Designing Instructional Digital Media in Higher Education: A Guide for Instructional Designers

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Introduction

In an era where instructional digital media permeates every aspect of life, instructional media has transformed how educators and learners create, consume, and engage information. Instructional digital media has the potential to be a pivotal element in crafting meaningful and inclusive learning experiences. Instructional designers (IDs) are essential architects in harnessing the dynamic capabilities of instructional digital media to foster not only student engagement but also deep learning and a profound connection to educational content (Mayer, 2017).

Educational environments were forced to pivot to virtual methods of distribution of content during the COVID pandemic of 2020, this event opened the doors for a transformation allowing instructional digital media to flourish. Instructional digital media spans an array of engaging formats including videos, audios, animations, simulations, e-books, infographics, games, and streaming applications. Advances in artificial intelligence (AI) further add to this list, offering personalized content creation at an unprecedented pace and scale (Amado-Salvatierra et al., 2023). The potential for education is immense, promising more adaptive and responsive learning environments that can cater to the diverse needs of students. However, this potential can only be realized when instructional digital media is wielded with a clear understanding of its implications and integrated into educational practices effectively.

Instructional digital media is not merely a tool for engagement; it is a bridge to deep learning, a platform for the active construction of knowledge, and a means to forge stronger connections—not just between students and content but also among students, instructors, and the broader educational community.

To assist instructional designer with navigating instructional digital media this guide has been divided into these key areas:

- *Pedagogical Approaches*: Explore effective strategies for integrating instructional digital media focusing on engagement and active learning.
- *Instructional digital media Creation and Selection:* Discuss the importance of choosing and creating multimedia content supporting diverse learning preferences to ensure accessibility and inclusion.
- *Assessment and Feedback:* Describe methods to leverage instructional digital media for both formative and summative assessment.
- *Ethical Considerations:* Explain the responsibilities of using instructional digital media, including equity, access, and the respectful use of content.
- *Continuous Improvement:* Provide ideas for critical feedback informing continuous improvement.

The journey through this chapter is an invitation to rethink the role of instructional digital media—to view it not just as a supplementary tool but as a central component of instructional design. This rethinking requires a delicate balance of technology, pedagogy, and creativity, all

aimed at achieving the ultimate goal of enriching the educational experiences of all learners (Mayer, 2017).

Pedagogical Approaches

In this section, an instructional designer and online instructor with practical application of digital literacy, multicultural education principles, and educational technology scrutinizes the often technocentric views of the discipline and shares pedagogical approaches to the use of digital instructional media.

Our world is bombarded with media from music to news, to sports. Instructional digital media has also made its way into current learning environments. With this in mind how can instructional designers harness the power of instructional digital media and inspire instructors to use it in their practice? Begin by sharing some of the research in the field of multimedia learning. Richard Mayer (2009) developed the Cognitive Theory of Multimedia Learning which is based on how to structure multimedia to maximize learning outcomes. After a series of research studies, he introduced principles based upon assumptions of how people learned with multimedia presentations. His information processing assumptions include dual-channel, limited capacity, and active processing along with Cognitive Load Theory. He folded these assumptions into principles for multimedia learning. It is wise to consider some of Mayer's principles as multimedia is introduced into practice, including: 1) Timed recorded instructions should play along with visuals simultaneously, 2) Instruction should be divided into small sections and the learner should have control over the pace, and 3) Learners relate more to a conversational style that is human, not machine generated. Overall, he concludes that learners benefit from the use of words and images based upon how information is processed. Learners retain more when engaging in knowledge construction rather than in knowledge transfer with drill and practice

methods. He states, “instructional design involves not just presenting information, but also presenting it in a way that encourages learners to engage in appropriate cognitive processing” (p. 168).

To put this theory into practice a common technique is to make short, personalized videos allowing the learner to slow the pace or replay the video. Producing less professional, one-take videos with mistakes can make the instructor appear more human verses a professionally produced talking-head approach. On the flip side using highly produced quality videos for introductions can add an element of storytelling or documentary feel. As these highly produced videos are more expensive, they should contain content that has longevity and entices students about the content and learning outcomes. This is where a creative videographer can become vital to the process. Some guiding questions can be used as when deciding how to design instructional digital media: 1) what knowledge and skills learners need to acquire; 2) how the instructional digital media can support these learning outcomes; 3) whether the instructional digital media is employed to embody a specific instructional approach; 4) whether instructional digital media can capture learners’ learning process and support them to demonstrate their learning outcomes.

In applying the principles of multimedia learning with pedagogical approaches there are several strategies for practical application:

- Scaffolding information within multimedia contexts involves providing structured support to learners as they engage and grow with new concepts or skills. This is based on Vygotsky’s concept of the “zone of proximal development” based upon what the learner cannot do, what the learner can do with some help, and what the learner can do alone (Vygotsky, 1978). This can easily be achieved in multimedia learning by creating short videos breaking down complex concepts into smaller, more manageable chunks. This

helps learners digest information more effectively. Implementing progress indicators or checkpoints throughout a video allows learners to monitor their own progress and stay motivated. Offering hints or prompts at strategic points can guide learners through challenging tasks without giving away the answers outright. Adding text highlights or animations to a video are a great way to give visual hints to the learner. Simulations or interactive activities can provide hands-on experience and scaffold learning by allowing learners to explore concepts in a controlled environment. Using artificial reality (AR) or virtual reality (VR) can enhance the learning experience by putting students into imagined situations.

- Active learning encourages learners to engage with multimedia actively, rather than passively receiving information. Embedding quizzes and exercises within video content encourages learners to apply what they've learned in real-time. Incorporating discussion forums, group projects, or peer review assignments fosters collaboration and peer learning in online environments. Presenting learners with real-world problems or case studies challenges them to think critically and apply their knowledge to practical situations. The addition of multimedia to promote active learning can make higher education online learning more innovative, interesting, and engaging (Barbetta, 2023).

- Engagement is key to maintaining learners' interest and motivation throughout a course or learning experience. Engagement and interaction have consistently been significant topics in the educational field (Fredricks et al.,2004; Ke & Kwak, 2013). Incorporating videos, animations, infographics, and interactive elements into digital courses adds visual appeal and variety to the learning experience. Tailoring content to individual learners' interests and learning preferences increases engagement and relevance. Introducing

game-like elements such as badges, leaderboards, or rewards or integrating social features like discussion boards, chat functions, or peer-to-peer feedback encourages interaction and community building among learners.

- Learning objectives, learners' engagement and interaction are highly intertwined. Learning objectives serve as the foundations for instructional design, while learners' engagement and interaction are important factors to influence whether those objectives can be achieved. The strategic use of instructional digital media could be a catalyst to increase learners' engagement and interaction, which encourages active participation and learning. For instance, IDs can use conferencing platforms to engage learners in online collaborative discussions. This synchronous online discussion mirrors face-to-face interaction, which provides learners with opportunities to bounce ideas, explore different angles of the same matter, and offer emotional support. It taps into learners' cognitive and metacognitive skills, as well as social interaction.

- Real world skills are essential in the design of instructional digital media as it requires IDs to consider how to develop learners' real-world skills. These real-world skills--critical thinking, communication, collaboration and creativity (4Cs) (National Education Association, n.d.), are integral to the learning objectives. In the instructional practices, IDs can utilize instructional digital media to develop learners' real-world skills/4Cs. For instance, social media and some online discussion forums allow learners to negotiate and communicate ideas. Interactive simulations or digital games designed with educational purposes provide learners with opportunities to explore complex systems and solve problems, fostering both creativity and critical thinking.

- In today's diverse learning landscape, accommodating different learning modalities is essential. Multimedia should offer flexibility to support both synchronous and asynchronous learning, including synchronous activities like live webinars, virtual classrooms, and real-time discussions enable learners to engage with instructors and peers in real-time. Asynchronous events such as tutorials, podcasts and virtual field trips cater to learners who prefer to study at their own pace and on their own schedule. Multi-modal content delivery of offering content in multiple formats (e.g., text, audio, video) accommodates different learning preferences and accessibility needs.

By leveraging these approaches, educators can create more effective and inclusive online learning experiences meeting the needs of today's learners. However, be mindful that instructional digital media is constantly evolving and should not be used for its own sake. Learning should be the driving force to guide the use of instructional digital media. IDs should make sure that instructional digital media is strategically selected and utilized in a meaningful way. The goal of using instructional digital media is to enhance learning experiences, foster engagement, and increase knowledge retention. Finally, here is an example to illustrate an approach in implementing digital instructional media. The learning task asked students to locate online texts requiring critical evaluation. Texts were curated on a website for classmates to view and assess. Students chose a peer-selected text to examine by enacting online reading evaluation strategies. The students verbalized their thinking and the reading strategies. Simultaneously, they recorded their processes. Ultimately, students created a digital video combining their evaluation processes and reflections, sharing on a discussion board for peer feedback. This learning activity utilized a variety of instructional digital media tools serving distinct purposes. A class website could be used to curate content, exchange information and foster collaboration. Recording tools

were able to capture students' learning processes and reflections, focusing on their critical thinking and metacognitive skills. The class discussion board showcased students' work, promoting communication and collaboration. Altogether, instructional digital media tools that were intentionally designed with the goal of cultivating real world skills which greatly contributed to students' learning experience.

Instructional digital media Creation, Selection, and Integration

In this section, the author, a professor of religious studies with extensive online teaching experience, shares insights from collaborating with professional videographers and IDs to create immersive learning experiences.

Feelings of isolation represent a major concern for online students. For teachers, common criticisms are that digital learning erases traditional forms of interaction, such as eye contact and Socratic discussions (Romero-Hall and Ripine, 2021; Parra, et al, 2022). These difficulties, however, pertain to pedagogical challenges rather than the hopelessness of online learning. A wide range of research shows learning through instructional digital media, such as video, can be more effective than in person (Neotel, et al., 2021; Sablic et al. 2021). Regardless of the modality, whether virtual or in person, explains Kormos et al. (2023), success "starts and finishes with interaction" (p. 361). Instructional designers need to have ideas on how to utilize instructional digital media to create experiences allowing courses to come alive thus inspiring authentic engagement.

Shown to be an effective measure for student learning and engagement, the Community of Inquiry (COI) model emphasizes three forms of presence: social, teaching, and cognitive (Garrison et al, 2000). Rooted in the Constructivist model of learning, COI has reference to

individuals who construct knowledge through reflecting on course material as part of a larger learning community, all of whom see each other as “real” people (Kormos et al. 2023). Despite their value, introductory textbooks on global religions can contribute to the idea that religions are ancient, unapproachable, and distant, while lectures, however dynamic and interactive, fall short in fully bridging the gap. Visiting religious sites provides unique first-hand experiences with religious communities, which students can then reflect on together. Being unable to replicate these experiences for the online environment, however, Site Visit videos provide their own unique experiences. For an asynchronous online introductory class at the University of Arizona on world religions, five high quality Site Visit videos were adopted to foster these three presences.

These videos were designed to address feelings of isolation, challenge bias, and foster active learning and reflection (Sablic, et al, 2020). Through them, students entered otherwise inaccessible spaces, listened in on conversations, observed community practices, face expressions, the inside of buildings, clothing, and the sounds of different events and rituals. While physical Site Visits can be disruptive to religious communities, each recording was done through the invitation of the community, who, in several cases, enthusiastically shared these videos and posted them to their community’s website.

At the end of the course, several students responded in an online survey that they had increased desire to visit different religious spaces, together with an increased confidence to speak about religion with others outside of class, demonstrating cognitive presence. Seeing their instructor engage these communities, as explained by one student, “made these communities seem more personal and not otherworldly or foreign.” Video technology provides students with a level of

autonomy, allowing them to view content at any time, together with the ability to rewatch, change playback speed, pause, and skip sections (Argyriou, et al, 2020). The instructor held control over the creative and editing process, thus taking advantage of evidence-based techniques to heighten course relevance and student interest (Noetel, et al, 2021). By connecting videos to course assessments, such as discussions and the final project, students reflected on their experiences and shared them with others, achieving a sense of social, teaching, and cognitive presence that fostered community and inspired active learning and retention (West et al., 2024).

Cognitive load theory argues that learning takes place within a cognitive infrastructure, and as such, needs to account for how neurological pathways process information as well as their limitations. Understanding this when integrating digital tools is important in mitigating student fatigue and boredom, and thus expanding our digital efficiency (Singh, 2022). With studies proposing "best practices" for the use of instructional digital media, inclusive of proper video length, the use of signaling to highlight important information, and utilizing visuals and sounds in complementary ways (Steehler et al. 2023), Thompson et al (2021) emphasized pedagogy over particulars. For example, integrating multimedia directly into course assessments is much more important than making sure videos fit within some arbitrary ideal length (Brame, 2016). But still, a knowledge of cognitive structures matters so that teachers are not unintentionally hindering student learning.

The goal with Site Visit videos was to initiate real-world experiences of actual communities that felt connected to the class, and that students could then reflect on as a learning community. In discussing these shared experiences, either through video or text, students presented themselves and saw each other and their instructor as "real." As one student reflected,

“I felt as though I was experiencing the religion virtually and almost as if I was there because the instructor was there.” Another wrote, “The videos made everything more real and potentially broke down biases I’d formed while reading on my own.” These types of digital instructional media can engage students and assist in minimizing learning gaps, inspire interactivity, establish presence, and foster unique learning experiences.

Taking students into these different spaces via instructional digital media challenged preconceptions and enabled critical thinking. Seeing these communities as real, students engaged these videos with a sense of real-world relevance, encouraging them to critically reflect on prior knowledge and to build new understanding. Many students responded that they felt better informed and that they had already opened conversations with family, friends, and coworkers about the content of the videos. When learning is shared with others, explained Stacy Delacruz (2018), it becomes real. One student wrote, “The videos brought the textbook and the religions we read about to life.” Students went beyond analyzing disconnected “things,” to gaining memorable experiences with the world around them. While this use of Site Visit videos represents one approach to how multimedia technology can aid pedagogy in creating presence, reflection, and interaction in online education, there are endless ways and means technology can transform and energize our online courses and inspire active learning.

Assessment and Feedback

In this section, our author, a researcher, and online instructor, explores the research on using multimedia as an assessment practice and a mechanism for a feedback loop.

In the realm of instructional design, creating performance-based assessment activities aligning with instructional digital media content is pivotal for fostering effective authentic learning experiences. Assessments should not only evaluate learners' grasp of the learning outcomes, but also provide opportunities for multiple ways of meaning-making through both formative and summative evaluation. Leveraging instructional digital media to deliver timely and constructive feedback to students by incorporating constructive peer review mechanisms, can significantly enhance the learning journey and demonstrate the achievement of the desired learning outcomes. A research study on the use of digital storytelling (Buckner, 2018) demonstrates using multimedia for authentic assessment as a catalyst for empowering students to engage in the learning process while demonstrating the learning outcomes of the experience. It was important to clearly define the outcomes related to real world context, develop assignments with meaning and application, and finally construct an effective mechanism for evaluating the final product. IDs can perform the first two tasks, but there were not many instruments available on how to evaluate multimedia projects. An example of an instrument to measure media is a rubric developed from a four-year study on Digital Storytelling as an Authentic Assessment Practice (Buckner, 2018).

Appendix A

When working with instructors new to using multimedia for activities, it is vital to be able to lay out ideas, activities and resources backed up by research or theoretical framework. This helps to reduce apprehension and gives a good base to introduce new thoughts into their practice. Offering detailed guidelines to the learners with a rubric outlining the criteria for evaluation provides transparency about expectation and will lead to success. Another area to consider is the opportunity for self-assessment and reflection. This allows learners to monitor

their progress and identify areas for improvement. This use of multimedia allows for creativity and agency for students to demonstrating learning outcomes. It takes the learner from a passive participant into an active, engaged contributor or even teacher. In Richard Feynman technique of learning, he outlines a process for learning that includes teaching it to someone else. He states, "If you want to master something, teach it." (Feynman, n.d.). Another way to get learners involved with digital tools and skills is to have them re-design assessments. Using the co-development approach helps to capture the learner's previous experiences, joining the new material and clarify their aspirations. The Funds of Knowledge theory (Moll et al., 1992) can be applied to this strategy as it dives into the learner's overall set of abilities and knowledge that is deep seated in daily life giving them a solid foundation for building new ideas or ways of thinking. Finally, it is essential to build in time and space for failure when developing activities involving multimedia. Living in a digital age and society, does not equip all learners to create projects in non-traditional format. This is an opportunity for IDs to find or produce resources to assist both instructors and students with multimedia assignments. It also allows the learner to practice and develop digital literacy skills beyond that might exist outside of the formal learning outcomes.

Effective feedback is the cornerstone of meaningful learning experiences. Introducing multimedia into the feedback loops gives us the opportunities to enhance student learning making the experience transformative. From multimedia annotations to interactive simulations, these tools offer dynamic avenues for instructors to provide timely, personalized, and engaging feedback to learners. Instructional designers can help instructors to leverage multimedia tools like audio or video recordings, screencasts, or annotated documents to provide personalized and timely feedback to students. These feedback formats can be engaging and interactive conveying

tone and nuance more effectively than written feedback or a checkmark on a rubric. The use of video or audio feedback has the potential to encourage learners to feel they have made a personal connection with the instructor. Implementing a constructive peer review process with multimedia represents a dynamic approach to enhancing teaching effectiveness and promoting collaborative learning environments. Multimedia tools offer unique opportunities for instructors to engage in peer review processes through interactive, visual, and auditory mediums. As highlighted by Zhang and Nunamaker (2003), multimedia facilitates the exchange of rich, contextualized feedback, enhancing the depth and effectiveness of the peer review experience. One advantage of utilizing multimedia in peer review is the ability to provide multimodal feedback, which caters to diverse learning preferences and communication styles. This approach aligns with the principles of Universal Design for Learning (UDL), as advocated by Rose and Meyer (2002), wherein multiple means of representation and expression are utilized to accommodate the needs of all learners.

Multimedia-enhanced peer review fosters deeper engagement and understanding among participants by leveraging the power of visual and auditory stimuli. Research by Mayer (2005) suggests that multimedia presentations that combine relevant visuals and narration are more effective for learning and retention compared to text-based formats alone. By incorporating multimedia elements into peer review activities, instructors can enhance the clarity, impact, and memorability of their feedback, leading to more meaningful and actionable insights for improvement. The use of multimedia facilitates the creation of interactive and immersive peer review experiences, where instructors can simulate real-world teaching scenarios and provide authentic feedback in context. This approach not only enhances the authenticity and relevance of feedback but also promotes active learning and problem-solving skills among participants.

Finally, implementing constructive peer review with multimedia promotes collaboration and knowledge sharing among educators by facilitating the creation and dissemination of rich instructional resources and best practices. This collaborative exchange of multimedia-enhanced resources empowers educators to learn from each other, adapt best practices to their own contexts, and continuously improve their teaching practices and offers a dynamic and effective approach to promoting learning outcomes.

Ethical Considerations

Delving into the complexities of instructional digital media use in education with an instructional designer and adjunct faculty member whose research focuses on digital learning equity. This section critically examines how instructional digital media has the potential to either perpetuate inequities or significantly broaden access depending on how it is implemented.

Within the lifecycle of course design, integrating instructional digital media into the development process has become a cornerstone for enriching educational experiences. Instructional digital media's ubiquity across educational settings signifies a transformative shift in knowledge dissemination and consumption. With an array of instructional digital media creation tools at their disposal, educators and students can author and share content at an unprecedented scale. The accessibility of these tools democratizes content creation, enhancing opportunities for IDs to engage students deeply. However, the ease of access and lack of stringent guardrails raise critical ethical considerations, including equitable access, content use ethics, and intellectual property rights. Furthermore, ethical pitfalls abound as the widespread use of these technologies necessitates a responsible approach to ensure equity and access, empowering students for future digitally rich professional landscapes. These issues underscore the importance of fostering a culture that balances innovation with ethical integrity.

Advancing critical digital literacies is essential in higher education, as digital literacies encompass skills vital for navigating the digital world, including critical content consumption, creation, and communication (Belshaw, 2014). These literacies bridge classroom learning with real-world applications, preparing students for the digital age's complexities. IDs are crucial in fostering these competencies, highlighting their responsibility to cultivate students' critical thinking and responsible instructional digital media use. Integrating instructional digital media into coursework allows interactive learning experiences where students can articulate their understanding and perspectives. Interactive videos and multimedia-supported discussion boards create an environment that values student input. Assignments utilizing digital authoring tools enable students to produce videos, web pages, graphics, and interactive media, enhancing their critical and creative digital literacies. This boosts learner confidence and underscores the significance of digital literacies in their academic and professional lives, building impactful competencies for usage inside and outside of the classroom.

To achieve the affordances of instructional digital media, ethical design and development practices are crucial for IDs. Building a culture of transparency, responsible sourcing, and respectful sharing is essential. IDs should advocate for transparency in material usage and ensure shared content has proper permission. Protecting privileged information from inadvertent disclosure supports a learning ecosystem where privacy, security, and integrity are upheld, ensuring digital learning environments remain respectful and secure for all participants. This approach enhances the educational experience and reinforces the importance of ethical responsibility in the digital age. Fair use and open access can serve as indispensable approaches for navigating the complexities of intellectual property and copyright in the digital age. The abundance of open educational resources (OERs) and platforms for interactive media production

allows educators and students to engage in open remixing of content, fostering a culture of innovation and sharing while respecting authorship and ethical use. By promoting the use of open licenses and educating the academic community on the importance of ethical content use, IDs play a crucial role in shaping responsible instructional digital media practices that support IP rights and enhance the educational experience. Beyond ethical usage of instructional digital media, the digital divide also serves as a challenge, drawing a harsh line between those with and without access to digital technologies. The rapid shift to online learning during the pandemic highlighted the stark realities of limited access to essential digital tools, particularly affecting students from BIPOC communities, rural areas, and economically disadvantaged backgrounds (Adams et al., 2021). IDs must employ ethical considerations in their design strategies, ensuring equitable engagement with digital content. By applying UDL principles and selecting inclusive instructional digital media, they can help close this divide, fostering an educational environment that supports quality and equity for all students.

Inclusion and Accessibility

In this section, the authors explore how technology can help bridge gaps across cultural and linguistic differences and emphasize the importance of creating learning environments that celebrate diversity. This inquiry challenges educators to leverage digital tools to create a more inclusive and engaging learning environment that all learners can access and participate in.

Current learning environments are notable for representing a plurality of dimensions of diversity, including differentiation in race and ethnicity, languages spoken, and sociocultural backgrounds. The learning process consists of actively making meaning and connections, and students enter educational spaces actively constructing their own realities and meaning-making processes that highlight these dimensions of diversity (Kegan,1994). Additionally, meaning

making occurs through time and experience, significantly shaping the process of learning and teaching. However, the myriad ways in which learners make meaning is often not fully recognized or acknowledged by educators (Ignelzi, 2000). In utilizing instructional digital media, IDs must leverage the diversity of approaches to meaning making as an asset, choosing materials that are inclusive of the needs, goals, and preferences of all learners.

To support inclusive learning environments, IDs need to foster a sense of community in which learners feel connected, supported, and safe to share their experiences, ideas, and thoughts. This goal can be achieved by leveraging various digital tools, such as using interactive communicative tools and integrating social media to promote communication and collaboration. Additionally, by recognizing learners as funds of knowledge (Moll et al., 1992) who bring their entire lives into the classroom, IDs can create meaningful learning experiences that are shaped by and responsive to learners' experiences, beliefs, and understandings. Learning activities supported by instructional digital media connect learners to their own understanding of the world by recognizing and valuing the knowledge and skills they bring from their communities. IDs can employ culturally responsive pedagogical approaches to inform curriculum design and dynamic teaching practices with instructional digital media by considering the rich and varied cultural wealth, knowledge, and skills that students from diverse backgrounds bring to the learning community (Howard, 2021). Additionally, through high impact teaching approaches such as inquiry-based learning (Friesen & Scott, 2013) and project-based learning (Kokotsaki et al., 2016), instructors can support learners in exploring, sharing, and communicating the complexity of diverse cultures within course work, allowing learners to incorporate culture into assignments to enhance their learning.

The UN Sustainable Development Goal (SDG) 4 of the 2030 Agenda for Sustainable Development sets a goal to, “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (UN, 2023). This SDG emphasizes the human right to engage in meaningful and rewarding learning that celebrates the development of literacies, vocational skills and citizenship skills within a variety of learning environments, including universities, schools, and communities (UIL, 2021). To address the critical need to maximize opportunities for each learner, the UDL framework proposes guidelines that increase access and impact in educational environments, including: 1) multiple means of representation, to give learners various ways of acquiring information and knowledge; 2) multiple means of expression, to offer learners alternatives for demonstrating what they know; and 3) multiple means of engagement, to tap into learners’ interests, challenge them appropriately, and motivate them to learn (Meyer et al., 2014; Rose & Meyer 2002). While UDL offers principles for tailoring learning resources to diverse learning needs, digital tools and media extend this impact by considering learners' preferences, interests, cultural backgrounds, and modes of self-expression (Gronseth, 2018; Moon et al., 2023; Roberts, 2022). When designing and integrating instructional digital media, IDs should recognize and value learners’ diverse preferences and meaning making processes, and rethink the ways that new technologies, such as generative AI, can be utilized to enhance the comprehension, interpretation, and representation of learning.

Continuous Improvement

In this section, the focus shifts to the iterative nature of the educational design and the use of instructional digital media. The author discusses the importance of continuously enhancing digital learning tools and content to keep pace with technological advancements and pedagogical insights.

The thoughtful integration of instructional digital media reflects the innovative spirit that guides IDs. This spirit, rooted in ethical considerations, extends into a philosophy of continuous improvement, essential for ensuring instructional digital media consistently enriches learning experiences with relevance and engagement. As educational landscapes evolve, digital resources must adapt, embracing a cycle of iteration and responsiveness to feedback. At the heart of continuous improvement of instructional digital media lies the pivotal role of feedback. Gathering insights from both students as well as faculty and instructional design colleagues, and through methods such as surveys, focus groups, and analytics, provides a rich tapestry of perspectives that can guide the iterative refinement of instructional digital media. This feedback informs design cycles and fosters collaboration with faculty on course redesigns, whether updating content, technology, or overhauling entire courses. Additionally, connecting faculty with communities of practice enriches this process, providing a forum for reflection on instructional digital media pedagogical practices.

The rapid technological advancement within the educational field offers IDs' tools that significantly enhance learning experiences. From sophisticated audio and video editing tools to the potential of generative AI, new technologies enable the creation of engaging and accessible instructional digital media. However, integrating these technologies into curricula requires evaluating their educational value to ensure they are not only innovative but also accessible and supportive of inclusive learning experiences. Frameworks such as the Peralta Online Equity Rubric provide invaluable guidance in the vetting process, ensuring that the innovative tools chosen to contribute positively to the educational environment. Beyond technology, IDs must stay abreast of pedagogical trends to effectively incorporate instructional digital media into the

curriculum, engaging in ongoing professional development and leading training initiatives for faculty and students to keep pace with technological advances.

Ensuring the quality and accessibility of instructional digital media in higher education is another critical responsibility for IDs. Quality assurance frameworks, including the Online Learning Consortium's Quality Scorecard Suite and the Quality Matters Rubric, provide comprehensive criteria for evaluating instructional digital media's effectiveness and inclusivity. This process of course review ideally involves faculty and stakeholders in a continuous dialogue to refine and enhance digital learning materials. Recognizing faculty who participate in this review process can foster a culture of excellence and continuous improvement, ensuring that instructional digital media effectively supports the diverse learning needs of the student population.

Conclusion

Looking forward, the horizon of instructional design is rich with possibilities. The continuous advancement of digital instructional media promises to further transform educational settings, making learning more accessible and engaging. Anticipate these changes, the role of IDs will evolve, necessitating a perpetual adaptation to new tools and methodologies for creating and implementing instructional digital media. This dynamic environment calls for a proactive approach to learning and development, ensuring that educational practices not only keep pace with technology but also lead equitable innovations in pedagogy.

Instructional designers are urged to embrace the principles discussed throughout this chapter and to apply them in their practices for creating digital instructional media. By fostering an ethos of continuous improvement, staying abreast of technological and pedagogical

advancements, carefully selecting multimedia content to support diverse learners, leveraging instructional digital media for formative and summative assessments, and staying attentive to ethical considerations, designers can ensure that their instructional strategies for instructional digital media remain relevant and effective. Moreover, prioritize inclusivity and accessibility, ensuring all students, regardless of background or ability, benefit from digital instructional media. Moving forward with a commitment to use instructional digital media not just as a means to educate but as a platform to inspire, engage, and empower learners worldwide.

Appendix A

Digital Storytelling Rubric

Category	Excellent	Good	Satisfactory	Needs Improvement
Purpose (20 points)	Establishes a consistence purpose early on and maintains a clear focus. (20)	Establishes a purpose and focus but is inconsistent. (15)	There are lapses in focus and the purpose is fairly clear. (10)	Difficulty in figuring out the purpose and lacks focus. (5)
Plot, Theme, Resolution (15 points)	Has a clear beginning, middle and end. Plot is well developed by setting up a theme sustaining attention throughout and ending with a resolution. (15)	Has a loose beginning, middle and end. Plot is moderately developed by setting up a theme lightly holding attention and finding a resolution. (10)	Has minimally developed plot, theme or resolution and loses attention. (5)	Has no developed, plot, theme or resolution. (3)
Voice (15 points)	Employs pitch and timbre to connect with the audience. Voice quality is consistently clear and audible. Pace and rhythm are appropriate to hold attention. (15)	Voice quality is consistently clear and audible. Pace and rhythm are appropriate to hold attention. (10)	Voice quality is clear and audible. Pace and rhythm are consistent. (5)	Voice quality is inconsistent. Pace and rhythm do not hold attention. (3)
Sound, Emotion, Tone (15 points)	Music/sound is appropriate and enhances the story. If no music/sound, then the story is well represented through voice and images. (15)	Music/sound enhances the story. If no music/sound, then the story is represented through voice and images. (10)	Music/sound is used in the story. If no music/sound, then the story has voice and images. (5)	The story is not represented well with music or through voice and images. (3)

Content, Reflection (20)	Content clearly reflections on the outcomes of the story/project and highlights personal and professional growth. (20)	Content reflections on the outcomes of the story/project and shows some personal and professional growth. (15)	Content addresses some outcomes of the story/project and lightly touches on personal and professional growth. (10)	Content reflection, personal and professional growth are not clearly demonstrated. (5)
Economy, Time, Pace (15)	Conscious use of economizing of language for proper pacing of story and maintenance of audience attention. Length of presentation is highly appropriate for the story. (15)	Shows some economizing of language for proper pacing of story and maintenance of audience attention. Length of presentation is appropriate for story project. (10)	Shows little economizing of language for proper pacing of story and maintenance of audience attention. Length of presentation is acceptable for story project. (5)	Lack of economizing of language for proper pacing of story and maintenance of audience attention. Length of presentation is not acceptable for story project. (3)

References

Adams, S., Bali, M., Eder, Z., Fladd, L., Garrett, K., Garth-McCullough, R., Gibson, A. M., Gunder, A., Iuzzini, J., Knott, J. L., Rafferty, J., & Weber, N. L. (2021). Caring for students playbook: Six Recommendations for caring for students. Every Learner Everywhere. http://files.eric.ed.gov/fulltext/ED613431.pdf

Amado-Salvatierra, H. R., Chan, M. M., & Hernandez-Rizzardini, R. (2023, October). Combining human creativity and AI-based tools in the instructional design of MOOCs: Benefits and Limitations. In 2023 IEEE Learning with MOOCS (LWMOOCS) (pp. 1-6). IEEE.

Argyriou, L., Economou, D., & Bouki, V. (2020). Design methodology for 360 immersive video applications: the case study of a cultural heritage virtual tour. Personal and Ubiquitous Computing. 24:843-859. https://doi.org/10.1007/s00779-020-01373-8

Barbetta, P. M. (2023). Technologies as tools to increase active learning during online higher-education instruction. Journal of Educational Technology Systems, 51(3), 317-339.

Belshaw, D. (2014). The Essential Elements of Digital Literacies. Retrieve from: https://dougbelshaw.com/essential-elements-book.pdf

Brame, C.J. (2016). Effective educational videos: Principles and guidelines for maximizing student learning from video content. CBE--Life Sciences Education, 15(4), es6.

Delacruz, S. (2018). Building digital literacy bridges: Connecting cultures and promoting global citizenship in elementary classrooms through school-based virtual field trips. TechTrends, 63, 429-439. https://doi.org/10.1007/s11528-018-0350-1

Feynman, R. P. (n.d.). Feynman technique of learning. Retrieved from https://fs.blog/feynman-technique/.

Friesen, S., & Scott, D. (2013). Inquiry-based learning: A review of the research literature. Alberta Ministry of Education, 32, 1-32.

Fredricks, J. A., Blumenfeld, P.C. & Paris, A. H. (2004) School engagement: Potential of the concept, state of the evidence. Review of Education Research. 74 (I), 59-109.

Garrison, G. (2009). An assessment of organizational size and sense and response capability on the early adoption of disruptive technology. Computers in Human Behavior, 25(2), 444-449.

Gronseth, S. (2018). Inclusive design for online and blended courses: Connecting web content accessibility guidelines and universal design for learning. Educational Renaissance, 7, 14-22.

Howard, T. C. (2021). Culturally responsive pedagogy. In J.A. Banks (Ed.), Transforming multicultural education policy and practice: Expanding educational opportunity, (pp.137-163). Teachers College Press

Ignelzi. (2000). Meaning-making in the learning and teaching process. New Directions for Teaching and Learning, (82), 5–14. https://doi.org/10.1002/tl.8201

Ke, F., & Kwak, D. (2013). Online learning across ethnicity and age: A study on learning interaction participation, perception, and learning satisfaction. Computers & Education, 61, 43-51.

Kegan, R. (1994). In over our heads: The mental demands of modern life. Cambridge Mass: Harvard University Press.

Kokotsaki, D., Menzies, V., & Wiggins, A. (2016). Project-based learning: A review of the literature. Improving schools, 19(3), 267-277.

Kormos, E., Julio, L., & Morgan, A. (2023). Preservice teacher perceptions using video discussions to foster a community of inquiry – does the learning environment matter. TechTrends. DOI: 10.1007/s11528-022-00827-5

Mayer, R. E. (2017). Using multimedia for e-learning. Journal of Computer Assisted Learning, 33(5), 403–423. https://doi.org/10.1111/jcal.12197

Mayer, R. E. (2009). Multimedia learning (2nd ed.). Cambridge, England: Cambridge University Press.

Meyer, A., Rose, D. H., & Gordon, D. (2014). Universal design for learning: Theory and practice. Wakefield: CAST Professional Publishing.

Moon, J., Choi, G. W., & Seo, J. Y. (2023). Revisiting multimedia learning design principles in virtual reality-based learning environments for autistic individuals. Virtual Reality, 27(4), 3101-3113.

Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. Theory into Practice, 31(2), 132-141. https://doi.org/10.1080/00405849209543534

National Education Association (n.d.). Preparing 21st century students for a global society: An educator's guide to the "Four Cs". https://dl.icdst.org/pdfs/files3/0d3e72e9b873e0ef2ed780bf53a347b4.pdf

Noetel, M., Griffith, S., Delaney, O., Sangers, T., Parker, P., del Pozo Cruz, B., & Lonsdale, C. (2021). Video improves learning in higher education: A systematic review. Review of Educational Research. DOI:10.3102/0034654321990713

Parra, J., Chatterjee, S., Alzaid, A., & Korang, T. (2022). Designing activities for online geography courses informed by the community of inquiry framework. The Geography Teacher. 19:3, 102-112. DOI: 10.1080/19338341.2022.2077799

Roberts, D. (2022). Multimedia learning methods and affective, behavioural and cognitive engagement: a universal approach to dyslexia?. Journal of Further and Higher Education, 46(1), 62-75.

Romero-Hall, E., & Ripine, C. (2021). Hybrid flexible instruction: Exploring faculty preparedness. Online Learning, 25(3), 289-312.

Rose, D. H., & Meyer, A (2002). Teaching every student in the digital age: Universal design for learning. Alexandria, VA: ASCD.

Sablic, M., Mirosavljevic, A., & Skugor, A. (2021). Video-based learning (VBL) – past, present and future: an overview of the research published from 2008 to 2019. Technology, Knowledge and Learning. 26:1061-1077. https://doi.org/10.1007/s10758-020-09455-5

United Nations. (2023, July). Crisis in global learning: a call for action to improve education access, quality, equity and inclusion. https://www.un.org/en/desa/crisis-global-learning-call-action-improve-education-access-quality-equity-and-inclusion

UNESCO Institute for Lifelong Learning (UIL). (2021). Inclusive lifelong learning in cities: Policies and practices for vulnerable groups. https://unesdoc.unesco.org/ark:/48223/pf0000379538

Vygotsky, L. S. (1978). Mind in society. Cambridge, MA: Harvard University Press.

West, H., Hill, J., Abzhaparova, A., Cox W,. & Alexander, A. (2024). Pandemic pedagogies: reflecting on online learning using the community of inquiry framework. Journal of Geography in Higher Education, 48:2, 157-176. DOI: 10.1080/03098265.2023.2190962