Re-envisioning Education for the Future: A Review of “Future-Readiness in Education

**ABSTRACT**

The COVID-19 pandemic accelerated the expansion of online learning in education. With traditional face-to-face instruction disrupted, virtual teaching and learning rapidly became mainstream. Understanding what drives student acceptance and use of online learning systems is critical, given blended models combining online and in-person elements are likely to persist post-pandemic. This literature review synthesizes evidence on key factors influencing students’ online learning intentions and behaviors grounded in technology adoption models like UTAUT and TAM.

Performance expectancy, effort expectancy, social influence, facilitating conditions, perceived enjoyment and credibility are salient motivational factors. Performance expectancy, or perceptions of online learning's advantages for academic achievement, strongly predicts behavioral intentions, given students are pragmatically motivated by learning gains. However, effort expectancy, or perceptions of ease of use, has mixed impacts, suggesting ease of use is less determining for digitally adept students. Social influence from peers, teachers and parents also shapes intentions, evidencing the importance of encouragement from significant others. Facilitating conditions like technological infrastructure and support are crucial constraints on actual usage behavior beyond intentions. Intrinsic motivation from enjoyable, stimulating online activities promotes participation and knowledge acquisition too. Students also weigh perceived credibility of online information in usage decisions.

Optimizing these motivational drivers is imperative through instructional design aligning online components with enhanced learning, peer collaboration, scaffolding, user-friendly interfaces, technical support and high-quality content. Fostering positive user experiences enhances buy-in. The literature overwhelmingly focuses on higher education contexts, so research in K-12 settings is needed. Most studies use self-report surveys, calling for multi-method approaches triangulating student perceptions with actual usage data, academic performance and qualitative insights. Longitudinal designs are valuable to track evolving motivations over time as familiarity develops. Comparative research between disciplines and demographic groups would further contextualize findings.

This review integrates disconnected studies focused on singular motivational constructs using heterogeneous measures into a holistic framework for creating pedagogically effective online learning. The identified determinants provide guidance to educators on supporting student engagement. Tailoring design to user motivations and removing barriers facilitates student-centered online education. However, the absence of learners’ voices in existing literature highlights the need for research foregrounding student perspectives to ensure online components add value for learners. With online learning entrenched, understanding adoption drivers is key to maximize educational quality, accessibility and inclusivity. Ultimately, technology should enable educators to amplify success for all students.

# 1. Introduction

The COVID-19 pandemic has catalyzed a dramatic shift to online learning, forcing educational institutions around the world to rapidly transition face-to-face classes to virtual environments. While online learning was already growing steadily before the pandemic, the mass closures of schools and campuses in 2020 necessitated full-scale emergency remote teaching on an unprecedented level. What was initially intended as a temporary solution rapidly became entrenched in many educational systems. Even after schools physically reopened, most institutions retained significant online learning components in a hybrid model. According to reports, schools were fully closed for in-person instruction for an average of 18 weeks (4.5 months) worldwide between February 2020 and May 2022 due to the pandemic. The longer-term effects on educational practices have been momentous.

This massive involuntary disruption has spotlighted the central role digital learning now plays in education. Although nascent compared to traditional classroom modes, online learning has become mainstream. Prior to the pandemic, over one-third of higher education students had taken at least one online course. Compelled by the pandemic context, virtual tools and content delivery migrated from an optional complement for face-to-face teaching to the default option. Surveys show the share of students receiving online instruction increased dramatically by April 2020 compared to pre-pandemic levels (Ainscow et al., 2013).

Even after reopening school and university campuses, online components have stuck. A new blended model combining online and in-person teaching is emerging as the lasting norm, with far more digitally-enabled learning than before the pandemic. The potential of online learning to provide more personalized, flexible and engaging education has become more apparent. This medium is likely to keep expanding in the education sector given its logistical advantages and ongoing improvements.

Under these circumstances, investigating what motivates and enables students to effectively learn online is crucial. Online learning fundamentally differs from traditional face-to-face instruction in content delivery format, learning environment and interactions. Understanding factors influencing students’ acceptance and use of digital technologies for learning is key to creating pedagogically meaningful online experiences. If designed well, online learning has proven educational benefits like self-paced instruction, replayable content, and adaptive assessments. However, potential drawbacks like technical issues, distractions, and lack of interaction must also be acknowledged and mitigated. Examining drivers of student engagement is imperative so that online components amplify rather than inhibit learning.

Several theoretical models have been widely used to study technology adoption, including the technology acceptance model (TAM), the unified theory of acceptance and use of technology (UTAUT), and extensions of UTAUT. These models identify key factors influencing usage intentions and behaviors across diverse systems and populations. In online learning contexts, students weigh up motivations and constraints in deciding how deeply to invest effort versus disengage or merely passively comply. Their cost-benefit analysis of online learning mediates adoption.

Synthesizing findings from the technology adoption literature provides insights into what educators can do to promote acceptance. Optimizing student perceptions, experiences and supports is crucial so that online learning amplifies academic outcomes. This review synthesizes evidence on salient factors shaping students’ online learning intentions and participation, focusing on six key determinants:

* Performance expectancy – the degree to which students believe online learning will help them attain academic gains. This goal orientation is a major driver of adoption.
* Effort expectancy – how easy or difficult students perceive interacting with online systems to be. Ease of use influences intentions and willingness to invest effort.
* Social influence – the extent students believe peers, teachers, parents encourage them to engage in online learning. Social pressures shape motivations.
* Facilitating conditions – students’ perceptions of the technological resources, infrastructure and support available to participate effectively. Real barriers constrain usage.
* Perceived enjoyment – the intrinsic motivation and pleasure students obtain from online activities. Enjoyment promotes engagement and reinforces continual usage.
* Perceived credibility – how truthful, valid and reliable students evaluate online content and sources to be. Credibility judgments determine knowledge acquisition (Ainscow et al., 2013).

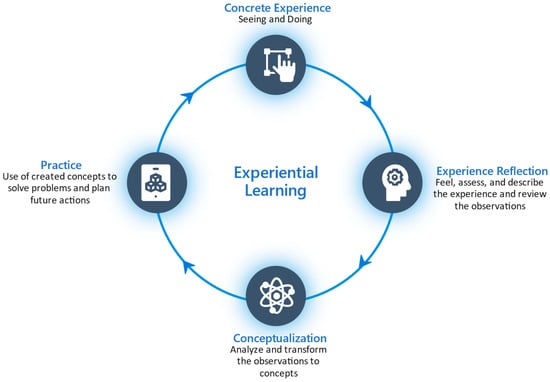


Figure 1The Experiential Learning Cycle

Understanding these factors is essential for fostering positive online learning experiences. This review summarizes evidence demonstrating how each factor impacts students’ adoption intentions and participation. Implications for enhancing acceptance are highlighted. Gaps are identified and future research directions proposed.

Online learning has rapidly evolved from peripheral to a primary education delivery mode. The pandemic massively disrupted traditional teaching internationally. Even after reopening, blended learning endures as the new norm. Maximizing the promise of online learning requires deciphering what motivates meaningful student engagement. This review contributes insights to help educators create accessible, empowering online environments that facilitate student success.

# 2. Background and Overview

The COVID-19 pandemic necessitated a rapid shift to online learning in schools and universities around the world. As educational institutions were forced to abruptly close physical campuses for extended periods, traditional face-to-face instruction was replaced by emergency remote teaching using virtual tools. What began as temporary online classes out of necessity has persisted, with many schools retaining significant online components even after reopening. This sudden disruption spotlighted the vital role of online learning in education today.

Although online learning was already growing steadily before the pandemic, its use was still limited compared to traditional classroom instruction. In higher education, just over one-third of students in the United States had taken an online course prior to the pandemic. However, the mass closures in 2020 accelerated adoption dramatically (Altass&Wiebe, 2017). By April 2020, the percentage of students receiving online learning jumped from 13% pre-pandemic to 83% across 15 countries. Online learning transitioned from an optional supplement to the default delivery mode.

Even after ending emergency closures and resuming in-person classes, online elements have endured. A 'new normal' of blended learning mixing online and face-to-face instruction is materializing. Educational practices have been permanently altered by the pandemic's disruption. Maximizing the potential of online learning thus requires understanding what drives effective student engagement and participation.

This report systematically reviews evidence on key factors influencing students' acceptance and use of online learning systems and platforms. It synthesizes findings from studies grounded in theoretical technology adoption models like UTAUT and TAM. The aim is to derive evidence-based implications for practice to guide educators, administrators, and designers in creating educationally meaningful online learning experiences (Altass&Wiebe, 2017).

The core factors examined comprise performance expectancy, effort expectancy, social influence, facilitating conditions, perceived enjoyment, and perceived credibility. Each section summarizes empirical findings demonstrating how these motivational drivers shape students' intentions to adopt online learning and their resultant participation. Gaps in the literature are also highlighted and recommendations made for directions of future research.

This review contributes insights from across disparate studies into an integrated understanding of how student perceptions and experiences of online learning can be optimized through instructional design and provision of support (Cook-Sather, 2003). It provides research-supported guidance for boosting pedagogical effectiveness by aligning design to user motivations. The conclusions will aid developers of online learning components in making them valuable additions amplifying student success.

# 3. Performance Expectancy

Performance expectancy reflects the degree to which using online learning systems is perceived as beneficial for students' academic achievement and learning performance (Cook-Sather, 2003). It encompasses their pragmatic assessment of how useful engaging with online learning will be for concrete outcomes like higher grades, better understanding of content, improved productivity, and gains in knowledge and skills.

Performance expectancy is theorized as a key determinant of technology acceptance and adoption decisions across models like UTAUT and TAM. It is a predominant factor because it encapsulates the instrumental motivations of users. Students are driven to invest time and effort into online learning if they believe it will tangibly help them learn more effectively and attain their learning goals. Their expectation that academic performance will improve acts as a major incentive to fully participate.

Empirical studies consistently demonstrate performance expectancy has a significant positive influence on students' behavioral intentions to use online learning systems. Students conduct a cost-benefit analysis weighing up the advantages of online learning (Gioia&Chittipeddi, 1991), and if their appraisal concludes it has meaningful benefits for achievement, their intentions to adopt and engage strengthen. They become more motivated to devote their energies into the online sphere of the course.

This holds true across diverse educational contexts. Both school and university students evaluate performance gains anticipated from online learning, such as flexibility in pacing and location, ability to repeat and review digital content, personalized feedback, interactive multimedia resources, reduced cognitive load, and complementing of classroom teaching (Gioia&Chittipeddi, 1991). If students believe these attributes will help increase their productivity, marks, subject comprehension, and assignment performance, their intentions to utilize online components intensify.

Communication from instructors and designers that explicitly links use of online learning resources and activities with enhanced learning outcomes is thus important. Students need to clearly see how online elements can improve their mastery and grades to motivate their engagement. Tying online activities to applied practical learning and skill development also amplifies perceived utility. Designers should incorporate online tools that facilitate effective learning like practice quizzes, simulations, interactive modules and discussion forums. Presenting empirical evidence demonstrating online learning's advantages for knowledge gains compared to solely face-to-face learning can further highlight its performance benefits.

Overall, performance expectancy is a salient predictor of students' acceptance and adoption of online learning across cultural and educational contexts. Tapping into pragmatic motivations focused on achievement is key (Gioia&Chittipeddi, 1991). Students must perceive tangible learning improvements from online components to fully invest their effort and energy into the virtual learning sphere. Aligning design with concrete gains that appeal to goal-oriented students is critical for meaningful participation.

# 4. Effort Expectancy

Effort expectancy encompasses students' perceptions of the ease of use of online learning systems and platforms. It reflects their assessments of how clear, understandable, and easy to interact with and navigate the virtual interfaces are. Effort expectancy is a significant factor highlighted in technology adoption models as influencing usage intentions and behaviors.

The logic is that if a system is perceived as easy to use with little effort required, users are more inclined to accept and adopt it. Minimal frustration and complications motivate engagement. On the other hand, if interacting with a technology is believed to be difficult and laborious, users are less likely to invest the effort (Greenfield et al., 2009). Instead, they may avoid using it or just engage superficially. Their intentions diminish.

Empirical evidence on effort expectancy's impact on students' online learning intentions is however mixed. Some studies have found no significant relationship, unlike for other determinants like performance expectancy. However, other studies conversely found effort expectancy positively predicted students' intentions to use online learning systems.

These contradictory results may potentially be explained by students' greater familiarity and skill with digital technology compared to other user populations like employees using organizational systems. As digital natives, easiness of use may be a less salient factor in determining online learning acceptance decisions, superseded by their academic motivations. They may presume their competence in navigating user interfaces reduces effort required.

Nonetheless, ensuring online learning systems and processes are as intuitive and seamless as possible remains beneficial. Minimizing hassle and complications helps those struggling with lower digital proficiency (Greenfield et al., 2009). Simplifying access to platforms with single sign-on and providing readily available technical user guides facilitates student adoption. As learners vary in technological adeptness, making usage straightforward for all users enables more equitable participation.

Overall, while ease of use may not be as decisive a driver for digitally native students compared to performance motivations, designing clear, understandable systems still caters to diverse proficiencies. Removing unnecessary obstacles reinforces willingness to participate actively in online learning, rather than passively or avoidance. Streamlining effort needed allows students to focus energies on learning.

# 5. Social Influence

Social influence encompasses students' perceptions that important others want them to engage in online learning and believe they should participate. This social pressure shapes behavioral intentions and student motivations to invest in virtual classes.

Sources of social influence include peers, teachers, family, friends, administrators, and the wider cultural or societal climate. Students are socialized into adopting technologies to the extent they perceive significant figures encouraging and approving this adoption. Positive social norms create conformity pressures (Lee et al., 2018).

For instance, fellow students normalizing and valuing online learning fosters collective buy-in. Teachers explicitly communicating the importance of online activities for learning outcomes motivates participation. Parents interested in digital education as enhancing achievement provides implicit endorsement (Lee et al., 2018). Class and school cultures embracing online learning as integral validates its significance and pushes students to take it seriously themselves.

In contrast, skepticism or denigration of online learning from influential figures implies it lacks legitimacy and value. Students pick up on those negative cues and develop intentions aligned with conforming to the subjective social norms. Their motivations to meaningfully engage online diminish.

Empirical studies consistently demonstrate social influence impacts students' intentions to adopt online learning across cultural contexts. Fostering positive social attitudes from those around students facilitates acceptance, while disapproval obstructs it. Peer collaboration and discussion in virtual learning communities strengthens social engagement.

Overall, harnessing social dynamics by encouraging influential figures like instructors, parents, administrators to endorse online learning, and facilitating positive peer interactions builds collective buy-in (Pratt, 2018). Social validation sways students' cost-benefit analyses by signaling online learning is normatively valued and important for them to invest in. Constructive social influence nurtures willingness to participate.

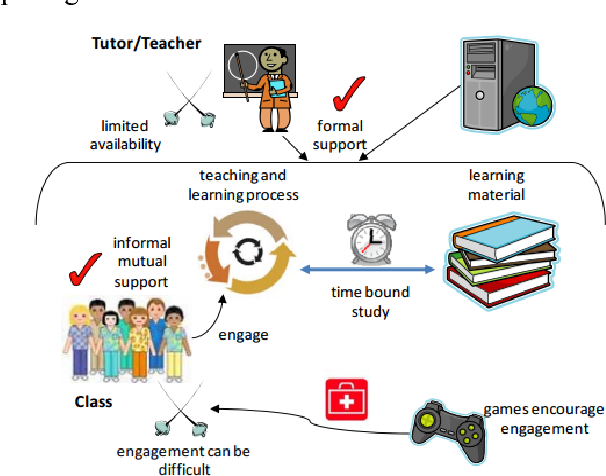


Figure 2The impact of online social games on E-learning usage among students

# 6. Facilitating Conditions

Facilitating conditions refer to students' perceptions of the availability of technological resources, infrastructure, and support systems needed to effectively engage in online learning. This encompasses both physical resources like suitable devices, internet connectivity, software, as well as the human infrastructure of guidance, training, and assistance from teachers, technicians, and peers(Pratt, 2018).

Facilitating conditions are conceptualized as actual contextual factors that enable usage, rather than just behavioral intentions. If students believe they lack the necessary environmental elements to participate online, their adoption is constrained. For instance, limited bandwidth, outdated devices, or lack of technical help when encountering problems all obstruct meaningful usage. Conversely, providing adequate user training, responsive IT support, and addressing accessibility barriers promotes participation.

Empirical studies demonstrate facilitating conditions have a significant direct influence on actual system usage behaviors, over and above initial usage intentions(Ramey & Ramey, 2004). This suggests that while students may be motivated to use online learning, deficient facilitating conditions impede their ability to realize that intent. Real-world barriers play a constraining role.

Proactively taking steps to ensure students have the requisite technological capital is thus essential. Providing equipment and internet access assistance where needed levels the playing field. User training in online conventions, literacy help, and technical troubleshooting allow students to translate positive intentions into substantive engagement. Teachers also need training and tools to orchestrate online learning(Ramey & Ramey, 2004). Responsive helpdesks and peer learning communities foster technology acceptance by minimizing obstacles.

Overall, facilitating conditions are a salient factor influencing whether students' intentions materialize in practice. Assessing learner needs and directly addressing inhibiting conditions through resources, training, and ongoing support enables students to meaningfully participate online. Eliminating barriers reinforces motivations.

# 7. Perceived Enjoyment

Perceived enjoyment reflects the intrinsic pleasure, fun and enjoyment students obtain from participating in online learning activities(Ramey & Ramey, 2004). It encapsulates their experiential perceptions of online learning environments being stimulating, interesting, and enjoyable in their own right.

Perceived enjoyment is conceptualized as an intrinsic motivator driving technology acceptance and use. Students who experience online classes as pleasurable and entertaining are more inclined to participate actively and frequently. Interest and enjoyment promotes engagement, attention, and utilization beyond just external motivations like achievement gains. It also fosters receptive learning.

Empirical studies of online learning conclusively demonstrate perceived enjoyment positively influences students' intentions to use and their actual use of online systems(Rasmusson, 2017). The more students associate online learning with joy and fun, rather than boredom or drudgery, the stronger their motivations to participate and apply themselves. Enjoyment also reinforces continual usage over time.

Instructional designers should incorporate engaging, enjoyable features like games, animations, videos, and interactive modules that stimulate enjoyment. Enabling students to feel autonomy and competence in virtual environments also enhances intrinsic motivation. Making participation fun, interesting, and varied boosts involvement, effort, engagement, and knowledge retention(Rasmusson, 2017).

Collaborative projects, peer interactions, and vibrant discussions help generate an enjoyable social climate online. Incorporating real-world relevance and contact also amplifies interest and perceived enjoyment. Ultimately, online learning should energize and empower students. Pleasant, gratifying experiences promote meaningful participation.

# 8. Perceived Credibility

Perceived credibility encapsulates students' assessments of the truthfulness, reliability, validity, and believability of information communicated through online learning systems(Robertson\*, 2005). It reflects their evaluation of how credible the content and sources accessed through online platforms are.

Students continually appraise the credibility of the material delivered via online classes in determining how seriously to take it. When credibility judgments are positive, information integration and acceptance intensifies. However, perceiving content as biased, misleading, or inaccurate diminishes knowledge acquisition(Robertson\*, 2005).

Empirical studies validate perceived credibility is a salient factor influencing students' intentions to use online learning systems. Credibility impacts the extent students view online materials as believable and meaningful for learning. Students scrutinize issues like accuracy, evidence sources, objectivity, recency, bias, and relevance in assessing credibility.

Educators should emphasize sourcing high-quality, authoritative content, and providing transparency about origins. Developing students' digital literacy skills in assessing credibility is also beneficial. Indicators of credibility like .edu domains, expert instructors(Saultz&Fusarelli, 2017), peer review processes, and data-based support bolster perceptions of online content validity and value for learning(Saultz&Fusarelli, 2017).

Overall, students filter online learning information through perceived credibility assessments. Design elements signalling legitimacy and knowledge advancement facilitates acceptance and intake. Cultivating critical analysis abilities enables students to make discerning value judgments. Credibility is key for translating access into meaningful learning gains(Snow, 2006).

# 9. Conclusion and Recommendation

## 9.1 Conclusion

This literature review aimed to synthesize evidence on the key factors influencing students’ acceptance and use of online learning systems and platforms. Drawing on technology adoption models, it examined the motivational role of performance expectancy, effort expectancy, social influence, facilitating conditions, perceived enjoyment and credibility. Several conclusions can be derived from across the empirical studies to guide practice in fostering educationally meaningful online learning experiences.

Firstly, performance expectancy, or students’ beliefs that online learning will enhance their academic achievement and learning outcomes(Syed et al., 2021), is a vital driver of their acceptance intentions and participation. Students pragmatically assess the tangible benefits for their grades, productivity, skill gains, and knowledge acquisition. Explicitly communicating and designing online activities aligned with concrete learning improvements is critical to motivate engagement. Appealing to goal orientation and instrumental motivations encourages buy-in.

Secondly, ease of use or effort expectancy has a less clear impact given students’ greater digital proficiency as digital natives. Nonetheless, minimizing complications still caters to diverse technical abilities. Ensuring seamless access, simplicity in navigation, availability of user guides, and helpdesk assistance facilitates participation. Removing unnecessary obstacles reinforces willingness to devote effort and energy to online learning activities.

Thirdly, social influence shapes students’ cost-benefit analyses and intentions to adopt online learning. Validation from peers, instructors, family and the wider institutional climate pressures students to conform to favorable social norms. Cultivating peer collaboration and enabling influential figures to actively encourage online engagement fosters buy-in. However, disapproval obstructs acceptance. Constructive social dynamics are key.

Fourthly, facilitating conditions like technological infrastructure, resources, support and training constitute real environmental constraints on the ability to translate intentions into substantive participation. Proactively assessing needs and providing requisite devices, connectivity, software access, literacy development and responsive technical assistance allows students to meaningfully engage online. Eliminating barriers is imperative.

Fifthly, perceived enjoyment enhances intrinsic motivation to participate online. Incorporating stimulating, fun content like games, discussions, and collaborative projects promotes effort investment and knowledge acquisition. Creating autonomy supportive environments also amplifies enjoyment and engagement. Pleasure and interest reinforce continual usage and receptive learning.

Lastly, students rely on perceived credibility assessments of online content validity in usage decisions. Emphasizing sourcing high-quality information from authoritative sources, being transparent about origins, providing corroborating evidence, and developing critical literacy skills enables students to integrate knowledge. Credibility signals determine acceptance.

Overall, optimizing student motivations, experiences, supports and the learning interface design is vital for active online participation. Educators should communicate performance gains, enable social connections, make participation easy and enjoyable, and demonstrate credibility. Technology should empower, not obstruct, learners. However, the literature overwhelmingly focuses on higher education. More research grounded in K-12 contexts is needed to extend findings. There is also an absence of student voices and perspectives in the quantitative, survey-based literature. Qualitative and learner-centered approaches providing nuanced insights would enrich understanding.

Longitudinal studies tracking how motivations evolve over time as familiarity develops would be valuable. Also, comparative research between disciplines and demographic groups could contextualize differences(Waghid&Smeyers, 2014). Multi-method designs triangulating self-reports with learning analytics, academic performance and behavior metrics would enhance validity. Overall, while substantial research examines singular constructs like performance expectancy, more holistic research is needed investigating how factors intersect in practice.

This review integrated disconnected studies into a unified framework for creating pedagogically meaningful online learning aligned with student motivations. The conclusions derived provide guidance for educators and designers seeking to leverage online components to amplify student success. However, the lack of learners’ input into the literature highlights the need for greater foregrounding of student voices to ensure technology enables empowering, student-centered education. With online learning established as a permanent fixture, continual research elucidating how to maximize its educational quality through design is imperative.

## 9.2 Recommendations

1. Align online learning activities and assessments with concrete learning performance improvements to enhance students' academic achievement motivations.
2. Provide evidence of how online components can augment learning productivity, mastery, grades, and skill development to tap into goal orientation.
3. Ensure online learning platforms and interfaces have intuitive, seamless navigation and interaction to minimize effort and complications for all learners.
4. Offer user guides, technology training, and helpdesk services to support students struggling with lower digital proficiency and address accessibility barriers.
5. Encourage influential figures like instructors, parents, and administrators to actively promote student adoption and engagement with online learning.
6. Facilitate positive peer support and collaboration in online participation to develop constructive social dynamics and norms(Walton & Darkes-Sutcliffe, 2023).
7. Assess learner needs to identify and proactively address facilitating conditions obstructing usage, by providing resources, training, connectivity, and ongoing technical assistance.
8. Incorporate stimulating, interactive content like games, animations, videos, discussions, and collaborative projects that students find enjoyable and interesting.
9. Give students autonomy in online environments to increase perceived competence, control, and intrinsic motivation.
10. Emphasize high-quality information from authoritative, trustworthy sources and provide transparency about origins.
11. Cultivate students' digital literacy skills to critically evaluate credibility of online sources and make discerning value judgements(Walton & Darkes-Sutcliffe, 2023).
12. Adopt learner-centered research approaches that foreground student perspectives and insights about online learning experiences.
13. Conduct longitudinal studies tracking evolutions in student motivations towards online learning over time as familiarity develops.
14. Undertake comparative research between educational levels, disciplines, demographics, and cultures to contextualize differences.
15. Employ multi-method designs triangulating self-reports, learning analytics, academic achievement, and actual behavior metrics.

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