



## MOVING FROM SILOS TO SYNERGY: ENHANCING CRITICAL THINKING THROUGH MULTIDISCIPLINARY LEARNING

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### ABSTRACT:

The rapid evolution of the twenty-first century has made abstract critical thinking, an essential skill in both professional and educational contexts. This study aims to highlight the value of multidisciplinary education in enhancing students' critical thinking skills in higher education. Traditional educational systems, which tend to emphasize specialized knowledge in a particular area, can impede the development of critical thinking. Multidisciplinary techniques foster a more integrated knowledge by combining ideas from other disciplines, including the arts, sciences, and technology. This study uses a qualitative research approach that incorporates a literature review and case study analysis to examine the impact of various educational programs that employ multidisciplinary strategies on students' analytical and problem-solving abilities. To tackle complex real-world challenges, it's important to enhance critical thinking, promote adaptability, and maintain an open mind, which involves engaging with multiple disciplines. Through the use of a literature review and a case study analysis, the study examines how multidisciplinary educational programs impact students' analytical and problem-solving abilities. When confronting difficult real-world problems, it is necessary to have improved critical thinking, flexibility, and open-mindedness, which are all associated with multidisciplinary engagement. By working on collaborative and cross-disciplinary projects, students can improve their ability to evaluate and interpret complex challenges. These attempts demonstrate the integration of knowledge from several fields. The article outlines effective interdisciplinary initiatives in academic settings and provides practical methods for encouraging collaboration inside institutions to foster a culture of critical inquiry. Educational institutions can adequately prepare students for the complexities of the modern workforce. Ensuring that they have the adaptability and creative thinking required for sustained success. Ultimately, integrating multidisciplinary education is a practical way to foster a new generation of thoughtful and adaptable thinkers and improve critical thinking.

### KEYWORDS:

**MULTIDISCIPLINARY APPROACHES, CRITICAL THINKING, HIGHER EDUCATION, CROSS-DISCIPLINARY LEARNING, SKILL DEVELOPMENT.**

### INTRODUCTION

In the 21st century, the skills necessary for success have undergone substantial changes, with critical thinking emerging as one of the most vital competencies in both educational and professional realms (Facione, 2020). Critical thinking enables individuals to process information, assess evidence and make well-informed decisions, which is crucial for solving problems in complex and ever-evolving environments. However, nurturing critical thinking demands more than traditional disciplinary education; it necessitates multidisciplinary strategies that equip students with more expansive perspectives and varied analytical frameworks (Gibbs, 2019). Interdisciplinary education merges knowledge from disparate fields, granting students the opportunity to comprehend issues in a more interconnected manner. This interconnectedness proves essential in tackling real-world challenges that are seldom limited to a single domain, such as climate change, healthcare and the ethics of technology (Dogan & Pahre, 2021).

The importance of multidisciplinary approaches in enhancing critical thinking is also evident in institutional efforts to integrate arts, sciences and technology. This integration encourages students to explore ideas across

traditional academic boundaries (Jones & Merrick, 2022). For example, programs that meld engineering with social sciences allow students to contemplate both the technical and social implications of their work; thus, they foster a more comprehensive understanding of complex issues. Such cross-disciplinary engagement, however, strengthens critical thinking by challenging students to apply diverse concepts and methods in new contexts (Kim, 2023). This research aims to investigate the effects of multidisciplinary approaches on critical thinking skills. It seeks to identify strategies and practices that can help higher education institutions cultivate a generation of versatile and reflective thinkers—because the future demands it.

### OBJECTIVES

The objectives of this research are to:

1. Analyze how multidisciplinary approaches enhance students' critical thinking skills in higher education.
2. Identify specific multidisciplinary practices that contribute to the development of critical thinking.
3. Provide recommendations for implementing effective multidisciplinary strategies within academic institutions.

## LITERATURE REVIEW

Research shows that regular stuff, which is cool for learning specific things, isn't always that great at making us think deeply about stuff in different ways (Baker & Clark, 2020). But multidisciplinary education, where you mix and match ideas from different subjects, is like the superhero here because it lets us look at problems from a bunch of angles (Klein, 2020). Studies have found that when you mix humanities, science, and technology, makes our brains better at breaking down tough problems and coming up with clever solutions—and that's super important for getting a job nowadays (Chen, 2021). So, like, Dogan and Pahre (2021) did this study and found that students who took environmental studies with a bunch of different subjects were way better at looking at data and coming up with answers that were both good for the planet and made sense in the real world. Gibbs (2019) said that doing lots of different things in institutions helps us question what we think and get better at reasoning. It's like a mental gym that makes us good at working with other people and changing our minds when we need to. But here's the kicker: doing projects with other students from different majors is like the holy grail for developing our critical thinking skills (Kim, 2023). Imagine working on a team where you've got a computer whiz and a psychology guru trying to solve a problem together—mind-blowing, right? It's like playing a game where you have to use all the pieces from different board games to win. It's tough, but it's so worth it because it makes you super flexible in how you think (Jones & Merrick, 2022). And, get this, some big-deal person named Facione (2020) said that learning how to deal with new and tricky situations is a must-have skill for thinking critically. So, multidisciplinary projects are basically like brain yoga that stretches your noggin and makes you smarter at handling all the curveballs life throws at you.

## METHODOLOGY

This research utilized a qualitative approach to gather a comprehensive understanding of the role of multidisciplinary approaches in fostering critical thinking. The methodology involved three main stages: **collection**, **categorization**, and **analysis** of data derived from various sources, including academic journals, institutional reports, and case studies on multidisciplinary programs. The selection of sources was based on relevance, prioritizing recent studies published in peer-reviewed journals on multidisciplinary learning, critical thinking, and higher education pedagogy. The case studies were chosen to illustrate the application of multidisciplinary approaches in various educational settings. By analyzing these case studies, this research aims to identify the strategies and pedagogical practices that effectively enhance critical thinking. In addition to the case studies, interviews from previous studies were examined to gain insights into the experiences of educators and students participating in multidisciplinary programs. The focus of this analysis is on understanding the observed impact on critical thinking skills as reported by Kim (2023) and Baker & Clark (2020).

Through this comprehensive analysis of literature, case studies, and interviews, the study aims to provide evidence-based recommendations for implementing multidisciplinary strategies in higher education.

## COLLECTION OF DATA

To ensure that the research was based on recent and relevant findings, we mostly picked data from those fancy peer-reviewed journals things that were published in the last five years. We were looking at stuff about mixing different subjects in institutions, how teachers teach in college, and things that help students think critically. We used some big brain databases like JSTOR, Google Scholar, and ERIC (which is like a treasure trove for teachers) to find articles that talked about this. Plus, we picked some case studies that are, like, the good factor on the block with their multidisciplinary programs, so we could see how they make it work in real life.

## CATEGORIZATION OF STUFF WE FOUND

After getting all this info, we made three big groups: one for teaching tricks in mixing up subjects, another for seeing if that stuff makes you think smarter, and a third one for the practice ways institutions plan their classes. This helped us look at how combining different subjects can boost brainpower. Like, we put all the articles about doing projects with buddies from other majors in one spot. That way, we could see if working together really does make you better at breaking down problems and stuff. We also kept those big reports from institutions and units apart. That helped us get the lowdown on how they set up their classes to make sure you learn a bunch of different things together. It's like when you have a class that's not just about math or science, but uses both to solve real-world problems. Super helpful for figuring out if this whole mixing-subjects thing is the way to go for learning better.

## ANALYSIS OF DATA

The analysis was like a big brainstorming session with different topics, looking for good connections between them. We checked out a bunch of sources, like teachers' ideas, higher education goals, and how well students did after trying out some multidisciplinary stuff. We used this thing called textual analysis to dig into the qualitative stuff, like when teachers talked about their experiences and the results, they saw in the classroom from mixing different subjects. We tried to figure out how doing projects and stuff with more than one subject can make you think better, like being good at changing your mind when you need to or solving problems. We looked at case studies and articles that had real-life examples where students got better at thinking critically. By putting all these ideas together, we got a pretty solid picture of what higher institutions should do to help students think more deeply. It's like we figured out some tricks or cheat codes for better learning. And the best part. These aren't just theories, they're actual things institutions can do to make sure students get better at thinking critically through mixing subjects.

## DISCUSSION

The findings from a bunch of studies and some reports from institutions show that when you learn a bunch of different stuff (like math, science, and English all mixed together), it's way better for helping you think more deeply and figure out what's important. There are case studies from different classes that prove this, and they also give some good ideas about how teachers can help students get better at this whole critical thinking thing, no matter what subject they're into.

### C.S. 1: MIXING STUFF FROM DIFFERENT CLASSES TOGETHER IN PROJECTS

So, there's this good thing happening at some institutions where they're making students do these projects that use stuff from science classes and humanities classes at the same time. Like, they're calling it multidisciplinary learning or something. At a place called Stanford University, they had this class about the environment that made students look at it with science goggles, but also with the kind of thinking you do in philosophy and money classes. They had to use biology, ethics, and economics to figure out what was going on with the Earth and how we could make it better without totally messing it up.

This one class they had was all about a big environmental mess happening right now, and students had to think about it from all these different angles. It's like, okay, you know the science behind it, but what's the right thing to do about it? And can we afford to do it? Stanford says that when students did this, they got way better at understanding big, complicated problems. They figured out that to solve these Earth issues, you need to look at numbers and be nice to the planet, but also think about if it's fair and doesn't ruin everyone's bank accounts.

The students who took this class said that afterwards, they could tackle tough real-world problems 20% better than before. That's like, going from a C to a B, or a B to an A, it's like your brain's a Swiss Army knife and now it has even more tools to use (Stanford University, 2022). So, mixing up what you learn from different classes can help you be smarter and more prepared for the real world, where stuff isn't just about one thing. It's not just science or history, it's everything together, making sense of the big picture (Stanford University, 2022).

### C.S. 2: MIXING STUFF WITH MORE TECH

So, in this paper by Lee and their buddies in 2021, they talk about this program where engineering and psychology students work together. They had to make apps that don't make your brain hurt if you're not super smart or something. The psychology students had to think about how people's brains work and stuff, and the engineering students got to play with coding, which is like the secret language of computers. It's like a big-brain party where everyone learns from each other. They say that doing this project helped them think harder and solve problems better because they had to use their smarts in new ways (Lee et al., 2021). It's like when you play a video game with

someone from a different school of thought, you know, you get better at the game and understand more about it. They improved their skills by mixing up their knowledge from different classes.

### C.S. 3: MIXING HUMANITIES WITH STEM AT UW

So, this cool thing happens at the University of Washington (UW) where they're like, "Hey, let's throw some humanities into our STEM classes!" (UW, 2020). They did this case study where they had a bunch of students doing a module that combined literature and medical ethics. They had to tackle some serious ethical problems in the medical world, but not just with science stuff, also with what they learned from books and stuff. It's like they had to think with their heart and their brain at the same time. The students dug it because it made them think about the right and wrong things in a different way, and it even made them better at solving problems because they could see more sides to the story. The teachers there said that the students started to think on their own more and weren't as scared to share their thoughts, even if they were different from everyone else's. So, mixing in humanities with all the sciencey-mathy stuff in STEM classes is like adding sprinkles to your ice cream – it makes it more interesting and fun to learn.

### C.S. 4: WHAT TEACHERS THINK AND HOW IT AFFECTS THE INSTITUTION'S VIBE

So, having teachers be a part of those big mix-and-match programs where they teach different subjects together is super key. In this survey by Vecino and Murtin from 2020, like, almost 85% of the profs said that their students got way more into it and weren't just sitting there zoning out. They also noticed that the students weren't showing off their big brains with critical thinking as much in class. But here's the cool part: teachers said that when they work with other teachers from different fields, this mix-up helps the teachers get along better and makes the school a place where everyone thinks about stuff differently and asks tough questions (Baker & Clark, 2020).

## FINDINGS

### 1. ANALYTICAL SKILLS GET A MAJOR UPGRADE

So, when you're in a place where you're learning all these different subjects together, like a mix of environmental science and ethics, it's like your brain gets this workout and starts to understand that problems are more complicated than just the facts (Chen, 2021). You start looking at things from a bunch of different angles, which is helpful when you're trying to figure out the right thing to do in real-life situations.

### 2. PROBLEM-SOLVING IS LIKE A SUPERPOWER FROM MIXING STUFF

When you're learning in a place where they throw a bunch of different subjects at you, like a big academic salad, you get better at solving problems because you can take bits and pieces from each one to tackle whatever comes your way. Jones and Merrick (2022) did this research that showed students who did these kinds of classes were

killing it at coming up with new ideas because they had a whole toolbox of stuff from various fields.

### 3. ADJUSTING TO ALL THE NEWNESS

This way of learning makes you super flexible and open-minded. Like, Baker and Clark (2020) said that when you're exposed to different ways of talking and thinking, you're more likely to be like, "Whoa, maybe there's more than one way to look at this!" You get used to hearing all these opinions and start questioning the stuff you thought was set in stone. It's pretty awesome because you learn to appreciate different points of view and not just stick to what you already know.

### CONCLUSION

From this study we did, it's like, totally clear that mixing up your brain with different subjects can make you think way better. Like, institutions can help by making us check out all sorts of stuff, which is like, super cool because it's like a brain gym for critical thinking. We've got to be able to juggle a bunch of ideas at once, and that comes from looking at things from a bunch of angles. Some folks might say being a know-it-all in one thing is better, but the study shows that's not the case. It's like, way better to have a smorgasbord of knowledge from all over the place. You can tackle anything that comes your way because you've learned from a bunch of different places. And let's be real, the world is changing super-fast, so being all versatile and stuff is going to be clutch when you're out there trying to adult. So, institutions should keep mixing things up because it's giving us skills that we'd never get if we just stuck to one thing all the time. Furthermore, the study shows that working together between different college groups is super important, because when students from different subjects hang out and learn together, it doesn't just make them smarter, it also helps them understand different ways of thinking and get good at dealing with all kinds of people from around the world. When you mix stuff like science, the artsy stuff, and techy things, students get to see a bunch of different ways to solve problems and think about things. This helps them get ready for the future and all the crazy stuff that's going to come at them. For institutions, this is a big deal because if they want to make sure students are ready for what's coming next, they should get teachers and students to do more projects together that involve more than just one subject. That's like the best way for students to get those brain skills to think about big, hard problems. But just saying it's important isn't enough, institutions need to make sure teachers know how to do this and make it a big part of what students do every day. Creating a vibe where everyone's into trying new things and thinking outside the box is super crucial. It's like the secret sauce to making sure students can keep learning and adapting forever. As the world keeps changing, this whole mixing-of-subjects thing is the way to go if institutions want to make sure students are ready to rock whatever the future throws at them.

## RECOMMENDATIONS

### 1. ESTABLISHING INTERDISCIPLINARY PROGRAMS

Universities should develop projects that require students to maintain their interdisciplinary combination--projects like resort development which cobble together environmental science, ethics and technology from three unrelated fields.

### 2. INTEGRATE WORK IN DIFFERENT DEPARTMENTS

Expansion of inter-departmental programs provides opportunities for the exchange of ideas as well as encouraging students to adopt a variety of viewpoints.

### 3. DEVELOPMENT IN MULTIDISCIPLINARY TEACHING FOR TEACHERS

This could push students to a level of critical thinking which was unimaginable under more traditional teaching methods.

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