

Summary: Properly evaluating educational technology, choosing which technology to use, and then understanding how to effectively use it, are important skills that all instructors need to master to improve instructional efficiency and the learning experience. Using technology just for the sake of using technology is not a panacea. Yet we should never be averse to using technology; it needs to be seen as a way to enhance instruction and learning, not as a crutch for poor instructional technique. Additionally, overcoming technology anxiety (both by students and instructors), which is one of the factors impeding its use, can be easily overcome.

Benefits: A lot of research has been done on the validity of using technology to enhance teaching and learning as well as identifying the main benefits that it provides (Ali, 2020; Bryan & Clegg, 2019; Krishnakumar, 2022; Light 2008; Santos et al., 2019):

- enhanced interest and motivation
- increased accessibility/availability for all
- improved safety
- heightened communication skills
- faster, more diverse feedback
- 21st century skills (*web search/navigation, digital creation*)
- enhanced educational experiences
- flexible instructional/learning activities
- improved more personalized instruction

Process: There are many different types of technologies; everything from email, learning management systems, specific types of software, specific types of hardware, to virtual reality, and everything in between. Although new enticing technology is developed and comes out every year, it is important to know how to properly evaluate this new technology for consideration in use for educational purposes. Although there are many educational technology evaluation frameworks to choose from, the following was chosen due to ease of use and to best address evaluation issues such as having too many choices, not having enough time, and lacking an organized process to effectively evaluate the technology.

Rubric for E-Learning Tool Evaluation: This rubric, designed by education researchers Lauren M. Anstey and Gavan P.L. Watson from Western University, provides eight categories for you to consider when reviewing any new educational technology (2018).

Category	Criteria	Works Well	Minor Concerns	Serious Concerns	Not Applicable
FUNCTIONALITY	Scale, Ease of Use, Tech Support, Hypermediality				
ACCESSIBILITY	W3C (world wide web consortium), User Focused, Required Equipment, Cost of Use				
TECHNICAL	Integration with LMS, OS, Browser				
MOBILE DESIGN	Access, Functionality, Offline Access				
PRIVACY/PROTECTION	Sign Ups, Data Ownership, Archiving/Saving				
SOCIAL PRESENCE	Collaboration, User Accountability, Diffusion				
TEACHING PRESENCE	Facilitation, Customization, Learning Analytics				
COGNITIVE PRESENCE	Enhancement of Cognition Tasks, Higher Order Thinking, Meta Cognition Engagement				

1. **FUNCTIONALITY:** does the technology being evaluated properly serve its purpose to the levels that would adequately meet your needs?
 - a. **Scale:** can it be used individually, in pairs, small groups, with the whole class?
 - b. **Ease of Use:** is it user-friendly; will it require a lot of training (you & students)?
 - c. **Tech Support:** where can you go to get help and how readily available is it?
 - d. **Hypermediality:** does this allow for options, multiple media types to be used?
2. **ACCESSIBILITY:** this relates to both meeting international standards to assist those with disabilities as well as adhering to good universal design accessibility principles.
 - a. **User-Focused Participation:** centered around the student, allowing for flexibility.
 - b. **Required Equipment:** will other equipment be needed, if so by whom?
 - c. **Cost of Use:** what is the price to buy, subscribe, maintenance, licenses?
3. **TECHNICAL:** this deals with other needed aspects to ensure the technology works.
 - a. **Integration with Learning Management System (LMS):** will it work with your LMS?
 - b. **Operating System(OS) & Browser(s):** does it use the ones you have?
 - c. **Additional Downloads (new drivers, patches, etc.):** what maintenance is needed?
4. **MOBILE DESIGN**
 - a. **Access:** can this tech be used on a mobile device through a browser or app?
 - b. **Functionality:** are there any difference between mobile and regular (desktop) version?
 - c. **Offline Access:** what level of functionality/usefulness is available when offline?
5. **PRIVACY, DATA PROTECTION:**
 - a. **Sign Up:** do students/users have to sign-up and provide personal information?
 - b. **Data Ownership:** who maintains ownership/copyright of data and content created?
 - c. **Archiving, Saving:** how is content/data archived and are there different ways to save?
6. **SOCIAL PRESENCE:**
 - a. **Collaboration:** is there support for synchronous and/or asynchronous interaction?
 - b. **User Accountability:** can the instructor tell which user is which (removal of anonymity)?
 - c. **Diffusion:** how popular is the tech and what competence level do the students have?
7. **TEACHING PRESENCE:**
 - a. **Facilitation:** helps with active management, monitoring, engagement, and feedback
 - b. **Customization:** can be easily modified to suit classroom and targeted learning outcomes
 - c. **Learning Analytics:** able to monitor learners' performance on a variety of measures
8. **COGNITIVE PRESENCE:**
 - a. **Enhancement of Cognitive Task(s):** helps with cognitive tasks that were once overly complex or inconceivable through other means (think calculator or newer AI systems)
 - b. **Higher-Order Thinking:** facilitates learners to exercise higher order thinking skills
 - c. **Metacognitive Engagement:** helps provide formative feedback on learning

To view the full version of this Rubric for E-Learning Tool Evaluation (available as a PDF) go to <https://teaching.uwo.ca/pdf/elearning/Rubric-for-eLearning-Tool-Evaluation.pdf>

Sources of Educational Technology: Educational technology can come from companies that are making technology specifically for educational purposes or they can come from other industries such as business or gaming. Many other industries create technology that can be effectively used with academia (example: Zoom which was originally developed for business settings). Below are some Educational Technology resources to help you stay current on new technology being used for education:

Educational Technology and Mobile Learning: <https://www.educatorstechnology.com>

EduTopia: <https://www.edutopia.org/technology-integration>

eLearning Industry: <https://elearningindustry.com/subjects/elearning-articles/elearning-trends>

***Research Journal: Educational Technology Research and Development:**

<https://link.springer.com/journal/11423/volumes-and-issues>

Overcoming Anxiety Associated with Using Technology

INSTRUCTORS: Some anxiety regarding technology will have already been reduced regarding choosing what technology to use. This guide has provided a rubric and knowledge resources to help you make educated and logical choices regarding technology. Another major aspect of technology anxiety is in actually using the technology in the classroom. Here are some helpful recommendations:

Accept It: we all need to understand that technology is here to stay and offers important benefits for both the student and the instructor. It is normal to have some anxiety but following these tips will help. Remember, you are a smart teacher with a growth mindset and are a life-long learner.

Practice on Your Own (Play Around with It): you can't expect to be good at something unless you become familiar with it and use it to gain a full understanding of its processes, capabilities, & limitations.

Get Specific Training: new technology often comes with tutorials and user guides for your use. Go through them so that you fully understand the technology. Additionally, the university's Information and Technology Support Services may offer one-on-one training.

YouTube It: like most topics, there are probably many good videos showing you how to use it on YouTube. Sometimes the video comments also offers great suggestions on using the technology.

Rehearse: Not to be confused with practice, rehearsing is using the technology right before you plan to use it in the classroom. This allows you to refresh your memory on the specifics for successful use.

Use a Cheat Sheet: There is nothing wrong with creating a user-aid to help you remember some specific steps or shortcut keys to help you use the technology effectively. Just plan ahead and make it.

Have a Back Up Plan: it is always a good idea to have a backup plan for everything you do, to include using new technology for the first time in the classroom. What if there is a login/password problem or the Internet goes down? Have alternatives that you can use just in case.

STUDENTS: Remember that students, just like instructors, can have anxiety with new technology. This should even be considered as an important aspect of students' engagement with the class: student-to-technology interaction (Anders, 2019, p. 116). In light of this, consider the following recommendations:

Explain it in Class: if the technology is relatively new or not that popular, then assume that no one knows how to properly use it. Therefore, take time in class to go over how to use the technology together.

Scaffolding: Even though you have gone over how to use the new technology in class, you may have some students who didn't fully understand, who have forgotten, or who weren't present for that class. Provide additional instructions via how-to guides and/or explanation videos that students can access on their own whenever they need.

Allow for Mistakes: students might "mess-up" the first time they do an assignment or work with the new technology. Create a learning environment where it is ok to fail (without massive repercussions), learn from it, and do better.

Motivate and Allow Enough Time: Be sure to instill the right growth mindset within students. Using a new technology is not an obstacle, it is a fun challenge. Set the example with an excited/enthusiastic attitude and allow enough time for student to get familiar with and properly use and understand the technology.

Get Students Feedback: Another important aspect of evaluating technology is to always be looking at it with a critical eye and getting feedback from anyone that uses it. Be sure to ask your students what they thought of the new technology and if they have suggestions on how its use could be modified/enhanced in the future.

References

- Anders, B. (2019). *The Army Learning Concept, Army Learning Model: A guide to understanding and implementation*. Sovorel.
- Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *Higher education studies*, 10(3), 16-25.
- Anstey, L., & Watson, G. (2018a). *A rubric for evaluating E-learning tools in higher education*. Educause Review. <https://er.educause.edu/articles/2018/9/a-rubric-for-evaluating-e-learning-tools-in-higher-education>
- Anstey, L. & Watson, G. (2018b). *Rubric for eLearning tool evaluation*. Western University: Centre for Teaching and Learning. <https://teaching.uwo.ca/pdf/elearning/Rubric-for-eLearning-Tool-Evaluation.pdf>
- Bryan, C., & Clegg, K. (Eds.). (2019). *Innovative assessment in higher education: A handbook for academic practitioners*. Routledge.
- Krishnakumar, S., Maier, T., Berdanier, C., Ritter, S., McComb, C., & Menold, J. (2022). Using workplace thriving theory to investigate first-year engineering students' abilities to thrive during the transition to online learning due to COVID-19. *Journal of Engineering Education*, 1–20.
- Light, D. (2008). *Evaluating educational technology interventions: How do we know its working*. Center for Children and Technology, Education Development Center, Inc.
- Santos, H., Batista, J., & Marques, R. P. (2019). Digital transformation in higher education: The use of communication technologies by students. *Procedia Computer Science*, 164, 123-130.