

SHORT NOTES ON CLASSROOM INNOVATIONS

When I should (not) use technology

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CONTEXT AND SETTING

New technologies regularly burst onto the academic scene, with many promising to transform the academic experience. Amburgey and Valeria⁽²⁰⁰⁷⁾ identified many problems faculty have in integrating new technologies, centred around the lack of assistance in translating the new tool for an educational environment. Saeed, Yang and Sinnappan⁽²⁰⁰⁹⁾ found that perception is central to technology adoption. What one professor finds indispensable, simple to learn, and easy to operate could appear to the next academic as both limited in scope and inscrutable. The underlying problem is one of expectations and assumptions. People display a wide range of assumptions about how intuitive technology has to be before it becomes a useful investment of time and mental energy. The fundamental lever could be considered technology readiness. Bagozzi⁽¹⁹⁹²⁾ states that attitudes toward technology often dictate the direct usage of the technology. Technology readiness varies so greatly between individuals that it becomes challenging to generalise assumptions about technology.

WHY THE IDEA WAS NECESSARY

What is needed to align expectations of new technology with the promised solutions is a simple, easy-to-use scale that determines where a given technology falls in the spectrum of possible utility and value. Such a tool would reduce the many variables down to a single number for each individual, indicating whether this tool adds value to an instructor. It would function as a quick litmus indicator of a technology's perceived value and usefulness.

Such a scale would be useful to faculty members in several circumstances. First and foremost, it will help faculty decide if a particular technology is worth their time and energy. It may be crucial to employ the scale near the close of a fiscal year, when year-end budget purchases become common. For individuals working in faculty centres and institutes dedicated to teaching effectiveness, the diagnostic tool would create a quick way to advise other faculty members on the relative worth of a particular piece of technology to them.

WHAT WAS DONE

We adopted the existing “Technology Acceptance Model” (TAM) and the Davis Scale within it. While these scales have been “operationalised” many times, they do not yet include a predictive value, which would seem more useful to a faculty member or Teaching and Learning Centre staff.

The Davis Scale offers two primary categories: Perceived Utility (PU) and Perceived Ease of Use (PEU). In our attempt to keep the tool simple and quick, we asked only three questions in each category. PU asked about efficiency, easiness, and usefulness, while PEU asked about learning to use it, campus support, and comparisons to other technology. To the established TAM, we added a further category of Perceived Value (PV), which asked about cost to benefit, competitor products, and the likely direction of future technology. Users are instructed to rate their agreement with each statement from ¹(no agreement) to ⁵(strong agreement).

These nine questions were placed on an Excel spreadsheet to enable the automated calculation of averages. However, we still needed to account for the variability in technology readiness. A faculty member who is highly conversant with technology may place little value on PEU but high value on PV, and an un-weighted scale would not reflect these preferences. Accordingly, the Excel file was expanded to include a ranking of the three categories: PU, PEU, and PV. We found that if the weighting were ⁶⁰⁻³⁰⁻¹⁰, then what-if results would be different enough from each other to warrant the parsing by preference. Excel makes the calculation automatically, adjusting for the weightings, and delivers a single numeric value on a five-point scale. This weighted average answers the question whether purchase or adoption is recommended (yes of various strength from ^{3.1-5.0}, no of various strength from ^{0-2.0}, and maybe from ^{2.1-3.0}).

EVALUATION OF THE IMPACT

The Technology Adoption Scale (TAS) was sent out via email to ⁴³ faculty members across five different institutions, garnering ¹¹ replies (a ^{26%} response rate). The summaries of their comments are grouped in themes: Strengths, Logistical, and Challenges. Each of the critiques was addressed, and the updated TAS, available online, already incorporates their suggestions.

Strengths. Roughly one-third of respondents (⁴ of ¹¹) cited utility or

usefulness as the prime benefit to this tool, and three also mentioned ease of use. Two respondents highlighted the ability to quantify a desire (or dislike) for a new technology as an advantage to this tool. All eleven respondents indicated that the tool would be acceptable if part of a faculty or faculty centre discussion on technology purchases. Seven directly used the phrase “I like” in describing the overall tool or specific features.

Logistical. Suggestions that were incorporated in the next revision included a request to alter the colour scheme and render the tool both more attractive and more intuitive, as well as re-wording the scale to not pre-assume a positive disposition. Two users questioned the reliance of the word “ease,” pointing out that different users will have varied reactions to this word. Three testers suggested that the agreement questions (which is on a scale of 0-5) should match the first question (ranking from first to third) to avoid asking users to switch rating scales in the same tool.

Challenges. Many reviewers expressed a desire for the weightings (the initial three questions about the TAM categories) to use the same five-point scale as the ensuing questions. A second common refrain among beta testers was the suggestion that the terminology invoked by the tool is too vague. Specifically, the terms “easy” and “value” provoked protest, since they are undefined.

The tool is available as both an Excel file download and a JavaScript-based web interface. Faculty may well wish to use such a tool for purchases late in the budgetary cycle, or to identify early some contingency plans for technology purchases.

SUMMARY

The respondents were particularly pleased with the self-service aspect of the tool, since it provided a simple recommendation (“probably yes” or “definitely no” for example) based on the user inputs. They also appreciated that the numbers could be easily changed, encouraging free exploration. The primary limitation is that the terms chosen in the tool were considered too general. A user of the tool would need to define “easy” and “value” with quantifiable numbers, as appropriate to the technology being proposed, before completing the tool to overcome this shortcoming.

Technology Adoption Scale

Answer these questions with a specific piece of technology or software in mind:

	Rank from first (most important) to third (least important):
	the tool should be easy to master
	the tool should be useful
	the tool should represent a good value

	How much do you agree with each statement? (1=no agreement, 5=strong agreement; use 3 to indicate no opinion).
	This tool would...
	help me become more efficient
	make specific tasks easier
	be useful in my job.
	be easy to learn how to use.
	be supported at my campus by the IT department
	be as easy as other technology I use.
	be reasonably priced (cost to benefit ratio)
	improve on similar (competitor) products
	represent the direction technology is heading

#N/A	Numeric Average
#N/A	Recommendation. "Should you purchase?"

Recommendation Scale	
4.1-5.0	Definitely Yes
3.1-4.0	Probably Yes
2.1-3.0	Maybe
1.1-2.0	Probably No
0-1.0	Definitely No

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