on carts, general access computers in the library, or something similar.

Provide staff development that models specific strategies and techniques for integrating higher-order thinking skills with the available classroom computers using tool-based applications (e.g., spreadsheets, graphs, multimedia, databases, concept-mapping, internet tools). This recommendation is targeted at moving participants to Level 3 relating to their level of technology implementation.

Provide staff development that increases participants confidence and competence with designing Level 4 instructional modules using a constructivist, experiential-based approach to curriculum development. This recommendation is targeted at (1) moving participants to a Level 4a implementation of technology, (2) improving the perceptions of Level 4a participants regarding their ability to support or integrate technology at a Level 4a, and (3) moving participants to a Level 4b relating to their level of technology implementation.

Additional recommendations consistent with your group's LoTi, PCU, and CIP levels are located at the LoTi Lounge website:

http://www.lotilounge.com/