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Paper

Envisioning Honors Education as Complex Problem-Solving: A Human-Centered Design Approach for Global Challenges

Patrick Akos*, Jordan King, and Linda Frost.

University of Tennessee, Knoxville.

*Correspondence: pakos@utk.edu

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Abstract

While honors education can pursue a variety of purposes, this article reimagines honors education as a catalyst for change by embedding human-centered design and interdisciplinary problem-solving into undergraduate curricula. The authors describe approaches in two cases from the United States that focus on local problem solving through human-centered design models and methods. Specifically, the models emphasize stakeholder engagement and iterative prototyping as strategies for designing projects that tackle wicked problems such as food insecurity, housing inequity, and climate resilience. Using internal assessment data and qualitative feedback, an analysis of the cases demonstrates that students gain transferable skills in empathy, critical thinking, and civic leadership that prepare them for collaborative problem-solving. In advancing insights for interdisciplinary and applied learning for programs in the United States, we aim to cultivate new directions for collaboration and exchange across global contexts to better leverage honors education as a driver of action through learning.

Keywords: honors education, wicked problems, design thinking, innovation.

1. Introduction

Honors education aims to stretch the boundaries of student capability by engaging them in critical thinking, creative inquiry, and self-directed learning. Far beyond simply providing access to advanced coursework, honors programs strive to cultivate transformative educational experiences that encourage students to navigate intellectual ambiguity, integrate knowledge across disciplines, and adopt a lifelong learning mindset. According to the National Collegiate Honors Council (NCHC), honors curricula enhance the undergraduate experience by fostering excellence, creativity, and engaged citizenship (NCHC, 2021). Within this landscape, wicked problems—those complex, multi-stakeholder, evolving issues that lack definitive solutions—present an urgent call to action.

While honors education exists across global contexts, its form and pedagogical priorities differ substantially between Europe and the United States. As noted in NCHC's international forum literature, even the distinction between "honors" and "honours" reflects different educational traditions, pointing to differences in meaning and practice rather than mere terminology (Lamb, 2012). Across much of Europe, honors programs have emphasized interdisciplinary, challenge-driven learning that foregrounds societal engagement, sustainability, and applied innovation. These approaches are shaped in part by broader European higher-education frameworks, such as the Bologna Process and the European Higher Education Area, which promote curricular coherence, student mobility, and learning situated in real-world contexts (Wolfensberger, 2015). By contrast, honors programs in the United States have traditionally focused on advanced disciplinary coursework, seminar-based instruction, and individualized faculty mentoring within decentralized, institution-specific structures. Although these models offer considerable academic rigor, they have been less successful at embedding interdisciplinary, design-oriented engagement with complex societal challenges.

As wicked problems increasingly define the social, environmental, and technological realities students will inherit, this divergence raises pressing questions about how U.S. honors programs can evolve to better prepare students for collaborative, systems-oriented problem-solving. While European honors ecosystems offer mature models for integrating design thinking and sustainability into honors curricula, fewer U.S. programs have operationalized these approaches at the programmatic level. This imbalance between European and U.S. honors practices provides a central rationale for examining how design-oriented honors education is currently being implemented in the United States.

In order to explore the promise and practice of honors education as complex problem-solving in the United States, this paper examines relevant conceptual frameworks and analyzes their application in two cases. We intend for this paper to provide a starting point for further discourse, testing, and critical reflection to ensure that honors education continues to meet the needs of students and society more broadly in an era defined by intractable wicked problems across social, economic, environmental, political, and technological dimensions.

Design thinking provides an ideal mindset and methodological toolkit for navigating these types of complex problems in honors education. Defined by empathy, iteration, interdisciplinary teamwork, transdisciplinary engagement, and a tolerance for ambiguity, design thinking enables students to explore real-world contexts and discover opportunities for meaningful intervention (Brown, 2009; Liedtka & Bahr, 2020; Goldschmidt & Weil, 2018). Techniques such as empathy interviews, stakeholder mapping, and rapid prototyping provide students with concrete ways to engage with diverse perspectives, better understand systemic complexity, and craft solutions that are responsive to the people they serve (Carlgren et al., 2016). Moreover, design thinking closely aligns with honors education's commitment to epistemic humility and process agility. Honors educators recognize that students often come to the table with expertise in one area but must remain open to new knowledge, especially when working on problems that transcend disciplinary boundaries and require sustained, collaborative innovation (Seifert et al., 2020).

Addressing wicked problems also cultivates the kind of reflective practice and global citizenship that honors education aspires to instill. In the context of wicked challenges, one cannot simply apply rote formulas; they must engage in ongoing reflection about their assumptions, their methods, and the impact of their decisions (Rittel & Webber, 1973). The emphasis on iterative feedback and adaptation mirrors honors programs' emphasis on metacognition—what the Association of American Colleges and Universities (AAC&U) terms "integrative learning," or the capacity to synthesize learning across academic and experiential domains (AAC&U, 2007). This ongoing cycle of reflection and adaptation empowers students to appreciate complexity, accept failure as a valuable part of the learning process, and grow into leaders who appreciate diverse ways of knowing. In coming to think across the past, present, and future, students also come to understand how their learning is embedded in broader systems within which they can actively seek to engage as change agents.

Ultimately, developing students' capacity for problem-solving in the face of complex, multifaceted problems through design thinking supports the broader civic mission of honors education. Preparing students for global citizenship requires fostering compassion, cultural humility, and a commitment to service in the face of systemic injustice and environmental change. Honors students who practice design thinking in service-learning contexts, for example, learn to see themselves as active contributors to communities rather than passive consumers of knowledge (Eyler & Giles, 1999). Honors programs that incorporate design thinking help students develop lasting agency, purpose, and engagement—skills that extend well beyond graduation (Miller et al., 2020). By preparing students to embrace the complexity of wicked problems, honors education fulfills its most profound promise: to nurture future scholars, professionals, and citizens equipped to tackle the grand challenges of the twenty-first century. This article responds to this impetus by outlining the theoretical underpinnings of wicked problems and design thinking in honors education. It then presents two institutional case studies before concluding with pedagogical and institutional implications amidst the opportunity for enhanced transatlantic exchange among honors practitioners and scholars.

2. Theoretical Foundations

2.1 Aligning wicked problems with the Sustainable Development Goals

Wicked problems, as originally defined by Rittel and Webber (1973), lack a clear endpoint, involve conflicting stakeholder perspectives, and require continuous reframing as new information emerges. These kinds of problems do not lend themselves to definitive solutions or straightforward paths. Instead, they demand flexibility, creativity, and an ongoing process of learning and adaptation. Due to this complexity, they challenge traditional disciplinary boundaries and necessitate nuanced, collaborative approaches. The United Nations 2030 Agenda, with its 17 Sustainable Development Goals (SDGs), provides a contemporary blueprint for cataloging these complex and persistent issues.

Each of the SDGs reflects the interdependence of social, ecological, and technological systems, and how they contain complex challenges that manifest as local and global opportunities for

action. Goals such as ending poverty, ensuring access to clean water, and mitigating the impacts of climate change all require responses that recognize systemic interconnections and multiple perspectives (United Nations, 2023). Integrating the SDGs into honors curricula enables students to explore these multifaceted challenges and appreciate that solutions cannot come from a single discipline or viewpoint alone. The framing around the prospects of progress toward a more sustainable future also invites students to critically investigate possible pathways toward achieving the SDGs, including on scales more local, and the need for collective action in negotiating the trade-offs involved in developing solutions. According to Levin et al. (2012), wicked problems require research and action that embrace uncertainty and pluralism, encouraging honors students to become co-creators of knowledge rather than passive recipients.

Ultimately, using the UN2030 SDGs as a focus for honors curricula enables students to grapple with problems that matter while taking agency in shaping the world they will inherit by contributing knowledge and local solutions to the broader global agenda. Aligning coursework, projects, and service experiences with these wicked problems provides authentic contexts for skill-building in leadership, empathy, communication, and innovation. Furthermore, honors programs that integrate wicked-problem exploration tend to produce graduates who are better equipped to navigate uncertainty and lead collaborative solutions in diverse communities (Boyer, 1990; Levin et al., 2012). In this way, the SDGs not only provide a blueprint for sustainable futures but also an educational framework that reflects the true spirit of honors learning: collaborative, courageous, and committed to the common good.

2.2 Applying human-centered design thinking

Design thinking (Brown, 2009; Liedtka & Bahr, 2020; Goldschmidt & Weil, 2018) offers a flexible framework for addressing the complexity of experiential learning as a way of engaging students in meaningful inquiry into complex, multifaceted problems. The approach is particularly well-suited for honors education, which seeks to cultivate intellectually ambitious, socially responsible, and adaptable learners. Taking a human-centered approach, in which problems and solutions focus on the needs and experiences of individuals and groups before considering technical strategies, puts an emphasis on empathy, rapid ideation, and iterative prototyping that cultivates the kind of divergent and convergent thinking that supports deeper critical thinking and innovation capacity (Razzouk & Shute, 2012). Engaging with these capacities also prepare students to navigate the VUCA (volatile, uncertain, complex, and ambiguous) conditions of the modern world (Sarid & Levanon, 2023) by taking initiative as civic-minded leaders who appreciate diverse viewpoints and collaborate across sectors.

Design thinking's structured yet adaptable process is especially well-suited for inter- and trans-disciplinary honors programs that require students to work across domains and co-create solutions to real-world challenges. Research has shown that experiential, problem-based learning can enhance critical thinking and help students transfer knowledge and skills across domains (Barrows & Tamblyn, 1980; Kuh et al., 2007). Approaches like Stanford’s d.school model and IDEO’s human-centered design toolkit emphasize the effectiveness of empathy interviews, stakeholder mapping, and prototype testing as tools to uncover diverse perspectives

and hidden assumptions while progressing from inspiration and ideation toward implementation of solutions (Liedtka, 2018; Glen et al., 2015). The British Design Council's Double Diamond (Discover → Define → Develop → Deliver) offers a useful scaffold for guiding honors students through deliberate phases of exploration and synthesis, enabling them to embrace complexity rather than feel paralyzed by it. Contemporary research highlights that applying these methods in honors contexts not only enhances students' collaborative problem-solving skills but also strengthens their resilience and capacity to navigate ambiguity—qualities that are crucial for thriving in an unpredictable world (Wrigley et al., 2020).

In practice, this design-thinking mindset enables honors students to continuously reframe questions, explore unexpected avenues, and evaluate solutions iteratively with input from stakeholders. Through these experiences, students develop intrapersonal abilities to negotiate the challenges and opportunities of dynamic learning environments, as well as interpersonal abilities in leveraging group efforts to create change in their communities. This capacity to approach complexity creatively, collaboratively, and flexibly is at the heart of honors education's goal to prepare the next generation of critical thinkers and change agents (Scheer et al., 2012; Carlgren et al., 2016). By grounding inquiry in design-thinking principles, honors programs can inspire students to leverage diverse tools and perspectives, empowering them to make informed, socially responsible decisions that respond to the nuanced challenges they will encounter as scholars, professionals, and global citizens.

2.3 European and global design-thinking ecosystem

U.S. honors programs—such as those in the University of Tennessee system—have long emphasized small seminars, advanced coursework, and close faculty mentoring (Long, 2018; Wolfensberger, 2015). However, addressing wicked problems across local to global contexts demands interdisciplinary curricula grounded in civic engagement, design thinking, and systems-level thinking. This shift is difficult within the structurally siloed U.S. higher education landscape. Faculty workload models, departmental priorities, and varying student preparation often hinder cross-disciplinary innovation (Holley, 2017; Rhoten & Pfirman, 2020). In contrast, European honors programs benefit from policy frameworks like the Bologna Process and the European Higher Education Area, which support mobility, curricular alignment, and broad academic exploration (European Commission, 2022; van der Wende & Westerheijden, 2021).

Europe has cultivated a robust design-thinking ecosystem that actively integrates interdisciplinary, collaborative, and human-centered problem-solving into higher education. Initiatives such as the Global Design Thinking Alliance (GDTA), the Hasso Plattner Institute (Germany), ULBS (Romania), OpenLab (Sweden), and Politecnico di Milano (Italy) offer rich case studies demonstrating how European institutions leverage design-thinking principles to tackle complex local and global challenges. These programs not only provide concrete models for developing students' critical thinking and creativity, but they also foster cross-cultural competencies and highlight diverse traditions and ways of knowing across Europe. Contemporary research highlights the effectiveness of these initiatives in promoting student engagement, empathy-driven solutions, and resilience in the face of complexity (Camacho et al., 2020; Goldschmidt & Weil, 2018).

Design thinking aligns seamlessly with the core aims of honors education across Europe, which is often defined by its emphasis on nurturing global citizenship and ethical leadership. Honors programs on the continent are increasingly adopting design thinking to help students navigate complex problems spanning sustainability, migration, health, and urban planning. The European Commission supports the integration of design thinking into curricula to prepare students for rapidly changing societal and labor market demands (European Commission, 2022). Meanwhile, scholars emphasize that design-thinking processes encourage collaborative creativity and empathy for diverse stakeholder perspectives (Liedtka & Bahr, 2020). These skills are especially vital in honors education contexts that aim to equip students with tools for interdisciplinary and transnational dialogue and action on complex problems (Morrison & Mercer-Mapstone, 2022).

Moreover, European design-thinking traditions embrace local knowledge, cultural vitality, and environmental sustainability alongside innovation to ensure that the understanding of problems and generation of solutions is rooted in specific contexts and networks of stakeholders. The Kyoto Design Declaration (2008) underscores this commitment to honoring local traditions and diverse knowledge systems in design processes, which aligns closely with honors education's emphasis on ethical engagement and cultural competency. Recent literature supports this emphasis on inclusivity and pluralism in design-thinking practice (Calvo & Bonner, 2021; Verganti et al., 2022), demonstrating that honors students benefit profoundly from these culturally attuned methods. By incorporating design thinking into European honors curricula, educators create transformative learning environments that inspire future collaborations and prepare graduates to make meaningful contributions across borders, disciplines, and cultures.

This honors education model supports professional competencies that go beyond academic knowledge. It emphasizes critical thinking, problem-solving, and a global/intercultural fluency that is highly valued by employers (National Association of Colleges and Employers, 2021; Seifert et al., 2020). Activities such as peer critique and public presentations enhance students' oral and written communication, demonstrating the capacity to advocate for their ideas and listen to diverse viewpoints (Levine et al., 2012; Long, 2018). The design-thinking process itself fosters career-relevant skills like creativity and innovation, adaptability, and the capacity to apply quantitative reasoning when evaluating options (Brown, 2009; Liedtka & Bahr, 2020; Goldschmidt & Weil, 2018; Culp & Smith, 2018). Throughout these experiential learning experiences, students also practice ethical reasoning and demonstrate integrity—an explicit NACE competency—as they navigate complex stakeholder interests and work toward equitable solutions.

The broader impact of these innovations extends beyond the classroom and into the university and the surrounding community. Honors programs that tackle wicked problems help students cultivate NACE's competencies of teamwork and collaboration as they co-construct solutions with faculty, community partners, and one another, ultimately translating their academic work into real-world impact (Seemiller & Grace, 2017; United Nations, 2023). By producing career-ready citizens who can communicate across disciplines, appreciate cultural nuance, and manage ambiguity, this honors education model supports the mission of the university to prepare future

leaders who contribute to the public good. These pedagogical practices not only enhance the institution's reputation as a center for innovation and civic engagement but also help produce a more adaptable and socially aware workforce, meeting society's need for creative problem-solvers equipped with both NACE career competencies and a strong commitment to making a difference.

In the United States, the expansion of such learning opportunities can progress through unique courses and programs that provide chances in creativity, the intellectual stretch of confronting unsolvable problems, and the meaningfulness of group collaboration. Student interest aligns with research that demonstrates the developmental power of sustained engagement with open-ended problems and iterative learning processes (Seemiller & Grace, 2017; Rittel & Webber, 1973). While these approaches are promising for building the adaptative capacities in students needed for 21st-century leadership, there remain findings tensions that require intentional pedagogical design, particularly in the United States context. For example, students may benefit from experiences that balance between cultivating content knowledge, applied skills, and familiarity with interactive design-thinking processes. Clarity in assignment purposes, outputs, and expectation, as well as resources and frameworks to guide students through engagement with the different elements of their learning and design process are needed. By infusing the aspects of more traditional honors education approaches in the United States that emphasize liberal arts education with these solution-oriented approaches instructors might scaffold design-thinking instruction intentionally and make visible the trajectory from intellectually rich complex inquiry to community-relevant innovation.

3. Methods

This paper examines two applied cases—honors programs in the University of Tennessee system in the United States—that engage with wicked problems, local and global sustainability goals, and human-centered design thinking. Essentially, we share how two honors programs in the University of Tennessee system apply human-centered design to engage students in wicked problems and investigate what student-reported learning outcomes emerge. We respond to the following research question: How do students perceive the process and outcomes of learning through human-centered design approaches in honors education? While the background described above provides a grounding in key concepts, initiatives, and trends in these areas, our case analysis aims to understand how pedagogical and programmatic strategies were operationalized in practice to illustrate opportunities for further progress, particularly in the United States.

3.1 Case contexts

The University of Tennessee Knoxville

The Chancellor's Honors Program at the University of Tennessee, Knoxville is intentionally structured around two core principles central to this study: engagement with wicked problems and the application of human-centered design thinking. Wicked problems serve as the organizing frame for student inquiry, emphasizing ambiguity, competing stakeholder interests, and systemic complexity. Design thinking provides the methodological scaffold through which students research, reframe, prototype, and iterate responses to these challenges. Together,

these principles guide course sequencing, assignment design, and community engagement across the program.

The Chancellor's Honors Program at the University of Tennessee, Knoxville illustrates a contemporary approach to honors education that integrates interdisciplinary inquiry with a commitment to real-world impact. Designed with campus-wide faculty between 2021-2024, this program engages academically talented students across disciplines to tackle some of society's most intractable challenges. Rather than limiting honors education to traditional notions of elite coursework and siloed academic tracks (Wolfensberger, 2015), which have been historically prevalent in the United States, the program aims to foster resilience, creativity, and empathy, preparing students to navigate complexity in their post-baccalaureate careers and further academic pursuits (Levine et al., 2012).

Students develop these skill sets through a progressive sequence of three courses. First, in *UNHO 207: Complex Problems and Human-Centered Design*, which serves as the gateway course for the Chancellor's Honors Program minor, first-year students are immersed in the messiness of "wicked problems" and situate within the problem space to build a deep understanding through ethnographic research, stakeholder mapping, and related design thinking techniques.

Second, in *UNHO 307: Complex Problems and Innovation*, students shift their focus to generating and prototyping solutions. Building on their research from UNHO 207, they leverage design-thinking techniques, such as rapid prototyping, storytelling, and service blueprints, to produce creative, human-centered solutions (Cross, 2011; Liedtka, 2018). Community partners and faculty mentors give regular feedback as students test concepts with end-users in real-world contexts. Through this iterative cycle of build-test-learn, students develop projects such as a sustainable community garden and a mobile app to promote mental health awareness among youth.

Third, in *UNHO 367: Complex Problems and Tennessee Opportunities*, students complete a full design cycle to create a project that addresses a state-wide problem aligned to one of the United Nations' Sustainable Development Goals (SDGs). Applying their knowledge and skills of the design process gained in the previous courses, students become more autonomous (e.g., assess and choose which design techniques to use) with faculty guiding students in proposing interventions to city, county, and state-wide issues. Through partnerships with stakeholders, students critically analyze interests and motivations across a range of perspectives in order to advance potential solution strategies.

The University of Tennessee Chattanooga

The Innovations in Honors Program at the University of Tennessee Chattanooga operationalizes wicked problem-solving through a sustainability-oriented design-thinking pedagogy embedded in its Innovation Lab sequence. Rather than treating sustainability as a thematic endpoint, the program frames it as an iterative process of inquiry, imagination, and intervention. Design thinking structures student engagement with complex community challenges by emphasizing

immersion in local contexts, empathy-driven research, collaborative ideation, and iterative experimentation with stakeholders.

Given the history of Chattanooga's public-private partnerships that moved the city from the dubious distinction of being the "dirtiest city in America" (reported as such by iconic news anchor Walter Cronkite in 1969), to the first National Park City in North America in 2025, the Innovations in Honors (IIH) Program was developed to address local issues while remaining informed by broader perspectives. Following the model of the honors curricula of the University of Applied Sciences Rotterdam in the Netherlands (Miltenburg & Weerheijm, 2018; Weerheijm, 2019), the IIH program implemented "Innovation Labs" to engage students in prototyping creative solutions within the community. Recent work in the *Journal of the European Honors Council* highlights how innovation labs create structured environments where honors students can experiment, iterate, and co-design solutions with community partners. These findings affirm that the UTC Innovation Lab's emphasis on immersion, inquiry, and intervention aligns with emerging global models of honors-led innovation and socially responsible design. In 2023, the Chattanooga Mayor's Office and the UTC Honors College signed a formal agreement recognizing this collaboration and specifically offering support to the UTC honors students working on behalf of the city.

The UTC Innovation Lab is a two-semester sequence for students to engage in a solution-oriented, community-embedded learning experience in which they apply design thinking in the process of developing, implementing, and evaluating a project in partnership with city departments and community organizations. Innovation lab structures strengthen students' capacity to navigate complexity by combining human-centered research with rapid prototyping cycles (Weerheijm, 2019). Through this collaboration, students participate in a community of "change creators" who apply creativity and critical thinking to test ideas that respond to the needs and goals of local stakeholders.

Instead of focusing on the SDGs as a lens for framing the thematic focus of the projects, the pedagogy implemented in UTC's Innovation Labs focuses on sustainability as a process of principled innovation. This entails problem solving by understanding systems, envisioning more sustainable futures, and strategically experimenting with solutions while engaging with the values and visions of partners and stakeholders (Brundiers et al., 2021). To enact this problem-solving process in designing community-based innovations, instructors scaffold student learning and action in four areas: immersion, inquiry, imagination, and intervention. First, students are immersed in the context of their issue, developing an understanding of local manifestations and theoretical influences for practical challenges and opportunities. Next, students explore ways to generate insights on their issue through research, empathy mapping, (auto)ethnographic observation and other methods. Students build these insights to leverage their individual and collective imaginations in prototyping and iterating solution ideas. This leads to the testing of interventions in community settings as a product of the design thinking process, with the aim to develop projects that are desirable (meet the needs of stakeholders), feasible (able to be practically implemented given time and resource limitations), and viable (possess the potential to be scaled and sustained through future iterations).

Instructors guide experiential learning that seeks to facilitate individual, group, and community engagement while contributing to transversal skill-building through action, feedback, and reflection. The interdisciplinary and interactive process leads to student outputs in several areas. In the second semester of the two-part course, students put their I.D.E.A.S. into action, implementing their design, evaluating its impact, advising future efforts, and storytelling their experience. In this way, students focus on both the external quality and impact of their efforts on the community, as well as the internal quality and impact of their personal learning journey. Student project examples include a participatory workshop that supported underserved communities in learning about Chattanooga's public transportation options, the creation of a walkability toolkit and assessment for use by community members, and collective action campaigns to promote sustainable behaviors among the public.

3.2 Data Collection and Analysis

To gain insights on how pedagogies in each case are applied as well as how they contribute to student skill development and new perspectives on learning and problem-solving, several forms of data collection and analysis were applied. While a systematic research process was not conducted to determine causation between pedagogy and learning outcomes, we seek to leverage insights from students to consider how they experience both programs to draw insights for human-centered design approaches in honors education in the United States.

Several sources of data were used to generate an understanding of student perceptions on their participation in each program. At the University of Tennessee Knoxville, student evaluations from 2024-2025 were used to analyze aspects of the course design. Qualitative feedback from focus groups and open-ended survey comments supplemented this information to describe student reflections on key learning opportunities and the factors that shaped them. The sample included 63 upper-level students in three sections of the pilot UNHO 207 course from a variety of majors. At the University of Tennessee at Chattanooga, open-ended feedback from a sample of evaluations from 41 students from a variety of majors was also used to understand elements of the learning experience that contributed to skill development. Additional written reflections were used to describe student perspectives on their learning process. Themes and specific examples were drawn from these sources to illustrate student engagement in addressing wicked problems through design processes.

These approaches to data collection and analysis present limitations to the generalizability of findings from these cases. However, as a preliminary demonstration of potential outcomes and best practices for learning through human-centered design in honors education, the insights generated prove valuable for understanding novel approaches in the setting of the United States. Our aim is to critically review these insights in order to display how honors courses and programs might be designed by engaging with broader frameworks that have been established in Europe and globally. Below, we present key takeaways from our case analysis approach to suggest the achievements, challenges, and opportunities for integrating complex problem-solving approaches that can inform honors education in the United States and beyond.

4. Results and Discussion

4.1 Engaging with Wicked Problems

At the University of Tennessee Knoxville, students highlighted the immediate and long-term benefits of the experience on their learning. For example, one student described how they "really love the class," among other reasons because it "is an awesome thing to talk about in an interview and will definitely be helpful in the future." Other students directly described the value of the course in addressing wicked problems through engagement with human-centered design and global sustainability frameworks. In the words of one UNHO 207 student:*"Overall, I really enjoy this class and believe it is very beneficial because it prepares me and gives me a good foundation for how to view and approach complex problems… I feel more qualified to potentially help address wicked problems in the future and make an impact in the world."* This was echoed by another student who noted that the course "*stretched my thinking and brought me new perspectives on tackling wicked problems,"* particularly through exposure to multiple viewpoints and sustained group collaboration.

At the University of Tennessee Chattanooga, students similarly emphasized their growing capacity to engage with complex, real-world problems. They reported increased comfort with ambiguity, enhanced awareness of interconnected social, environmental, and technological systems, and greater confidence in their ability to contribute to local and global problem-solving efforts. Several students described how this experience shaped new personal and professional aspirations related to civic engagement and sustainability.

4.2 Learning Through Human-Centered Design Processes

Empathy and Stakeholder Engagement: Across both cases, students emphasized the value of empathy-driven inquiry and engagement with diverse stakeholders. At UT Knoxville, students highlighted how human-centered design approaches helped them better understand the lived experiences of those affected by wicked problems. At UTC, students described how empathy translated into tangible project ideas, with one noting that "*designing innovative solutions to community challenges has given me insight into how empathy for others can help drive meaningful impacts*."

Students also underscored the importance of interdisciplinary collaboration and transdisciplinary engagement with community partners. Working with peers from different academic backgrounds and with external stakeholders strengthened their ability to listen, negotiate perspectives, and co-create solutions responsive to real needs.

Iteration, Prototyping, and Ambiguity: Students in both programs reflected on the role of iteration and experimentation in their learning. UT Knoxville students suggested that additional scaffolding—such as clearer examples aligned with the UN SDGs or the British Design Council's Double Diamond model—could further support their navigation of the design process. These reflections illustrate how iterative learning challenges students while also deepening their

understanding of complexity. Pedagogy that is novel to students needs scaffolding, in particular complex and contextual learning.

At UTC, students described how repeated ideation and prototyping cycles allowed them to adapt their thinking and refine solutions over time. One student explained that the opportunity to "*ideate and test multiple ideas, as well as change courses multiple times*," fostered confidence in their ability to adjust when faced with uncertainty.
Development of Collective and Civic Competencies

Collaboration and Teamwork: Quantitative and qualitative feedback across both cases highlighted strong development of collaboration and teamwork skills. UT Knoxville students rated collaboration highly, noting the effectiveness of hands-on activities and sustained group work. UTC students echoed this sentiment, describing how working with peers from diverse majors strengthened their ability to collaborate across differences and build shared understanding.

Adaptability and Agency: Students also reported growth in adaptability, creativity, and agency. UTC students emphasized how engagement in community-based design projects helped them see themselves as capable of navigating complexity and leading change. As one student summarized, the experience fostered creativity and adaptability "*needed in all career fields and everyday life*."

4.3 Tensions and Pedagogical Challenges
Despite these positive outcomes, students in both cases identified tensions inherent in complexity-based learning. At UT Knoxville, students expressed a desire for clearer expectations, more consistent feedback, and stronger alignment between course materials and applied outcomes. At UTC, students noted challenges in balancing freedom with structure, as well as tensions between repeated assignments and open-ended exploration. These challenges underscore the importance of pedagogical design in terms of both structure for engagement and experimentation as well as support for navigating the learning process and translating it into personal and public benefit.

4.4 Limitations and directions for future research
This study is exploratory in nature and relies primarily on student self-reported perceptions drawn from course evaluations and reflective materials. While these data offer valuable insight into how students experience design-thinking-based honors education, they do not allow for causal claims regarding learning outcomes or direct comparisons across institutional contexts. Additionally, the cases examined represent programs within a single university system, limiting generalizability across the diverse landscape of U.S. honors education.

Future research should employ longitudinal and mixed-methods designs to examine the development of problem-solving competencies over time and to investigate how institutional structures shape the scalability of design-oriented honors models. Comparative research across

U.S. and European honors programs would further strengthen understanding of how policy, pedagogy, and culture interact in preparing students to address wicked problems.

5. Conclusion

This paper has endeavored to identify opportunities to further incorporate complex problem-solving into honors education, particularly through human-centered design as an approach for engaging with local and global sustainability challenges. By investigating two cases in the University of Tennessee system, we have aimed to bridge the gap between practices in the United States and Europe by illustrating how such approaches can be operationalized in new settings. Implementing complex problem-solving in these contexts comes with challenges, including deviation from standard models of honors education and lack of familiarity from students, faculty, and program administrators. However, the demonstrated experiences and outcomes in the two cases highlight the need for increased engagement in these areas due to the ways in which this engagement prepares students as leaders, collaborators, learners, and change agents in a dynamic world.

Looking ahead, pedagogical models and skill frameworks should continue to be developed, implemented, and evaluated in honors education to provide enhanced rigor to this type of experiential learning. Future research should systematically investigate the learning outcomes that students gain as well as the instructional and learning environmental factors that shape them. Additional work should explore drivers and barriers for instructors and administrators to engage with these approaches, recognizing the tensions in adopting innovative pedagogical strategies particularly amidst logistically constrained settings. Pursuing greater exchange across programs, whether within the same university system as in this system or across global regions, can serve to generate evidence and examples for applying complex problem-solving in honors education. By supporting students to engage in human-centered design processes that address wicked problems, honors education can advance its contributions to local and global sustainability in new directions.

Collaborative efforts—such as shared modules, faculty exchanges, and comparative research—could further strengthen this trajectory. As shown in *JEHC* and *Honors in Practice*, honors education has the potential to become a hub for ethical, interdisciplinary, and socially engaged learning (Dare et al., 2021; Scager et al., 2020). Centering honors around wicked problems positions students as agents of change—rather than passive recipients of prestige—preparing them to lead across sectors and cultures.

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