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Preparing Design Students for an Omnidimensional Future in MultiMedia

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Abstract

Much of education stands at a pivotal crossroads, demanding a transformative approach to prepare students for an interconnected, technology-driven world. As the field expands beyond traditional print into multidimensional domains like user experience (UX), artificial intelligence (AI), and augmented reality (AR), aspiring designers face the challenge of mastering diverse systems that encompass physical, psychological, social, cultural, technological, and economic factors. Addressing this need, the proposed Multimedia major aims to bridge legacy practices with emerging design trends, equipping students to navigate dynamic professional landscapes effectively.

This program integrates communication, graphic design, journalism, and music courses, offering a comprehensive curriculum that balances foundational skills with cutting-edge competencies. It prioritizes cross-disciplinary collaboration, hands-on experiential learning, and a systems-thinking approach. Core elements include technical expertise in motion graphics, human-centric design, data visualization, and robust training in multimedia storytelling and ethical considerations. Furthermore, the program emphasizes career preparedness through internships, capstone projects, and partnerships with community media organizations, ensuring students graduate with industry-relevant skills portfolios.

Challenges in traditional academic programs, such as limited course offerings and outdated pedagogies, underscore the necessity of a forward-looking initiative. This major exemplifies a shift toward a holistic educational model by leveraging innovative solutions like experiential learning, integrating analog artifacts within digital courses, and fostering adaptability through AI and AR applications. It aligns with employer expectations, which increasingly prioritize versatile employees who are adept in UX, 3D modeling, and interdisciplinary collaboration.

As design, communication, journalism, and music evolve into a multidisciplinary practice, the Multimedia major aspires to cultivate professionals capable of synthesizing diverse perspectives to address complex, real-world challenges. This approach ensures graduates are technically proficient and agile thinkers prepared to make meaningful contributions to an ever-expanding field. The new program envisions a future where students are equipped to thrive "everywhere, all at once" in a globally connected, rapidly advancing multimedia ecosystem.

Keywords: *Design Education, Multimedia Curriculum, Emerging Technologies, Cross-Disciplinary Learning, Career Preparedness*

1. Introduction: Rethinking Design Education In A Post-Print, Omnidimensional Era

Higher education in design stands at a pivotal inflection point, where the acceleration of digital innovation has fundamentally reshaped not only the tools of creative production but also the demands of professional practice. Traditional curricula rooted in print-era paradigms now struggle to accommodate the distributed, interactive, and interdisciplinary nature of contemporary multimedia environments. Design education must therefore evolve beyond medium-specific training toward a systems-thinking model that integrates user experience (UX), artificial intelligence (AI), augmented reality (AR), data storytelling, and open-access publishing.



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At the heart of this paper is the claim that a curriculum structured around the CDIO (Conceive–Design–Implement–Operate) framework offers a transformative path forward for multimedia education. Originally developed in engineering contexts to bridge theory and practice through iterative, project-based learning, CDIO has since been successfully adapted to creative disciplines, including political science, journalism, and media design [7]. The CDIO approach enables students to systematically engage with real-world problems, develop collaborative and technical fluency, and iterate solutions within digitally networked ecosystems—skills essential for careers that now demand multidimensional literacies.

Concurrently, a major epistemological shift is underway in academic communication and knowledge production. As Jason Kelly and Tim Hitchcock argue, the “digital turn” in scholarly publishing exposes the limitations of legacy print models, which often fetishize the aesthetic of the bound object at the expense of participatory, scalable, and efficient dissemination of ideas [6]. New models such as Diamond Open Access and Git-based versioning systems have opened the door to a more integrated and transparent mode of scholarly exchange—one aligned with the iterative logic of CDIO pedagogy and responsive to the ethical, social, and economic demands of digital culture [5; 9].

This paper proposes a new Multimedia major at Central Connecticut State University that draws upon the CDIO framework to cultivate graduates capable of “designing everywhere, all at once.” It begins by identifying the limitations of siloed, print-era instruction and outlines a restructured curriculum that integrates cross-disciplinary training, experiential learning, and digital publishing. Grounded in market research, pedagogical theory, and open-access scholarship, the program aims to align education with both industry and public knowledge-making.

2. Rationale for a Transformative Pedagogy

2.1 The Expanding Domain of Multimedia

Multimedia design today operates across a broad spectrum of disciplines and technologies, no longer confined to the visual or static. Contemporary practice intersects user experience (UX), artificial intelligence (AI), augmented and virtual reality (AR/VR), data visualization, sonic environments, and interactive journalism. These domains are not merely technical arenas but are embedded within broader social, economic, and cultural ecosystems. As such, students must be trained to approach design not only as an aesthetic endeavor but as a systems-level activity that requires critical engagement with the physical, psychological, social, and economic structures shaping human experience.

Designers now routinely build immersive narrative environments using Unity or Unreal Engine, prototype user flows in Figma, and produce soundscapes or podcasts in Ableton—each requiring fluency not only in tools but in transdisciplinary thinking and collaboration. Emerging roles, such as XR designers, creative technologists, and UX researchers, increasingly call for hybridized competencies that cross domains traditionally segmented in higher education. This expanded field of practice mirrors what John Biggs and Catherine Tang describe as “constructive alignment,” where learning objectives, teaching methods, and assessment are designed to produce deep, transferable knowledge outcomes [1]. A multimedia curriculum must therefore reflect the complexity and convergence of these domains by prioritizing integration over specialization.

2.2 The Limitations of Legacy Pedagogies

Despite this changing professional landscape, many academic programs remain anchored in print-era models and medium-specific instruction. The legacy of modernist design education continues to favor isolated skillsets—e.g., print layout, typographic refinement, or linear narrative construction—at the expense of agile, project-based, and iterative learning models that reflect contemporary production cycles. Such models often fail to accommodate non-linear thinking or collaborative problem-solving, which are essential for navigating today’s omnidimensional design environments.

As Jason Kelly and Tim Hitchcock have observed, the fetishization of print remains a dominant ideology in academic culture, often conflating form with intellectual legitimacy and overlooking the inherent affordances of digital and interactive media [6]. Consequently, pedagogies grounded in static production



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outputs—such as the single-authored paper or the formatted print portfolio—perpetuate a narrow definition of scholarly and creative value. These limitations hinder students' capacity to experiment with emergent formats and inhibit the kinds of knowledge-sharing practices that digital publishing, open peer review, and remix culture afford.

Moreover, traditional pedagogies fail to align with industry workflows that demand fluency across platforms and collaboration between coders, storytellers, designers, and analysts. According to labor market data, employers increasingly seek “T-shaped” professionals: individuals with deep expertise in a core area and broad skills across other disciplines. A pedagogy that emphasizes medium-specific craft while isolating students from cross-functional collaboration does not meet this demand. As Susan Kenyon argues, the CDIO model enables students to “learn through participation in industry-designed projects,” simulating the conditions of real-world practice and producing graduates who are “society-ready” as well as technically adept [7].

These gaps underscore the urgency of developing a curriculum architecture that dissolves disciplinary silos, emphasizes process over product, and prepares students to navigate—and shape—the evolving media landscapes of the 21st century.

3. CDIO as a Framework for Omnidimensional Learning

3.1 Overview of CDIO Pedagogy

The CDIO (Conceive–Design–Implement–Operate) framework was originally developed at the Massachusetts Institute of Technology to reform engineering education through a more holistic, practice-based approach. Rather than emphasizing abstract technical theory in isolation, CDIO was designed to simulate the real-world innovation process by embedding learning within the full life cycle of product development—from conceptualization to deployment [4]. Since its inception, CDIO has expanded far beyond engineering, with successful adaptations now found in business, education, digital media, and even political science [7].

The pedagogical foundation of CDIO rests on active, iterative, and project-based learning. It emphasizes collaboration, systems thinking, and ethical problem-solving, enabling students to prototype solutions in response to real social and technical challenges. In contrast to siloed and linear instruction, CDIO scaffolds learning around cyclical design processes, reinforcing practical engagement through hands-on experience, peer critique, and formative assessment. As Biggs and Tang have noted, such integrative methods reflect a high-impact model of “constructive alignment,” where course outcomes, activities, and evaluations are coherently designed to reinforce transferable learning outcomes [1].

3.2. CDIO Applied to Multimedia Education

The CDIO model is especially well-suited to the demands of multimedia education, where students must navigate an expanding field that includes interactive design, data-driven storytelling, and multimodal publishing. Applied in this context, each CDIO stage corresponds with specific experiential goals, tools, and deliverables:

3.3 CDIO Applied to Multimedia Education

- **Conceive:** Students identify a societal or media need, conduct UX research, and frame the problem ethically and strategically.
- **Design:** Learners storyboard and prototype across platforms (e.g., AR, web, film, and audio), integrating design thinking with iterative user testing.
- **Implement:** Students execute full production workflows using collaborative tools such as Unity, Adobe Creative Suite, Figma, and Ableton.
- **Operate:** Projects are publicly deployed via open access platforms, with analytics, versioning, and user feedback guiding continuous refinement.



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This structure directly responds to the need for agility in digital media practice, where professional production increasingly involves cross-functional teams and multi-platform dissemination. By foregrounding open-ended inquiry and real-world deployment, CDIO ensures that students not only build technical proficiency but also cultivate the ethical and adaptive mindsets required to thrive in omnidimensional design environments.

4. Curriculum as Ecosystem

A curriculum for multimedia education must be understood not as a linear sequence of technical modules, but as an integrated and evolving ecosystem. Just as multimedia design itself is characterized by convergence and co-authorship, the structure of learning must facilitate interdependence between disciplines, technologies, and modes of expression. This approach enables students to form connections across disparate domains, fostering a capacity for synthesis that is essential to real-world creative and communicative practice.

4.1 Cross-Disciplinary Foundations

At the heart of this ecosystem is a cross-disciplinary foundation that blends journalism, communication studies, graphic design, and music technology. This integration equips students not only with broad technical fluency but also with narrative literacy—the ability to analyze, construct, and adapt stories across platforms and audiences. As Kenyon emphasizes in her application of the CDIO model to political science, when students are immersed in complex, real-world problems that cut across disciplinary lines, they develop not just skills, but “society-ready” attitudes and adaptive expertise [7].

To meet the increasing demand for professionals who can function in hybrid roles—e.g., designers who can write, journalists who can code, or musicians who can visualize data—students must learn to move fluidly across conceptual and technical domains. This systems-based orientation also reflects Biggs and Tang’s notion of constructive alignment, where learning objectives, teaching strategies, and assessment are mutually reinforcing across disciplines [1].

4.2 Key Focus Areas

The ecosystem model is animated by key thematic and technical focus areas that reflect current industry priorities and pedagogical innovations. These include:

- **Motion graphics and time-based media** are foundational to storytelling in digital environments where narrative unfolds through movement, sequence, and sound.
- **Human-centric and data-informed design**, bridging UX principles with ethical storytelling and audience engagement strategies.
- **Experiential capstones and internships**, which ground academic learning in community-based media practice, public humanities, and professional production cycles.
- **Emerging technologies** such as AI, AR/VR, and code-driven interfaces challenge students to engage with the expanding grammar of interactive and immersive communication.

These areas are not taught in isolation but are embedded into studio projects, collaborative workshops, and real-world partnerships. They reflect a curriculum responsive to the increasing complexity of digital ecosystems, where content is fluid, user interaction is dynamic, and ethical design is a central concern [4].

4.3 Example Project Pathways

The following project pathways illustrate how this curriculum supports creative experimentation while aligning with professional practices and CDIO stages of development:

- **AR documentary** paired with interactive journalism, allowing students to produce immersive narratives that critically engage with contemporary issues in real time and space.
- **Podcast series** accompanied by motion graphic-based data stories, training students in the integration of sound design, visual storytelling, and data interpretation.



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- **Web-native exhibits** that combine journalistic inquiry, sound composition, and responsive interaction, demonstrating the principles of multimodal narrative design.

These capstone-level projects function both as pedagogical culmination and as public-facing scholarship. As Fitzpatrick argues in *Generous Thinking*, design education must not only equip students to “do” but also to “contribute”—to share their work openly and engage publics through transparent, accessible media [5]. This ethos of contribution aligns closely with evolving industry expectations, where the ability to conceptualize, produce, and publish integrated digital content is increasingly essential. Contemporary job descriptions across the fields of multimedia design, UX, and immersive technology emphasize hybrid skillsets—such as storytelling through data, human-centered prototyping, and cross-platform publishing—as prerequisites for employment [11]. These roles not only call for technical fluency but also reward the creative, ethical, and collaborative competencies embedded within the CDIO-based curriculum. The following list illustrates several key career pathways that graduates of such a program are well-positioned to enter, along with their average U.S. salaries and projected job growth outlooks.

4.4 Sample Multimedia Designer Jobs and PayScale

Multimedia Designer

Average Salary: Approximately \$60,751 per year in the U.S.

Job Outlook: Projected job growth of 23% from 2021 to 2031

Relevance: Vital for producing cross-platform content, including video, interactive graphics, and digital exhibits [8]

User Experience (UX) Designer

Average Salary: Approximately \$124,415 per year in the U.S.

Job Outlook: Expected to grow at 4.7% annually

Relevance: Program emphasis on human-centric design and usability testing directly prepares students for these roles [2].

Augmented Reality (AR) Developer

Average Salary: Approximately \$111,002 per year in the U.S.

Job Outlook: Projected growth of 17% from 2023 to 2028

Relevance: AR/VR and immersive media are increasingly integrated into education [3].

Front End Developer

Average Salary: Approximately \$100,000 per year in the U.S.

Job Outlook: Projected job growth of 17% from 2031 to 2033

Relevance: Vital for producing responsive, user-centered web interfaces that integrate design, interaction, and code, skills directly aligned with the curriculum’s emphasis on human-centric, cross-platform multimedia development [10].

The projected double-digit growth in interactive, user-focused roles strongly validates the CDIO-based multimedia curriculum’s emphasis on technical fluency and systems thinking. As industries increasingly prioritize talent capable of navigating complex digital ecosystems, educational models that foreground integrative, project-based learning equip graduates with the skills most in demand. The alignment between workforce needs and the curriculum’s structure underscores the relevance of these programs.

5. From Print Fetish to Digital Futures: Publishing as Pedagogy

In an era where media production and academic dissemination increasingly occur in digital spaces, publishing must be reframed not as a terminal output but as a formative process. The incorporation of



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publishing into pedagogy prepares students to participate meaningfully in the evolving landscape of public knowledge and digital communication. The integration of open publishing into multimedia education supports the development of technical skills and fosters ethical transparency, iterative learning, and civic engagement.

5.1 Rethinking the Role of Print

While print media continues to hold cultural and aesthetic value, its dominance in academic and creative education often imposes artificial constraints on what constitutes legitimate or high-quality work. Traditional print publishing—particularly in the humanities—has become ritualized and fetishized, privileging the bounded object over accessibility, responsiveness, and intellectual innovation [6]. This emphasis on the permanence and prestige of the printed artifact overrides its pedagogical utility, functioning as a barrier to timely, collaborative, and dynamic modes of scholarly exchange.

In design education, this “print fetish” often manifests in the valorization of the perfect-bound portfolio or single-authored booklet, which can obscure the broader technological potentials of interactive, networked media. Such models risk training students in static production habits, rather than in the adaptive, participatory practices that define contemporary publishing ecosystems.

5.2 Open Access and Digital Publication as Capstone Outputs

To address these limitations, the proposed multimedia curriculum integrates open-access digital publication as a culminating form of student work. Rather than producing artifacts destined for private critique or short-term grading, students engage in the creation of public-facing, publishable projects using platforms such as GitHub, WordPress-based academic journals, and open peer-reviewed systems like the Open Scholarship Project (OSP). These models reflect emerging practices in the digital humanities and media studies, where scholarship is iterative, interactive, and co-authored through public dialogue and accessible design [5; 9].

Open publication invites students to contribute meaningfully to real communities of discourse. It creates a shift from consumption to participation, reinforcing the values of collaboration, transparency, and intellectual generosity. As Kenyon emphasizes in her adaptation of the CDIO model, such public-facing work enhances student motivation, increases retention of core competencies, and helps cultivate a sense of civic responsibility in knowledge production [7].

5.3 Publishing as Design Practice

More than just a medium of transmission, publishing emerges as a site of design practice itself, where students engage with content and the structure, ethics, and accessibility of information. Skills such as versioning, modular storytelling, metadata design, and interface customization are becoming increasingly essential in contemporary professional environments. These practices nurture the development of flexible, adaptive communication systems that respond to user needs, platform constraints, and audience feedback.

Incorporating publishing into the design curriculum also prepares students for various professional roles in digital archiving, interactive publishing, and public humanities. The boundary between making and thinking is increasingly porous; experimental publishing becomes a means of doing theory, pedagogy, and activism simultaneously [9]. In this model, the capstone is a node in a living, versioned network of inquiry. Ultimately, this redefinition of publishing reflects a pedagogical shift from print finality to digital futurity, emphasizing process, iteration, openness, and the designed experience of knowledge.

6. Professionalism in a Fluid Media Ecosystem

The accelerating convergence of media platforms and creative roles has radically reshaped professional expectations for graduates entering the design and communication fields. Contemporary media careers require a hybrid skill set that encompasses technical proficiency, narrative agility, and collaborative



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adaptability. As a result, educational institutions must design curricula that mirror these conditions and prepare students not just to perform tasks, but to evolve professionally in a rapidly changing ecosystem.

6.1 Aligning with Industry Expectations

In today's media landscape, roles such as "experience designer," "interactive journalist," or "creative technologist" exemplify the collapse of old disciplinary boundaries. Employers increasingly seek hybrid talents: coders who can write, journalists who design interfaces, and designers who understand data analytics. According to industry reports and employer surveys, these intersections are central to sustainable career pathways in design, media, and communication [4].

The CDIO model directly supports these evolving needs by anchoring professional growth in team-based, iterative, and project-driven learning environments. Rather than training students in isolated technical tools or static genres, CDIO pedagogy emphasizes systemic thinking and real-world deliverables that simulate professional production cycles. As Kenyon illustrates in her adaptation of CDIO for political science education, students trained through this framework emerge not only with technical competence but also with confidence in team leadership, stakeholder engagement, and ethical decision-making [7].

By embedding professional tools such as Figma, Adobe Creative Cloud, Unity, and collaborative version control platforms into the curriculum, students gain fluency in the very ecosystems they will encounter in the workplace. More importantly, they develop the collaborative soft skills and critical thinking capacities that employers consistently cite as the most valuable—and often missing—traits in new hires.

6.2 Adaptive Thinking and Lifelong Learning

Perhaps most essential to long-term success in a fluid media environment is the capacity for adaptive thinking—the ability to continuously reframe, redesign, and revise one's work in response to feedback, failure, and changing conditions. The CDIO model explicitly supports this mindset through its cyclical structure: each project moves from conceptualization through deployment and back to reflection and revision. In this way, iteration is not a remedial activity but a core design principle [1].

This emphasis on failure as a learning mechanism is particularly important in creative education, where ambiguity, experimentation, and revision are central to innovation. The CDIO pedagogy embraces iterative, reflective practice, fostering a culture of lifelong learning, enabling graduates to meet the demands of today's job market and to continuously adapt as technologies, tools, and ethical questions emerge.

Creative practitioners today must be "epistemically fluent"—capable of moving across knowledge systems, collaborative practices, and technological infrastructures with agility and insight [9]. The pedagogical structures of the CDIO-based multimedia curriculum are specifically designed to cultivate that fluency, preparing students not only for employment but also for leadership in shaping emerging media cultures.

7. Conclusion: Designing "Everywhere, All at Once"

To prepare students for a media landscape that is distributed, interactive, and constantly evolving, design education must also become distributed, integrative, and adaptive. The 21st-century media ecosystem no longer adheres to fixed boundaries between disciplines, platforms, or roles. Instead, practitioners think systemically, collaborate across knowledge domains, and publish dynamically across networked environments. In this context, multimedia education must be reimaged as an ecosystem that nurtures agile, ethical, and future-oriented creative thinkers.

The new Integrated Multimedia Production major at Central Connecticut State University responds directly to this imperative. By embedding the CDIO framework into its core structure, the program enables students to conceive, design, implement, and operate media systems that are socially responsive and technologically fluent. Through the integration of open access publishing and collaborative, project-based learning, students do more than build portfolios—they cultivate the critical, civic, and creative capacities needed to participate meaningfully in public discourse and digital culture. The inclusion of cross-



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disciplinary foundations, iterative design processes, and community-facing outputs ensures that graduates are not merely employable but also equipped to lead and innovate in a world defined by convergence and change.

Ultimately, this is a call not just to educate students to publish media, but to empower them to shape media futures. As media systems increasingly determine how we communicate, remember, and imagine, it is vital for the next generation of designers to be trained not only as technicians or storytellers but also as ethical participants and transformative agents in the design of public knowledge. Designing “everywhere, all at once” means accepting that the boundaries between thinking, making, and publishing have collapsed—and that education must evolve accordingly.

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