FEA Tool Final Project

Technology Integration Matrix (TIM)

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Overview

The Technology Integration Matrix (TIM), developed by the Florida Center for Instructional Technology, incorporates a five-part spectrum of technological adoption (marked by *Entry*, *Adoption*, *Adaptation*, *Infusion*, and *Transformation*) and demonstrates its impact on five core traits of effective learning: *Active, Collaborative*, *Constructive*, *Authentic*, and *Goal Directed*. The result is a twenty-five (25) cell matrix representing the different effects that can be reached through different levels of technological integration, serving as a resource for instructional designers to evaluate whether a school or instructor is integrating technology into their pedagogical system in a meaningful way.

Background

Where does this come from?

According to the FCIT's website and several of their published studies, the TIM was created from the constructivist philosophy and with special attention to effective teacher practice. In their 2012 study that introduces the second edition of the TIM, they argue that while "teachers and principals have likely received training on specific software or devices, there is often a need for additional training in and modeling of the most effective uses of technology for higher-order thinking skills in everyday instruction" (Harmes et al. 3).

The TIM and its related components, applications, and administration-dedicated website are all designed to help instructors understand how digital technologies can impact the five core traits of effective learning and bring about higher-order thinking in the classroom. The FCIT has dedicated its research and training resources to equipping schools with the tools and

understanding they need to train other instructors and make better judgments about technology purchases, integrations, and evaluations.

Where does this apply?

According to the FCIT's website, the TIM is designed to help schools and districts to evaluate the level of technology integration in classes while providing them with models for meaningful ways their technology can be integrated. The authors argue that "the TIM can be used in the context of comprehensive technology planning, grant evaluation, and program accountability." In this way, the TIM is both a prescriptive tool (by providing teachers clear descriptions of how their classes should look) and an evaluative tool (by helping supervisors clearly mark areas of strength and weakness for teachers and districts alike).

As the TIM saw greater success and adoption by educational leaders, the FCIT worked to create several corollary applications with specific focuses in similar decision-making environments: the TUPS (Technology Uses and Perceptions Survey) is an online survey designed to help with purchasing decisions, the TIM-O is a lessons observation tool, the TIM-LP is a lesson-planning tool, and the ARTI (Action Research for Technology Integration) is a model for creating pilot studies of new technologies' use.

History

The original TIM was developed in 2003-2006 using funds from the Enhancing Education Through Technology (EETT) program under the No Child Left Behind Act. After several revisions and the addition of newer technologies (like internet videos) to the matrix, the second version of the Technology Integration Matrix was created in 2011 with funding from the Elementary and Secondary Education Act and the American Recovery and Reinvestment Act

(ARRA). The TIM was adopted by several associations and organizations as their primary analysis tool with regard to educational technological integration. iTeach Professional Learning adheres to the TIM in its worldwide online training, and many teachers use TIM in their evaluations of successful pedagogy in instructional contexts.

The agency responsible for the TIM's creation is the Florida Center for Instructional Technology (FCIT), based at the University of South Florida in Tampa. Established in 1982, the FCIT has developed several tools and programs that have scaled with the TIM's growth and the rise in demand for their training workshops. According to the FCIT's website, the center hosts more than "100 full-day workshops each year" on a variety of instructional technology topics and releases "2 to 3 million digital assets" each day to instructors worldwide to aid in their technological integration.

Purpose

The purpose of the TIM is to help instructors and administrators in identifying and describing successful integrations of technology with respect to five core traits in meaningful instruction: *Active, Collaborative*, *Constructive*, *Authentic*, and *Goal Directed*. By providing a tool that can be used both prescriptively (to help model strong integrations for aspiring teachers) and descriptively (to evaluate integrations and identify areas for growth), the tool aids in communication, accountability, goal-setting, and resource distribution as districts and schools seek to make better use of technology in their instruction.

Using the Tool

Assumptions

The original TIM (as designed in 2006) would now be most closely-related to the modern-day TIM-O, since the Technology Integration Matrix's first application was as a lesson observation tool. For the sake of this paper, we will focus on the use of the TIM-O.

The TIM-O's strength is its ability to communicate in clear, actionable terms the specific ways that technology can be leveraged for effective learning. As a result, the FCIT's website is designed to help entire schools or districts to adopt a TIM approach to modeling and evaluating their teachers so they can use the tool to improve their output. While the matrix can certainly be used by individual teachers, the language and detailed reporting materials provided by the FCIT indicate a top-down strategy for helping students.

As a result, the rubric is intended for an observer to sit in on a class and mark ways in which the instructor's integrated technologies align with or diverge from descriptors in each of the five elements of effective teaching. The matrix produces five levels of integration for each of the five elements, allowing the observer to mark anywhere in the 25 cells in order to describe the instructor's strengths and weaknesses.

The exact objective of such a process is well-defined by the five learning principles themselves: *Active, Collaborative*, *Constructive*, *Authentic*, and *Goal Directed*. Each element represents a continuum from a complete lack of student engagement to the total engagement of higher-order thought. For more information on the assumptions of each of these learning principles, please consult the FCIT's website to view several introductory materials on the matrix.

Examples of Similar Tools

While few have the global adoption rate of the Technology Integration Matrix, there are dozens of rubrics created by learning associations and universities with the same goal of prescribing best practices in technology integration. The Kentucky Teacher Internship Program (KTIP) created a "Rubric for Effective Use of Technology" that breaks up each technology's use into several domains and evaluates its effectiveness across each environment. Kellogg and Sovereign's "Rubric of Essential Technology Conditions for K-12 Schools" is a very comprehensive tool, covering not only traits of effective integration but also the circumstances surrounding parent-teacher discourse, community engagement, facilities management, and channels of decision-making.

Overall, each of these similar tools selects a desired state for student learning and then creates a set of descriptors that will allow schools and districts to agree upon and focus on changes in their technological makeup. It is worth noting that several of these tools cite the TIM in their design, often following its focus on the five elements of effective learning.

Advantages and Disadvantages

As a huge fan of Merrill's Five Principles of Instruction, I would argue that the TIM's decision to use common language in describing fundamental goals in learning makes it much easier for the TIM to serve its ultimate purpose. The role of any rubric is to help communicate, align, and focus the efforts of instructors so that they can profit from the clear and actionable feedback of their peers and supervisors. To that end, the simplicity of the design and language of the TIM not only makes it easier to evaluate instructors and provide useful information, but it also helps teachers think in creative ways about methods of achieving the goals of their

technology integration in the classroom. This is essential when considering the rapid growth and turnover in technology, since teachers should understand the fundamentals of technology so they can apply those theories when new technologies pop up.

Thanks to the FCIT's attention to administrative assistance and facilitation, the TIM is one of the easiest tools to adopt and maintain at the district level. With a website for tracking the data on a district's instructors and the training materials for facilitating one's own workshops and certification programs, the TIM has grown in adoption and international popularity largely thanks to its multiplying method of diffusion.

However, a few disadvantages hurt the TIM's ability when compared to similar tools. First, the TIM does not designate specific courses of action with regard to different environments of learning. While this is intended to allow schools to interpret the theories of the rubric in specific contexts, this can be especially difficult when trying to communicate to instructors that deal in flipped-classroom models, hybrid learning programs, online courses, after-school programs, or tutoring environments. Most would have to deeply understand the TIM's fundamentals in order to make good use of the tool.

In addition, the TIM does not provide an explicit course of action for instructors that demonstrate strengths in specific fields. The matrix is primarily designed to describe successful integrations, making its most logical application that of describing to weak instructors exactly what they should do to improve their skills. However, given its design, instructors that score highly on the TIM would have little actionable feedback on which to leverage or increase the influence of their successful instruction. Perhaps their role would be to simply train others on successfully integrating technologies in the classroom!

Conclusion

This FEA tool was developed in order to help schools and teachers grapple with the rising prevalence, opportunity, and instability posed by technology in instructional settings. Using a simple and intuitive design that focuses on five core traits in effective learning, the FCIT was able to create a rubric that makes it easy for schools to both describe and prescribe strong models for technology integration across any new devices, software, or digital resources. In addition, their top-down approach to training and diffusion has helped entire districts to adopt new standards in evaluation, accountability, and goal-setting with regard to their technological purchases and implementations. The TIM's focus on fundamentals in learning will make it even more relevant as technologies continue to evolve more quickly and as environments in schooling change.

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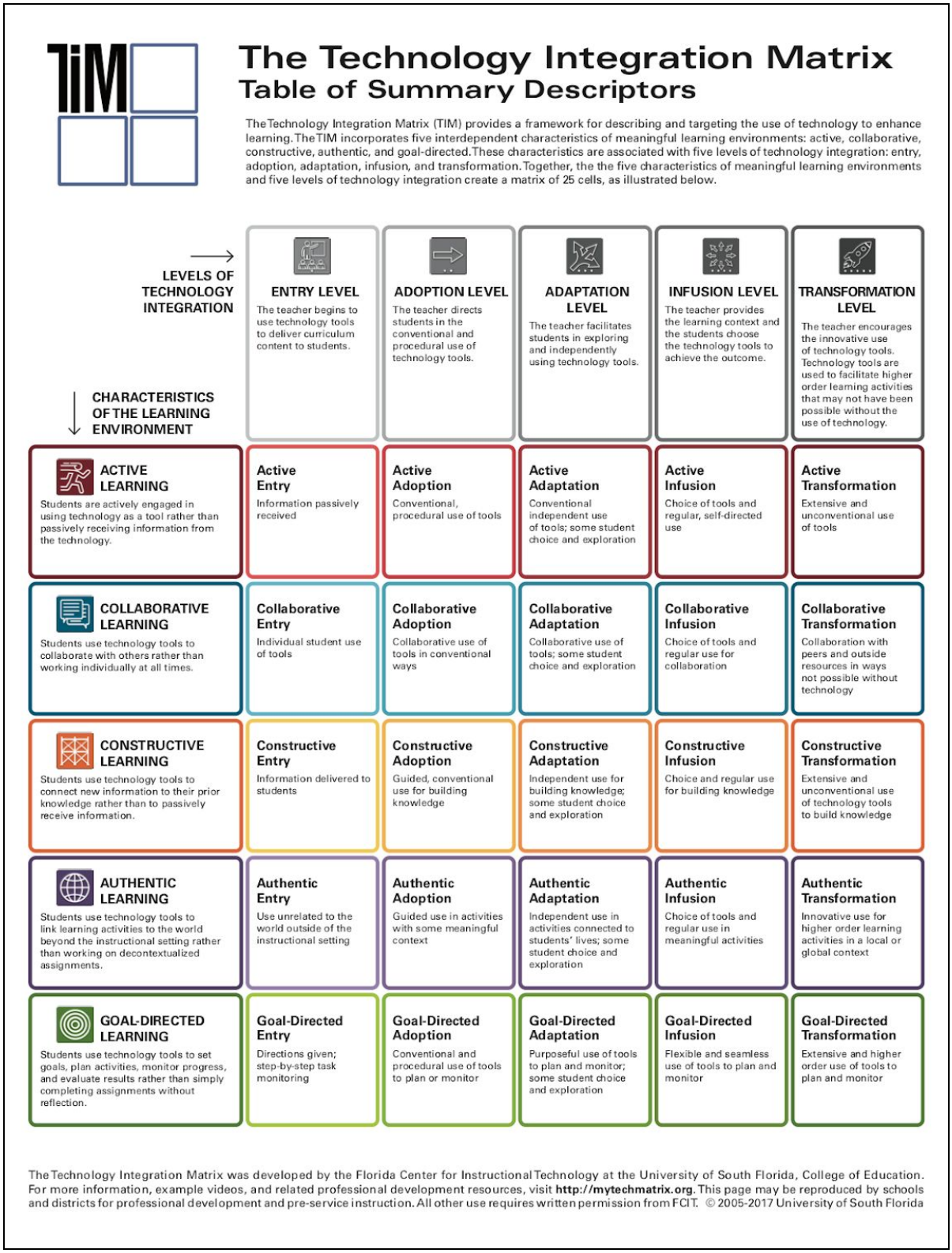

The Technology Integration Matrix
Table of Summary Descriptors

The Technology Integration Matrix (TIM) provides a framework for describing and targeting the use of technology to enhance learning. The TIM incorporates five interdependent characteristics of meaningful learning environments: active, collaborative, constructive, authentic, and goal-directed. These characteristics are associated with five levels of technology integration: entry, adoption, adaptation, infusion, and transformation. Together, the the five characteristics of meaningful learning environments and five levels of technology integration create a matrix of 25 cells, as illustrated below.

LEVELS OF TECHNOLOGY INTEGRATION → / CHARACTERISTICS OF THE LEARNING ENVIRONMENT ↓	ENTRY LEVEL	ADOPTION LEVEL	ADAPTATION LEVEL	INFUSION LEVEL	TRANSFORMATION LEVEL
	The teacher begins to use technology tools to deliver curriculum content to students.	The teacher directs students in the conventional and procedural use of technology tools.	The teacher facilitates students in exploring and independently using technology tools.	The teacher provides the learning context and the students choose the technology tools to achieve the outcome.	The teacher encourages the innovative use of technology tools. Technology tools are used to facilitate higher order learning activities that may not have been possible without the use of technology.
ACTIVE LEARNING Students are actively engaged in using technology as a tool rather than passively receiving information from the technology.	**Active Entry** Information passively received	**Active Adoption** Conventional, procedural use of tools	**Active Adaptation** Conventional independent use of tools; some student choice and exploration	**Active Infusion** Choice of tools and regular, self-directed use	**Active Transformation** Extensive and unconventional use of tools
COLLABORATIVE LEARNING Students use technology tools to collaborate with others rather than working individually at all times.	**Collaborative Entry** Individual student use of tools	**Collaborative Adoption** Collaborative use of tools in conventional ways	**Collaborative Adaptation** Collaborative use of tools; some student choice and exploration	**Collaborative Infusion** Choice of tools and regular use for collaboration	**Collaborative Transformation** Collaboration with peers and outside resources in ways not possible without technology
CONSTRUCTIVE LEARNING Students use technology tools to connect new information to their prior knowledge rather than to passively receive information.	**Constructive Entry** Information delivered to students	**Constructive Adoption** Guided, conventional use for building knowledge	**Constructive Adaptation** Independent use for building knowledge; some student choice and exploration	**Constructive Infusion** Choice and regular use for building knowledge	**Constructive Transformation** Extensive and unconventional use of technology tools to build knowledge
AUTHENTIC LEARNING Students use technology tools to link learning activities to the world beyond the instructional setting rather than working on decontextualized assignments.	**Authentic Entry** Use unrelated to the world outside of the instructional setting	**Authentic Adoption** Guided use in activities with some meaningful context	**Authentic Adaptation** Independent use in activities connected to students' lives; some student choice and exploration	**Authentic Infusion** Choice of tools and regular use in meaningful activities	**Authentic Transformation** Innovative use for higher order learning activities in a local or global context
GOAL-DIRECTED LEARNING Students use technology tools to set goals, plan activities, monitor progress, and evaluate results rather than simply completing assignments without reflection.	**Goal-Directed Entry** Directions given; step-by-step task monitoring	**Goal-Directed Adoption** Conventional and procedural use of tools to plan or monitor	**Goal-Directed Adaptation** Purposeful use of tools to plan and monitor; some student choice and exploration	**Goal-Directed Infusion** Flexible and seamless use of tools to plan and monitor	**Goal-Directed Transformation** Extensive and higher order use of tools to plan and monitor

References

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