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Dear readers!

It is with great pleasure that I present Volume 11 of the *Journal of Applied Learning in Higher Education (JALHE)*, published by Missouri Western State University. This volume brings together the highest number of articles since the inception of the journal- ten diverse and innovative contributions, that collectively demonstrate the breadth and vitality of applied learning methodologies across disciplines and institutional contexts. Authors include faculty members from within the institution, as well as from other institutions across the nation. From the sciences to the social sciences, from classroom-based innovations to experiential travel courses, the articles in this volume reflect the evolving landscape of higher education pedagogy and our continued commitment to evidence-based teaching practices that enhance student engagement, learning outcomes, and real-world preparedness.

The opening articles by Daewon and Birmingham remind us that applied learning extends beyond traditional academic boundaries. Daewon explores the critical intersection of social capital and language proficiency among international student-athletes, illuminating how social networks can serve as vital resources for overcoming language barriers in higher education. Birmingham's work on applying criminological theories to mental health and criminal behavior through case study approaches demonstrates the power of connecting theoretical frameworks to practical applications, enabling students to understand complex social phenomena through applied analysis.

Several contributions in this volume address pedagogical innovation in the sciences. Allen presents an evolving approach to teaching comparative vertebrate anatomy, while Mirayala offers a compelling model for pathology outreach through autopsy simulation. These articles underscore the importance of hands-on, experiential learning in disciplines where understanding complex biological systems requires more than passive knowledge acquisition.

The theme of differentiation and personalization appears prominently in Thorne Wallington's examination of dynamic differentiation for applied learning, which provides valuable insights into meeting diverse student needs in contemporary classrooms. Similarly, Costello introduces the PAR (Participation, Attendance, and Reflection) assessment framework for flipped classrooms, offering a structured approach to evaluating student engagement in active learning environments.

Two articles focus specifically on criminology and criminal justice education. Marble provides compelling evidence of applied learning's impact on teaching crime theories, using students' own reflections to demonstrate pedagogical effectiveness. This student-centered evidence complements Birmingham's theoretical case study approach, together illustrating multiple pathways for making criminological concepts accessible and relevant to learners.

Fisher's contribution on open-ended questions enhances our understanding of how carefully crafted prompts can simultaneously improve writing skills and deepen learning processes. This work speaks to the fundamental challenge of developing

critical thinking and communication skills that transcend disciplinary boundaries.

The volume also ventures into innovative curricular design with Deka's examination of planning and implementing course-integrated interdisciplinary travel. This article addresses the growing interest in high-impact practices that take learning beyond campus walls, while acknowledging the complexities of designing and executing such transformative educational experiences.

Finally, Baldwin's exploration of incorporating mindfulness-based activities into the learning environment reflects the profession's increasing attention to holistic student development, recognizing that cognitive learning is enhanced when we attend to students' emotional and psychological wellbeing.

Collectively, these ten articles represent applied learning in its fullest sense—pedagogy grounded in practice, informed by evidence, and responsive to the diverse needs of today's students. Whether addressing international students navigating language barriers, science students dissecting complex anatomical systems, or criminal justice students analyzing real-world cases, the authors in this volume share a commitment to active, engaged, and meaningful learning experiences.

I extend my gratitude to all contributors, reviewers, and editorial board members whose dedication makes this publication possible. We hope that Volume 11 will inspire continued innovation in applied learning pedagogy and contribute to ongoing conversations about excellence in higher education teaching and learning.

Sincerely,

Tilottama “Tilo” Roy,
Editor-in-Chief, JALHE
October, 2025

Do we need social capital to improve our language proficiency? International student-athletes' language barrier and the benefits of social capital

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ABSTRACT

According to the National Collegiate Athletic Association (NCAA), almost 25,000 athletes worldwide participate in diverse sports at the collegiate level (Become an International Student-Athlete, n.d.). International Student-Athletes' gifted athletic performance tends to contribute to a team's winning, which is directly related to an increased level of athletic program (Ridinger & Pastor, 2001). Due to this reason, their athletic ability has been highly valued, and coaches and athletic administrators try to recruit gifted athletes worldwide (Ridinger & Pastor, 2001). However, despite these positive factors of having ISAs on the team, limited research has been conducted concerning ISAs' challenges and supportive practices. To support, Love and Kim (2011) stressed that due to the increased number of ISAs in collegiate athletics in the United States, issues related to ISAs should be explored. According to Yoon's (2023) study, the language barrier is one of the difficult challenges among ISA populations, and it should be minimized for their academic performance (Kwon, 2009; Woods et al., 2006; Lin, 2012), which is related to their athletic eligibility (Hodes et al., 2015).

According to Bourdieu (1986), social capital can naturally occur in our society and can be utilized as social energy, continuously providing and exchanging beneficial resources for those within the same group. In addition, social capital offers numerous valuable resources for ISAs, as they need to improve their English skills while adapting to new cultures in both academic and athletic settings within the higher education system in the United States (Yoon, 2023). He also added that ISAs can learn many things from social capital, and it also provides tremendous opportunities to improve English ability through continuous social interactions. Thus, the purpose of this research is to explore the international student-athletes' perspectives on the language barrier and how social capital positively impacts minimizing language barriers and developing their language proficiency.

A qualitative research method was adopted to explore current ISAs' authentic experiences. The snowball sampling method was used to find suitable participants, and twelve current ISAs in various sports were selected from D-I, D-II, and D-III universities under the NCAA. The data was collected through in-depth and semi-structured interviews, and the collected data was analyzed using interpretative phenomenological analysis.

As a result, most participants stated that following up on academic practices, such as writing, speaking, and reading, is not easy with the new language. They needed extra time to complete academic duties and translators to fully comprehend some specific terminologies in English. To overcome challenges resulting from language barriers, most participants are willing to meet with friends and teammates to engage in productive work, thereby improving their language skills. Some participants appreciated having social capital for their language development and believed that it had been significantly improved due to their social capital. In addition, as supportive practice for the future, most participants suggested increased gathering opportunities, such as team dinners,

casual team meetings, pairing with senior and new ISAs, and creating social events for domestic student-athletes and ISAs. Another remarkable suggestion from this study is that ISAs need to feel welcomed and supported by coaches, teammates, and administrators because they are far from their family and home country, which does not provide the same environments as they used to have, such as food, weather, transportation system, bank system, and leisure activities etc.

INTRODUCTION

Talented student-athletes come from around the world to the United States to pursue their athletic and academic goals in the higher education system. According to the National Collegiate Athletic Association (NCAA), almost 25,000 athletes worldwide participate in diverse sports at the collegiate level (Become an International Student-Athlete, n.d.). These individuals are recruited due to increased competition levels in collegiate athletics under the NCAA (Ridinger & Pastore, 2001). Furthermore, according to these authors, international student-athletes' (ISAs) athletic abilities tend to contribute to a team's winning, which is directly related to an increased university's competition level. Due to these positive factors, intercollegiate-level institutions in the United States strive to capitalize on recruitment opportunities for gifted foreign student-athletes worldwide, thereby enhancing the success of their athletic programs (Ridinger & Pastore, 2001). Other previous scholars added that coaches try to recruit ISAs because of their positive impact on goal-oriented work ethics (Asher, 1994) and professionalism (Hoffer, 1994), which can contribute to domestic student-athletes' learning opportunities. Besides these positive impacts, ISAs provide learning opportunities for cultural diversity in the team, which tend to expand coaches' and teammates' perspectives on beliefs and norms (Baghurst et al., 2018). Ridinger and Pastore (2001) further argue that ISAs' gifted athletic performance highly contributes to teams' wins, which tend to increase local pride for the university. As the number of ISAs has demonstrated and previous scholars have noted, ISAs have become integral components of athletic programs in the United States. Therefore, athletic administrators, academic advisors, professors, and coaches should pay more attention to providing a supportive environment for this population. However, despite these positive factors of having ISAs on the team, limited research has been conducted concerning ISAs' challenges and supportive practices. Love and Kim (2011) also stressed that due to the increased number of ISAs in collegiate athletics in the United States, issues related to ISAs should be explored.

In general, living in a different country requires learning a new language if the new country uses a different language. The mother language in the United States is English, and the majority of ISAs need to demonstrate a high level of English proficiency to successfully pursue their goals in the United States. In common, all courses and classroom activities are conducted in English in academic settings, and practice and game environments always require English in athletic settings. Participating in classroom activities and practices is not enough; they must have a certain GPA to be eligible for athletic standards under

the NCAA (Hodes et al., 2015). This factor indicates that they have two important duties to perform at the same time while learning a new language: being a good student and a good athlete.

The level of English proficiency is a crucial factor for ISAs' success in the United States. According to Rao (2017), depending on the ISAs' primary language, if English is not the language they use in their country, they will experience significant challenges daily due to the language barriers in the United States. A low level of English proficiency may lead to a failing grade (Kwon, 2009; Woods et al., 2006; Lin, 2012), and negative academic performance will negatively affect athletic eligibility (Hodes et al., 2015). In everyday life, people communicate with others through language (Wilson et al., 2012). If ISAs feel communication challenges with professors, coaches, teammates, and colleagues, the overall results in academic and athletic settings cannot be shown positively. Thus, developing supportive practices for ISAs' language development can be crucial for their overall success in the United States. For example, in classroom settings, if there are ISAs who demonstrate a lack of English proficiency, professors should pay closer attention to ensure they fully understand the course context. In addition, professors can make extra meeting times or introduce English tutors for ISAs who show a lack of language proficiency.

Social capital provides beneficial resources as potential assets to group members (Bourdieu, 1986), and people can experience positive outcomes in everyday lives due to the positive social capital (Conrad, 2007). It can be established through social networks with trustworthy behavior (Richardson, 2012), continuously reproducing additional social networks in everyday life (Bourdieu, 1986). As previous scholars have indicated, the beneficial factors of social capital, the study by Forbes-Mewett and Pape (2019) demonstrates that social capital provides valuable resources for ISAs living in the United States. As such, since ISAs often experience homesickness, difficulty adapting to a new culture in the U.S., and language barriers (Pierce, 2012), social capital can be beneficial in mitigating these challenges.

Among the common challenges faced by the ISA population, such as homesickness, cultural differences, and language barriers (Meadows et al., 2011), according to Baghurst et al. (2018), the language barrier is the most significant challenge for foreigners. Abel (2002) further argues that language barriers can cause additional stress for ISAs, especially when they are in a new environment. Therefore, the purpose of this research is to explore how social capital positively impacts minimizing and developing language barriers for ISAs from their perspectives.

THEORETICAL FRAMEWORK

Social capital can be used as social energy, and it continuously provides and exchanges beneficial resources for those who are in the same group (Bourdieu, 1986). Social capital can naturally emerge in a group of communities; however, according to Bourdieu (1986), an institution's initial action to foster social capital is a crucial factor from the outset. This author noted that for positive

social capital, people tend to engage in thoughtful exchanges, such as expressing gratitude, showing respect, and using kind words, to maintain mutual understanding and recognition with others. Hanifan (1916) stressed that by being members of communities, students would improve their educational performance through the concept of social capital. As previous researchers have described, ISAs need to build social capital to achieve success in the United States. In common, to build social capital, we need to start communicating with others in English and participating in social gatherings. According to Yoon's (2023) study, social capital brings many beneficial resources for ISAs because they need to improve their English ability while adapting to new cultures in academic and athletic settings in the higher education system in the United States. He also added that ISAs can learn many things from social capital, and it also provides tremendous opportunities to improve English ability through continuous social interactions.

METHODOLOGY

A qualitative research method was adopted to explore current ISAs' authentic experiences. Furthermore, in order not to focus on obtaining a practical set of numerical values, to deal with the actuality of truly experienced circumstances by participants (Gale, 1993), the qualitative research method was used. The snowball sampling method was used to find suitable participants, and twelve current ISAs in various sports were selected from D-II universities under the NCAA. The data was collected through in-depth and semi-structured interviews, and the collected data was analyzed using interpretative phenomenological analysis.

In detail, interviews lasted 25-35 minutes and were recorded using an iPhone 15 Pro's Voice Memo feature. Probing questions, such as, "Could you please share your overall experiences of being ISAs in the United States?" or "You stressed out that… so can you please share your stories with me more?", "As an ISA, what have been the most common/difficult challenges you have faced in the United States? And what kind of practices have you done to overcome these challenges?", "Do you think social capital provides beneficial resources for ISAs?", "Has your English proficiency developed through communicating and spending time with your friends? "If you are in charge of ISAs, what can be the most important programs/practices for ISAs?", "For future ISAs, please share what skills they should improve to have a successful life in the U. S.?". In these questions, causal conversations were primarily conducted with ISAs, while still prefacing an informed consent agreement with a detailed explanation of this study. Information about the study participants is shown in Table 1.

Participant	Years in College in the U.S.	Institution level	Ethnicity	Sports type	Nationality
1	2 years	D2	Caucasian	Individual	Russia
2	4 years	D2	Caucasian	Individual	Spain
3	3 years	D2	Caucasian	Individual	France
4	4 years	D2	Hispanic	Individual	Columbia
5	5 years	D2	Caucasian	Individual	Czech Republic
6	2 years	D2	Asian	Individual	France
7	1 year	D2	Hispanic	Individual	Spain
8	1 year	D2	Hispanic	Individual	Spain
9	3 years	D2	Hispanic	Individual	Spain
10	2 years	D2	Caucasian	Individual	Latvia
11	1 year	D2	Caucasian	Individual	Germany
12	3 year	D2	Caucasian	Individual	Switzerland

Table 1. Information about the study participants

Data Analysis

Interpretative phenomenological analysis (IPA)

IPA was used to analyze all collected interview data. The entire data analysis procedure followed the steps of IPA developed by Smith et al. (2009). When it comes to steps of analyzing data with IPA, researchers analyze data using IPA by examining statements from participants line-by-line, illustrating how they understand the phenomenon in question through their experiences. Afterward, themes and patterns are carefully identified by reading the statements of each participant. In the third step, a dialogue should be developed between the collected data and the initial themes, which are informed by researchers' knowledge and experiences. In the final step, a framework should be established to highlight the relevance of the themes and organize the data results, providing a clear understanding of how the interpretation evolved from the original transcripts.

Conducting this research with IPA could provide insight into the ISAs' experiences of making sense of their challenges related to language barriers and

how social capital has supported them in minimizing language barriers and improving English proficiency.

Regarding analysis procedures of IPA, as Emery and Anderman (2020) suggested, this research's researchers start line-by-line, focusing on illustrations of participants' statements from their experience and how they comprehend the phenomenon in question. Afterward, codes and themes were identified by reading each participant's statements.

For this research, IPA was the best fit because the study's research team desired to have a deeper understanding of how ISAs interpret their experiences of language barriers and beneficial factors of social capital. Additionally, since IPA is iterative, we can refine each analysis procedure enacted for every logical step to support conclusions, making it impossible to discover a universal truth. Accordingly, data analysis was conducted using the following steps.

1. Each interview's data was carefully listened to and transcribed; then, the initial transcripts were read and listened to simultaneously to increase the researcher's active engagement with the data set.
2. Each transcript was divided into groups, followed by meanings, identifying notional comments for the initial notes. The following step developed emergent themes from the initial notes. In this step, superordinate themes were established by checking emergent themes' interrelationships.
3. The third step was repeated for the first and second steps to increase the rigorous procedure, and then superordinate themes were analyzed, anticipating sameness and differences to generate the final themes.
4. In the final step, the finalized themes from the data results were carefully reviewed to determine their relevance to one another, providing a clear understanding of how the interpretation evolved from the original transcripts.

Trustworthiness

Qualitative researchers should be able to manifest how data analysis has been carried out by documenting, framing, and showing the analysis methods in detail, allowing the reader to conclude whether the research process is trustworthy (Attride-Stirling, 2001; Côté & Turgeon, 2005; Ryan et al., 2007). Thus, documents should be organized, field notes should be composed, and interview transcripts should be chosen for detailed inspection (Riessman, 2005). To increase the rigor and trustworthiness of this study, initial and final interview transcripts were shared with participants for data accuracy as a member-checking method.

FINDINGS

Twelve current ISAs participated in an in-person interview. They expressed their experiences regarding perspectives on language barriers, the importance of social capital, and supportive practice for ISAs. As the literature review stated above, most participants pointed out the language barrier as the most difficult challenge experienced in the United States, and how they perceived beneficial

outcomes from social capital regarding minimizing the language barrier and developing their English proficiency. They also mentioned how they will foster an environment for the development of social capital for current and future ISAs. Additionally, some participants emphasized the importance of social capital for the general well-being of ISAs in the United States. Therefore, the study result presents three sections: 1) the most difficult challenges as ISAs: the language barrier, 2) the importance of social capital, and 3) supportive practices for ISAs' general well-being on campus.

The most difficult challenges as ISAs: Language barriers

The first theme identified by the analysis of all participants' interview data is the language barrier. Since language is the most fundamental method in communicating with others, most participants shared their vivid experiences of having a difficult time in everyday life as ISAs due to language barriers. Especially in academic settings, they have experienced more challenges. Some participants also mentioned that language is the key to communicating with others, leading to the development of social capital. They perceived that language proficiency is important for excelling in various aspects of life in the United States, such as socializing with others and achieving good grades in coursework. In the interview, they were asked, "*As an international student-athlete, what has been the most common/difficult challenge you would face in the United States"?* Participants shared their perspectives on the most difficult challenge as a language barrier. For example:

Participant 2: I mean, I am really easy going with everything, but if I pick one that stresses me out, it can be a language barrier. I don't feel stress reading and writing, but speaking, though, because sometimes, some Americans don't get my accent, so it is hard for me to have a quick chat with my friends and professors.

Participant 3: At first, learning the new language was not easy for me. I mean… speaking and writing in a new language is not easy, especially in the classroom.

Participant 4: I think it's language barriers. Even though my English was pretty good when I got here, it's pretty difficult to keep up with the conversation in a larger social setting, especially when they're using all the idioms and stuff like that.

Participant 5: I feel the first issue was the language. For the first couple of months, it was pretty hard to speak… sometimes I was like, I didn't want to speak up because I just didn't know how to say.

Participant 6: Language… At the beginning, talking to professors was difficult because I didn't understand anything. Now I think I'm improving and can understand them better, even though sometimes I had to ask them something about the assignments after class.

Participant 7: I still have to use Google Translate when I study or do homework. I feel I'm not able to understand everything the professor asks, and I don't want to fail my classes. Learning a new thing takes longer just because of

the language.

Participant 8: Of course, the first one was the language barrier. At the beginning, it was hard to communicate with everyone and also to understand them. It wasn't because I was shy; it was difficult to meet new people when I didn't know the language.

Participant 9: Studying takes me double the time because of the language barrier. I need to translate everything first to understand.

Participant 10: Adapting to the new language, it was difficult at the beginning to understand the professors. Sometimes, it is still hard for me to understand some terminology. I have to make extra time to go to office hours to ask the professor about the class or go to tutoring. Also, during the exams, I need extra time to complete them.

Participant 11: I feel I can't have the same conversation in English as I can in Spanish. It is hard to express myself in a language that is not my first one. I feel frustrated when this happens, because I want people to understand me.

Participant 12: Even though I don't speak English that badly, there were moments where communication felt challenging, especially in high-pressure situations.

Participants 3, 7, 9, and 10 argued that following up coursework with a new language has not been easy for them; they need to spend extra time completing the course-related tasks, compared to their peers (domestic students). In general, following coursework in college can be challenging; however, like ISAs, learning subjects in a new language could require extra energy and time. Another remarkable factor found in Participant 5, 6, 8, and 10 is that they specifically stressed that they experienced language barriers at the beginning, but their language proficiency has improved over time. This factor implies that coaches and administrators can focus more on language development programs for the new ISAs if they are from countries where the mother language is not English. As the majority of participants stressed that the language barriers are the difficult challenge in the United States, coaches and administrators need to pay more attention to minimizing this challenge because it tends to affect negative academic performance (Kwon, 2009; Woods et al., 2006; Lin, 2012, Hodes et al., 2015) and this negative result potentially affects their athletic eligibility (Hodes et al., 2015).

Importance of social capital for English proficiency and well-being

The second theme, developed from the interview data of all participants, is the importance of social capital for English development. As previous scholars have argued (Bourdieu, 1986; Conrad, 2007), the beneficial factors of social capital, especially for ISAs (Forbes-Mewett and Pape, 2019), will provide opportunities for ISAs to develop their language proficiency over time. To explore the true experience from ISAs' perspectives, participants were asked, *"Do you think social capital would be beneficial for developing language in general"?* and they did not hesitate to answer the positive factors of social capital for their English development. For example:

Participant 2: Of course. Hanging out with people was the most helpful thing I did to improve my English. Even now I'm still learning new things, sometimes I still feel I don't know the language. Because there are a lot of words that I have to translate. I needed to survive in this new country, that's why I had to talk to people; if I needed something, I had to ask someone to help me. Being in a team helped me to improve my English, because I hang out with them every single day, and the only language we can use is English.

Participant 3: Yeah, as you know, we need help for many things. After knowing people, like teammates and classmates, we can hang out, do homework, and go to the cafeteria together. So, I have to speak English to do such things with them. Through talking to other people, even though we don't have a good level of English, I feel like our level of English got better. I think we can be better and better every time through talking to people. Yeah, so I feel like meeting a lot of people is very helpful for learning English.

Participant 5: Yeah, just being a part of a community or a group of friends is really good and can teach you a lot. I think I'm very thankful that happened to me my freshman year, that my roommates were American golfers and they actually brought me into their social setting. For my English, I'm grateful for that. I lived with three Americans. So, I think that's why my English improved a lot right away because I just had to speak English. I think that's very important.

Participant 6: As an international student, everything is new, the language, the culture, and everything. So, you need someone for help, because you will always need help. At the beginning, I had a community with the international group and American students. So, it was really nice to stay together to study and do some activities together. I do believe that having a community is important because you can practice and improve your English through it. I mean, my English wouldn't be as good as it is now without my friends and communities in town.

Participant 7: I explained to my professors that I was still learning the language, and some of them were very helpful. It helps knowing that I'm not the only one with the same problem. I have international friends who are facing the same obstacles, and we help each other.

Participant 8: I believe so. The more I meet my people in town, the easier it is for me to speak English because I feel more comfortable. And I feel like I am more motivated to have clear and better communication because I don't want to feel left out or something due to my language barrier. Yeah, so meeting my people whenever I am free is important for my English. And I think I've learned a lot of idioms and common slang through hanging out with my friends. So, my English is getting better, I think.

Participant 9: I always feel support from my team and my coach; they are my second family, and I could not imagine being alone this far from home. I don't feel alone, but I feel supported, and also my language is getting better because I can try starting conversations with them, so I can improve and improve every time I try to speak.

Participant 12: Yeah, if I didn't meet anybody, and I stayed at the dorm,

then my English would never be better, and I would feel lonely. Spending time with friends, either domestic or international, has helped me a lot in practicing my English. My listening skills improved a lot over this year. Domestic or some senior international friends always help me correct my English pronunciation. I love that. Because of them, I feel more confident speaking English, because I know my English has gotten way better, compared to the first semester when I literally had no friends here.

Participants 2, 3, 5, 6, 8, 9, and 12 implied that social capital positively impacts ISAs' language improvement because it continuously provides English learning opportunities through social gatherings, especially for listening and speaking. These participants believed that through any activity done together, such as completing a course assignment, practicing, and socializing, they can ultimately develop their English communication skills. Additional positive factors of social capital implied by participants 3, 6, 7, 9, and 12 are less feeling of loneliness and being left out, while feeling supported and learning new things. These participants emphasized that, through developing social capital, they spend more time together as a group, which reduces their likelihood of feeling lonely and being left out on campus. Additionally, they feel strongly supported, relying on each other and learning about a new culture in the United States.

Supportive practices for ISAs' general well-being on campus

The third theme developed by all participants' interview data is the supportive practices for ISAs' general well-being on campus. To minimize ISAs' language barriers, as the second theme and its results proved, administrators, coaches, and teammates have knowledge of supportive practices for providing opportunities for developing social capital for ISAs. To explore effective practice for ISAs' language development, participants were asked, *"Do you have any suggestions or recommendations for schools and athletic departments to have better support programs for ISAs"?* They provided some suggestions along with their experience. For example:

Participant 1: I think having more meetings builds relationships inside the team. So, let them spend more time in a group, like team dinners or even just basic team meetings, where everyone gets to get familiar with each other. It helps them get closer to each other and understand each other because they all have different cultures, so they can find something similar to what they have at home.

Participant 2: I think schools should offer an English program or classes, just for those international students who don't have a good level of English, to help them improve, and teach them ways to improve it. I think international students would feel more comfortable in a school that shows they care about us (ISAs), and they want to help with our main struggle in this country, which is the language barrier.

Participant 3: Maybe doing a lot of activities with everyone, like international and non-international students. We can all gather to meet new people from other countries and share cultural stuff.

Participant 4: I feel like making sure to make us feel like we are not alone here. Also, like introducing whoever went through first as an international student, I feel like that's really important when it comes to understanding because they already went through being a student athlete, an international student athlete in America.

Participant 5: It's good to build a strong international community because if there's a person like you (researcher) who welcomes all of them into their family or home… just like knowing that you're welcome. Because yeah, and I did feel very welcome in your house and my coach's house. Also, I asked before I came, here, and that was if we will need a car when we come here, and everyone was telling me, no, no, no, you will be fine and most of the coaches gonna give you rides, but in reality, I needed a car, because no other international students had a car, so having no car was not easy.

Participant 6: Making sure they feel comfortable. They need people always, so making sure they know they can ask you anything, like buying a car or like, or where to find groceries, you know. And like having some activities together with everyone and new people, so they don't feel alone or are not welcomed.

Participant 7: I will create groups, not just internationals, but also mixing with Americans. For example, when we do events with internationals, it would be good to have domestic students. But maybe bring all student athletes to hang out together. Also, the international department should make mandatory meetings to explain things like paperwork, taxes, and how visas work.

Participant 8: I think the best thing that they can do is let international student-athletes know that if they need something, their coaches and teammates are gonna be there for them. Like, you want to show them that there is support for them, so they don't feel alone or left out.

Participant 9: I think it is important to support foreign students when they come to the school. They don't have the support from their parents, they feel alone, and they just want to feel welcome in their new house. Offering them help, like some type of transportation, because most of them (ISAs) don't have a car, so they are stuck in their dorms.

Participant 10: Trying to engage them with the team as much as possible and let them know about what kind of person you are. So, it's easier for them to understand you and help you. I think you should try to make connections with your professors and people in the class whom you could get help from. And probably to make sure that international student-athletes feel good in their teams and that they have the support from their teammates, coaches, making sure that they (ISAs) know that there would be support for them if they are feeling homesick or they are having issues with being here.

Participant 12: I would create a mental health and well-being program specifically for ISAs. Many international athletes struggle with homesickness, cultural adaptation, and pressure from their sports. Having access to sports psychologists, mentorship programs, and workshops on mental resilience would be extremely beneficial.

Participants 1, 3, 4, 5, 7, 10, and 12 strongly express their perspective about the importance of community gatherings. Through meeting people, ISAs will have opportunities to introduce themselves, share their initial background, and discuss their majors, sports, and other interests. At the same time, they can learn about other countries' cultures, trying to embrace differences and similarities. Including participant 5, participants 6 and 8 argued that ISAs want to feel welcomed and genuinely cared for by coaches and administrators. As Yoon's (2023) study showed, coaches are the ones who bring ISAs to their teams in the United States; it is common sense that coaches must put extra effort into players for their general well-being. Other considerable practices mentioned by participants 2 and 12 are English development classes and a mental health program for international students. As the first theme and interview date showed, most ISAs had to deal with language barriers in the beginning, and some of them are still struggling due to this reason. If the school has English development classes or specific tutoring programs for language development purposes for international students, it would be beneficial for them to overcome the language barrier. The other program suggested by participant 12 is a mental health program for international students. ISAs are not only experiencing language barriers, but also cultural differences and homesickness (Meadows et al., 2011) in the United States. This factor directly indicates that they are experiencing additional stress, beyond just academic and athletic settings. Thus, as Yoon's (2023) study suggested, athletic administrators and coaches may need to seek and provide counseling opportunities for ISAs' emotional and mental health can be necessary.

CONCLUSION

Due to increased competition levels in college athletics under the NCAA, and the level of contribution to the team's winning results from ISAs, collegiate athletics have tried to expand recruitment pipelines worldwide (Ridinger & Pastore, 2001). This phenomenon has led to an increase in ISA populations in athletic programs under the NCAA. Not only do ISAs provide positive outcomes for athletic settings, but they also share goal-oriented work ethics (Asher, 1994) and professionalism (Hoffer, 1994) in athletic programs that provide learning opportunities for cultural diversity for domestic student-athletes. Thus, the purpose of this research is to explore the most significant challenge for ISAs and the practices they have employed to mitigate it.

As a result, most participants stated that following up on academic practices, such as writing, speaking, and reading, is not easy with the new language. They needed extra time to complete academic duties and translators to fully comprehend some specific terminologies in English. Sometimes they did not feel comfortable talking to others due to their language proficiency, and they struggled to share their feelings in English. To overcome challenges resulting from language barriers, they are willing to meet with friends and teammates to engage in productive work, thereby improving their language skills. Some participants appreciated having social capital for their language development and believed that it had been significantly improved due to their social capital.

In common, in the group, people do many productive activities together, and this factor indicates that it continuously provides opportunities for ISAs to speak English with friends. Some participants also show positive attitudes towards creating and developing social capital for the ISAs because they have learned many new things, such as cultural differences and norms through meeting new people, minimizing their homesickness and feeling of isolation, and feeling left out.

Furthermore, most participants suggested that gathering opportunities, such as team dinners, casual team meetings, pairing with senior and new ISAs, and creating social events for domestic student-athletes and ISAs, are essential to create and develop social capital initially because through these gathering opportunities, ISAs can introduce themselves to others, getting to know other students and student-athletes. Another remarkable suggestion from this study is that ISAs need to feel welcomed and supported by coaches, teammates, and administrators because they are far from their family and home country, which does not provide the same environments as they used to have, such as food, weather, transportation system, bank system, and leisure activities etc. Also, generally, since ISAs are vulnerable to experiencing homesickness, cultural shocks, and language barriers while they are fulfilling their academic and athletic duties, one participant suggested developing and providing a mental health and well-being program specifically for ISAs. Thus, this research team highly recommends that current athletic administrators, professors, academic advisors, and coaches consider the suggestions mentioned above to provide a better environment for current and future ISAs.

Limitations of the study

This study contains several limitations. First, since participants were selected from only Division II schools under the NCAA, findings of current ISAs' experiences might not fit all college-level athletic programs. Second, due to the researchers' personal experience, being in the position of ISAs, as a foreigner, graduate students as IS, personal bias could be an intruder in the data analysis and the finding process. Finally, not all participants had interviews in their native (primary) language and might not fully understand the research questions and the meaning of conducting this study.

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Applying Criminological Theories to Mental Health and Criminal Behavior: An Applied Learning Case Study Approach

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Keywords: applied learning, criminology, mental health, General Strain Theory, Rational Choice Theory, depression, schizophrenia

ABSTRACT

The overlap between mental health disorders and criminal behavior is a growing area of concern in both criminology and applied practice. Depression and schizophrenia are two of the most studied disorders linked to justice involvement, yet their interaction with criminological theories is often underutilized in applied learning. This paper reframes the relationship between mental health and crime through General Strain Theory and Rational Choice Theory, presenting case-based applications for teaching, training, and professional development. Using fictionalized but research-informed case studies, we illustrate how applied learning activities can help students and practitioners connect theory to practice, improve treatment-oriented responses, and reduce reliance on incarceration for individuals with mental illness.

Mental health and crime intersect in complex ways, particularly within carceral systems where rates of psychiatric disorders far exceed those of the general population. The U.S. Department of Justice (2024) reports that 64% of jail inmates have a diagnosable mental illness, compared to 21% of adults in the general population. Depression and schizophrenia represent two of the most significant disorders implicated in criminal justice contact, each raising distinct theoretical and applied questions.

Traditional approaches often focus narrowly on symptom management or crime prevention, overlooking how mental health conditions interact with criminological theories. Applied learning strategies—especially case-based pedagogy—can bridge this gap by grounding abstract theory in practice-oriented scenarios. This approach equips students, practitioners, and justice professionals with frameworks to interpret behavior and design interventions.

THEORETICAL FRAMEWORK

General Strain Theory

General Strain Theory (Agnew, 1992) posits that individuals under chronic stress may engage in delinquency when legitimate coping strategies are unavailable. Depression intensifies the impact of strain, reducing resilience and problem-solving capacity.

Rational Choice Theory

Rational Choice Theory (Cornish & Clarke, 1986) suggests that individuals make decisions based on a cost-benefit analysis. Schizophrenia complicates rational choice because hallucinations and cognitive distortions interfere with decision-making processes.

CASE APPLICATIONS FOR APPLIED LEARNING

Case 1: Depression and Strain (Maria)

Maria, a 27-year-old woman, lost her job and was arrested for shoplifting food. Diagnosed with Major Depressive Disorder, she reported hopelessness and social isolation.

Applied analysis indicates that strains include unemployment, poverty, and prior victimization. Depression amplifies these stressors by lowering her sense of agency and coping ability. Students can apply Agnew's framework to map Maria's strains and design a reentry plan integrating therapy, housing assistance, and workforce training.

Case 2: Schizophrenia and Rational Choice (David)

David, a 34-year-old man, was arrested for trespassing while experiencing auditory hallucinations. Diagnosed with schizophrenia in early adulthood, he cycles between homelessness and short jail stays.

Rational Choice Theory assumes cost-benefit logic, but psychosis disrupts decision-making. David's choices often emerge from delusions rather than reasoned judgment. Students examine how Rational Choice Theory both applies and fails in David's case, then develop alternatives such as mental health courts,

housing support, and medication management to reduce justice involvement.

Pedagogical Implications

The use of case studies in applied learning promotes:

1. Theory-to-practice transfer: Students not only memorize theories but apply them to realistic contexts.
2. Critical thinking: Learners evaluate where theories succeed and where they fail to explain behavior.
3. Intervention design: Applied activities encourage the development of treatment and policy recommendations.
4. Empathy and professional readiness: Role-playing offenders' experiences fosters practitioner sensitivity.

DISCUSSION

The findings from prior research suggest that depression aligns closely with strain-based theories, while schizophrenia complicates rational choice models. Both conditions demonstrate how mental illness magnifies vulnerabilities to justice involvement, often through co-occurring substance use and social disadvantage.

Applied learning pedagogy allows instructors to use these theoretical tensions as teaching moments. Rather than treating theories as static explanations, case-based teaching frames them as analytical tools to guide decision-making in real-world contexts. This approach better prepares students for work in correctional, clinical, and community-based settings.

CONCLUSION

The intersection of mental health and crime requires a dual focus on theory and application. Depression and schizophrenia illustrate how different disorders map onto criminological frameworks in distinct ways, producing unique risks for justice involvement.

For applied learning, case-based teaching offers a powerful strategy to bridge abstract criminological theory with practical interventions. Students who engage with realistic scenarios develop deeper understanding, empathy, and readiness to address complex challenges at the intersection of mental health and criminal justice.

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An Evolving Approach to Teaching Comparative Vertebrate Anatomy

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ABSTRACT

Comparative vertebrate anatomy is a discipline that is rooted in a wide variety of other biological sciences including zoology, evolution, and human anatomy. It is commonly taught as part of an undergraduate curriculum with lecture and lab components. There is considerable variation in terms of which topics are emphasized and in which order those topics are covered. This is influenced by instructor expertise and interests as well as consideration of the educational needs of the student population. For instance, emphasis may be placed on taxonomy and evolutionary relationships of specific vertebrate groups or might stress the significance of structure-function relationships. Assessment of student performance is an important component of any course and can vary significantly depending on the balance between examinations and coursework activities. The specific nature of the examinations might involve flagged structures on preserved specimens, text-based questions, or even an oral component. Each of these approaches carries with them a suite of costs and benefits. The breadth and depth of information combined with an abundance of unfamiliar terminology can be intimidating for students and can be a significant barrier to student success. This case study describes how a comparative anatomy course at University of Missouri-Kansas City has been modified since its inception, both in terms of course content and assessment. The general goals were to improve the educational experience for students and to increase engagement through adoption of applied learning techniques. Some of the content changes have related to the timing and inclusion of topics, an effort to better build on preexisting knowledge and application of that knowledge alongside new information gained through observation as part of active group collaboration. Exam scores, course evaluation data, and personal communications from students indicated that in addition to the stated goals there was a reduction in exam-related anxiety.

INTRODUCTION

Comparative Vertebrate Anatomy has foundational roots in a wide range of other science disciplines and because of this broad integration there is no definitive prescription for how to teach it. Some of the key core concepts of Comparative Vertebrate Anatomy include aspects of evolution, structure and function of anatomical structures across biological levels of organization, and morphological development (Danos et al., 2022). Instructors place emphasis on a combination of these and other aspects depending on their personal suite of expertise. The course that is the topic of this current discussion has been taught at University of Missouri-Kansas City (currently BIOLOGY 338L) each Spring since 2014. The course has undergone several annual cycles of modification and reinvention to better align with the academic interests of the students that take the class and to foster a more productive learning environment. Some of the major ways that this class has evolved over time and the ways that they have been implemented will be discussed.

Some changes have allowed a more seamless integration of continuing themes that reinforce the core concepts of the class. Making frequent reference to cladograms of phylogenetic relationships in order to show the distribution of particular anatomical features across taxonomic groups. Other updates have served to fortify the students' sense of community and personal investment in the class, adopting approaches that encourage and reward the use of healthy study habits in service of facilitating increased student success. Great emphasis is placed on cooperative team work and regular review checkpoints.

LITERATURE REVIEW

One of the most frequently cited tools used by educators at all levels is Bloom's taxonomy of cognitive learning objectives (Adams, 2015) which is often represented as a triangle that is internally divided into six stacked levels. The stacked levels represent action verbs related to increasingly complex levels of understanding, with knowledge at the base and Evaluation at the peak. This commonly cited version of Bloom's taxonomy represents one of three domains (the cognitive domain) that were originally described (Bloom, 1956) using nouns, and later revised (Anderson and Krathwohl, 2001; Krathwohl, 2002) to shift the emphasis to verbs; replacing Knowledge with Remember for example. The verbs in the pyramid have numerous synonyms which help educators create measurable learning outcomes. Examples of some of those relating to the core concepts of comparative vertebrate anatomy (Danos et al., 2002) and the learning objectives for the Comparative Vertebrate Anatomy Lab are Name, Identify, and Label at the Remember level referring to the numerous structures encountered. Utilize and relate are examples of verbs that relate to higher levels, for example in utilizing basic dissection techniques and relating the function of one structure to another.

Encouraging a cycle of explaining something new relating to something already known, applying that in a practical way, and discovering something new. Changes to assessment have better reflected the ways in which learning has occurred, rewarding understanding of key concepts and application of theory. This has better allowed students to hone a number of transferrable skills that have practical applications such as effective communication, fine motor skills, pattern recognition, and lateral thinking.

Two of the most successful techniques of the pedagogy at the foundation of this class are the availability of multiple exposures (Chen and Yang, 2020) and scaffolding (Coffman et al., 2023). The similarity in structure between unit one and unit two is intentional as is the way that dissections are carried out for each of the vertebrate specimens. Dissection itself is an essential technique at the core of this class. Dissection serves as both an example of active learning and experiential learning because students must plan and coordinate dissections and then carry them out to an acceptable standard. Vertebrate dissection is also an example of applied learning because practical skills are being developed and unlike on plastic models in the lab, real specimens can potentially illustrate natural variations that may be of interest for certain structures (Kolb, 2015). Active learning techniques are often assumed to be more effective for longer term retention (Kooloos et al., 2020), however more passive approaches like attending lectures, certainly have value and should not be discounted so easily. Variation in spelling of anatomical terms is one of the most challenging aspects of comparative anatomy class for many. The use of word banks is said to be quite rare in anatomy education because of concerns about potential cueing effects (Britson, 2020), although it is unclear to what extent this is actually an issue at higher education levels. One benefit of word bank use for both student and educator is the lack of point reductions from partial spelling errors.

METHODOLOGY

Comparative Vertebrate Anatomy was first introduced in the Spring semester of 2014 and was offered as a special topics class comprising two fifty-minute lectures and a single two-hour lab each week. Lecture content was divided into four modules with the first covering taxonomy, development, and integument. The second module focused on skeletal anatomy and evolution, the third focused on the muscular system, and the fourth dealt with the remaining organ systems. The three lab modules differed in that the skeletal system was included with unit 1. Lab units two and three involved dissection of several vertebrate specimens including frog and cat. A notable theme in student evaluations that first year was that students particularly enjoyed the vertebrate dissections and that they would have liked to have done more of them. Therefore, when the class was officially added to the departmental curriculum in 2015 it was redesignated as a primarily lab-based class with an accompanying recitation session. Time spent in lab was doubled with there now being two two-hour lab sessions each week with a recitation. Recitation sessions are treated differently at different institutions with some being faculty-led and others being

led by a teaching assistant. In this instance the recitation was treated much like a lecture session, providing not only essential background information but also giving an opportunity to discuss concepts and species not accessible in the lab, including animals that it could not be possible to study in a classroom setting. The addition of a recitation session also helped synchronize, balance, and ground the faster lecture-style delivery with the slower but more active lab tasks.

Number of Units

A major change that occurred between 2017 and 2018 was that the number of units was reduced to two resulting in some topics being more extensively discussed in recitation to make more efficient use of the available lab time. Unit one now included the integumentary, muscular, and skeletal systems, and unit two addressed the rest of the organ systems. The role of recitation and lab portions of the class became more clearly delineated with recitation taking on more characteristics of a traditional lecture setting where not only could background material related to lab sessions be introduced and reviewed, but more abstract and diverse topics could be explored beyond the scope of what could be observed in lab.

Order Of Topics

It is common in undergraduate anatomy education to organize course materials in a systems-based fashion whereby entire organ systems are explored as a series of discrete but related units. Undergraduate textbooks tend to be organized in a way that encourages that progression. Graduate anatomy classes and their accompanying dissection guides often take a regional anatomy approach to course progression and take a more integrated approach, studying bones, muscles, blood vessels, and nerves of a specific part of the body at the same time. This better reflects the way that organ systems coexist in the body and better relates to the realities of medical applications. Decisions regarding systems-based versus region-based course progression influence whether dissections follow a sequential or simultaneous pattern. When teaching a course on the history of the Earth we might expect to follow events from most ancient to more recent, and in a similar fashion comparative anatomy education often follows an orthogenetic or linear progression from before the dawn of vertebrate life forward to modern vertebrate diversity. It is very common to begin with a discussion of invertebrate ancestors of vertebrates and to progress through course content to end at mammals, and more specifically humans. This approach allows for inclusion of extinct species along with discussion of their role in an ecosystem and setting them in the context of major global events through time. Students taking the Comparative Vertebrate Anatomy Lab at UMKC reported that they had preferred emphasis to be on extant animals rather than the extinct forms because they better matched their learning goals. Most had recently either taken general biology and human anatomy and most were interested in careers in healthcare fields (a mixture of medical, dental, and veterinary). This was valuable feedback and as of the Spring semester of 2020 the decision to reverse

the direction of course content topic progression was made so that instead of proceeding from fish to mammals it would begin each of the two units with an introduction to mammalian anatomy and then compare those features to each of the other model vertebrate taxa. Following positive feedback this was taken one step further by explicitly reviewing human anatomy at the start of each unit in 2021.

Passive And Active Learning

Learning can occur through passive and active approaches (Kooloos, 2020) and a variety of these teacher-centered and student-centered approaches are used in the Comparative Vertebrate Lab. The weekly recitation conveys a wide variety of information in a format that can be revisited later as a repository of reference material and extends the scope of knowledge beyond what can be encountered in lab. A traditional lecture-hall format works well in that instance and it sets the stage for more active learning to take place in the lab itself. Through combination of recitation and lab sessions students are exposed to multiple approaches by which they can interact with the material. Students listening to lecture presentations accompanied by visual-heavy slide decks, learn by doing by carrying out dissections, and review information by verbally articulating what they have learned to others in their dissection teams. Full participation in dissections during lab sessions is an essential part of the Comparative Vertebrate Anatomy Lab experience. Attendance is taken during lab sessions and students earn participation points for not only being present but actively working as part of their assigned team.

Multiple Exposures and Scaffolding

The lab houses a number of anatomical models showing details of human skin, and thin sections of mammalian skin are examined. Deep to the skin students observe that skeletal muscles are organized into functional groups, and selected muscles are identified on human anatomical models. Next, the muscles that are identified in humans are observed in cat specimens, which have by now been skinned. Students collaborate to complete the dissection and explore the concept of muscle homology. Studying articulated mammalian skeletons in addition to isolated bones allows students to better visualize muscle origin and insertion relationships. After mammals, students in lab move on to studying birds with feathered skin histology, skeletal anatomy, and a pigeon dissection, re-experiencing the same or equivalent structures and reinforcing the knowledge. Recitation gives a broader discussion of avian anatomy and this continues for reptiles, amphibians, and fish along with dissections of bullfrogs, dogfish sharks, and perch fish. This is supported by weekly quizzes that are completed outside of class each week. Unit two begins in a similar fashion as unit one, with a survey of human organ systems followed by comparison with a variety of non-human mammals. Dissection of the selected animals continues in lab throughout unit two in the same taxonomic order as in unit one. Repetition in this fashion is potentially even more effective because students have so many

choices for how they prefer to interact with the course content. Whether alone or in a group, using models or dissections, re-listening to recitation recordings or attempting to verbally explain to a peer, there is something for visual, auditory, verbal, and kinesthetic preferences alike. The multiple exposures approach (Chen and Yang, 2020) is further supported by the use of pre-lab resources that accompany each lab packet. Studying these before coming to lab seemed to greatly enhance satisfaction and effectiveness during lab. Lists of structures and video files showing completed dissections were provided so that students could come to lab well prepared ready to work efficiently. Students were told that practical exams would be using the specimens from a mixture of groups and so students were encouraged to make the most of their time in lab by looking at the dissected animals of other teams. As each unit progressed students showed increased confidence as they gained familiarity with the lab routine and required less prompting and handholding, as is a desired outcome when applying scaffolding techniques (Coffman et al., 2023)

Enrollment Capacity Limit

Enrollment size was intentionally limited to 22-24 students to allow for six or seven dissection teams to comfortably work in the space available. Between 2014 and 2018 the variety of preserved dissection species increased from bull frog and cat to include dogfish shark (a cartilaginous fish), perch fish (a bony fish), bullfrog (an amphibian), pigeon (a bird), and cat (a mammal). This not only better represents the taxonomic diversity of vertebrates but also demands a more challenging array of dissection techniques to properly explore the anatomy of each vertebrate specimen. The tactile differences in integument between the scales of a bony fish and shark are striking and come with them technical challenges that must be overcome in order to produce high quality dissections showing all the necessary structures. Beginning each unit with a synopsis of relevant human anatomy has the benefit of leading students to then apply this knowledge to the subsequent animals. Occasionally there have been course evaluation comments stating that some students would prefer more frequent examinations with shorter units based on less information. However, the units are intentionally as lengthy as they are to encourage review of earlier dissections in the light of more recent information, time to produce and use self-made learning aids, and to draw more meaningful comparisons between related but disparate vertebrate forms. Cramming is discouraged as a strategy and every effort is made to encourage positive study habits such as making effective use of class-time and frequent review and consolidation of knowledge. This approach enables students to experience lab in the spirit of Kolb's learning cycle (Kolb, 2015) of concrete experience, reflective observation, abstract conceptualization, and active experimentation. Information introduced relating to humans as vertebrates becomes more concrete when experienced in the context of examining other mammals like cats and deer, and later in the form of reflective observation of comparable structures in non-mammalian vertebrates like birds and fish. Active experimentation in the form of attempting to locate, isolate, and identify homologous structures in the various vertebrate specimens leads back to

a more concrete understanding why and how structures are the way they are in humans as mammals. Having the professor and Teaching Assistant present in lab helps reassure students that they are correctly identifying structures and are making the necessary connections.

Adoption Of Word Banks

Some students begin the semester with a sense of dread regarding memorization of structures, directional terms, and taxonomic names, and may have been told that this is not an effective way to understand a topic. Rote memorization without deeper contextualization can be problematic but an intentional use of memorization can be effective as a foundational tool on which to support more extensive explanations that lead to understanding. If you don't know what a structure is then it can be difficult to communicate effectively with reference to that structure. Although many students are proponents of using flash cards for study and review, they do not all experience the same level of success. Use of a pre-made set of flash cards might be a smart shortcut for some students whereas for others the very act of making their own flash cards is the most useful part of the process. The more active a role they play in their learning process the better and even those students that preferred to study alone reported that they found building flash cards to be a rewarding experience. Flash cards are however only one way that students deal with large volumes of terminology. Actively connecting together terms from a vocabulary list to produce explanatory paragraphs is a powerful approach, especially when combined with real-time observation of specimens. Being shown direct linkage between what is being done in class and expectations for examinations can help reduce anxiety related to assessment. One of the most common assessment strategies for a Comparative Vertebrate Anatomy lab class is to use times station-based exams. The setup used in this class calls for each student to start the exam at a separate 'exam station' where they will be see a question card with one or more questions relating to a model, specimen, or illustration of some sort. All questions at the station need to be answered within the time allotted for that station and when the time is up they move to the next station. This process repeats until all stations have been visited at least once, or twice in this particular case. The time allowed at each station is typically shorter for the second exposure than the first time around. It is very common for students to have to write their answers out fully for each question, and for spelling errors to carry a point deduction. This is how the class operated from 2014 to 2017 and each semester it was obvious that many of the points being lost on lab exams were due to spelling mistakes and that often times a student would be comfortable identifying a structure but would fall victim to minor spelling errors and would only receive partial credit for what they felt was a correct answer. When this happened, some students expressed as dissatisfaction with their score and reflected as an increased level of anxiety around future exam dates. In the Spring of 2018 to help address this issue, and in an effort to reduce student anxiety and reduce the need to use partial credit, it was decided to start using word banks with terms listed in

alphabetical order. While the use of word banks in anatomy lab exams is certainly not a new concept by any means, it is still relatively uncommon (Britson, 2020). Having a singular large word bank of all relevant terms proved to be an unrealistic goal as there were simply too many terms to fit on a page with a reasonable font size. For that reason, a series of smaller lists of more closely related terms were constructed to accompany each exam station. When the format was explained to students it proved to be the case that some students made the mistake of assuming that since the insistence on spelling perfectly was now reduced that the level of academic rigor was also reduced. This was of course not the case and students that assumed they would have plenty of time to scan the word banks for words they recognized scored much lower than the students that prepared properly. This was only an issue the first time, word banks were used and since that time emphasis has been placed on adequate preparation for lab exams, encouraging learning the correct spelling of all words, and being able to articulate those words as parts of full sentences. It is recommended to think of an answer to a question before referring to the word-bank and to then refer to the word bank before writing the answer on the answer sheet. This has the additional benefit of potentially slowing students down to avoid making mistakes through haste. Providing word banks in exams that are modified versions of structure lists from lab packets has proven very successful in enabling effective efficient class review, exam preparation, and a general reduction in anxiety. One especially effective type of lab exercise had students in dissection teams place flags into specimens to identify each anatomical structure listed in the word-bank and photograph them to create study resources. This helped ensure that none of the structure were overlooked or forgotten about. If a structure proved difficult to locate or if it was something that could easily be confused with something else then this provided an opportunity to seek clarification. Also, if a structure was damaged or absent in a particular specimen then it allowed that to be noted and communicated to others in the class. Students were encouraged to do this first for the specimens that their team had been working on and then to follow the same procedure using the specimens of different dissection teams. This not only reinforced the most important features but it emphasized that natural variation in size and shape is something that should be expected. This exercise formed the core of activity for the pre-exam review. Teams were randomly assigned a dissected specimen of one of the vertebrate groups and were told to indicate with numbers flags a number of structures from their word bank lists. Identifications were listed on a piece of paper and placed beneath the dissection tray. Specimens were exchanged between adjacent teams and the receiving team was tasked with identifying the structures that had been indicated by the original group. The groups could then self-grade their identifications and potentially suggest alternate identifications if the original identification was incorrect. The amount of time with each specimen was timed to help get students exposed to exam-style time constrains, although more time was given than would be the case in an actual exam to allow for more effective communication between team members. When specimens arrived back at the original group there was an opportunity to see how many of their

identifications had been accepted by the other groups, and if other suggestions had been made. This provided a sort of peer review for identifications rather than relying on the instructors alone. Points are awarded for attendance/participation to encourage active involvement in the class, but in-class review activities themselves do not have point values associated with them to ensure that these remained low pressure learning experiences. Weekly online lab quizzes in the style of the examinations carried point values and had a time limit but could be attempted twice before the due date. Students were encouraged to attempt the quizzes under exam-like conditions and to review their results to identify potential areas of weakness in preparation for the examinations.

Final Essay, Final Exam, or Final Project

The original version of the class featured a final project that required library research typical of lecture formatted classes. This allowed for coverage of topics beyond that which could be covered in class because of time limitations. On the other hand, some students expressed concern that the time required for the final essay research was distracting them form studying for the lab exam. It was also unfortunate that there was no opportunity to have students share their reports with others in class before the end the semester. Switching format to a final exam composed of multiple-choice questions modified from previously used unit exam questions allowed for re-exposure to earlier material in the context of spaced repetition. This was coupled with the incentive to drop the score of one of the earlier unit exams if that score was lower than the final exam score. After reflecting on the intended outcomes of the exam it was decided that although it did result in increasing overall grades, some students had resorted to rote memorization and cramming as a way to cope with the stresses associated with the end of semester. The cumulative exam format was abandoned in favor of a more applied and experiential activity which took the form of a brief literature research project that would be expressed as a poster presentation and an associated exam. Assignment instructions guided students to select a topic from a suggested list that they were interested in for further reading, or to find an article which could be related back to course materials. Potential topics were to be submitted for approval as a graded part of their project. On the initial run. Allowing students to suggest their own topics on which to base their project proved to be less successful than had been anticipated as many of the topics lacked imagination or were too simple. Randomly assigning topics from an extensive list proved to be much more satisfying for both students and instructors. Some of the topics selected were extensions of the core course topics, focusing on a particular biological process, anatomical feature, or taxonomic grouping. Other topics had not been explicitly covered in class but served as extensions of course material into published literature and research. Students were also required to suggest five multiple choice questions based on the information contained in their posters. To discourage procrastination submission of a draft version of the poster and suggested questions were

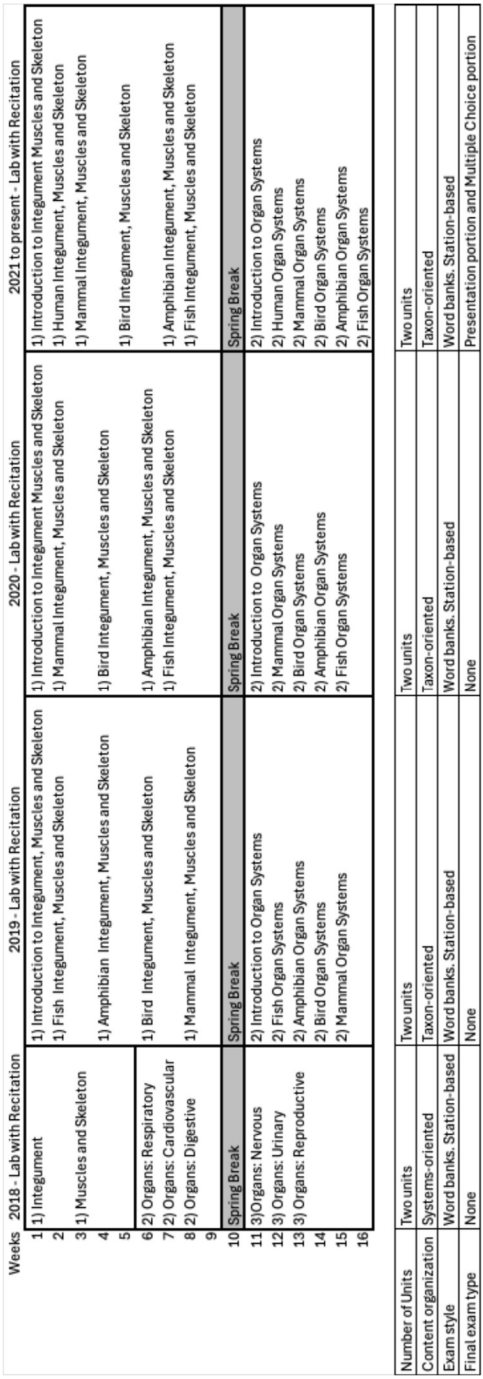
required. Three of the five questions from each student formed the basis for the exam portion of the final. The full list of potential questions was distributed to students along with each of the posters so that students could read through the posters and find the answers as part of their exam preparation. As a final review, students were required to present their posters to the rest of the class and answer any questions that arose. This proved to be a much more effective format in terms of promoting learning as an extension of the main course content.

RESULTS

Figure 1 shows a semester-by-semester comparison and summary of the number of course units each semester as well as those content makeup of each of those units. Also included is information about the number of units, exam style, and final exam type. The number of students each semester is limited to 22-24 students.

Weeks	2014 - Lecture	2014 - Lab	2015 - Lab with Recitation	2016 - Lab with Recitation	2017 - Lab with Recitation
1	1) Taxonomy and Development	1) Taxonomy and Development	1) Taxonomy	1) Taxonomy	1) Integument
2	1) Integument	1) Integument	1) Development	1) Development	
3	2) Skeleton	1) Skeleton	1) Integument	1) Integument	1) Muscles and Skeleton
4			2) Skeleton	2) Skeleton	
5					
6	3)Muscles	2)Muscles	2)Muscles	2)Muscles	2) Organs: Respiratory
7					2) Organs: Cardiovascular
8					
9					
10	Spring Break	Spring Break	Spring Break	Spring Break	Spring Break
11	4) Organs: Respiratory	3) Organs: Respiratory	3) Organs: Respiratory	3) Organs: Respiratory	4) Organs: Nervous
12	4) Organs: Digestive	3) Organs: Cardiovascular	3) Organs: Cardiovascular	3) Organs: Cardiovascular	4) Organs: Digestive
13	4) Organs: Urinary and Reproductive	3) Organs: Nervous	3) Organs: Nervous	3) Organs: Nervous	4) Organs: Urinary
14	4) Organs: Cardiovascular	3) Organs: Digestive	3) Organs: Digestive	3) Organs: Digestive	4) Organs: Reproductive
15	4) Organs: Nervous	3) Organs: Urinary	3) Organs: Urinary	3) Organs: Urinary	
16	4) Organs: Endocrine	3) Organs: Reproductive	3) Organs: Reproductive	3) Organs: Reproductive	

Number of Units	Four units	Three units	Three units	Three units	Three units
Content organization	Systems-oriented	Systems-oriented	Systems-oriented	Systems-oriented	Systems-oriented
Exam style	Multiple Choice and Matching	Fill-in the blank. Station-based	Fill-in the blank. Station-based	Fill-in the blank. Station-based	Fill-in the blank. Station-based
Final exam type	Essay	None	Cumulative Final	Cumulative Final	Cumulative Final



Weeks	2018 - Lab with Recitation	2019 - Lab with Recitation	2020 - Lab with Recitation	2021 to present - Lab with Recitation
1	1) Integument	1) Introduction to Integument, Muscles and Skeleton	1) Introduction to Integument Muscles and Skeleton	1) Introduction to Integument Muscles and Skeleton
2		1) Fish Integument, Muscles and Skeleton	1) Mammal Integument, Muscles and Skeleton	1) Human Integument, Muscles and Skeleton
3	1) Muscles and Skeleton			1) Mammal Integument, Muscles and Skeleton
4		1) Amphibian Integument, Muscles and Skeleton	1) Bird Integument, Muscles and Skeleton	
5				1) Bird Integument, Muscles and Skeleton
6	2) Organs: Respiratory	1) Bird Integument, Muscles and Skeleton	1) Amphibian Integument, Muscles and Skeleton	
7	2) Organs: Cardiovascular		1) Fish Integument, Muscles and Skeleton	1) Amphibian Integument, Muscles and Skeleton
8	2) Organs: Digestive	1) Mammal Integument, Muscles and Skeleton		1) Fish Integument, Muscles and Skeleton
9				
10	Spring Break	Spring Break	Spring Break	Spring Break
11	3)Organs: Nervous	2) Introduction to Organ Systems	2) Introduction to Organ Systems	2) Introduction to Organ Systems
12	3) Organs: Urinary	2) Fish Organ Systems	2) Mammal Organ Systems	2) Human Organ Systems
13	3) Organs: Reproductive	2) Amphibian Organ Systems	2) Bird Organ Systems	2) Mammal Organ Systems
14		2) Bird Organ Systems	2) Amphibian Organ Systems	2) Bird Organ Systems
15		2) Mammal Organ Systems	2) Fish Organ Systems	2) Amphibian Organ Systems
16				2) Fish Organ Systems

Number of Units	Two units	Two units	Two units	Two units
Content organization	Systems-oriented	Taxon-oriented	Taxon-oriented	Taxon-oriented
Exam style	Word banks, Station-based	Word banks, Station-based	Word banks, Station-based	Word banks, Station-based
Final exam type	None	None	None	Presentation portion and Multiple Choice portion

Figure 1. Summary of comparative vertebrate anatomy lab information by semester.

DISCUSSION AND CONCLUSION

Although some aspects of the course have remained unchanged since the original version, much of the structure of the class has been altered significantly to reflect established best practices and personal pedagogical preferences. Increasing the proportion of dedicated lab time devoted to active learning based around dissection teams set the class apart from others in terms of fostering applied and experiential learning that built on the framework provided by the weekly recitation. Introduction of word banks had a noticeable effect in reducing exam-related stress and made it easier to meet the needs of students with special accommodations, and increased grading efficiency, without sacrificing academic rigor. Reorganizing course content both in terms of the number of units and the ordering of topics within those units served to emphasize thoughtful reflection on previously acquired knowledge in the light of practical observations. Changing the format of the final examination to be more like a capstone experience than an exercise in recall paid off better than anticipated and effectively reinforced the learning goals of the class while expanding the scope of the course content within the available time. Switching from a systems-oriented progression to a taxon-oriented progression created opportunities for repeated exposure of previously encountered structures, and opportunities to predict locations of structures in novel specimens based on those previous experiences. Many students have commented on the convenience of taking the comparative anatomy lab after having completed a human anatomy course, and how much of the information is still relatively fresh in their minds at the start of the Spring semester having just taken human anatomy in the Fall.

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Dynamic differentiation for applied learning

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ABSTRACT

As colleges and universities adapt to increasingly diverse student populations and workforce demands, applied learning has emerged as a central strategy for fostering engagement, critical thinking, and career readiness. Implementing applied learning effectively requires instructional approaches that recognize varied student backgrounds, skills, and preferences. This article examines the use of choice boards, defined as a menu of assignment options, as a means of enhancing applied learning in higher education. Drawing on literature about differentiation, applied learning, and student-centered pedagogy and including a limited case study from an undergraduate teacher education course, the paper explores how choice boards can support student agency, inclusivity, and academic rigor. Findings suggest that integrating choice boards into applied learning provides flexibility without sacrificing standards, enabling students to tailor their learning experiences while still meeting course objectives. Implications for curriculum design and instructional practice highlight the potential of choice boards to improve motivation, accommodate diverse learners, and strengthen the connection between theory and practice in higher education settings.

INTRODUCTION

As higher education continues to evolve in response to diverse student needs and workforce demands, educators are increasingly exploring instructional strategies that promote engagement, autonomy, and meaningful learning. Applied learning—where students actively use knowledge in real-world or simulated contexts—has emerged as a vital approach for fostering deeper understanding, critical thinking, and career readiness. However, implementing applied learning effectively requires acknowledging the varied backgrounds, skills, and learning preferences that students bring to the classroom. Differentiation, the practice of tailoring instruction to meet individual learner needs, offers a valuable framework for addressing this diversity.

One promising yet underexplored strategy for facilitating differentiated applied learning in higher education is the use of choice boards. Choice boards present students with a curated menu of task options aligned with specific learning objectives, allowing them to select how they engage with and demonstrate their understanding of course material. This structure supports student agency while maintaining academic rigor and relevance. By combining the principles of differentiation with the active, experiential nature of applied learning, choice boards may offer a practical solution for enhancing student motivation, accommodating diverse learners, and improving learning outcomes in higher education settings. This article explores the design, implementation, and potential impact of using choice boards to differentiate applied learning experiences in college-level courses.

LITERATURE REVIEW

The following literature review examines the changing student population, benefits of applied learning in higher education, and defines and explains how choice boards can be a beneficial aspect of these systems.

Changing Populations

The student population in higher education is undergoing significant transformation, reflecting broader demographic, economic, and societal shifts (Ortiz & Waterman, 2016). One of the most notable changes is the growing diversity of students in terms of age, race, ethnicity, and socioeconomic background. While traditional college students—those aged 18 to 22 attending full-time—still represent a significant portion, there is a rising number of non-traditional students (Salmi & D'Addio, 2021). These include adult learners, part-time students, working professionals, parents, and military veterans returning to education later in life (Franklin, 2013). This shift has prompted colleges and universities to reevaluate how they support and engage students with varied life experiences and needs.

Economic pressures are also reshaping who attends college and how they do it. Rising tuition costs and student debt have caused many students to opt for community colleges, online programs, or hybrid models that allow them to work

while studying (Franklin, 2013). First-generation college students and those from low-income families often balance multiple responsibilities and face unique challenges that demand more flexible, supportive systems from institutions (Salmi & D'Addio, 2021). In response, many schools are investing in mental health services, financial aid counseling, and career readiness programs tailored to the realities of today's student body (Scherer & Leshner, 2021).

Technology is playing a major role in broadening access to higher education. Online learning platforms have made it possible for students in remote or underserved areas to earn degrees, while also accommodating learners who need more adaptable schedules (Compton & Davis, 2010). As technology continues to evolve, so too will the ways in which students engage with education, requiring schools to remain agile and innovative (DeVita et. al, 2016).

Overall, the higher education landscape is becoming more dynamic and complex. The evolving student population brings with it a wealth of experiences and perspectives, enriching the academic environment but also challenging institutions to move beyond one-size-fits-all models. Colleges and universities must continue to adapt in order to meet the changing needs of their students, ensuring that higher education remains accessible, relevant, and equitable for future generations. Differentiated instruction is key to that adaptation.

Differentiation in higher education

Differentiation in higher education refers to the intentional design of instruction, assessment, and learning environments to accommodate the diverse needs, backgrounds, and learning preferences of students (Tomlinson, 2014). While often associated with K–12 education, differentiation is increasingly relevant at the college level due to the growing diversity in student populations, including first-generation students, adult learners, students with disabilities, and individuals from varied cultural and linguistic backgrounds (IRIS Center, 2019). Differentiated instruction can involve offering multiple means of engagement, representation, and expression—such as using varied teaching methods, flexible assignments, or adaptive technologies—to ensure all students can access and demonstrate their understanding of the material (Mintz, 2016).

Instructors in higher education can implement differentiation through strategies like varied assignment formats, tiered activities that address different levels of readiness, and providing options for collaborative or independent work (Lightweis, 2013), all of which can be used in applied learning. By embracing differentiation, colleges and universities can foster more inclusive and equitable classrooms where all students are challenged appropriately and supported in achieving their academic and career goals (Dosch & Zidon, 2014).

Applied Learning

Applied learning in higher education offers students the opportunity to connect theoretical knowledge with real-world experience, making their

education more practical, engaging, and relevant (Lemke & Wilcoxen, 2024). Rather than learning concepts in isolation, students engage in hands-on activities such as internships, service-learning projects, research, simulations, and lab work that reinforce academic content. This approach helps solidify understanding, improves retention, and cultivates problem-solving skills by placing students in authentic contexts where they must apply what they've learned (Ash & Clayton, 2009).

One of the primary values of applied learning is its impact on career readiness. Employers increasingly seek graduates who can demonstrate experience, adaptability, and the ability to work collaboratively in professional environments. Applied learning experiences allow students to develop these competencies while building portfolios, resumes, and networks that can ease the transition from college to career (Kennedy & Archambault, 2012). Through internships or project-based coursework, students gain insight into workplace expectations and discover how their academic studies align with their future goals (Shepherd & Yeon, 2023).

Applied learning also promotes deeper student engagement and motivation (Ash et. al, 2005). When students see the real-world relevance of their coursework, they are more likely to take ownership of their learning and persist through challenges (Shepherd & Yeon, 2023). This sense of purpose can be especially valuable for students from diverse or non-traditional backgrounds, who may benefit from a more personalized and interactive approach to education.

In addition, applied learning fosters essential soft skills such as communication, leadership, adaptability, and critical thinking (Kokotsaki, Menzies & Wiggins, 2016). These are often best developed through experiential opportunities that require collaboration, reflection, and real-time decision-making (Kolb & Kolb, 2005). By navigating the complexities of applied settings, students not only gain confidence but also learn how to adapt their knowledge to varied audiences and unpredictable situations—vital professional skills (Buchanan et. al., 2019).

Ultimately, the value of applied learning lies in its ability to bridge the gap between theory and practice. It enriches academic instruction, strengthens workforce preparation, and helps students make meaningful connections between their education and their future. As higher education evolves to meet the needs of a changing world, integrating applied learning will be crucial in preparing students to thrive in complex, fast-paced environments.

Choice boards

A choice board is a differentiated instructional tool that presents students with a variety of learning activities organized in a grid or menu format, allowing them to choose how they engage with content (Florian, 2014). Each option on the board is aligned with the same learning objectives but varies in format, depth, or approach, offering students autonomy over how they demonstrate understanding. This strategy is rooted in the principles of student-centered

learning and supports diverse learning preferences, helping to increase motivation, ownership, and engagement (Trust & Maloy, 2020).

In higher education, choice boards can be adapted to suit a range of disciplines and course levels. For example, in a literature course, a choice board might offer options such as writing a critical essay, creating a multimedia presentation, leading a group discussion, or analyzing a theme through visual art. All tasks address the same core objectives, such as critical analysis or comprehension, but allow students to express their understanding in a way that plays to their strengths or interests (Buechel, 2023). This flexibility is especially helpful in classrooms with diverse learners, including adult students, multilingual students, or those with varying academic backgrounds (Trust & Maloy, 2020).

Choice boards also encourage higher-order thinking and creativity. By offering options that vary in complexity and skill application, instructors can design boards that include activities targeting Bloom's Taxonomy levels—from remembering and understanding to analyzing, evaluating, and creating (Arendt, Trego & Allred, 2016). Students might be required to select at least one task from each cognitive domain, ensuring a balanced approach to learning. This method fosters deeper engagement with the material while encouraging learners to think critically about how they learn best (Carless, 2022).

Instructors in higher education can also use choice boards to support collaborative learning (Hanewicz, Platt & Arendt, 2017). Certain tasks might be designed for individual work, while others promote small group collaboration, peer review, or discussion-based exploration. This variety allows students to build communication and teamwork skills while still having control over the structure of their learning (Rideout, 2018). Additionally, instructors can use choice boards for formative or summative assessment, tailoring the level of rigor and feedback to meet course goals (Gijbels et al, 2006).

Ultimately, the use of choice boards in higher education promotes flexibility, inclusivity, and deeper engagement. By shifting some control to students, instructors can cultivate a more active and personalized learning environment. Choice boards respect the diverse needs and strengths of students while ensuring that academic standards are met, making them a powerful tool for modern, student-centered teaching (Arendt, Trego & Allred, 2016).

CASE STUDY

During the spring semester 2025, I implemented a choice board into the applied learning component of my Introduction to Reading and Language Arts Methods course, which was comprised of 26 students of varying backgrounds and interests including early childhood, elementary, and special education certification areas. This five-hour course has served as the foundational literacy class for education students for the past decade. Beginning in 2017, the course has included an extensive applied learning component that requires students to spend 20-25 hours observing, planning lessons, and working with P-12 students in reading and language arts methods. I had recently noticed that an increasing

proportion of students were working full-time in schools or were otherwise engaged during the time that whole group applied learning experiences would take place, so I created a choice board with options for multiple engagement opportunities (see Figure 1). My key considerations in creating this assignment were: 1. Exposure to specific reading and language arts methods in typical classrooms; 2. Engagement with P-12 students; 3. Opportunities to plan and teach reading and language arts methods and; 4. Opportunities to engage creatively with literacy rich environments to develop an enthusiasm for teaching reading. I then applied these considerations to the four areas of differentiation recommended my Tomlinson (2014): content, process, product, and learning environment.

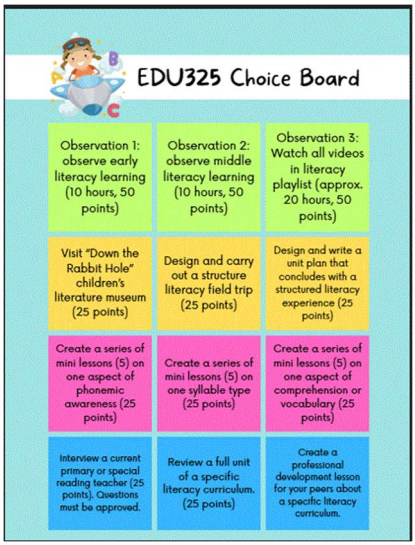

Figure 1. ***EDU325 Choice Panel***

1. Content: the content of this course is aligned with the Missouri State Teacher Education standards for early childhood, elementary, and special education teachers. Because students from three different programs all take this course, I was able to differentiation *some* content based on the program area. Many of the standards are in all three programs, so the content differentiation was limited.
2. Process: students were offered varied activities, resources, and strategies to make sense of the content. For example, students could choose an article, video, or interview to learn about the literacy skill they were observing and planning for as part of the applied learning experience.
3. Product: students could demonstrate their understanding of the material in a variety of ways including lesson plans, presentations, video recordings, and live presentations.
4. Learning environment: students were able to identify their own placement, attend the elementary school alongside the instructor, or have the instructor find them an individual placement with a mentor.

While I did not collect student-level data on this experience, all the of the students did complete their applied learning experiences. Slightly more than half followed the traditional applied learning program that I led, taking groups of students to a local elementary school and working with special reading students at that school. Because of the flexibility in how the assignment points were accrued, some students started their applied learning with the traditional professor-led applied learning and then earned additional points through other projects. Finally, several students who work full-time in schools were able to

complete the applied learning requirements in their work environment.

For each choice, truncated rubrics and assignments were created to guide students in the process while also allowing the inherent flexibility of choice boards to remain. Those documents are included in Appendix A.
Students were required to plan and submit "check points" on their applied learning time, and three students required intervention to remain on track to completing the project. End of semester reflections noted that students appreciated the flexibility of the applied learning project, particularly in terms of when and where the hours were completed.

Students were surveyed anonymously at the end of the course. Overall ratings on the choice board assignment were favorable, with students appreciating the flexibility to create options that could be done in their employment setting. Some students noted that having a traditional instructor-led placement as an option was preferably to all student-led placements.

The applied learning component of this course has been included on the syllabus as 20% of the grade since 2019. This has always included a rubric that includes a time log (completion of the activities) and a reflection piece that asks students to connect concepts covered in the course with the applied learning experience. The additional components of the course include projects and exams, all of which use clearly-defined rubrics and grading criteria. It is my belief that the applied learning supports progress toward mastery of the learning objectives defined in these projects, but the applied learning project itself was not designed to be an outcome measure.

Using choice boards for applied learning does create some challenges. First, students need to be held accountable throughout the semester both in terms of rigor and quantity. One student originally wrote that she would observe herself teaching, so I adjusted the rubric for observing to include options such as special education and special reading outside of their normal employment placement. Second, because this is an introductory class, students did not have schema to observe and plan science of reading lessons from the beginning of the experience. To make the early experiences meaningful and productive, I gave students specific tasks to complete during their applied learning, such as interviewing a P-12 student to understand their oral language background. I was then able to scaffold later tasks for more independent learning.

Previous research (see Buchanan et al, 2019) has demonstrated that applied learning in teacher education has promise and opportunities for partnerships with P-12 partnerships. By implementing choice boards, teacher educators can provide the flexibility of multiple models of implementation while still meeting the diverse and divergent needs of diverse student populations.

CONCLUSION

In an increasingly diverse and dynamic higher education landscape, instructors must adopt flexible and inclusive strategies to support meaningful learning for all students. Integrating choice boards into applied learning offers a compelling approach to differentiation, allowing students to engage with course

content in ways that align with their strengths, interests, and goals. By providing structured yet adaptable options for demonstrating knowledge, choice boards help bridge the gap between theory and practice while fostering student ownership, creativity, and deeper engagement.

While this article explores choice boards in a course that inherently includes applied learning, these assignment options could also be applied in general education courses. By presenting students with a menu of task options aligned with core learning objectives instructors can accommodate different learning styles, interests, and levels of readiness. For example, a biology choice board might include options to design an infographic explaining a cellular process, conduct a virtual lab simulation, or write a research brief connecting course content to a real-world environmental issue. Similarly, in a history course, students might choose to create a podcast about a pivotal event, compare and contrast primary documents, or lead a seminar discussion. This structure allows students to engage with material in ways that highlight their strengths while still meeting rigorous academic standards. By applying Tomlinson's (2014) criteria for differentiation, it is possible to create a range of options in many content areas.

This exploration of choice boards as a tool for differentiated applied learning highlights their potential to enhance both instructional effectiveness and student outcomes. As institutions continue to prioritize experiential learning and equity, further research and innovation in this area can inform best practices and inspire new approaches to curriculum design. Ultimately, leveraging choice boards in higher education not only supports academic success but also prepares students to navigate complex, real-world challenges with confidence and adaptability.

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APPENDIX A

Field Work Choice Board EDUXXX Spring 2025

Observations Choose at least one (1)	***Additional choices*** Choose up to one	***Stackable Options*** Choose as many as needed (can do multiple of one)
Early: Ten (10) hours observing early literacy activities such as oral language, print concepts, and phonological awareness (50 pts)	**The Rabbit Hole**: Visit "The Rabbit Hole" children's literature museum and create a lesson plan (35 points)	**Book Report:** Create and write a book report on a children's chapter book (cannot be picture book.) 5 points for 200 pages or less, 10 points for 201+
Elementary: Ten (10) hours observing primary or older literacy activities such as phonics, comprehension, and vocabulary	**MYO Field Trip**: Create and implement a structured field trip connected to a children's book (35 points)	**Lesson Plan** Create a mini lesson plan for a read aloud or independent reading children's book. Must be standards-based. (5 points)
Virtual: Twenty hours of videos will be provided covering both early and middle literacy development	**Interview 1**: Interview a current primary or special reading teacher (35 points). Questions must be approved.	**Read Aloud** Go to a read aloud in a classroom or library (5 points)
MYO: Create your own observation (50 pts/10 hrs)	**Interview 2**: Interview a librarian (35 points). Questions must be approved.	
Points:		

EDU325 Choice Board Rubric
General Evaluation Criteria

- **Exceeds Expectations (Full Points)**: Demonstrates deep understanding, creativity, and professional-level application. Work is thorough, polished, and well-supported.
- **Meets Expectations (¾ Points)**: Demonstrates understanding and application of concepts. Work is clear, mostly complete, and meets assignment requirements.

- **Approaching Expectations (½ Points)**: Demonstrates partial understanding. Work lacks depth, detail, or clarity; some requirements missing.
- **Below Expectations (¼ or 0 Points)**: Minimal effort, incomplete, or missing key elements.

Observations (50 points each)

Criteria:

1. **Completion of Required Hours** (10–20 hours documented) – 10 pts
2. **Quality of Notes/Reflection** (depth, accuracy, evidence of learning) – 15 pts
3. **Connections to Literacy Concepts** (theory to practice) – 15 pts
4. **Professionalism & Presentation** – 10 pts

Projects/Experiences (25 points each)

(e.g., museum visit, field trip, unit plan, mini lessons, interviews, curriculum review, developmental plan)

Criteria:

1. **Completion of Task Requirements** (all elements included, correct format) – 5 pts
2. **Application of Literacy Knowledge** (accurate use of concepts/strategies) – 7 pts
3. **Creativity/Originality** (innovative approaches, engaging presentation) – 5 pts
4. **Clarity & Organization** (professional, polished work, grammar/mechanics) – 4 pts
5. **Depth of Reflection/Analysis** (goes beyond surface-level description) – 4 pts

Scoring Example

- Exceeds Expectations: 24–25 pts (project) | 47–50 pts (observation)
- Meets Expectations: 18–23 pts (project) | 37–46 pts (observation)
- Approaching: 13–17 pts (project) | 25–36 pts (observation)
- Below: 0–12 pts (project) | 0–24 pts (observation)

On PAR Assessment: Using Participation, Attendance, and Reflection in the Flipped Classroom

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Abstract

Higher education uses active learning models like the flipped classroom to foster deeper engagement and real-world skill development. However, traditional assessment methods may not capture the collaborative and process-oriented nature of these learning environments. The Participation, Attendance, and Reflection (PAR) framework is an assessment approach designed to align with the goals of flipped pedagogy. Drawing on the author's experience implementing PAR in an undergraduate public relations course, the article illustrates how this model promoted student accountability, critical thinking, and professional growth. Implementing the framework encouraged consistent participation, reframed attendance as a professional responsibility, and leveraged reflection to deepen learning. Additionally, the article discusses the transferability of PAR across disciplines, course sizes, and delivery formats. By centering assessment on student engagement and reflective practice, the PAR framework offers a practical, inclusive approach to evaluating learning in the evolving academic landscape.

INTRODUCTION

Picture a student walking into class after a late-night shift, juggling their cell phone and coffee with a tuition bill weighing on their mind. This is not an exception; it is the norm for many of today's students who have jobs, family responsibilities, and financial stress. These students are also trying to navigate a digital environment that competes constantly for their attention. While students may be stretched in many directions, they are also outspoken in their desire for relevant, applied learning experiences that connect to their future.

Against this backdrop, higher education is undergoing a transformation, not just in terms of pedagogy, but also within a broader sociopolitical context. Amid ongoing discussions of academic freedom and the value of higher education, as well as an increased scrutiny of institutions across the country, colleges and universities are being called to adapt their teaching and assessment practices (Fischer, 2024). For this reason, many instructors at all levels of higher education are reexamining how learning is defined, measured, and demonstrated in ways that reflect disciplinary standards, the political landscape, and the realities of today's students. One area receiving particular attention is the growing use of active learning strategies, which not only reshape how content is delivered but also challenge conventional notions of assessment (Fischer, 2024).

Flipping the classroom is an active learning strategy that has gained traction in many disciplines, from communication and education to business and STEM fields. The flipped approach shifts the delivery of content outside the classroom, creating space during class time for hands-on application of course concepts and theory to support critical thinking and deeper engagement with the material and among peers (Kuh, 2008; Låg & Grøm, 2019; Lo, 2020). However, traditional forms of assessment, such as exams, essays, or research papers, may not be the best tools for capturing the skills and competencies developed in a collaborative environment. This gap between what students is asked to *do* in active learning spaces and how they are ultimately *measured* calls for new ways of thinking about evaluation. One such approach that aims to bridge the gap is Participation, Attendance, and Reflection (PAR), a process-based, holistic framework that helps instructors evaluate how students show up, contribute, and grow throughout the semester.

ASSESSMENT IN THE FLIPPED CLASSROOM

Applied learning is recognized as a key pedagogical tool because it fosters student engagement, improves knowledge retention, and prepares students for future success in their careers (Abeysekera & Dawson, 2015; Kolb, 1985; Låg & Grøm, 2019). For this reason, the flipped classroom approach has become a go-instructional model in higher education in disciplines that emphasize skill development and applied knowledge (Bishop & Verleger, 2013; Cheng et al., 2020; O'Flaherty & Phillips, 2015). By inverting the traditional course structure, flipped learning can empower students to engage deeply with the content through peer discussion and collaboration, case study analyses, group projects, and real-world problem-solving (Abeysekera & Dawson, 2015; Cheng et al.,

2020; Lo, 2020).

However, assessment strategies that effectively capture all facets of learning in these environments may be challenging for instructors who may rely on traditional modes of assessment, as traditional assessment models typically focus heavily on final deliverables over the developmental process. Participation, although valued, may be less structured and difficult to evaluate with consistency. Further, attendance can be treated as a binary metric, rather than as a contributor to collaborative learning and accountability. Finally, reflection, while recognized for its role in metacognition and knowledge integration is sometimes underutilized (Ash & Clayton, 2004; Moon, 2013; Van Sickle, 2016).

These challenges highlight a broader issue: the disconnect between innovative, student-centered pedagogies and the conventional tools still used to evaluate learning. As educators increasingly embrace active learning models like the flipped classroom, there is a growing need for assessment strategies that align more closely with the goals of engagement, collaboration, and continuous learning. One such approach is the PAR framework, which is rooted in an established body of scholarship that calls for more integrative, process-oriented approaches to assessment in applied and experiential classrooms (Ash & Clayton, 2004; Cheng, 2020; Freeman et al., 2014; Låg & Grøm, 2019). By incorporating participation, attendance, and reflection as central components of the grading system, PAR may bridge the gap between flipped pedagogies and traditional assessment frameworks.

IMPLEMENTING PAR IN THE FLIPPED PR CLASSROOM

Because students are often encouraged to take risks, share ideas, and provide feedback to their peers, building a culture of accountability and reflection in the flipped classroom is essential. The PAR framework can foster this culture by making participation visible, framing attendance as a professional responsibility, and encouraging students to articulate and evaluate their own learning journey. To illustrate how PAR functions in practice, the following case study will explain how PAR was applied in a flipped public relations course taught in the Media & Journalism department at a public university in the Midwest.

The foundational, three-credit course met Monday, Wednesday and Friday for 50 minutes. It was comprised of 15 – 25 students from a variety of majors including communication studies, sport marketing, media and journalism, business, sustainability, and others. Students completed readings and video lectures outside of class, freeing up in-class time for applied learning activities, such as case study evaluations, press conference and crisis simulations, event planning exercises, campaign development, and mock debates. The three pillars—participation, attendance, reflection—allowed students to actively apply course concepts in a low-stakes, peer-supported environment, which mirrors the collaborative problem-solving environment that is required in the workplace.

Participation

In the flipped PR Principles course, students engaged in a variety of in-class activities that simulate real-world public relations scenarios: case study analysis, campaign planning, mock press conferences, debates, and crisis simulations. These exercises encouraged students to apply theoretical knowledge in dynamic settings, requiring them to analyze, synthesize, and evaluate communication strategies in real time.

Participation was not relegated to simply speaking in class—it was about being mentally present, contributing ideas, collaborating with peers, problem-solving under pressure, and other behaviors the instructor could observe. Additionally, when working in groups, students were required to designate a leader who would turn in their notes at the end of class. Because a higher level of involvement counted toward their participation points, they took ownership of their ideas and were invested in the success of their teams.

Attendance

In the PAR framework, attendance goes beyond just being present in the room. It was framed as a professional behavior that supported accountability, reliability, and team collaboration—essential traits in any communication career. Students were expected to attend class consistently, not only for their own learning, but to support their peers in completing shared tasks.

To promote a more empathetic and real-world approach, the course instructor introduced the concept of Personal Time Off (PTO). Students were allotted a small number of flexible class absences they were required to ask for in advance. This flexibility mirrored workplace norms, giving students more accountability for their absences and removing the punitive tone that can be associated with attendance policies. At the end of the semester, any unused PTO was converted into extra credit, providing an incentive for consistent attendance while respecting students' personal needs.

Reflection

The third pillar of the PAR framework is reflection—an essential but sometimes underutilized aspect of assessment. After completing major activities, students were asked to reflect on what they learned, how they approached a problem, what strategies worked and which ones needed to be refined, and how their understanding of PR concepts evolved through the activity. The reflections were guided by prompts and shared in weekly writing assignments, in small group discussions, and through in-class activities and role-playing. The goal was to encourage metacognition (Abeysekera & Dawson, 2015) and help students draw connections between theory and practice. By making their learning visible, the instructor observed that as the semester progressed, students developed a deeper understanding of public relations principles and gained confidence in their ability to apply them.

In the PR classroom, participation, attendance, and reflection created a cohesive framework that was more than the sum of its parts. Participation

fostered active engagement, attendance ensured accountability, and reflection helped students connect experience to theory. These elements reinforced one another, producing a richer learning environment that cultivated both academic growth and professional readiness.

Tracking PAR Tasks

Throughout the semester, students completed a variety of PAR-related activities tied to in-class learning objectives. Student participation and reflection were tracked in different ways, including instructor observation, in-class activities, and discussion and activity notes. These deliverables provided evidence of how students were processing the material and contributing to the learning environment. Moreover, attendance was recorded for each class session, but with an emphasis on presence as contribution rather than physical attendance.

Grading & Weighting

To promote fairness and reduce anxiety, only a subset of PAR activities was used in calculating the final grade. At the end of the semester, 10 to 15 tasks were randomly selected from the full semester's log for each student. This method ensured that students who were consistently engaged performed well, while reducing the pressure of perfection for every single class. It also discouraged strategic attendance or participation for only "known" graded days, encouraging steady effort. PAR tasks collectively made up 10 to 15 percent of a student's overall grade for the course. This weight signaled to students that how they showed up (e.g., prepared, focused), collaborated, and reflected was a pathway to successful completion of the course.

ALIGNING CLASSROOM EXPERIENCES WITH PROFESSIONAL EXPECTATAIONS

Implementing the PAR framework enhanced student engagement, accountability, and skill development in the flipped public relations classroom. While no formal study has been conducted to date, anecdotal evidence and instructor observation indicated more consistent participation, demonstrating a deeper understanding of course concepts and greater confidence in applying communication strategies in a collaborative environment.

Similarly, through recurring practice and feedback in simulations and projects, many students demonstrated improvement in their public speaking, strategic thinking, and collaborative problem-solving, which are key to success in professional environments. Further, the introduction of PTO also shifted classroom dynamics. By giving students control over their absences without fear of penalty, the policy reinforced mutual respect and real-world responsibility. At the same time, the PAR framework promoted consistency. Because students were aware that random participation and reflection tasks were graded, they were motivated to stay engaged throughout the semester, not just when a major

assignment was due.

Finally, the reflection component provided some of the richest insights into student learning. Many students wrote candidly about what they struggled with during an activity, how their understanding of a concept shifted, or what they would do differently next time. These moments of metacognition revealed growth that might otherwise go unnoticed. These insights can be invaluable for the instructor in determining what activities are working and which ones need further refinement.

POTENTIAL CHALLENGES

Although the PAR framework aligns with inclusive teaching practices and creates room for student autonomy, there are some limitations to its implementation. One concern for instructors may be an increased workload, as monitoring participation, taking attendance, and reviewing reflections can be a time-consuming process. Another challenge for instructors may be perceived subjectivity. Because participation and reflection are less quantifiable than exams or quizzes, students may perceive grading is inconsistent or biased. This risk can be mitigated by clearly communicating expectations and including them in the course syllabus. It is also possible students may resist participation-based grading. Gaining buy-in requires explaining the purpose of PAR, designing flexible opportunities for contribution, and making class time fun. Finally, issues of scalability and fit must be acknowledged. While PAR is highly effective in small to medium-sized classes, applying it in large lecture courses may require more thoughtful adaptation. Likewise, some disciplines with long-standing reliance on standardized exams may view process-oriented assessment as a departure from accepted norms. In these cases, PAR can still be applied, but instructors may need to integrate it slowly alongside traditional assessment methods. Even small shifts in assessment practice can make a profound difference in how students engage, collaborate, and see themselves as capable learners who are ready for the workforce.

EXPANDED APPLICABILITY

Although the PAR framework was developed within the context of a flipped public relations classroom, its core principles—engagement, accountability, and reflective practice—are applicable across a wide range of disciplines, class sizes, and course formats. For example, in a biology course participation might involve lab work or data analysis; in a finance course, participation could mean working collaboratively to analyze investment scenarios or present financial recommendations. In classes with many students, instructors may use polls, clickers, or quick-response apps (e.g., Kahoot, Mentimeter) to capture participation, or digital tools (e.g. discussion boards, pre- or post-class posts) found in a learning management system. In smaller classrooms, participation can be evaluated through participation in discussion and in-class group work. Whether the course is face-to-face, delivered online, or hybrid, the most value for students comes from the application of course concepts in real-time,

collaboration, and meaningful assessment.

Similarly, when attendance is framed as professional accountability rather than as a punitive measure, the concept of PTO can bring value in virtually any classroom and can be beneficial to students entering the workforce. Whether students are working on studio critiques in an art class or troubleshooting supply chain challenges in case-based exercises in an operations management course, showing up consistently and contributing to group processes remains essential. The PTO concept is also scalable, requiring minimal administrative burden while offering students a real-world approach to time management. It is an easy policy to implement in large classes, hybrid formats, or courses with rotating attendance schedules.

Reflection also transcends disciplines. It helps students in all fields develop self-awareness and deepen their understanding of how they learn. Reflective prompts can be tailored to focus on technical skills, ethical reasoning, or creative processes, depending on the course objectives. The use of technology can also be incorporated into the reflection component when students are encouraged to deliver their reflections using short audio or video clips, blog posts, infographics and more.

In conclusion, the PAR framework is an assessment strategy that can be both rigorous and responsive, honoring the complexity of learning while adapting to the realities of today's students. With it, instructors can create a more authentic, process-based approach that cultivates engagement, accountability, and self-awareness across many disciplines and formats. Though challenges exist, PAR offers a practical path toward assessment that mirrors the collaborative, adaptable, and reflective skills students need in their professional and civic lives.

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An Applied Learning Approach to Teaching Crime Theories: Evidence of its Successful Impact Using the Students' Own Words

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Keywords: crime theories, criminological theories, applied learning, case study approach

Abstract

This paper is primarily a best practices article that introduces an applied learning approach that is used in the Introduction to Crime Theories class at Missouri Western State University to help the students learn criminological theories better. The approach consists of having students investigate real crime stories in order for them to make connections with the crime theories they are studying in the class. The impact of this applied learning approach on student writing assignments and the evidence that students have a greater understanding of and the ability to clearly articulate the key points of these theories using examples of their writing over the past few semesters is presented. A comparison of aggregate scores on exams and written assignments shows that these students performed better on both written assignment scores and exam scores than the students in traditional crime theories courses.

An ancient Chinese proverb tells us, “I hear and I forget; I see and I remember; I do and I understand” (Duley & Permaul, 1984, p. 18). Having taught undergraduate criminal justice students for almost 30 years, I can relate to students hearing me teaching on crime theories and then forgetting what I have said. As technology advanced over the past few decades, we as teachers become more proficient in the use of visual aids and began using lecture aids such as PowerPoint so that students could better remember what we were teaching as they could “see” pictures, videos, and lecture notes. The goal then, as we follow this proverb, is that we want students to not only remember, but to understand what we are teaching. Particularly, in the area of teaching crime theories we want our students to not only remember for the final exam, but to understand these theories as they continue their criminal justice studies and ultimate career. Thus, we need to help them “do” something in order to better understand what we are teaching them. The “do” is better understood as some form of applied or experiential learning. Using a case-study applied learning approach, we have found that students better understand crime theories and their implications by having them connect the crime theories to well-known crimes and/or criminals.

LITERATURE REVIEW

Kolb (1984) is largely credited with introducing or at least reintroducing experiential or applied learning to higher education. He drew upon the work of earlier learning theorists such as John Dewey, Jean Piaget, William James, and others to explain the experiential learning process. During this same decade that Kolb published his book, another researcher (Crew, 1987) lamented the state of education in the 1980s. Crew argued that the social upheavals of the 1960’s led to a worsened learning environment and a focus by teachers to teaching to the test. Crew argued that an experiential or applied learning approach could improve student learning, stating that, “the best teaching-learning situation is the proper blend of actual and vicarious experiences, of theory and practice, each enriching the other” (Crew, 1987, p. 147). He further stated, “when knowledge is learned in relation to use in actual simulations, that knowledge becomes more permanent, functional, and transferable” (Crew, 1987, p. 147). Other researchers writing about applied or experiential learning in the 1980s stated that, “students involved in experience-based learning also have improved attitudes towards learning in general” and that students involved in applied learning participate more in, “class discussion rather than passively absorbing information from the instructors and textbooks” (Duley & Permaul, 1984, p. 20). Experiential learning assumes that one learns best when one gains knowledge through a process of discovery (Crew, 1987). Another researcher stated that, “an essential element of experiential education is the bridging of academic and applied learning settings whereby the connections between theory and practice are investigated in some detail” (DeMartini, 1983). In more recent years Trolian and Jach (2020), found that applied learning in higher education were correlated with increased motivation in academics.

An applied learning or experiential approach to teaching criminal justice or

criminology concepts has been successfully done by college or university instructors. Specific to the area of teaching crime, deviance, and criminal justice, Greenberg (1989) explained his approach to helping students better learn about the criminal justice system by having his students interview the local population of incarcerated juveniles and adults. Another researcher found that student learning is enhanced when students employ the discovery process in a more active educational experience (Taub, 1991). Taub also had students involved in visiting and interviewing inmates in correctional centers, residents of abuse shelters, and participants of self-help groups. Taub focused on having students in these settings observe social psychological phenomena directly and to apply social psychological concepts and theories in actual situations. More recent researchers have used virtual reality technology to teach students various aspects of criminal investigation (Meenaghan & van Sintemaartensdijk, 2024).

In the area of teaching crime theories, a number of researchers have attempted and advocated for various applied learning approaches. Orum (1980) was an early advocate for an applied learning approach to teaching crime theories. His participatory approach involved having the students prepare presentations of specific theories/theorists to teach the class. Rothe and Collins (2013) used film and music to help teach about criminological theories. They argued that using such mediums enhanced the undergraduate students' ability to understand and apply crime theories to their everyday lives. One group of researchers discussed a variety of approaches for teaching crime and deviance theories to undergraduate students using carefully designed visual representations, small-group discussions, and a case-study approach (Williams, Rodeheaver, & Sethuraju, 1995). Norman (1991) also used an approach to teaching crime theories where students were assigned to analyze and apply certain crime theories to specific types of crimes. This approach has been described by researchers as a "case-study" approach to teaching crime theories (Quinn, Holman, & Tobolowsky, 1992). They explained that, "the case study method of explaining crime allows students to see how various factors are involved in a crime when they apply a variety of theories to an actual case" and that "this method is very effective in transforming theory from a mere object of study into an explanatory device that students can use habitually" (p. 67).

CONTEXT OF CURRENT RESEARCH

The Introduction to Crime Theories class (CRJ 305) is a core class requirement for the Bachelors of Science in Criminal Justice (BS-CJ) degree at Missouri Western State University. Students usually take this upper division class during their junior year. As indicated by the course name, it is an introductory class of all the major branches of criminological theory presented in a one semester course schedule. Over the course of the class, students are presented with 45 specific crime theories from these main branches of criminological thought that have been introduced from about 250 years ago to the present day.

I have taught this or similar crime theory courses at three different institutions of higher education going back almost 30 years. Students have typically gotten bogged down with the numerous crime theories and it is a major challenge to simply get them to remember the names and basic information of the theories for the requisite exam. That has changed since I have developed and taught using the case study method.

In 2021 I began developing a particular case-study method to teaching crime theories that employed an applied learning approach for my CRJ 305 course using a two-prong strategy to help them understand the theories from actual crimes and criminals. The first prong involved having all of the students learn about the same crime/criminal in a particular week to make application to that week's crime theories. All of the students would learn about the crime/criminal by watching a documentary film and then engaging in an online discussion forum where each of them were asked to apply certain concepts of the week's crime theories to that crime/criminal. All students were then asked to read the discussion postings of all other students, making at least one comment to one of them, and thus giving each of them an opportunity to learn from the other students in the class as to how they applied the crime theory concepts to the selected crime/criminal.

The second prong of the applied learning strategy involved having students select a specific crime/criminal that they would use throughout the semester to apply to all 45 crime theories in a writing assignment due near the end of the semester. They were first instructed to find a lengthy book or internet sources to learn as much as possible about their chosen criminal. They were instructed to make sure their sources of information included much about the younger years and upbringing of the person and that their chosen criminal had to be someone that had been convicted and sentenced for the crime(s) for which they were widely known. Some of the criminals commonly chosen by students included Ted Bundy, Aileen Wuornos, Charles Manson, and Richard Ramirez.

In this major writing assignment, the students were asked to explain in detail how the specific theory did or did not apply to their chosen criminal. Where they could find some clear connections between a particular crime theory and their criminal, they were asked to explain these connections using concepts from the theory. Similarly, with the crime theories where there was no connection to their criminal, they were asked to provide good explanation as to why the theory did not fit using concepts from that particular crime theory.

METHOD

This paper is mostly a best-practices paper where I have described my experience using a case-study approach to teaching crime theories. However, it goes beyond best practices to present qualitative research showing greater student comprehension of crime theories using the case-study approach. To test the effectiveness of this approach I have compared aggregate exam scores and scores on the theory/policy writing assignment for several "traditional" approach crime theory classes offered prior to 2020 and for all of the "case-study"

approach classes taught after 2021. The primary method used to determine student improvement of comprehension of crime theories came from a review of student writing about these theories.

Having access to the required records, I have been able to review student scores and writing artifacts and have selected a few of them to highlight how much these students have learned about the crime theories by applying them to real crime/criminals. I will first introduce and discuss a particular crime theory and then using exact quotes detail what the students prior to 2021 said about the theory (referred to as "traditional students"). I will then introduce some exact quotes from student assignments since 2021 where they explain in much greater detail about their understanding of the particular crime theory using the information about the chosen crime/criminal. It has been very gratifying to see that most students in my classes since 2021 are able to articulate much more information and understanding about these crime theories using this case-study method of teaching crime theories.

RESULTS

A comparison of exam scores between the traditional and case-study students showed that the case-study students did better on exams testing their comprehension of crime theories. The average exam score for the traditional students (total of 182 students) was 80/100. The average exam score for the case-study students (total of 92 students) was 83/100. There was a greater disparity between the two groups of students on the average scores on the theory/policy written assignment(s). The traditional students averaged a score of 69/100 on these papers. The case-study students averaged a score of 82 on these writing assignments. This much higher score on an assignment where the students had to articulate their understanding of these crime theories by the case-study students is impressive and demonstrates the value of using this applied learning approach to teaching crime theories. The more impactful evidence of the superiority of using the case-study approach is in the following examples of student writing as they explain their understanding and application of these crime theories.

The first crime theory that is usually introduced in an introduction to crime theories class is rational choice theory. This theory comes from the pioneering writings of Cesare Beccaria and Jeremy Bentham (among others) from the mid to late 1700's. They asserted that criminal behavior is ultimately a choice, made in the context of personal and situational constraints and opportunities and that law-violating behavior is the product of careful thought and planning.
One of the traditional students wrote this about Rational Choice Theory, "With the rational choice theory, informal factors have a much larger influence on juveniles than formal factors like law enforcement officials do. If a young individual has no regard for formal factors in their lives, it enables them to be able to commit crimes of all levels with no fear of punishment from law enforcement."

One of the case-study students wrote the following detailed explanation regarding how Rational Choice Theory connected to Melvin Ignatow who murdered his girlfriend Brenda Sue Shaefer in Kentucky in 1988.

Ignatow officially formalized a rational decision of harming Brenda when he consciously formulated the idea of killing her (before), which he successfully did (during), and knowingly concealed the crime (after). This can be viewed as a rational, calculated step, each with their own intended outcomes and perceived benefits, thus aligning with the principles of Rational Choice Theory.

- **Motive for the Crime:** Ignatow committed the crime largely due to his proclivity to abuse and control, which when he became aware of Brenda's plan to end their relationship, triggered the anger to commit the crime.
- **Non-Criminal Options:** Ignatow could have sought counseling or therapy to deal with his anger and control issues or could have simply accepted the end of the relationship and moved on. One can infer that the reason he did not choose these options is likely related to his abusive nature and lack of regard for Brenda's life and well-being.
- **Skills that Helped in Committing the Crime:** Ignatow displayed a certain level of cunning and manipulation, which certainly helped him in planning and committing the crime without immediately being caught.
- **Resources/Materials:** Ignatow needed a secluded location and means to restrain and harm Brenda. He had the assistance of a former girlfriend, Mary Ann Shore, who helped him prepare a location and execute the crime. Shore's involvement and their joint planning were crucial to carrying out the crime.
- **Planning for the Crime:** He meticulously planned the crime with the help of Mary Ann Shore, who assisted in preparing a location, which included digging a grave for Brenda prior to her murder. They also planned the restraint and abuse of Brenda.
- **Before the Crime to Reduce Risk of Capture:** Ignatow used manipulation and deceit to maintain a semblance of a normal relationship with Brenda to lure her into a false sense of security. The secluded location and the pre-dug grave were also efforts to avoid detection, completely.
- **After the Crime to Avoid Capture:** After the crime, he and Shore concealed evidence, and Ignatow maintained his innocence, misleading the investigators. He managed to hide the photographic evidence (which later helped induce his confession) of the crime effectively, leading to his initial acquittal.

The second crime theory that we are going to discuss and introduce student writings is Routine Activities Theory that was authored by Cohen and Felson in 1979. The basic concepts of this theory are that crime victimization is a function of the interrelationship between the following three variables: the availability of suitable targets, the absence of capable guardians, and the presence of motivated

offenders.

One traditional student wrote, "Routine activities theory refers to the idea that most crime occurs in the daily routine of individuals that commit crime. The theory must also include motivated offenders, suitable targets, and a lack of guardianship which statistically can be backed up." Another traditional student wrote, "A crime event can only happen when a likely offender, and a suitable target come together in a particular place and time, and there is no capable guardian there to prevent an interaction between the offender and the target."

A case-study student explained this theory using the case of Charles Cullen who worked as a nurse and used his position to kill dozens if not hundreds of patients.

- **Motivated Offender:** Charles Cullen, who had the intent and capability to harm patients fits the criteria for a motivated offender due to his position and access to medical substances that could be used lethally.
- **Suitable Target:** The patients under his care were suitable targets because they were vulnerable due to their health conditions and their dependency on medical staff. Making them defenseless against his actions
- **Lack of Capable Guardianship:** The hospitals where he worked lacked adequate oversight and monitoring, this absence allowed him to administer lethal doses of medication without immediate detection or intervention.

Another case-study student wrote the following in applying Routine Activities Theory to the serial killer John Wayne Gacy:

Routine Activities Theory describes crime as the convergence of three factors: a motivated offender, a suitable target, and the absence of a capable guardian.

In John Wayne Gacy's case, these elements aligned repeatedly, facilitating his crimes. Gacy acted as a highly motivated offender, driven by deep psychological needs and a willingness to deceive others.

He selected victims who often matched his criteria of suitable targets, usually young men alone or seeking work, which made them vulnerable to his manipulation. Many of these individuals were in transitional or isolated settings, such as bus stations or bars, where Gacy could approach them under the false pretense of offering help, friendship, or employment. This setting allowed him to identify and select individuals who were both accessible and unsuspecting.

The absence of capable guardians added another crucial factor in enabling Gacy's actions. Many of his victims lacked strong family support or lived unstable lives, which left them without consistent protective figures. Even those with families or stable connections were often led to trust Gacy due to his outward appearance as a reputable business owner and community volunteer. For instance, his offer of a job to 15-year-old Robert Piest provided a false sense of security, allowing Gacy to isolate him without drawing suspicion. Gacy's

home also eliminated any chance of intervention, giving him the level of control needed to carry out his crimes.

A key crime theory developed mostly during the twentieth century was Social Learning Theory. This theory explains that criminals learn criminal attitudes, traits, and techniques by observing others and that criminal behavior increases when it is reinforced either positively or negatively and that it decreases when punishment is either positively or negatively applied.

A traditional student wrote the following regarding Social Learning Theory. "If a behavior produces positive reinforcers and increases occurrence, it is called positive reinforcement. When a behavior removes or possibly avoids negative reinforcers and then increases an occurrence it is called negative reinforcement. If a behavior produces aversive stimuli which then decreases the occurrence this behavioral process is called positive punishment. When a behavior removes or avoids positive reinforcers which then decreases the occurrence it is called negative reinforcement. A behavior can either create or take away a neutral stimulus which does not affect its occurrence. When a behavior no longer produces a neutral stimulus which decrease the occurrence it is called extinction."

The following case-study student gave a more detailed explanation of Social Learning Theory using Aaron Hernandez, a professional football player who was convicted of murder as an example:

Social Learning Theory suggests that individuals learn behaviors through observation, imitation, and modeling, as well as through direct reinforcement and punishment.

Hernandez grew up in an environment where he was exposed to violence and criminal behavior.

Hernandez observed peers and family members engaging in illegal activities, which may have normalized these types of behaviors for him.

Social Learning Theory emphasizes the role of reinforcement (positive or negative) and punishment in shaping behavior.

If Hernandez engaged in violent or unlawful behaviors and received social approval or admiration from peers or gang members, this could be seen as a positive reinforcement. Gaining respect, status, or a sense of belonging within a group that values toughness and criminality could encourage him to continue such behaviors.

If engaging in criminal behavior allowed Hernandez to avoid negative outcomes this could reinforce his actions. Using violence might have provided him with a means to control or defend himself in a hostile environment. The lack of immediate punishment for earlier offenses and delinquent behavior may have led to a belief that such behaviors were acceptable. If he did not experience strong penalties for prior criminal actions, it could have diminished the deterrent effect of punishment.

Another case-study student wrote the following explanation of the connections between Social Learning Theory and Richard Ramirez, a serial killer in California in the 1980's:

Differential Association: Upbringing and early exposure to criminal influences, such as his older cousin Mike, may have played a role in his criminal development. Mike was a war veteran. He showed Richard pictures of victims he killed overseas. Richard was aroused by these photos. Mike also taught him tactics such as not being seen and how to hide in the dark.

Differential Reinforcement: For Ramirez, the excitement and thrill he felt during his criminal acts could be a form of positive reinforcement, which could have motivated him to continue engaging in criminal behavior.

Imitation: Ramirez might have observed and imitated criminal behaviors from the criminals he associated. When Ramirez was younger, he watched his cousin Mike shoot his wife. Blood splattered on his face from the shooting.

Definitions: It's possible that Ramirez had developed definitions and justifications for his criminal actions, through rationalizations or distorted moral perspectives.

Positive Reinforcement: Ramirez may have experienced positive reinforcement from pleasure, excitement, or satisfaction from committing his crimes. This positive experience could have motivated him to continue criminal behavior.

Negative Reinforcement: Ramirez was not caught initially he was reinforced to continue his crimes since he was not suffering negative consequences

Another social crime theory is Social Bond Theory authored by Travis Hirschi in 1969. This theory explains that individual with a strong moral bond to society are "controlled" by prosocial attachments, commitments, involvement, and belief and thus do not typically engage in criminality.

A traditional student wrote the following about Social Bond Theory. "Hirschi's Social Bond Theory explains and provides a framework of what would need to occur in order to stop juveniles from becoming delinquent. This particular theory starts with the premise that at birth you have no conscience and develop a sense of right and wrong from the influence of your parents, school, and community. According to Travis Hirschi's Social Bond Theory, there are four elements and types of bonds that juveniles develop in order to determine whether or not they are likely to commit crimes and become delinquent." Another traditional student wrote, "This theory is made up of four elements. The attachment, commitment, involvement and belief are the four different sections."

A case-study student showed how these four elements or lack thereof contributed to the criminal conduct by the California serial killer, Richard Ramirez:

- Attachment: In his early life he had a troubled upbringing. He lacked attachment to his parents. His father was an alcoholic and abusive and he would beat Richard and the rest of the family. The absence of positive attachments may have contributed to his criminal behavior.
- Commitment: Commitment refers to the individual's investment in conventional, noncriminal pursuits such as education, career, or family.

Richard always performed poorly in school. Ramirez dropped out of Jefferson High School in the ninth grade. He pursued a life of crime and violence.

- Involvement: Involvement in sports or community engagement can deter individuals from criminal behavior. At a younger age Richard was not involved in any extracurricular activities. As an adult he was not involved in any community groups or churches. Richard was involved in heavy criminal activity, such as rape, murder, burglary, and kidnapping.
- Belief: The belief element suggests that individuals who share common values and beliefs with society are less likely to commit crimes. Richard's crimes were brutal, he lacked regard for human life. His crimes were marked with violence and Satanism. His crimes were significant deviation from societal norms and beliefs.

In 1990, Travis Hirschi, with colleague Michael Gottfredson, moved from explaining crime and delinquency in terms of social control toward explaining it in terms of self-control. Their "General Theory of Crime" (also known as low self-control theory) posits that crime is committed by those who have low self-control due primarily to poor or incompetent parenting during their early childhood.

A traditional student wrote the following about this this theory. "An opposing theoretical perspective proposed by Gottfredson and Hirschi is an antidevelopment theory, and it takes aim as the primary cause of all crime and deviance. They believe that all individuals are born with predisposed selfish tendencies, and only children that have had an adequate upbringing with parents who have made a connection or attachment to the child, can eliminate the behavior of the anti-social individual with no self-control. These theorists believe that the individual must have established self-control by the age of ten or the individual won't establish self-control at all. Studies have shown that individuals having no self-control tendencies have a tendency to engage in risky behavior including criminal behavior." Another traditional student wrote, "Gottfredson's and Hirschi's general theory of crime specifies that self-control is defined as the tendency to refrain from antisocial behavior due to recognition of the long-term costs associated with such behavior."

A case-study student wrote the following using Aaron Hernandez as the case study example for this theory:

Low Self-Control Theory suggests that individuals with low self-control are more likely to engage in criminal behavior. Aaron Hernandez's actions, particularly the violent and impulsive nature of the crimes he committed, align with the characteristics associated with low self-control. His involvement in activities such as fights, gun possession, and murder suggests a tendency to act without considering the long-term consequences of his actions. Impulsive behaviors, such as those exhibited during his criminal acts, are central to the concept of low self-control.

Low self-control is a product of inadequate parenting. Hernandez's

upbringing included challenges such as familial issues and exposure to violence, which could have contributed to the development of low self-control. His father's absence and a loud family environment could have negatively impacted his ability to develop self-regulation and impulse control during formative years. Low self-control theory also emphasizes the role of peer influence. Hernandez's associations with individuals involved in criminal activities reinforced his own impulsive behaviors. Being part of a social group, that values aggression and criminality may have further diminished his self-control and increased the likelihood of engaging in risky behaviors.

In 1957 Sociologists David Matza and Gresham Sykes introduced Neutralization Theory which suggests that delinquents and criminals know their behavior is wrong, but they justify it on a number of grounds. Doing so allows offenders to "drift" into and out of criminal conduct without buying into criminal definitions or identifying as a criminal. Matza and Sykes explained that 5 techniques of Neutralization facilitated this drift into criminal behavior. The 5 techniques are denial of responsibility, denial of injury, denial of victim, condemnation of the condemners, and appeal to higher loyalty.

A traditional student wrote the following about Neutralization theory. "The theory claims that offenders rationalize their criminal behavior in four ways. 1. Denial of responsibility: Individuals may claim they were influenced by forces outside themselves and that they are not responsible or accountable for their behavior. 2. Denial of injure: This is the rationalization that no one was actually hurt by the offender's behavior. 3. Denial of the victim: Offenders see themselves as avengers and the victims as the wrongdoers. 4. Condemnation of the condemners: Offenders claim that the condemners (usually the authorities who catch them) are the hypocrites. Appeal to higher loyalty: Offenders often overlook the norms of conventional society favor of the rules of a belief they have or of a group they belong to."

In contrast, a couple of case-study students went into great detail regarding the use of neutralization techniques used by their chosen criminals. The first wrote the following regarding the connections between Gary Ridgeway, the Green River Killer, and Neutralization Theory:

Denial of Responsibility: Ridgway blamed his upbringing with his controlling and abusive mother and his troubled childhood for shaping him into the person he became.

Denial of Injury: He justified his murders by telling himself that no one would miss or care about these women. By dehumanizing his victims and considering them as people whose lives didn't matter.

Denial of the Victim: Ridgway neutralized any feelings of empathy or guilt. His belief that sex workers were "bad" people who brought harm upon themselves through their lifestyle choices allowed him to rationalize their murder as justified.

Condemnation of the Condemners: He rationalized his murders by arguing that law enforcement and society at large were doing nothing to stop the

issues that led to his victims being vulnerable in the first place.

Another case-study student wrote the following connecting the serial killer John Wayne Gacy and neutralization theory:

Denial of Responsibility: Gacy denied responsibility by blaming external factors like mental illness. His defense during the trial claimed he had multiple personality disorders, which distanced him from his actions. This technique lets Gacy shift the blame, avoiding full accountability for the murders.

Denial of Injury: Gacy minimized the harm he caused by dehumanizing his victims. He referred to them as "worthless" or "prostitutes," making it easier for him to rationalize that their deaths were not significant. This technique helped Gacy avoid guilt by convincing himself that the people he killed didn't deserve sympathy.

Denial of the Victim: Gacy justified his crimes by framing his victims as responsible for their fate. He targeted young men hitchhiking or seeking quick work, implying that their risky behavior made them deserve what happened. This denial of victimhood allowed him to distance himself from the immorality of his actions.

Condemnation of the Condemners: Gacy often deflected blame on the authorities, claiming that the police were unfairly targeting him. When he was investigated for Robert Piest's disappearance, he accused the police of harassment. This technique allowed Gacy to shift attention away from his actions and frame himself as the one being wronged.

DISCUSSION

I could have brought in many more student writing examples showing the expanded explanations and connections that the case-study students have made as they have connected key concepts of criminal theories with actual criminals and crime stories. The students in my recent Introduction to Crime Theories classes where I have employed this applied learning approach to teaching have been able to demonstrate through their writing more complete comprehension of these crime theories. Traditional students in the previous classes were not able to demonstrate nearly so comprehensive mastery or accurate articulation of these theories.

The case-study students in these recent classes have expressed that they are more interested in studying crime theories when they are able to study them using actual crimes and criminals, something that Quinn, et al. (1992) stated would be an effect of using the Case-Study method of teaching crime theories. Trolian and Jach (2020) also found that such applied learning approaches were correlated with increased student academic motivation.

There are many benefits to considering a case-study approach to teaching. This is a facet of applied learning that can benefit instructors across many disciplines. Theory courses can be considered dry or boring by some students and adding an element where students relate the theories to real stories or events can turn that "boring" class into an interesting one. The case-study approach could not only benefit other criminal justice instructors teaching crime theories

courses, it would also benefit instructors teaching criminology, sociology, or any other theory courses in other disciplines. This case-study approach to teaching crime theories adds to the growing literature of applied learning in criminal justice. Criminal Justice instructors can make use of this approach in addition to making visits to criminal justice facilities (Greenberg, 1989; Taub, 1991), making presentations in class (Orum, 1980), using film or music (Rothe & Collins, 2013), or using virtual reality technology (Meenaghan & van Sintemaartensdijk, 2024).

LIMITATIONS AND CONCLUSION

This is not a quantitative research study and the results are primarily qualitative observations of student writing artifacts. Thus, there are limitations of this study. One key limitation is potential self-selection bias in the selecting of student writing artifacts, although I tried to reduce this bias by randomly selecting such artifacts. That potential bias is somewhat mitigated by the inclusion of writing assignment and exam score comparisons to highlight the differences between the two teaching approaches. A limitation of this comparison of writing assignment and exam scores is that this simple analysis did not control for outside influences on these scores. Further experimental or quasi-experimental research using control or comparison groups would be helpful.

In my experience, students typically consider a crime theory class as boring and difficult. It is common to require such a class in a bachelor's degree program in Criminal Justice. That was my experience for many years as I taught this class at three different institutions of higher education over the past almost 30 years. Students typically struggled to do well in the class and would complain that they had too many theories to learn. I also found it difficult to repeatedly teach this class when students did not show much interest or mastery of the material. That desire to change how I taught the class and my own interest in crime stories is what led me to developing this applied learning approach to teach crime theories through a case-study of actual crimes and notorious criminals. I have found that not only am I more interested in teaching this class, but the students are much more interested in it when they can relate it to a criminal case that fascinates them. With that increased interest they also do better mastering the material as evidenced by their own writing and the comparison of paper and exam scores. Thus, we come back full circle to the Chinese proverb quoted at the start. As we have students "do" more through applied learning, these students should "understand" better.

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Open-Ended Questions: Enhancing Writing and Learning Processes

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Keywords: open-ended questions, student writing, homework vs. in-class writing, writing quality, critical thinking, content depth, clarity and structure, creativity, reflective learning, applied learning, writing instruction, cognitive engagement

Abstract

This study examines how prompt type (instructor-assigned descriptive vs. student-generated open-ended questions) and writing context (in-class vs. homework) influence student writing quality. Undergraduate students completed three short essays under varying conditions, and their work was evaluated across content depth, critical thinking, clarity, structure, and creativity. Results show that student-generated open-ended questions produced significantly higher scores in clarity, structure, and creativity than instructor-provided descriptive prompts. Homework assignments yielded additional gains in critical thinking, demonstrating the extended time and flexibility for deeper analysis and reflection. Comparisons further indicate that prompt design exerts a stronger influence on writing quality than writing location, though homework provides meaningful advantages for higher-order thinking. These findings reinforce research on applied learning, where open-ended questioning promotes reflection, transfer of knowledge, and personal growth. Limitations include the modest sample size and the absence of long-term measures. Future research should examine larger, more diverse populations, qualitative insights, and the role of AI-assisted platforms in shaping writing development.

INTRODUCTION

Open-ended questions (OEQ) are widely recognized as powerful tools for enhancing student learning, critical thinking, and writing development. Unlike closed or highly structured prompts, open-ended questions encourage students to explore, reason, and reflect, thereby making their responses more meaningful and personally relevant. Within applied learning environments—such as problem-based learning (PBL), case-based learning (CBL), project-based learning (PjBL), inquiry, service-learning, and simulations—open-ended questions serve as catalysts that connect theoretical concepts with real-world application. By inviting multiple perspectives and solutions, they promote active engagement that deepens understanding and fosters transferable skills.

While the pedagogical value of open-ended questions is well established, less is known about how the source of the prompt—whether student-generated or instructor-provided—affects learning outcomes. Student-created questions may provide a stronger sense of ownership, engagement, and reflection, while instructor-provided prompts may offer more structure but potentially limit creativity. Similarly, the context of writing—whether completed as homework or during class—may influence the depth of analysis, clarity of expression, and confidence in writing. This study investigates both dimensions by comparing essays written in response to student-created open-ended questions with those written to instructor-assigned descriptive prompts, and by examining whether homework contexts yield stronger writing outcomes than in-class responses. Using AI-based text analysis alongside student feedback, this research clarifies how prompt type and writing environment affect not only writing performance but also the ability to reflect and apply learning

LITERATURE REVIEW

Open-ended questions are widely recognized as essential tools for fostering deeper learning and meaningful engagement. Unlike closed-ended prompts, they require more than factual recall; they invite explanation, reasoning, and reflection, making them powerful in both writing and applied learning contexts. This literature review examines open-ended questions from four perspectives.

First, it defines open-ended questions and contrasts them with closed-ended formats to highlight their unique role in promoting reflection, critical thinking, and creative problem-solving. Building on this foundation, the next section explores their value in writing and classroom learning, showing how they help students move beyond recall to analysis, synthesis, and creative expression.

Second, it examines research comparing in-class and homework writing, tracing how differences in time, structure, and setting influence the depth, clarity, and originality of student work.

Finally, it considers the role of open-ended questions in applied learning contexts such as problem-based learning, case-based learning, project-based work, inquiry, service-learning, and study abroad programs. This section highlights practical examples where structured reflection prompts deepen student learning, promote critical application, and prepare learners for

professional contexts**.**

Taken together, this review demonstrates that open-ended questions are not just teaching strategies but integral mechanisms that shape student thinking, writing, and applied learning. They provide the bridge between theory and practice, helping learners build confidence, develop transferable skills, and generate original insights.

Defining Open-Ended Questions

How and why questions are fundamental to open-ended inquiries, as they encourage deeper reflection, critical thinking, and creative problem-solving. Open-ended questions require respondents to explain concepts, analyze information, and develop ideas rather than simply recalling facts. By prompting thoughtful responses, these questions foster engagement and a more nuanced understanding of topics. In contrast, closed-ended questions focus on what and who, often leading to brief, factual answers. These questions are designed to elicit specific information or confirm details, making them useful for assessing knowledge but limited in promoting discussion or deeper exploration. While both types of questions serve important functions, open-ended questions are particularly valuable in education, research, and communication, as they allow for diverse perspectives and more meaningful dialogue (Sandling, 2024).

Open-Ended Questions in Writing and Learning

Open-ended questions are powerful tools for both writing and learning. They move students beyond simple recall and push them to think more deeply, creatively, and critically. In writing, open-ended prompts help students build stronger arguments, use evidence effectively, and develop original ideas (Phillips, J., 2023; Responsive Classroom, 2024). In the classroom, they require learners to analyze, evaluate, and synthesize information, which leads to richer engagement with complex topics and more meaningful understanding (Komildjanovna, 2024; Sandling, 2024).

Research supports these benefits. King (1994) showed that students who created their own questions achieved higher comprehension scores. Chin and Osborne (2010) found that open-ended prompts encouraged deeper reasoning and justification in science lessons. Elbow (1998) highlighted their role in freewriting, where they help students overcome writer's block and spark fresh ideas. More recently, studies have shown their value in tutoring and technology use. Kryzhanivska, Capraro, and Spallinger (2023) observed how writing tutors used open-ended questioning in ESOL peer review to build clarity and critical thinking. Wang et al. (2024) demonstrated that open-ended reflection tasks helped students evaluate AI-generated writing, promoting metacognition and ownership of their work.

In applied learning, the impact is just as clear. Open-ended questions drive the core moves of applied learning: explaining, justifying, and transferring knowledge. In science classrooms, teacher questions provide structured support that helps students build concepts, not just recall facts (Chin, 2007). Dialogic

approaches using open-ended prompts have been shown to improve engagement and learning outcomes in randomized trials (Alexander, 2018). Meta-analyses confirm these effects across disciplines: active learning strategies that rely on questioning raise exam performance, reduce failure rates, and close equity gaps compared to lecture-based instruction (Freeman et al., 2014; Theobald et al., 2020). Training students to ask and answer their own higher-order questions also improves metacognition and knowledge construction (King, 1994).

Together, this evidence shows that open-ended questions are not just teaching techniques. They are engines of deeper reasoning, active engagement, and reflective learning. They build stronger writers, more thoughtful learners, and more confident problem-solvers—whether in the classroom, in applied learning environments, or in professional preparation.

Comparison of In-class writing to Homework Writing

When comparing in-class writing to homework writing, several key dimensions reveal distinct advantages and limitations in each context. Regarding content depth, in-class writing often requires immediate responses, which can limit how comprehensively ideas are developed. While this environment promotes focus and concise thought (Knight, 2017), it does not typically allow time for deep exploration of topics. In contrast, homework writing allows for reflection and research, resulting in richer and more thorough content (Wilson, 2023).

In terms of critical thinking, in-class assignments encourage quick analysis and response but may not support deeper synthesis or evaluation due to time constraints (Tahira & Haider, 2019). Homework, however, gives students the opportunity to think critically about their arguments, assess sources, and refine their reasoning—resulting in stronger analytical writing (Fan et al., 2022).

Clarity and structure also differ. Although classroom structure can help keep students focused, limited time may reduce the coherence of their writing (Wilson, 2023). With homework, students can plan and revise their organization, leading to better flow and clearer arguments (Wilson, 2023).

Finally, in terms of creativity, while peer interaction in class can stimulate ideas, time pressure may suppress unique expression (Csikszentmihalyi, 1996, p. 216). Homework offers freedom for students to explore different styles and ideas, encouraging originality without immediate deadlines (Fan et al., 2022).

Open-ended Questions in Applied Learning

Open-ended questions are one of the most effective tools for making applied learning work. They do more than check for recall; they push students to think harder, connect ideas, and explain their reasoning. In problem-based learning, for example, open-ended prompts encourage learners to define problems in their own words and explore possible solutions (Dochy et al., 2003; Gijbels et al., 2005). Case studies and simulations use similar questioning to build clinical reasoning and decision-making, asking students to weigh evidence and consider trade-offs (Thistlethwaite et al., 2012). Project-based and inquiry-

driven approaches also thrive on open-ended questioning, which keeps curiosity alive, drives investigation, and strengthens problem-solving (Zhang, 2023; Furtak et al., 2012). Even in service-learning, reflection questions like "What surprised you?" or "How does this connect to what we studied?" help students link their experiences to broader frameworks and values (Eyler & Giles, 1999; Warren, 2012). Across all of these methods, the lesson is clear: open-ended questions create the framework that helps students move from surface learning to deeper insight.

Practical examples show how powerful this approach can be. In one interdisciplinary outdoor education program, Bennion et al. (2020) used reflective essays based on open-ended questions to measure both cognitive and personal growth. Students wrote about academic themes, personal identity, and their relationship with the natural world. The responses revealed rich, complex learning that traditional tests often miss. Similarly, Meyers and Arnold (2016) asked students in a Washington, D.C. study-away program to respond to open-ended surveys before and after their trip. The reflections sharpened career goals, deepened understanding of agricultural policy, and improved communication skills. These outcomes fit well with Kolb's (1984) experiential learning cycle, showing how reflection supports lasting change. In a study abroad program in the Balkans, Dayberry and Fisher (2023) used the DEAL model—Describe, Examine, and Articulate Learning (Ash & Clayton, 2009; Maxfield & Fisher, 2012)—to guide student reflection. With structured open-ended prompts, students linked their experiences to course objectives, building self-awareness, intercultural competence, and practical skills in emergency preparedness.

Taken together, these examples show that open-ended questions do more than spark discussion. They make applied learning more meaningful, helping students connect theory to practice, reflect on their growth, and carry those insights into professional and personal contexts.

PROBLEM STATEMENT

Despite widespread use of writing prompts in education, there is limited empirical evidence comparing the effectiveness of student-selected open-ended questions to instructor-assigned descriptive topics. Additionally, the impact of writing environment—homework versus in-class—on writing quality remains underexplored. This study investigates whether student response to an open-ended question and writing context significantly influence the depth, clarity, critical thinking, and creativity in student writing. While the research builds on prior work in prompt design and applied learning, it makes a distinct contribution by integrating AI-based scoring with student feedback to evaluate both the type of prompt and the writing environment. In doing so, this study not only reinforces but also extends existing knowledge, providing new insights into how student choice and context interact to shape writing outcomes.

Hypotheses

Hypothesis 1. Student writing produced in response to student-selected open-ended questions will demonstrate higher quality—measured in depth, clarity, creativity, and critical thinking—than writing produced in response to instructor-assigned short descriptive prompts.

Hypothesis 2. Student writing produced as homework responses to open-ended questions will demonstrate higher quality—measured in depth, clarity, creativity, and critical thinking—than writing produced in class, regardless of prompt type.

Hypothesis 3 (Exploratory). The positive effect of student-selected open-ended questions on writing quality will be stronger in homework settings than in in-class settings, indicating an interaction between prompt type and writing environment.

Null Hypotheses

Null Hypothesis 1 (H_{01}). There is no significant difference in writing quality between essays written in response to student-selected open-ended questions and essays written in response to instructor-assigned short descriptive prompts.

Null Hypothesis 2 (H_{02}). There is no significant difference in writing quality between essays written as homework responses to open-ended questions and those written in class, regardless of prompt type.

Null Hypothesis 3 (H_{03}). There is no significant interaction effect between prompt type (student-selected open-ended vs. instructor-assigned descriptive) and writing environment (homework vs. in-class) on writing quality.

METHODOLOGY

Research Design

This study used a quasi-experimental design to compare the quality of student writing across three distinct assignment types:

A. Short Descriptive Prompt in Class. Students responded in class to an assigned topic using a short, descriptive prompt that requires simple and straightforward answers. For the first essay (A) students were given the following instructions: In class in 250 words or more describe health in your family. This topic is broad so you can choose any aspect of your family's health that you want. You will have time to complete this assignment in class.

B. Homework Assignment. For a homework assignment, students individually created an open-ended question related to the topic “What can I do to be healthier?” After receiving instruction and examples on how to write effective open-ended questions, each student wrote a 250-word response to their own question and submitted it.

C. In-Class Assignment. For the in-class activity, students created an open-ended question related to healthy eating, using the prompt “This essay focuses on how to eat properly in order to maintain good health.” After receiving instruction and examples on writing open-ended questions, each student wrote a

250-word response to their question during class and posted it to the discussion board.

Participants

The participants were undergraduate students enrolled in an introductory health and wellness course. The sample size consisted of 35 students. Not all students participated. Of those who provided gender information (n = 32), 11 identified as male, 18 as female, and 3 as other. The ages of respondents ranged from 18 to 24 years, with an average age of 19.76.

Regarding academic majors, 11 students were in Science & Technology, 10 were in Healthcare, followed by Fine Arts & Humanities (5), Social Sciences (5), Business (2), and undecided (2). In terms of academic standing (n = 35), most respondents were freshmen (22), followed by sophomores (11), and juniors (2). None were seniors.

Procedure

1. Writing Tasks: Students completed three essay-writing tasks. In the first (Task A), they responded to a brief descriptive prompt provided by the instructor (n=32). In the second (Task B), they created their own open-ended question as a homework assignment and wrote a response (n=31). In the third (Task C), they generated an open-ended question during class and responded to it (n=33). For each task, students were instructed to write an essay of approximately 250 words. Because the study was decided after the assignments were already completed, there was no predetermined order for the tasks. Their order was based on the class schedule.

2. AI Evaluation: The writing samples were analyzed using the ChatGPT statistics program, which was configured to evaluate the overall quality of student writing. The analysis focused on the following criteria:

- **Content Depth:** The richness and comprehensiveness of the ideas presented.
- **Critical Thinking:** Evidence of analysis, synthesis, and evaluation.
- **Clarity and Structure:** The organization, coherence, and logical flow of the writing.
- **Creativity:** The expression of original and unique perspectives.

Data Collection and Analysis

The statistical program built into ChatGPT was used to generate a quantitative analysis of the writing samples, providing scores (from 1 to 5) for each evaluation metric. These scores were then statistically compared between tasks using independent-sample t-tests. The AI tool is designed to maintain consistency in assessments based on predefined criteria, and it does not "learn" or change its rating parameters over time. Each assessment is performed independently using the same evaluation standards, meaning that if it were to assess an earlier essay again, it would likely give a similar rating (OpenAI, 2023).

An independent-samples t-test was used in this study. Although the same students completed both tasks, individual scores were not matched across conditions. Instead, the data were analyzed as two sets of means, without linking a student's Task A score to their Task C score. Because the pairing information was not preserved, the data were treated as independent, making the independent-samples t-test the appropriate choice, even though both sets of essays came from the same students.

IRB approval was granted as an exempt study. Although the assignments were part of a regular class, they were only reviewed after completion and grading. Student grades were not affected by the study findings. The statistical program analyzed the essays as an entirety. No names were included, ensuring complete anonymity.

Scoring Reliability and Validity of Analyses

Student essays were evaluated on four dimensions**: content depth, critical thinking, clarity and structure, and creativity.** Each dimension was scored on a standardized rubric using a 5-point scale (1 = low, 5 = high). To ensure reliability, consistent scoring procedures were applied across all assignments, and evaluators were trained on rubric use prior to analysis. Inter-rater reliability was established by having a subset of essays scored by two independent raters, with agreement statistics (Cohen's kappa/ICC) confirming acceptable consistency.

Because scores represented continuous data on an interval scale, it was appropriate to compute mean values for each category. Averaging across students yielded stable indicators of task performance, minimizing the influence of outliers. The assumptions of normality and homogeneity of variance were evaluated and considered adequate for the sample sizes. Independent-samples t-tests were then used to compare means across conditions, providing a valid basis for determining whether observed differences in writing quality were statistically significant.

RESULTS

The results presented in this section reflect the statistical analysis of the three assessed writing assignments. The independent sample t-tests comparing the AI-generated scores from Writing Assignments A, B, and C yield the following results:

In-Class Writing (A) vs. Open-Ended Question (C)

Table 1 presents the analysis results comparing in-class essays written from an instructor-provided prompt (Task A) with in-class essays written in response to student-generated open-ended questions (Task C).

Category	C (Student OEQ, *n* = 33) *M* (SD)	A (Instructor Prompt, *n* = 32) *M* (SD)	*t*	*p*
Content Depth	4.000 (0.559)	3.880 (0.725)	-0.880	.387
Critical Thinking	4.100 (0.595)	3.880 (0.725)	-1.590	.126
Clarity and Structure	4.120 (0.600)	3.600 (0.500)	-3.640	.001
Creativity	3.920 (0.640)	3.640 (0.568)	-1.980	.060
Average Score	4.045 (0.530)	3.750 (0.559)	-2.630	.015

Table 1. **Descriptive Statistics and *t*-Test Results for Writing Assignments A and C**

Note. Task A = essay written in class using an instructor-provided descriptive prompt. Task C = essay written in class in response to a student-created open-ended question (OEQ).

Explanation. Table 1 presents descriptive statistics (means and standard deviations) and *t*-test results comparing student essays written in two conditions: Task A (instructor-provided descriptive prompt) and Task C (student-created open-ended question). Both tasks were completed in class. The results indicate that students scored higher overall when responding to their own open-ended questions, with a statistically significant improvement in average scores (p = .015). Specific gains were most notable in **Clarity and Structure**, where student-created OEQs produced significantly stronger writing (p = .001). Although increases in **Content Depth**, **Critical Thinking**, and **Creativity** were observed, these differences did not reach statistical significance.

The degrees of freedom for an independent-samples *t*-test (equal variances assumed) is

$$df=nA+nC−2=32+33−2=63df=nA+nC−2=32+33−2=63$$

Note: Degrees of freedom (*df*) are included with each *t*-test to indicate the sample size and precision of the analysis. Reporting *t*(df) with corresponding *p* values follows APA standards and provides readers with a transparent and replicable account of the statistical results.

Here is an interpretation of the **descriptive statistics and t-test results** for writing conditions A and C:

For **content depth**, no significant difference was found between instructor-provided prompts (M = 3.880, SD = 0.725) and student-created open-ended questions (M = 4.000, SD = 0.559), $t(63) = -0.88$, p = .387.

For **critical thinking**, scores were slightly higher for student-created OEQs (M = 4.100, SD = 0.595) than for instructor prompts (M = 3.880, SD = 0.725), but the difference was not significant, $t(63) = -1.59$, p = .126.

For **clarity and structure**, students performed significantly better when responding to their own open-ended questions (M= 4.120, SD = 0.600) compared to instructor prompts (M = 3.600, SD = 0.500), $t(63) = -3.64$, p = .001.

For **creativity**, scores were somewhat higher for student-created OEQs (M = 3.920, SD = 0.640) than for instructor prompts (M = 3.640, SD = 0.568),

with the difference approaching significance, $t(63) = -1.98$, $p = .060$.

Finally, for the **average score**, student-created OEQs ($M = 4.045$, $SD = 0.530$) outperformed instructor prompts ($M = 3.750$, $SD = 0.559$), $t(63) = -2.63$, $p = .015$, indicating a statistically significant overall advantage.

Summary. Student-created open-ended questions (Task C) significantly improved overall writing performance, especially clarity and structure, with modest gains in creativity, content depth, and critical thinking. The comparison between Task A (instructor-provided prompt) and Task C showed that essays written in response to student-created questions achieved significantly higher clarity and structure scores, while creativity gains approached significance. Content depth and critical thinking did not show statistically significant differences, though mean scores were higher in Task C, suggesting modest improvement across these areas.

Open-ended Questions: B as Homework vs. C in Class

Table 2 presents the results of the analysis comparing Task B, homework essays responding to student-generated open-ended questions (OEQs), with Task C, in-class essays written in response to OEQs.

Category	**B (Homework, *n* = 31) *M* (SD)**	**C (In Class, *n* = 33) *M* (SD)**	***t***	***p***
Content Depth	4.208 (0.721)	4.000 (0.571)	1.450	.162
Critical Thinking	4.416 (0.583)	4.083 (0.601)	3.240	.004
Clarity and Structure	4.041 (0.858)	4.125 (0.612)	-0.590	.558
Creativity	3.833 (0.701)	3.916 (0.653)	-0.620	.539
Average Score	4.125 (0.616)	4.041 (0.541)	0.860	.401

Table 2. Descriptive Statistics and t-Test Results for Writing Assignments B and C

Note. Task B = essay written as homework in response to a student-created open-ended question. Task C = essay written in class in response to a student-created open-ended question (OEQ).

Explanation. Table 2 presents descriptive statistics (means and standard deviations) and *t*-test results comparing student essays written in two conditions: Task B (student-created open-ended question completed as homework) and Task C (student-created open-ended question completed in class). The results indicate

that overall performance did not differ significantly between the two settings, although students who completed the homework task (Task B) scored somewhat higher on average. The most notable difference appeared in **Critical Thinking**, where homework essays showed significantly stronger performance ($p = .004$). Differences in **Content Depth**, **Clarity and Structure**, and **Creativity** were not statistically significant, although mean scores were slightly higher for homework in most categories.

The degrees of freedom for this independent-samples *t*-test (equal variances assumed) is:

$$df=nB+nC-2=31+33-2=62df=nB+nC-2=31+33-2=62$$

Here is the interpretation of the **descriptive statistics and t-test results comparing Data Sets B (homework) and C (in-class writing)** for each writing category:

For **content depth**, no significant difference was found between homework essays ($M = 4.208$, $SD = 0.721$) and in-class essays ($M = 4.000$, $SD = 0.571$), $t(62) = 1.45$, $p = .162$.

For **critical thinking**, students scored significantly higher on homework essays ($M = 4.416$, $SD = 0.583$) compared to in-class essays ($M = 4.083$, $SD = 0.601$), $t(62) = 3.24$, $p = .004$.

For **clarity and structure**, no significant difference was observed between homework ($M = 4.041$, $SD = 0.858$) and in-class essays ($M = 4.125$, $SD = 0.612$), $t(62) = -0.59$, $p = .558$.

For **creativity**, results showed no significant difference between homework ($M = 3.833$, $SD = 0.701$) and in-class essays ($M = 3.916$, $SD = 0.653$), $t(62) = -0.62$, $p = .539$.

For the **average score**, homework essays ($M = 4.125$, $SD = 0.616$) scored slightly higher than in-class essays ($M = 4.041$, $SD = 0.541$), but the difference was not significant, $t(62) = 0.86$, $p = .401$.

Summary. The comparison between Task B (student-created OEQ as homework) and Task C (student-created OEQ in class) showed that overall performance was slightly higher for homework essays, but the difference was not statistically significant. The strongest gain appeared in critical thinking, where homework essays scored significantly higher ($p = .004$). In contrast, content depth, clarity and structure, and creativity showed no significant differences, although mean scores were generally higher in the homework condition. These findings suggest that the additional time and flexibility afforded by homework may particularly enhance critical thinking.

In-Class vs. Homework: Topic (A) vs. Open-Ended Question (B)

Table 3 presents the analysis results comparing in-class essays written from an instructor-provided prompt (Task A) with homework essays written in response to student-generated open-ended questions (Task B).

Category	A (Instructor Prompt, In Class, n = 32) M (SD)	B (Student OEQ, Homework, n = 31) M (SD)	*t*	*p*
Content Depth	3.862 (0.639)	4.275 (0.701)	-3.550	.001
Critical Thinking	3.827 (0.658)	4.482 (0.574)	-5.750	<.001
Clarity and Structure	3.517 (0.508)	4.103 (0.816)	-3.830	.007
Creativity	3.586 (0.568)	3.862 (0.693)	-2.290	.030
Average Score	3.698 (0.506)	4.181 (0.597)	-4.790	<.001

Table 3 Descriptive Statistics and t-Test Results for Writing Assignments A and B

Note. Task A = essay written in class from an instructor-provided descriptive prompt. Task B = essay written as homework in response to a student-created open-ended question (OEQ).

Explanation. Table 3 presents descriptive statistics (means and standard deviations) and *t*-test results comparing Task A (instructor-provided descriptive prompt completed in class) and Task B (student-created open-ended question completed as homework). The results indicate that students performed significantly better on homework essays across several dimensions, with particularly strong gains in **critical thinking** ($p < .001$) and **average overall score** ($p < .001$). Significant improvements were also observed in **content depth** ($p = .001$), **clarity and structure** ($p = .007$), and **creativity** ($p = .030$). These findings suggest that completing student-generated open-ended questions as homework provided more opportunities for deeper reasoning and stronger writing outcomes than in-class responses to instructor prompts.

Since $nA = 32$ and $nB = 31$, the degrees of freedom Tasks A vs. B are:

$$\mathbf{df = nA + nB - 2 = 32 + 31 - 2 = 61}$$

For **content depth**, students scored significantly higher on homework essays (M = 4.275, SD = 0.701) compared to in-class essays (M = 3.862, SD = 0.639), $t(61) = -3.55$, $p = .001$.

For **critical thinking**, students performed significantly better on homework essays (M = 4.482, SD = 0.574) than in-class essays (M = 3.827, SD = 0.658), $t(61) = -5.75$, $p < .001$.

For **clarity and structure**, homework essays (M = 4.103, SD = 0.816) were significantly stronger than in-class essays (M = 3.517, SD = 0.508), $t(61) = -3.83$, $p = .007$.

For **creativity**, scores were also higher for homework essays (M = 3.862, SD = 0.693) than for in-class essays (M = 3.586, SD = 0.568), $t(61) = -2.29$, $p = .030$.

For the **average overall score**, students again scored significantly higher on homework essays (M = 4.181, SD = 0.597) compared to in-class essays (M = 3.698, SD = 0.506), $t(61) = -4.79$, $p < .001$.

Summary. Writing performance was significantly stronger across all evaluated categories when students responded to a homework-based open-ended question (Task B) compared to an in-class essay without a guiding question

(Task A). Homework assignments with open-ended prompts consistently fostered deeper analysis, clearer organization, and greater creativity. The findings strongly support the value of combining open-ended questions with homework conditions, as students benefited from additional time to reflect, refine, and expand their ideas. Overall, the results suggest that thought-provoking prompts—paired with opportunities to write outside of class—enhance writing performance by encouraging critical engagement and richer expression.

Summary of Results (Tables 1–3)

Across all three comparisons, the results highlight the benefits of student-created open-ended questions (OEQs), especially when paired with homework writing. In **Table 1**, essays written in class to student-created OEQs (Task C) scored significantly higher overall than essays written in class to instructor-provided descriptive prompts (Task A), with the most notable gains in clarity and structure. **Table 2** compared OEQs written as homework (Task B) to OEQs written in class (Task C). Homework essays demonstrated significantly stronger critical thinking, while other categories showed no meaningful differences, suggesting that extended time outside class primarily enhances reasoning. **Table 3** provided the clearest contrast, showing that homework essays written to student-created OEQs (Task B) outperformed in-class essays based on instructor prompts (Task A) across all measured categories—content depth, critical thinking, clarity and structure, creativity, and overall score. Taken together, these findings indicate that both **student choice in generating open-ended questions** and **time for reflection in homework settings** contribute to stronger writing performance, with the combination of the two yielding the most consistent and significant improvements.

DISCUSSION

This discussion examines the impact of open-ended questions and writing context (in-class vs. homework) on student writing quality. Using three comparative analyses, the study evaluates how different types of prompts and writing environments influence key performance indicators: content depth, critical thinking, clarity and structure, and creativity. The results from each of the three conditions are compared with one another to highlight differences and similarities. The findings support existing literature that emphasizes the value of open-ended questions in promoting deeper thinking, better organization, and increased engagement. They also confirm that homework settings provide more time for reflection, planning, and expressive writing. Together, these results offer important insights for improving writing instruction and curriculum design, while also strengthening the use of reflective tools in applied learning.

Evaluation of Hypotheses Based on Study Findings

Hypothesis 1 predicted that student writing produced in response to student-selected open-ended questions (OEQs) would demonstrate higher

quality than writing produced in response to instructor-assigned descriptive prompts. Results from Table 1 (A vs. C) support this hypothesis. Students writing to their own OEQs scored significantly higher overall, with the most notable gains in clarity and structure ($p = .001$). Although content depth, critical thinking, and creativity were not statistically significant, mean scores were higher in all areas, indicating that student-generated prompts encourage more thoughtful and organized writing.

Hypothesis 2 predicted that homework responses would yield higher quality than in-class responses, regardless of prompt type. Results from Table 2 (B vs. C) and Table 3 (A vs. B) confirm this. Homework-based essays showed consistent advantages, particularly in critical thinking ($p = .004$, Table 2) and overall writing performance ($p < .0001$, Table 3). The opportunity for reflection and revision gave students a measurable benefit.

Hypothesis 3 (Exploratory) predicted that the positive effect of OEQs would be stronger in homework than in in-class settings. Results from Table 3 (A vs. B) demonstrate that homework OEQs outperformed in-class instructor prompts across all categories, with significant differences in depth, critical thinking, clarity, creativity, and overall score. Although a formal interaction test was not conducted, the evidence suggests that combining OEQs with homework yields the strongest improvements.

Together, the findings reject all three null hypotheses (H_{01}, H_{02}, H_{03}) and confirm that both prompt type and writing environment significantly shape writing quality, with the best outcomes occurring when students generate their own OEQs and respond to them as homework assignments.

Prompt Type and Writing Quality (A vs. C)

Comparing in-class writing with an instructor-provided descriptive prompt (Condition A) and in-class writing with a student-generated OEQ (Condition C) illustrates how question design influences writing. Results showed significant improvements in overall performance ($p = .015$) and in clarity and structure ($p = .001$), with a marginal increase in creativity ($p = .060$).

These findings echo prior research. Phillips (2023) notes that OEQs—especially "how" and "why" questions—promote deeper thinking and creativity by requiring students to analyze and synthesize rather than recall. Chin and Osborne (2010) found similar benefits in science classrooms, where OEQs encouraged reasoning and justification. Elbow (1998) emphasized that exploratory prompts help writers generate and organize thoughts. In applied learning, Bennion et al. (2020) and Meyers & Arnold (2016) showed that reflective OEQs enhance personal insight. Taken together, these perspectives help explain why Condition C yielded more coherent and organized writing.

Writing Location and Critical Thinking (B vs. C)

When comparing homework (Condition B) and in-class (Condition C) writing using OEQs, overall writing quality was broadly similar, but a significant difference emerged in critical thinking ($M = 4.42$ vs. $M = 4.08$, $p =$

.004). Homework essays gave students time for reflection, supporting deeper analysis, synthesis, and evaluation (Fan et al., 2022). Other categories—content depth, clarity, and creativity—showed no significant differences, suggesting that well-phrased prompts can stimulate strong responses even under time constraints.

These results align with Wilson (2023), who argues that in-class settings sharpen focus, and with Csikszentmihalyi (1996), who observed that time pressure can limit creativity. Overall, homework provided a distinct advantage for higher-order thinking, while in-class writing still produced comparable depth and organization when guided by strong prompts (Tahira & Haider, 2019).

Combined Effects of Prompt and Location (A vs. B)

The most substantial gains appeared when comparing in-class descriptive prompts (Condition A) with homework OEQs (Condition B). Students performed significantly better across all categories—content depth ($p = .0014$), critical thinking ($p < .0001$), clarity and structure ($p = .0066$), and creativity ($p = .030$). This demonstrates the combined effect of prompt design and writing location.

Homework gave students the flexibility to plan, revise, and elaborate, while OEQs demanded deeper reasoning and broader exploration. As Wilson (2023) and Knight (2017) note, homework enables richer development of ideas, whereas in-class assignments often constrain elaboration. This synergy explains why Assignment B produced the strongest results overall.

Applied Learning Implications

These findings reinforce the literature that identifies OEQs as powerful tools in applied learning. Studies on problem-based learning, case-based learning, and inquiry (Dochy et al., 2003; Gijbels et al., 2005; Thistlethwaite et al., 2012; Furtak et al., 2012) consistently show that OEQs push students beyond recall, prompting analysis and reasoning. Similarly, project-based learning and service-learning contexts (Zhang, 2023; Eyler & Giles, 1999; Warren, 2012) highlight how OEQs foster reflective and critical engagement.

Practical applications confirm these patterns. Reflection essays (Bennion et al., 2020), pre- and post-trip surveys (Meyers & Arnold, 2016), and structured prompts in study abroad (Dayberry & Fisher, 2023) demonstrate that OEQs generate richer, more thoughtful responses. The present study adds to this evidence, showing that OEQs paired with homework produce the deepest insights, clearest organization, and strongest critical thinking.

Thus, OEQs act as tools in applied learning, providing the cognitive framework that transforms writing into deeper reflection, stronger engagement, and transferable skills.

CONCLUSION

This study provides strong evidence that both the type of writing prompt and the setting in which writing occurs significantly influence student writing quality. Across three comparisons, student-generated open-ended questions (OEQs) consistently produced higher scores in clarity, structure, and creativity when compared to instructor-provided descriptive prompts. Homework assignments, meanwhile, showed significant gains in critical thinking, underscoring the value of extended time and flexibility for deeper analysis and reflection. Taken together, the findings highlight the dual importance of thoughtful prompt design and appropriate writing context in shaping student learning outcomes.

Key Findings

- ***Prompt type matters.*** Open-ended questions, especially those framed as "how" and "why," enhanced clarity, organization, and originality in student writing.
- ***Homework strengthens reasoning.*** Writing completed outside of class yielded stronger critical thinking and content depth, reflecting the benefits of time for revision and reflection.
- ***Applied learning benefits.*** The evidence from this study shows that open-ended questions enhance critical thinking and reflection, two cornerstone skills in applied learning methods such as problem-based learning, case-based learning, project-based inquiry, and service-learning.

These results confirm that OEQs are powerful tools for applied learning, aligning with research in problem-based, case-based, project-based, inquiry, and experiential contexts. By prompting explanation, evaluation, and transfer, they help students connect theory to practice and build skills that extend beyond the classroom.

Limitations and Future Research

This study was limited by its relatively small sample size and the scope of evaluation criteria. Future research should involve larger and more diverse student populations, along with long-term measures of writing development. Qualitative methods—such as student reflections, process logs, and interviews—could provide richer insights into how OEQs and writing contexts influence confidence, motivation, and engagement. Further studies should also examine how OEQs function at different stages of applied learning: activating prior knowledge in problem-based learning, supporting reasoning in simulations, sustaining inquiry in project-based work, and fostering reflection in service-learning. Research into assessment strategies, including application-focused rubrics, oral defenses, and worked-example comparisons, is also warranted. Finally, given the rise of digital tools, future studies should explore how students use and respond to AI-assisted platforms when engaging with open-ended

prompts.

Use of AI in This Study

AI played an important supporting role throughout this project. It was used for literature exploration (locating and summarizing relevant studies), data analysis support (statistical analysis of student writing, creation of quantitative measures, structuring results tables, formatting in APA style, and explaining statistical tests), and manuscript preparation (reviewing clarity, grammar, and organization). While the interpretation and conclusions remained researcher-driven, AI tools contributed to both efficiency and precision in analyzing and presenting the findings.

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Planning and Implementing Course-Integrated Interdisciplinary Travel

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Abstract

Many students aspire to incorporate travel into their college experiences, yet they face significant challenges, particularly regarding affordability. This paper proposes a model for collaborating on meaningful travel experiences to enhance student travel while lowering costs. Course-integrated interdisciplinary travel involves a shared travel experience between two college courses. Students collaborate on learning how to travel and planning leisure activities. Faculty members establish overarching goals, select countries to visit, and choose specific sites within each country relevant to both courses and tourism. This paper discusses identifying faculty collaborators, selecting countries and sites to visit, planning the trip, creating a timeline, and recruitment. The authors include an example of designing a course-integrated interdisciplinary travel experience.

PLANNING AND IMPLEMENTING COURSE-INTEGRATED INTERDISCIPLINARY TRAVEL

Consider a typical college classroom experience. It may not be surprising to envision this scenario: Students filter in, take their seats, and listen attentively as the professor lectures on the topic, illustrating key points with a PowerPoint presentation. Professors often desire to enhance learning by introducing discussions and projects that encourage deeper comprehension (Singleton & Newman, 2009). These additions signify intentions to extend learning beyond the traditional teacher-centered approach (Serin, 2018). Now, imagine an even broader expansion, where discussions and projects extend to other sites, enabling students to see, hear, and interact with the subjects they covered in class. If this sounds intriguing, please continue reading.

Extending learning beyond the classroom, particularly through site visits, can create inspiring educational opportunities that cannot be realized within a conventional classroom setting. These visits include field trips, retreats, and extended national or international journeys emphasizing education over tourism, aiming to enhance classroom learning (Ritchie, 2003). Educational tourists seek to experience locations where significant events took place, absorbing the sights, sounds, and scents of these places. By visiting these sites, educational tourists can explore the broader culture around them while participating in typical tourist activities such as sightseeing and shopping (Carr & Axelsen, 2005).

Educational tourism, particularly study abroad experiences, has a significant impact and leaves lasting memories for college students (Paige et al., 2009). Notable effects include cultural competence, cognitive achievements, and personal growth (Stone & Petrick, 2013). Students also gain travel skills, including packing, navigating TSA procedures, using public transportation, and overall travel safety. Despite these benefits, only nine percent of college undergraduates participate in credit-bearing study abroad programs, which include short-term (eight weeks or less during the academic year or summer), mid-length (quarter or semester), and long-term (one year or more) (Institute of International Education, 2024). The most significant barriers to participation include personal finances, the affordability of trips (Houser & Bornais, 2023), lost wages while away, and the difficulty of taking time off work to travel (Vernon et al., 2017). Additional barriers include safety concerns expressed by students or their families, as well as the desire to maintain good grades (Vernon et al., 2017).

To address these barriers, this paper introduces the course-integrated interdisciplinary travel model as an affordable and adaptable approach. It examines strategies for selecting collaborators, identifying travel sites, establishing planning timelines, and integrating shared projects into the curriculum. Examples of past collaborations illustrate how this model reduces costs, fosters interdisciplinary learning, and provides students with valuable cultural and intellectual experiences.

THE COURSE-INTEGRAATED INTERDISCIPLINARY MODEL

One way to reduce travel expenses is by creating interdisciplinary travel experiences. Increasing the number of traveling students lowers the per-student cost and provides opportunities for collaboration on mutually interesting projects. Our approach, the course-integrated interdisciplinary model, encompasses two important aspects. First, travel is just one component of a standard three-credit course that meets regularly throughout the semester. Second, two classes share the same travel experience. The purpose of travel is to deepen understanding of the information presented in class and enhance exploration of course topics, including the surrounding culture.

These distinct classes come together to learn how to travel, visit sites relevant to each discipline, and collaboratively share content to expand interdisciplinary skills. This model necessitates careful consideration of which classes will pair best, travel locations, sites to visit, timing, the integration of coursework, and collaboration in the planning process. The model requires consideration of how students will intellectually engage with the curriculum of both courses. Faculty must ensure that there is a clearly defined connection that is recognizable to students. Some disciplines will fit together better than others, which is explored through the various types of opportunities available for collaboration. Then, once collaboration is solidified, the focus shifts to travel opportunities for students who will enroll in the courses.

TYPES OF COLLABORATION

Deciding whom to collaborate with is often the first step in building a strong interdisciplinary travel experience. Shared-discipline collaborators are members of the same or closely related departments who teach unique courses and can easily share travel experiences. Another way to collaborate is by pairing a discipline-specific class with a language or culture class. These discipline-culture collaborations are particularly beneficial since one of the collaborators is likely to have experience in the language or culture of the travel destination (Cann, 2000). An example of a discipline-culture collaboration is described in Cann's (2000) recollection of a partnership involving travel to Brazil, with students enrolled in a Marketing course. The students chose to simultaneously enroll in either a Cultural Diversity course or a Spanish course. Through this collaboration, Cann (2000) noted that students gained language and cultural knowledge of the area, along with immersion into the world of international business and marketing through a Brazilian lens. Students gained an enriching experience not offered through their traditional curriculum in the major (Cann, 2000).

Third, instructors may teach courses from unique disciplines but often discover commonalities within those fields (see Dugas & Morgan, 2021; Stumph et al., 2021). These nonshared-discipline collaborations create numerous opportunities for distinctive experiences and strongly emphasize interdisciplinary teamwork among faculty members and students. Dugas and Morgan (2021) described a collaboration involving two courses traveling to

Ireland. The titles of the courses were Cultural Geography, and Culture, Communication, and Place. The two faculty members defined key concepts presented in each course and how these concepts overlapped and connected through the planned experiences while traveling. The co-authors explained that, "…students demonstrated, through discussion performance and essay content, knowledge and the application of skills concerning cultural observation, description, and interpretation and analysis of their acculturative experiences" (Dugas & Morgan, 2021, p. 141). This trip exemplifies a successful interdisciplinary collaboration for study-away courses across various academic disciplines. The collaboration highlights the opportunity to bring students, faculty, and the academic community together through shared experiences.

Another example of nonshared-discipline collaboration, described by Stumph et al. (2021), involved three courses traveling to Italy for six weeks. The courses were team-taught by instructors from the College of Engineering and the School of Business. The curriculum and trip incorporated key educational components related to business, culture, and leadership, attracting students from a diverse range of majors. Students engaged in several week-long opportunities while traveling, which were (1) Geography and Art, (2) Language and Culture, (3) History and Religion, (4) Leadership, Business and Law, and (5) Travel in Italy. This allowed for exposure to new and exciting educational opportunities both within the university population and extended to global literacy surrounding travel, culture, leadership, and business. The authors noted the effectiveness of the team-teaching model for working on shared goals across several disciplines (Stumph et al., 2021).

Choosing a nonshared-discipline collaborator should start with individuals who are interested in creating collaborative opportunities and have experience traveling with students, such as attending conferences or participating in field trips. Collaborators who share their course designs and objectives often find common ground for developing unique travel experiences for students (Cann, 2000; Dugas & Morgan, 2021). Students then glean from rich opportunities that can have a lifetime of influence on their careers and overall aspirations. Interdisciplinary collaboration builds relationships between departments and faculty. Such collaborations also provide opportunities for students to work together across disciplines. Employers increasingly value interdisciplinary collaborative skills, yet students seldom collaborate with peers outside their disciplines (Becerra, 2021).

TRAVEL SITE SELECTION

Sometimes, the travel site is established before individuals decide to collaborate. This occurs when the university has an ongoing relationship with a site or when a faculty member has a connection to a site. Otherwise, travel locations often emerge from discussions of common goals among potential collaborators. Collaborators should consider whether the sites offer various opportunities for each discipline and whether visiting the cities would engage the students. Additionally, students should have plenty of opportunities to

explore other city sites to enhance their projects and contribute to travel planning (Ransbury & Harris, 1994).

Some universities employ global engagement staff to facilitate trip planning, while others, particularly those just starting to offer travel opportunities, may not provide any support. Travel agencies specializing in educational tourism are excellent resources for trip planning and can be found by searching online for 'college educational tourism'. While some companies offer pre-determined itineraries that may suit specific programs, others provide comprehensive customization, which is appealing for faculty collaborators from various disciplines. Faculty members should verify provider regulations by consulting with university administration and reviewing the policies outlined by the university's Study Abroad or similar office (Craig et al., 2025). Faculty, on-campus staff, educational travel companies, the internet, and discipline-related journal articles are all valuable resources for identifying sites to visit.

EARLY PLANNING

Establishing a realistic timeline for planning a course-integrated travel experience is essential. Typically, universities schedule course offerings one year in advance, so the related travel experience must also be organized ahead of time. **Figure 1** presents a suggested timeline starting two years before the planned travel. Much of this timeline depends on whether the university has established mechanisms for planning and implementing course-integrated study away trips. Having two classes from different disciplines may increase the number of approvals needed for travel (from different chairs and deans) and formats (syllabi that comply with departmental and college standards) (Cann, 2000). Approval might also involve the university's Curriculum Committee and Faculty Senate if new classes are introduced and existing course offerings are not utilized.

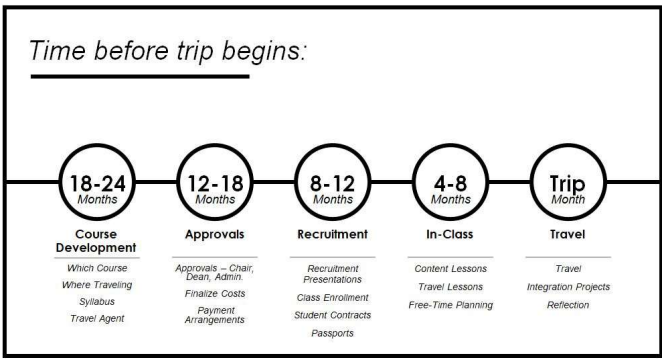

Figure 1. Two-Year Planning Schedule for Course-Integrated Travel

Note: Establishing a new course may require additional planning time, depending on the university's course approval process.

A second component of early planning is recruitment. Key factors such as course requirements, eligibility, trip destinations, timelines, and overall expenses are crucial for effective advertising. Recruitment should commence one year

before the trip (Craig et al., 2025). The university's study away team, Marketing Department, and any educational travel company involved can provide valuable assistance. Creating a theme for the trip that unites both courses is an effective strategy for posters or digital advertisements. Online design tools like Adobe Express (https://adobe.com/express) and Canva (https://www.canva.com) offer options for crafting engaging and visually appealing posters with images and attention-grabbing designs.

Including a QR code that links to a survey tool, such as Google Forms (https://workspace.google.com/products/forms), allows interested students to submit their names and email addresses for future contact. Participating in university-hosted fairs (such as study away and freshman registration) and spreading the word through faculty, advisors, students, and student organizations are excellent recruitment methods (Craig et al., 2025). Another early recruitment strategy is to establish and initiate fundraising efforts for interested students. Two simple methods include online catalog companies that typically offer 50% return and local restaurants that encourage students to bring in customers during slower evenings, providing up to 30% of their earnings.

Collaboration between classes can vary from superficial to quite extensive. If the two classes are scheduled to meet simultaneously, they can conduct joint sessions focused on the travel experience, including discussions about what to pack, safety, and traveling in groups. They can also come together when planning their outings and excursions during their free time. All students will visit the same sites, enabling them to meet and discuss how those sites relate to their learning, regardless of which course they are enrolled in. Finally, teams of students from both classes can collaborate on overarching projects where members contribute to a joint product. According to Craig et al. (2025), interdisciplinary travel facilitates topic understanding and critical thinking because students are exposed to multiple perspectives while developing multicultural competencies.

One Example

This example illustrates a nonshared-discipline collaboration between psychology and journalism, led by the co-authors of this paper. Both instructors bring experience in guiding students' travel to conferences. Such travel opportunities demonstrated clear benefits for students, including presenting their research at conferences, engaging with other students and faculty, exploring the host city, and learning how to travel. A shared commitment to enhancing travel experiences led to the development of course-integrated interdisciplinary travel experiences in psychology and journalism classes. To date, three collaborations have taken place: London/Paris (2022), New York City (2024), and London/Vienna, scheduled for 2026. The London/Vienna collaboration pairs an upper-division psychology elective titled "Madness to reason: The history of psychology in Europe" with an upper-division journalism requirement titled "Multimedia storytelling." These courses, offered in Spring 2026, are established offerings at the university. Both courses are also available as Honors

Colloquia, allowing honors students to enroll in either class to fulfill a portion of their Honors Program curriculum.

Choosing travel locations is essential for the psychology class, as historical sites play a significant role in this course's theme. Fortunately, larger metropolitan areas include points of interest for the journalism class. London and Vienna were chosen because both cities have well- established and rich legacies in psychology and journalism. Both cities are intentionally woven into the course content, emphasizing contributions to psychology and journalism. **Table 1** includes a list of sites related to psychology, journalism, and tourism. This table also functions as a worksheet for organizing trip content. For each city visited, one-third of the locations relate to one discipline, another third to the other discipline, and the final third to tourism. All students collaboratively visit each site. The trip schedule intentionally includes free time for students to explore sites they have researched before the trip, enhancing their projects.

	Courses		
	Psychology Sites	**Journalism Sites**	**Tourist Sites**
City 1: London	Freud Home St. Mary's Museum Jack the Ripper Tour	Fleet Street Tour The Guardian Charles Dickens Museum	London Eye/Thames Cruise Harry Potter Studios London City Tour
City 2: Vienna	Freud Museum/Tour Viktor Frankl Museum Fools Tower	United Nations Albertina Museum Wien Museum	Schönbrunn Palace Prater/Vienna City Tour Mozart Apartment

Table 1. Site Visit Examples by City

Students from both classes meet during the Spring semester, similar to a standard class. The course content primarily covers distinct topics, but students in each class collaborate in various ways. The courses meet simultaneously, and students come together for travel lessons, which include preparation, packing, group movement, and safety during travel. Additionally, pairs of students from each class choose themed projects related to the travel site and course content. For the London and Vienna excursion, the themes span both classes. Student pairs must enhance at least one of their themed projects with information gathered from visiting a site relevant to their theme upon returning from the trip, and present it publicly. The trip takes place after finals week, extending the semester to the week following their return, allowing students to present their integrated projects.

Planning for this collaboration began two years in advance, including the selection of a travel company to customize the trip within a reasonable budget. The university's Office of Applied Learning approved the proposed classes and travel. The theme, "Visions of mind: Exploring media and madness in Europe," was created to promote the program, along with a graphic poster. Recruitment efforts began one year before the trip, extending into the summer during registration fairs for incoming freshmen. Potential travelers filled out a Google

Form (https://workspace.google.com/products/forms), accessible through a QR code on recruitment materials, which linked them to a video presentation about the specifics of the trip. The preparation allowed for enrollment during the semester before the class would ensue, when students typically register for classes. Preparations continue throughout the academic year, including fundraising efforts, combined "how to travel" workshops, and coordinated explorations of free-time sites.

The course-integrated interdisciplinary model can be applied to various travel experiences. One possibility is a weekend retreat featuring two distinct courses centered around a common theme. For example, two classes—one focused on World War II history and the other on Japanese culture and events—participated in a retreat in Independence, MO, where they visited the Truman Library and engaged in the Decision Center, which analyzed the Berlin Blockade and the Hiroshima bombings (Deka et al., 2016). This example was implemented by one of the co-authors and two other professors specializing in different disciplines (History and English). The example was presented at the 2016 meeting of the National Collegiate Honors Council, held in Seattle, Washington. Another option is a week-long trip to a major domestic city that provides numerous opportunities for two classes. For instance, in 2024, the Psychology of Gender class traveled to New York City alongside the Multimedia Storytelling class, collaborating on travel lessons and exploring sites relevant to both classes. This trip was carried out by the co-authors and implemented in the Spring of 2024. Both examples served as catalysts for designing interdisciplinary study away courses across campus in future iterations.

CONCLUSION

The course-integrated interdisciplinary travel model achieves several goals. It increases the affordability of travel, a noted barrier for many students (Houser & Bornais, 2023). It fosters collaboration among students from various majors, which builds recognized and desired skills for employment marketability (Becerra 2021). It enhances cultural competence, cognitive achievements, and personal growth, which are noted benefits of educational travel (Stone & Petrick, 2013). It encourages collaboration among faculty members and departments, adding to future opportunities for students. This paper highlights planning aspects, including finding collaborators, city selection, sites to visit, and establishing a timeline, hopefully inspiring interest in offering such opportunities while providing insight to begin planning.

Study away opportunities integrate applied learning through the incorporation of recognized and desired skills sought by a global marketplace of employment and exploration (Cann, 2000). Interdisciplinary pedagogical approaches to instruction and the implementation of course offerings enable the cultivation of a more informed and qualified workforce (Becerra, 2021). This is evidenced by students graduating with a global lens on their academic disciplines as well as other offerings and opportunities available to them

(Stumph et al., 2021). Through applying their experiences and awareness of cultural similarities and differences, students are better equipped to be effective in their careers and beyond. Students who participate in these interdisciplinary experiences emerge as informed and engaged citizens within the greater global marketplace of ideas and opportunities (Dugas & Morgan, 2021).

The co-authors experienced such connections first-hand with feedback given from former students reiterating the inquiry from employers about their study away experiences and wider awareness of its connection to their specific career field. This is especially relevant when it comes to employers seeking candidates that can communicate ideas beyond their contextual environment. The co-authors conclude that interdisciplinary study away has the potential for lifelong impact on participants.

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Incorporating Mindfulness-Based Activities into the Learning Environment

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Abstract
The learning environment (LE) is a dynamic and evolving space that is co-created by faculty, staff and students. The LE can play an important role in student success and can also impact job satisfaction for faculty and staff. Mindfulness-based activities are gaining attention as strategies to impact the learning environment in multiple ways. Incorporating mindfulness-based activities into the learning environment holds the potential for positive impact with students, faculty, and staff alike. This article will describe mindfulness-based activities, explore associated literature, and offer strategies to consider implementing in your own learning environment.

INCORPORATING MINDFULNESS-BASED ACTIVITIES INTO THE LEARNING ENVIRONMENT

As institutions of Higher Education continue to evolve, the impact of the learning environment (LE) on student success and well-being becomes increasingly important. Rusticus (2023) described the key elements of a positive learning environment as psychological, social, cultural, and physical settings. These key elements are broad and expansive, providing an opportunity for multiple strategies to be explored. Mindfulness-based activities are supported in the literature as strategies that can impact these elements of the LE. Incorporating mindfulness-based activities into the LE holds the potential for positive impact for students, faculty, and staff alike.

BACKGROUND

Mindfulness has been practiced for thousands of years, particularly in Eastern cultures. This practice is recognized as a component of Buddhism, but can also be seen in a variety of other religious, cultural, and secular settings. Jon Kabat-Zinn, PhD is a prominent figure in the modern mindfulness movement. This movement expands the practice of mindfulness beyond a religious practice. His work continues to drive a broadened view of the potential impact of incorporating mindfulness into our life routines. Dr. Kabot-Zinn (2005) describes the many influences we have that impact our mental health and well-being. Mindfulness has been described as a way to shift into a more conscious way of being. Mindfulness is a practice that can cultivate “moment-to-moment, non-judgmental awareness” (Kabot-Zinn, 2005, p. 4). Mayo Clinic describes mindfulness as a way to focus on what you're sensing and feeling in the moment, without judgment. “Practicing mindfulness involves breathing methods, guided imagery, and other practices to relax the body and mind and help reduce stress” (Mayo Clinic, 2022, p. 1). Mindfulness can be one strategy to help move the mind from a more stressful part of the brain to a brain space that can be more logical, thoughtful, and controlled. Logical, thoughtful and controlled could positively impact the LE. Additionally, mindfulness may help with stress reduction, self-awareness, increased attention span, positive physiological impact with things like blood pressure and improved sleep (Mayo Clinic, 2022). Mindfulness can be accomplished in a variety of ways. Activities associated with mindfulness can range from a simple breathing activity, meditation, a mindful walk, or perhaps using your senses to consciously observe an object. These are just a few examples of mindfulness practice opportunities.

For the profession of nursing, applied learning in mindfulness-based activities extends beyond the LE. Practicing nurses can experience high levels of stress that can impact them on a personal and professional level. Mindfulness can be one strategy to help manage and combat work related stressors. In addition to the self-care benefits of mindfulness there could be benefits for clients in the care of nurses. Bernstein (2019) describes how mindfulness can help nurses be more fully present with their patients. Being present creates a space that limits distractions and enhances decision making. This awareness of

potential enhanced decision making would be positive for the LE and connects nicely to many other career fields. While there are official training and certifications available in mindfulness, there are numerous applications that are free and available online. Headspace, Calm, or UCLA Mindful are just a few examples of resources that are available for exploration.

LITERATURE REVIEW

The incorporation of mindfulness-based activities into the learning environment is not new in the education setting. Literature can be found from the early 1970s that supports the use of mindfulness to improve educational outcomes for elementary school students. In more recent years, a focus on mindfulness as a tool for success in higher education has become more prominent. While some studies are centered on incorporating mindfulness as a course that is a component of a plan of study (Alexander et al., 2024; Deshpande et al., 2023; Ergas & Hadar, 2023), others seek relationships between the practice of mindfulness and positive outcomes in higher education settings (Barry et al., 2019; Regehr, Glancy, & Pitts, 2013; Schwind et al., 2017; Vidal-Melia et al., 2022; Zarotti, Povah, & Simpson, 2020).

Engaging students, staff, and faculty in a 10-week mindfulness course, Alexander et al. (2024) found it difficult to retain their subjects in a lengthy course. However, those who completed the course reported lower levels of perceived stress. Additionally, of those who completed the entire course, most reported they would continue using their new-found mindfulness tools (Alexander et al., 2024).

Over the course of four years, Desphande et al. (2023) engaged over 300 students in a course designed to teach multiple methods of mindfulness. A total of ninety participants completed surveys before, during, and after the course. The data showed that there was a statistically significant improvement in mindfulness and life satisfaction. Additionally, there were statistically significant decreases in both psychological distress and perceived stress (Desphande et al., 2023). Furthermore, all 90 participants stated they would encourage others to participate in a mindfulness course.

Ergas and Hadar (2021) examined outcomes of a semester-long mindfulness course over the period of eight years. The authors analyzed the data from 143 participants' responses and shared many positive outcomes. During their examination of the qualitative data, authors found that mindfulness practice was reportedly linked to positive effects in over eighty percent of the participants (Ergas & Hadar, 2021). The positive outcomes included "enhanced self/body awareness", "stress reduction/coping", "improvements in concentration/focus", "compassion", and "joy and enhanced sense of meaning in life" (Ergas and Hadar, 2021, p. 369).

Using a randomized controlled trial, Barry et al. (2019, p. 302) examined the use of a "spoken guided mindfulness practice of breath awareness" recorded and provided to 43 participants. Another 39 participants were placed in a control group and provided no mindfulness intervention. At the end of the 8-week

intervention (participants were asked to use the recorded mindfulness activity daily), it was found that there were statistically significant differences in multiple outcomes. Those in the control group reported a decrease in "depression" and an increase in "self-efficacy", "hope", and "resilience" (Barry et al., 2019, p. 304).

Schwind et al. (2017) provided mindfulness exercises at the beginning and end of each class for eight weeks. Students were additionally asked to practice "mindful breathing four to five times per week" (Schwind et al., 2017, p. 92). At the end of their qualitative study, the authors reported that students shared they had less stress and anxiety along with an increase in relaxation and focus.

Seeking a relationship between mindfulness, resilience, and academic achievement, Vidal-Melia et al. (2022) looked at questionnaire outcomes of almost 500 students in four separate educational organizations. Instead of providing mindfulness exercises, the authors used a scale that determined the presence of mindfulness. The results showed that there was a significant positive influence on resilience when the participants exhibited characteristics of mindfulness. Additionally, authors found that resilience and academic achievement were significantly directly related.

Lastly, Regehr, Glancy, and Pitts completed "a systematic review of the literature and meta-analysis" (2013, p. 1). The authors examined peer-reviewed articles and found 24 studies which "examined the effects of various models of cognitive, behavioral, and/or mindfulness-based techniques" (Regehr et al., 2013, p. 7) on students in higher education. The goal of each study was to reduce the amount of stress the participants experienced. The most promising finding from the meta-analysis completed by Regehr et al. (2013) was the reduction of stress and anxiety among hundreds of university-level students

APPLYING MINDFULNESS-BASED ACTIVITIES

The authors have implemented mindfulness, particularly mindful breathing, into the LE and as a component of self-care for future nurses. A key component of most mindfulness activities is a focus on breathing. The use of something as simple as breathing provides a quick and easy way to incorporate mindfulness into the LE. The focus has leaned toward applying mindful breathing activities during times of anticipated or observed stress. Brief, mindful breathing activities have been used prior to class, during simulation, prior to exams, and when working with individual students. Having a moment of intentional breathing can help bring the mind back to a state that allows for enhanced focus and clarity. Anecdotally, some students have provided positive feedback with this type of mindfulness activity.

In addition to the practice of mindful breathing, there are many other mindfulness-based activities that can be explored. Another primary focus utilized is the practice of gratitude. Nursing is a high stress career and research has identified strategies to combat burnout. One way the American Nurses Association (2023) suggests for increasing physical and psychological well-being in nurses and those around them is by practicing gratitude. The

significance of practicing gratitude extends beyond nursing. Tolcher et al. (2024) describes positive impact with gratitude intervention groups in college students. There are multiple ways to practice gratitude, it is easy to learn, and is an inexpensive option to incorporate.

Gratitude is something that has endless opportunities for expression. This includes the simple act of a thank you message or card. Sending words of thank you to individuals who keep our building clean, guest speakers, students who went above and beyond on a project, or a peer who stepped in to help can have positive impact on the LE. These simple acts of gratitude are a few examples of ways to instill gratitude into the LE. On a larger scale, a "stress less" finals week activity has been implemented over the last several semesters. There is a note of gratitude shared with students for their hard work all semester, positive thoughts are extended for final exams, grab and go snacks are available, and a variety of items to inspire are available at the motivation station.

Engaging students directly can be as easy as having students write down what they are grateful for on a white board when they enter the classroom. Some have created opportunities for "Griffin Gratitude" which allows for expression of gratitude and connects to the larger University level LE. Some students or professors may prefer to use interactive technology to participate in mindfulness activities. There are several platforms that can be used in-person or via online format. Kahoot! is an example of one such user-friendly platform for all levels of education, this interactive learning tool provides quick feedback and has provided positive results when used consistently in the classroom. The word cloud feature on this platform works seamlessly for students to anonymously send their words of gratitude that are displayed collectively on screen. Pear Deck and Nearpod are also great platform options to use that are free and integrate as add-on extensions into Google slides. This allows students to respond to prompts at their own pace or instructor-led pace.

Learning management systems that have a white board interface, such as Canvas, will allow students to post sticky notes to a digital board that can be displayed during class time or anytime in the course. This option was utilized; however, it did not work with students using iPads, therefore verifying compatibility with whichever platform you utilize is imperative prior to integration. Discussion boards with a weekly posting of student and instructor gratitude could provide a more feasible option if awarding points to this activity as an assignment is warranted.

Students may be reluctant to buy-in to these activities initially. Incorporating as a component of self-care teaching allows for reasoning behind various activities and how they can be beneficial in our daily and professional lives. One faculty member has students create two self-care goals and share about their experience in achieving these goals through an assignment.

CONCLUSION

Applying mindfulness-based activities have the potential to positively impact the LE. Their inclusion can benefit students, faculty, and staff alike. The possibilities for utilization are broad and expansive. They have been implemented in a variety of ways, but their utility is, possibly, limited only by the imagination.

While there is a growing body of literature supporting varied utilizations of mindfulness-based activities in higher education, additional research could provide more robust evidence to support university-led initiatives. This team hopes that interested individuals explore the literature and consider incorporating mindfulness-based activities into their own LEs.

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Autopsy Simulation as a Model for Pathology Outreach Among Students

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Abstract

The global shortage of pathologists, driven by rising diagnostic demands and a declining workforce, threatens future healthcare systems. Limited exposure to pathology in medical school and low public awareness contribute to this issue. This study investigates the use of an autopsy simulation to promote early interest in pathology among high school students. Conducted with a rural STEM club, the activity guided students through a mock forensic case involving alcoholic liver cirrhosis. Participants engaged in gross organ examination, histology analysis, and toxicology review, diagnosing the cause of death through collaborative critical thinking. The simulation sparked interest in pathology careers and supported public health education by highlighting alcohol's effects on the body. Its low cost, interdisciplinary design, and scalability make it a promising model for outreach. By introducing students to pathology in an interactive way, such simulations may help address workforce shortages and inspire future careers in medicine and science.

INTRODUCTION

Despite the central role that pathologists play in the healthcare field, the average layperson most likely could not adequately detail the job of a pathologist. Because the role mainly involves reporting diagnoses to other physicians, most pathologists have limited interaction with patients, medical trainees, and even pre-medical students. Even among practitioners in the healthcare field, pathologists are often perceived as tucked away from the public eye. This portrayal of pathology may contribute to the lack of interest students typically have in pursuing this career. Traditional approaches to increasing the pathology workforce have included outreach through guest lectures or shadowing, yet these methods provide little opportunity for exciting hands-on learning that students so often crave. Perhaps a novel approach lies in the use of simulations. Autopsy simulation provides students with an opportunity to engage with pathologists and utilize investigative thought. This approach may give students a hands-on experience that mitigates the ethical barriers of real autopsy observation and the risks of compromising a forensic case. This method aims to spark interest in the field of pathology through accessible, experiential learning.

Pathologist Shortage Worldwide

The role of pathologists includes analyzing fluids, tissues, and cells to diagnose disease. With the recent shift towards preventative care in medicine, the modern landscape of pathology is rapidly changing to accommodate increased demand in both academic and private practices (Gross et al., 2018). Accompanying this flourishing job market are concerns regarding a pathology workforce shortage on a global scale (Walsh & Orsi, 2024). From 2017 to 2022, the number of pathologist job listings in the United States more than doubled, suggesting a widening range of duties and increased demand for screenings and complex diagnostic procedures worldwide (Zynger & Pernick 2023). In the UK, the Royal College of Pathologists reported that among all histopathology departments surveyed, only 3% indicated that there was adequate staffing to meet their workload (Walsh & Orsi, 2024). Other studies demonstrated significant disparities in pathologist-patient ratios, with Poland having the lowest ratio in Europe (one pathologist per every 63,028 citizens) and Niger having the lowest ratio in Africa (one per every 9,264,500 citizens) (Walsh & Orsi, 2024; Märkl et al., 2021). Even in countries with significantly higher pathologist-patient ratios such as the United States, the workforce may have shortages for a variety of reasons. Although ~600 pathology residency positions become available each year in the US, some will remain unfilled. Of those completing residency programs, many pathologists will forgo clinical practice, becoming physician scientists working in laboratories (McCloskey et al., 2020). In addition, 2022 Main Residency Match data revealed that 44% of PGY-1 pathology residency positions were filled by international medical graduates, some of whom would be expected to practice in other countries (McCloskey et

al., 2020). A significant portion of pathology PGY-1 positions being filled by international medical graduates indicates a growing reliance on a global workforce. Many IMGs face visa restrictions or many intend to return to their countries of origin, raising concerns about the long-term stability and self-sufficiency of the US pathology workforce. This trend also may reflect a relative lack of interest or awareness among US medical graduates about pathology as a viable specialty. As a result, surveys from the College of American Pathologists have shown that ~26% of open pathologist positions go unfilled each year (Gross et al., 2023). Some specialties such as forensic pathology face a larger recruitment crisis; there are currently ~700 board-certified forensic pathologists practicing in the U.S., yet more than 1,200 are needed to adequately serve the population (Tatsumi & Graham, 2022). The need for pathologists exists on a global scale, prompting a need for increased recruitment efforts toward medical students earlier.

Exposure and Recruitment Challenges

Surveys among medical students have provided insight into possible barriers to increasing the number of students pursuing pathology. In these surveys, many students felt they had not been sufficiently exposed to pathology to consider it as a career choice (McCloskey et al., 2020). 30-40% of students found the roles of a pathologist to be unclear, which may further signify a lack of exposure both before and during medical school (Tatsumi & Graham, 2022). Another survey revealed that 55% of allopathic and 53% of osteopathic students decided on their specialty during the third year of medical school (McCloskey et al., 2020; George et al., 2022). Factors such as exposure to role models, clinical experiences, and earning potential have been found to significantly influence medical students' specialty choice (Yoon et al., 2018; Azok et al., 2024). Considering the fact that pathology is not often a required core rotation in medical students' third year during which the majority of these students determine their specialty, one solution to increasing pathology interest may lie in increasing the number of pathology-related experiences before the fourth year of medical school.

Surveys also found that 16% of allopathic students and 24% of osteopathic students determined their specialty before matriculation into medical school (George et al., 2022; Schukow et al., 2023). The Association of American Medical Colleges reports an even higher rate, with 26-28% of students remaining in their desired pre-matriculation career interest at graduation (Association of American Medical Colleges, 2022). These values can vary among specialties, with psychiatry holding a higher retention rate from matriculation to graduation (59%) than surgery (24%) (Westfall et al., 2025). Additionally, of the students applying for PGY-1 pathology positions, 25% reportedly had already chosen to pursue pathology before medical school (George et al., 2022; Schukow et al., 2023). Though these surveys also report that a majority of students match into a specialty different from their initial preference during pre-clinical years, the significant percentage of students

matching into their pre-matriculation specialty interest indicates a possible avenue for workforce outreach. The exposure of young adults to pathology even before matriculation – such as during the high school or undergraduate years – may be beneficial for the recruitment of future pathologists. Multiple high school and undergraduate early exposure programs have noted increased interest in health careers following program attendance (Affini et al., 2024; Gunaldo et al., 2018; Sugarman et al., 2024). However, most pathology subspecialties differ from typical healthcare fields in their relative lack of patient interaction, rendering pre-medical exposure programs less helpful in the recruitment of pathologists. There are few early exposure programs in the U.S. customized for increasing pathology interest in high school and undergraduate students. Due to the global concern for pathologist shortages, a demand exists for increased pathology education resources and exposure programs to both increase awareness of the career and foster interest in pathological specialties.

METHODS

To study the efficacy of autopsy stimulation we obtained ATSU-KCOM, IRB (SM-001). To evaluate the efficacy of autopsy simulation as a model for pathology outreach, a high school STEM club in a rural area was recruited to participate in an autopsy simulation. All aspects of the simulation were approved by high school STEM staff prior to the simulation to determine the most age-appropriate topics. Students were first given this prompt:

> "You are a new pathologist working in Adair County. A case was brought in this morning when a 30-year-old male was found face down, deceased in the kitchen by his wife. According to his family, he was always in good spirits and "perfectly healthy" from what they could gather, but he often refused to go to the doctor. There is a history of colon cancer in his family (uncle), but otherwise everyone else is healthy. His family is requesting an autopsy, because he is young and no one knows why he died. You can ask the investigator any questions you want about the scene, as well as ask the wife questions you think are important (ex: what was his mood lately, what did he last eat, have you seen him get in a fight recently?) Once you have all the information you need from the family, it's time to perform the autopsy. Rotate through each station and take note of things pertinent to the death investigation. Use the worksheet as a guide, but feel free to add whatever else you think might be important."

Students were then given instructions to investigate the cause of death for a "patient" using clues from three stations, each representing the basic stages of an autopsy as detailed in "Principles of Forensic Pathology": external exam, internal exam, and additional testing (Ely & Gill, 2023). The external exam station featured a live, human model. His skin was dressed in yellow makeup and bruising patterns along the arms and legs - a common presentation among

decedents with liver cirrhosis. Students documented the decedent's clothing, injuries, and stage of decomposition. Students were also instructed to collect fingerprints, height, and weight to aid in the confirmation of the patient's identity.

The internal exam station featured plastic organs and scales. Students documented gross pathologies such as tumors, ulcers, and other color changes. The liver was painted patchy-yellow mimicking a cirrhotic liver. Ulcers were found in the stomach lining, and large nodes made from clay were plastered onto the large intestine to represent the slightly higher incidence of colon cancer among patients with alcoholism. Students also weighed organs and were given "normal ranges" to determine if organs were normal or abnormal; weights can be useful for determining potential pathologies involving atrophy, hypertrophy, or edema. Though current studies show that liver cirrhosis is not associated with a significant change in weight, the liver in this activity was weighted to be below the normal range indicating atrophy, for simplicity's sake. The spleen and kidney were enlarged due to portal hypertension, and the heart was above normal weight due to cardiomegaly that may occur in patients with chronic liver dysfunction.

The final station detailing additional studies featured three histological images of organs belonging to the "patient" alongside photos of healthy organs. Students were asked to compare the patient's histology slide with the control slide and determine whether the patients were abnormal. A bone slide depicted osteoporosis, of which alcohol consumption is a risk factor. A liver slide depicted heavy fibrosis characteristic of liver cirrhosis, and a brain slide was provided depicting the loss of cytoplasm surrounding nuclei, indicative of neuronal damage. Although microscopic bone and brain specimens are not often analyzed in the forensic setting when investigating alcohol-induced liver disease, these additional photos were provided to increase student exposure to histology and pathology. This station also featured five drug testing strips, each showing negatives for morphine, cocaine, marijuana, ketamine, and methamphetamine. After students completed the worksheet and rotated through stations, they gathered for a discussion and debrief of their findings. Qualitative feedback was welcomed and recorded during this time.

RESULTS

After investigating the clues provided, students shared their findings in a group and discussed possible causes of death. Several students successfully deduced the cause of death as "complications arising from alcoholic liver cirrhosis." Students cited jaundice, abnormal gross/microscopic appearance of the liver, and negative toxicology findings as evidence of the diagnosis, though further discussion was warranted to demystify other gross abnormalities found at each station. Students were educated on the significance of the evidence presented as well as the physiologic processes beyond them, such as increased bruising found on the patient due to impaired liver function decreasing the production of clotting factors. These explanations led to broader discussions

regarding the effects of alcohol on the body – detailing how chronic, excessive use of alcohol exacerbates damage to the heart, liver, bones, and various other organs.

Beyond learning the content, the students had strong engagement with the material simulated in the activity. Facilitators observed that students questioned all the evidence, discussed differential diagnoses, and collaborated to connect the medical narrative, mimicking the investigative career of pathology. The simulation setting encouraged peer-to-peer learning, as students had to explain their reasoning and challenge one another's interpretations. The interactive format of the simulation also appears to support diverse learning styles. Visual learners benefited from examining gross pathology specimens and histologic slides, while tactile learners were engaged by touching different evidence stations and assembling the case collaboratively. Seeing the students being able to contribute to the discussion with minimal medical education suggests the simulation was appropriately taught to support students of various levels of background knowledge. The simulation also fostered an early professional identity by allowing students to mimic the role of a pathologist. They were encouraged to approach the case as a pathologist, drawing connections between findings, and considering the systematic impact of disease.

Many students had a new appreciation for the work of pathologists, which challenged the common perception that pathology is a field disconnected from patient care. Informal feedback from both students and teachers was positive with many students stating that the hands-on nature of the simulation deepened their understanding of the medical consequences of chronic alcohol misuse. Some students also asked about future opportunities to explore pathology or participate in similar simulations at the school. This simulation experience was a success for high school students, as it fostered critical thinking and collaboration. In addition, this event brought exposure to the field of pathology and the crucial, exciting work done by pathologists. This early exposure hopefully will encourage these high school students to explore the career of pathology and aid in reducing the pathologist workforce shortage in the future generation.

DISCUSSION

The autopsy provides an exciting, thought-provoking introduction to the work of pathologists. To solve this case, students had to consider diseases typically confirmed by pathologists working in various subspecialties, such as neurology, oncology, or infectious disease. This also provided an engaging setting for students to apply basic cytology principles to real-world problems. Feedback from this event was overwhelmingly positive; Students actively engaged in both the simulation and the following discussion, indicating that hands-on activities can significantly increase student interest in pathology and awareness of alternative career paths in medicine.

An unforeseen, added benefit of this event included the opportunity to discuss with high schoolers the risks associated with substance addiction. In a

2023 report by the Centers of Disease Control and Prevention (CDC), 22.7% of high school students reported alcohol use, making alcohol the most commonly used drug among teens (Hoots, 2023). The CDC also reported that 4,000 individuals under 21 years of age die from excessive alcohol use annually (Centers for Disease Control and Prevention [CDC], 2025). By participating in this activity, students saw first-hand the physical effects of alcohol abuse that might be seen in a real-life autopsy. Thus, students were able to logically and objectively assess the threat of substance abuse and make informed choices beginning at an early age. This crossover reinforces the value of interdisciplinary simulation-based learning as a tool for fostering career exploration and health education.

Given the low cost and design of this simulation, it can be adapted for other high schools or undergraduate institutions for pathology and STEM outreach. The curriculum can be modified to use various pathologies producing gross abnormalities in the human body, such as myocardial infarction with coronary vessel modeling or pulmonary embolism with lung dissection models. Use of the autopsy simulation in undergraduate pre-medical organizations may be effective in recruiting future pathologists
directly.

SIGNIFICANCE

The success of the activity demonstrates the potential for pathology-focused simulations to be integrated into high school anatomy classes and undergraduate pre-medical programs. Other high school and undergraduate pre-medical programs have recently reported increased interest in healthcare fields in students with early exposure to medicine (Affini et al., 2024; Gunaldo et al., 2018; Sugarman et al., 2024). High school students' engagement and voiced interest in this simulation demonstrate its promise as an outreach tool. Participating students will not only be exposed to pathology careers, but also begin to develop clinical reasoning skills at an early age. While challenges may present themselves, particularly in introducing histological concepts to students with limited backgrounds, the model offers a scalable, low-cost approach for early pathology outreach in high school and undergraduate settings.

LIMITATIONS

One limitation of this activity was the low exposure to histology in high schoolers, as well as their limited knowledge of diseases. Future simulations could include an introductory lesson on histology and use of virtual microscopy tools to better prepare students for the simulation. While this activity was successful in giving students an introduction to histology and gaining interest in pathology, the approach may be more suited for individuals studying microbiology, infectious disease, or cancer biology at an undergraduate level. Additionally, this study could only provide qualitative data regarding students' interest in pathology careers after participating in the simulation. The study was not intended to measure students' continued interest in pathology through high

school, college, and medical school.

CONCLUSION

The dwindling pathology workforce is a cause of concern, with rising caseloads and unfilled pathology positions having the potential to increase rates of physician burnout and early retirement (Gross et al., 2023). Additionally, the global shortage of pathologists is a threat to timely and accurate diagnostic services (Zynger & Pernick, 2023). Despite the increased demand for diagnostic services, pathology remains underrepresented in medical education and career exploration prior to medical school, which contributes to the decreasing workforce (Walsh & Orsi, 2024). Surveys among medical students have demonstrated a need for career outreach during the pre-clinical years of medical school or even earlier (McCloskey et al., 2020). This study implemented an autopsy simulation in a rural high school STEM club to assess whether hands-on, case-based simulation could serve as an effective outreach model. The simulation successfully engaged students in active problem-solving and diagnostic reasoning while introducing principles in gross pathology and histology. Participants demonstrated strong critical thinking skills and collaborated to identify the cause of death, using evidence from multiple stations. In addition to meeting our educational objectives, the simulation created opportunities for public health conversations around the effects of chronic alcohol abuse on organ systems (MacKillop et al., 2022). Feedback from students was overwhelmingly positive, with many expressing interest in pathology as well as a greater appreciation for the specialty's role within the healthcare team. As the demand for pathologists continues to grow, novel interventions such as this simulation may empower future professionals to reduce critical gaps in diagnostic medicine

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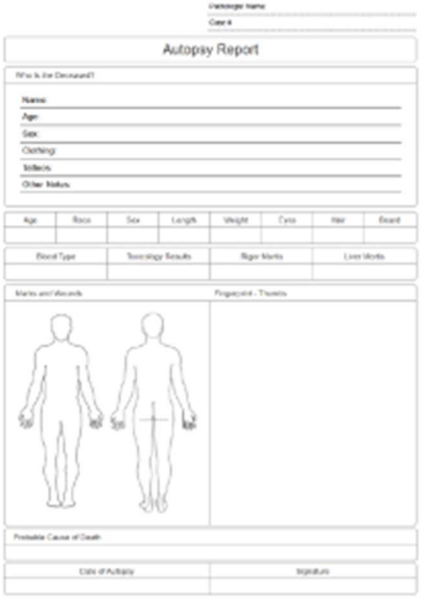
APPENDIX A

Figure 1. Autopsy Report Form Given to Students



Autopsy Report

Who Is the Deceased?

Name:

Age:

Sex:

Clothing:

Markers:

Other Notes:

Age	Race	Sex	Length	Weight	Eyes	Hair	Beard

Blood Type	Toxicology Results	Rigor Marks	Liver Marks

Marks and Wounds

Fingerprint - Thumbs

Probable Cause of Death

Date of Autopsy	Signature

Autopsy Report

Organ	Weight	Notes
Heart		
L Lung		
R Lung		
Spleen + pancreas		
Liver		
R Kidney		
Brain		

Width	Length	Remarks

Stomach contents / appearance	
Intestine appearance	

Toxicology	Positive/Negative Result
Cocaine	
Benzodiazepines	
Morphine (Heroin)	
Methamphetamine	
Codeine	

Brain Abnormalities	
Bone Abnormalities	
Liver Abnormalities	

Manner of Death: Accident, Natural, Homicide, Suicide, or Undetermined?

Cause of death	Signature