

CULTURAL FACTORS AND THEIR IMPACT ON PROBLEM-SOLVING APPROACHES AMONG HIGHER EDUCATION STUDENTS IN WEST BENGAL

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Abstract:

This study explored the cultural factors that influenced problem-solving approaches among higher education students in West Bengal. The region's collectivist values, strong family expectations, traditional educational norms, and linguistic diversity significantly shaped students' engagement with academic challenges. The research highlighted how collectivism fostered group-based problem-solving strategies, while family pressures often led to structured, rote learning. Traditional educational practices that emphasized memorization limited creative thinking and independent problem-solving. However, with the shift towards interactive and problem-based learning, there was potential to encourage innovative problem-solving skills. The study emphasized the importance of balancing traditional methods with critical thinking and independent learning, while also acknowledging cultural contexts. By fostering an inclusive and culturally sensitive learning environment, the research aimed to enhance students' problem-solving abilities and prepare them for the complexities of the modern world. The findings suggested that understanding the interplay between culture and cognitive processes was essential for improving educational outcomes in West Bengal's higher education system.

Keywords: Cultural factors, Problem-solving approaches, Collectivism, Traditional educational norms, Critical thinking, Problem-based learning, independent learning, Collaborative learning, Linguistic diversity

Introduction:

Problem-solving is an important skill for students, especially in higher education, where they face complex academic challenges, make decisions, and find solutions. However, students approach problem-solving differently, depending on various factors, one of the most important being culture. In India, particularly in West Bengal, the culture that shapes students' upbringing plays a key role in how they approach problem-solving. West Bengal, with its rich cultural background, social norms, and unique educational practices, offers a special context to understand how culture impacts students' problem-solving methods. Cultural elements like family traditions, community values, and socio-economic status interact to influence how students solve problems both in academics and daily life. Cultural factors have long been known to affect cognitive processes, such as problem-solving. Vygotsky (1978) stated that culture is crucial for cognitive development, as it

provides tools and frameworks for understanding the world. According to his socio-cultural theory, cognitive development, including problem-solving, is influenced by social interactions within a cultural context. This means that the way people solve problems depends not only on their inherent abilities but also on the culture they are part of. In West Bengal, cultural norms like respect for elders, a focus on community, and the importance of academic success can shape how students tackle problems. West Bengal's education system has traditionally focused on memorization and theoretical learning, which may limit students' creativity in problem-solving. These traditional methods, shaped by cultural expectations, could affect students' ability to approach problems flexibly and innovatively (Chattopadhyay, 2019). However, recent educational reforms have started promoting critical thinking and practical problem-solving. Despite these changes, cultural factors, such as family expectations, social structures, and regional values, still influence how students handle academic challenges. For instance, in West Bengal, family expectations often relate closely to students' academic success. The cultural emphasis on family reputation can put a lot of pressure on students to succeed, influencing how they approach problem-solving. Students may adopt strategies that meet their family's expectations, even if these aren't the most innovative or effective (Dasgupta, 2020). Also, in many rural areas of West Bengal, students may prefer group problem-solving over individual efforts, reflecting the region's collectivist values. This cultural trait may shape how students approach group projects and academic challenges, favoring shared knowledge and decision-making over independent solutions. Additionally, socio-economic factors in West Bengal also play an important role in shaping students' problem-solving abilities. Students from rural or low-income backgrounds often have limited access to resources like technology, books, and the internet, which can affect their ability to solve complex problems. These students might rely more on traditional, community-based solutions, which may not always match modern problem-solving techniques taught in colleges (Banerjee, 2018). The cultural focus on resourcefulness in such communities might encourage students to come up with creative, low-cost solutions, offering a different approach to problem-solving than what is typically seen in urban areas. This research will explore how cultural factors affect the problem-solving approaches of higher education students in West Bengal. By looking at the relationship between cultural values, family influences, community expectations, and educational practices, this study will provide insights into how these elements shape students' thinking and problem-solving skills. Understanding these influences is important for developing teaching strategies and curricula that are more in tune with the diverse needs of students in West Bengal.

Literature Review:

Problem-solving is an important skill in higher education because it helps with academic success and brain development (Sternberg, 2003). However, the way people solve problems can differ based on their culture. Cultural values, traditions, and education systems play a role in shaping how people approach problems (Nisbett, 2003). In India, particularly in West Bengal, cultural factors like group-focused values, education style, and language impact how students solve problems (Hofstede, 2001). Research shows that cultural factors have a big impact on how students think and solve problems. According to Vygotsky's socio-cultural theory, our thinking and

problem-solving skills are not only based on what we can do individually but are also shaped by the social and cultural surroundings we grow up in (Vygotsky, 1978). In West Bengal, cultural values like family expectations, respect for elders, and community traditions affect how students tackle problems. A carefully planned problem-solving course can boost academic performance and assist students, particularly those who are having difficulty, in handling both their college work and everyday life challenges more effectively (Burke, A., & Stewart, S. 2022). Another study found that Problem-based learning greatly enhances students' problem-solving skills in higher education (Atmaja et al., 2024). The study revealed that Undergraduate biology students solve problems in different ways depending on their knowledge, strategies, intentions, thinking about their own thinking (metacognition), and mindset, all of which affect their learning results (Hsu et al., 2024). Research demonstrated that Problem-solving strategies help improve eighth-grade students' performance in earth science, especially by making it easier for them to apply what they've learned (Russell, M., & Chiappetta, E. 1981). Evidence pointed out that A six-step learning activity model boosts creative problem-solving skills in higher education students by encouraging problem awareness, real-world practice, teamwork, and well-defined roles for both students and teachers (Kongkhan, & Sitti, 2018). Problem-solving strategies significantly enhance eighth-grade students' performance in earth science, especially by helping them apply the subject matter more effectively (Russell & Chiappetta, 1981). An investigation found that Higher secondary students show an average level of problem-solving ability, with no notable differences based on gender, location, school type, language medium, or parents' occupations (Prakash, 2020). Studies indicated that Problem-solving skills in higher education are typically nurtured at the intermediate level, with the contextual approach proving to be the most effective. This method emphasizes hands-on tasks that are directly connected to a specific field of study (Vintere, 2019). The problem-solving method significantly contributes to the development of social skills in secondary school students, especially by promoting values like cooperation and loyalty (Boudiaf, 2024). To enhance creativity and problem-solving skills among high school students in Khorramabad, strong leadership teams and a decentralized approach to formal education are essential (Minaee et al., 2024). A study highlighted that applying low-road transfer of higher-order thinking can enhance problem-solving strategies for students with disabilities, offering valuable insights for curriculum design and instructional methods (Niedelman, 1991). Dynamic problem-solving (DPS) is an effective assessment tool for evaluating students' overall cognitive abilities at the start of higher education, showing strong links to mathematics and science skills (Csapó & Molnár, 2017). Cultural factors such as whether a culture values individualism or collectivism, how power is distributed, and how uncertain situations are handled can affect how students solve problems (Hofstede, 2001). In West Bengal, people generally value group harmony and respect for authority. This can influence students to avoid questioning teachers or thinking outside the box, as shown by Gupta and Vaish (2007). In cultures that emphasize group consensus, students may take a more careful approach to problem-solving, focusing on group agreement rather than personal creativity. High power distance means students are more likely to depend on teachers for guidance, rather than trying to solve problems on their own (Hofstede, 2001). These cultural traits might limit students' ability to try new or different solutions. West Bengal's education system, which often focuses on

memorizing facts, can also affect problem-solving skills. Research by Chattopadhyay and Singh (2015) suggests that students in the region tend to follow traditional and structured ways of solving problems because of the strict teaching methods in local schools. This is different from educational systems that encourage more creative thinking and flexible problem-solving, like those found in other countries (Bhattacharya & Sanyal, 2016). Language also influences how students solve problems (Vygotsky, 1978). In West Bengal, where many students speak both Bengali and English, students may approach problems differently depending on the language they use. According to Ray and Ghosh (2013), students are more likely to think analytically when solving problems in English but may adopt a more holistic approach when thinking in Bengali. Traditional values, such as respecting elders and following old ways of thinking, also affect problem-solving in West Bengal. Research by Ghosh (2011) shows that students often prefer solutions that follow tradition or societal expectations. This can make students less likely to come up with creative or unconventional solutions. Programs that encourage mindfulness and critical thinking are becoming more popular in West Bengal. These programs are designed to help students think more independently and adapt to different types of problems, moving away from just accepting information without questioning it (Chakraborty & Das, 2020).

Cultural factors have a big impact on how students in higher education solve problems in West Bengal. By understanding how values like collectivism, respect for authority, language, and traditional beliefs influence students' thinking, educators can design better programs that encourage creative and independent problem-solving. Future studies should look into how these cultural factors can be included in curriculum development to improve critical thinking and problem-solving skills.

Theory Incorporating Problem-Solving:

Piaget's theory says that problem-solving is an important part of how people's thinking grows. He believed that as children get older, they go through different stages (sensorimotor, preoperational, concrete operational, and formal operational), and with each stage, they get better at solving more difficult problems (Piaget, 1952).

Vygotsky's theory highlights how social interactions help in solving problems. He suggested that our thinking, including problem-solving, is shaped by cultural tools, language, and the support of others who know more, like teachers or friends. A key idea in his theory is the "zone of proximal development" (ZPD), which shows how people can improve their problem-solving skills with the right help (Vygotsky, 1978).

Gestalt psychologists, such as Kohler and Wertheimer, believed that problem-solving often involves a sudden, "aha!" moment, where the solution comes all at once, instead of through trial and error. They argued that solving problems isn't just about logical thinking; it also requires changing the way we see or understand the problem (Kohler, 1925; Wertheimer, 1959).

Theory likens the mind to a computer, emphasizing how information is taken in, stored, and retrieved when solving problems. It proposes that people use methods, such as algorithms or heuristics, to process information and find solutions (Newell & Simon, 1972).

Heuristics are simple rules or shortcuts that people use to make decisions and solve problems quickly. Although they don't always lead to the right answer, they often give a good enough solution in many cases (Tversky & Kahneman, 1974).

Theory focuses on solving problems by dividing them into smaller, easier-to-manage tasks. The person works on narrowing the gap between where they are now and where they want to be, using steps that bring them closer to the solution (Newell & Simon, 1972).

Dual-process theory proposes that problem-solving involves two types of thinking: a quick, automatic, and intuitive process (System 1) and a slower, more thoughtful, and analytical process (System 2). Depending on how difficult the problem is, either one or both systems can be used (Kahneman, 2011).

Guilford's structure of intellect theory suggests that creativity is important for solving problems. He believed that solving problems needs both divergent thinking (coming up with many different solutions) and convergent thinking (choosing the best solution). According to Guilford, creativity is a key part of being good at problem-solving (Guilford, 1956).

Newell and Simon studied how people process information and approach problem-solving. They created a model that includes steps like defining the problem, finding important information, breaking the problem into smaller tasks, and then evaluating possible solutions. Their work helped establish the basis for computer-based models of problem-solving (Newell & Simon, 1972).

Polya's problem-solving cycle is a straightforward method for solving math problems, but it can be used for many types of problems. The cycle has four main steps: understanding the problem, making a plan, carrying out the plan, and checking the solution (Polya, 1945).

Cognitive Load Theory looks at how the limits of working memory affect problem-solving. It says that learning and problem-solving can be influenced by how much mental effort a task requires. To solve problems more effectively, it's important to reduce unnecessary information or tasks, so working memory can focus on what's most important (Sweller, 1988).

Feldman suggests that solving problems requires both cognitive abilities and specific skills. He created a model where people need to recognize patterns, identify important factors, and use various strategies like trial and error, analogy, or deductive reasoning. His model shows that problem-solving is a skill that can be learned and improved over time (Feldman, 2003).

Critical thinking is closely linked to problem-solving. Ennis defined it as the process of thinking carefully about, analyzing, evaluating, and combining information. Critical thinkers can approach problems with doubt, carefully think through different options, and look at evidence in an organized way, which helps them solve problems more effectively (Ennis, 1987).

Schema theory suggests that solving problems involves using mental frameworks (schemas) that represent what we know about the world. When faced with a problem, people use these schemas to find and apply helpful information, leading to a solution. If the problem is new or unfamiliar, they might need to create a new schema to understand and solve it (Bartlett, 1932).

Luchins studied how problem-solving can be affected by a "mental set," where people get stuck using a familiar strategy, even if it's not the best one for the current problem. This is called "Einstellung," and it shows how past experiences can influence the way people tackle new problems (Luchins, 1942).

Theory stresses that problem-solving is influenced by the context in which it happens, rather than just being an isolated activity. Brown, Collins, and Duguid argued that problem-solving is more effectively understood as something that takes place in real-life situations, involving teamwork, practical tasks, and tools, not just abstract thinking (Brown, Collins, & Duguid, 1989).

Problem Solving Strategies of Higher Education Students:

Higher education students use different ways to solve problems based on their learning styles, academic fields, and cultural backgrounds. These strategies usually involve both thinking and planning. Here are some common problem-solving methods used by these students:

Algorithmic Approach This method involves following a clear, step-by-step process to find a solution, often used when there is one specific answer. It is common in subjects like math or science. Example: In math, students might apply a formula, like the quadratic formula, to solve an equation.

Heuristic Approach: Heuristics are mental shortcuts or quick rules students use to make decisions when facing uncertainty or complexity. While they don't always lead to the perfect solution, they help when there is limited time or incomplete information. Example: A student writing an essay might first brainstorm keywords to organize the argument before writing the full essay.

Trial and Error: This approach involves trying different solutions and learning from mistakes until the correct one is found. It's used when students are unsure of the answer and are open to experimentation. Example: A student writing code might keep changing and testing the code until it works correctly.

Divide and Conquer: This method involves breaking down a large problem into smaller, easier-to-manage parts. It is helpful when dealing with big projects, research papers, or complex assignments. Example: A student working on a dissertation might break the work into smaller sections like the literature review, methodology, and writing each chapter separately.

Collaborative Problem-Solving: Many students work together in groups to solve problems, especially in subjects that require brainstorming or shared resources. Working as a team brings together different skills and viewpoints, often leading to better solutions. Example: In a group project, students might divide tasks based on their strengths, such as research, organizing data, and writing the final report.

Analogical Problem-Solving: This strategy involves comparing a current problem to a similar one that has already been solved. Students use past experiences to solve new, similar problems. Example: A business student might use the concept of supply and demand to understand economic models in different markets.

Conceptualization and Visualization: This method involves creating a mental or visual image of the problem to better understand it. Diagrams, flowcharts, or mind

maps help students see connections and structures within complex issues. Example: A student in biology might use diagrams of the human body to understand how organs work together, or a physics student might use diagrams to analyze forces. Critical Thinking: Critical thinking is the ability to carefully analyze and evaluate information in a logical way to solve problems. It is especially useful in subjects like philosophy, law, and social sciences, where students must weigh up evidence and draw conclusions. Example: When studying history, a student might examine different viewpoints and sources before making a conclusion. Mind Mapping: Mind mapping is a visual technique used to organize ideas and show how they are connected. It helps students break down a problem into smaller parts and understand how each part relates to the others. Example: A student might create a mind map for a research paper, starting with a main topic and branching out to subtopics, theories, and research findings. Metacognitive Strategies: Metacognition is about thinking about one's own thinking. Students using this method are aware of their problem-solving process and can adjust strategies if one isn't working. It involves planning, monitoring, and evaluating the approach. Example: Before solving a math problem, a student might consider which formula or method to use and check the solution as they work through each step. Resource Utilization: This method involves using available resources, such as books, online materials, or seeking help from professors, tutors, or classmates, to find solutions. Students often turn to outside sources when they face difficult problems. Example: A student struggling with a tough chemistry problem might use textbooks, online forums, or academic papers to help solve it. Reflection and Review: After solving a problem, students often reflect on the process to see what worked and what didn't. This helps them improve their problem-solving skills for the future. Example: After finishing a research paper, a student might review their professor's feedback to find areas for improvement and adjust their approach in the future. Creative Problem-Solving: This method involves thinking in new, creative ways to solve a problem. It's especially useful in fields like design, engineering, and the arts, where unusual solutions may be needed. Example: A design student might sketch several prototypes or brainstorm unique ideas to meet a client's needs. Time Management and Prioritization: Time management involves organizing tasks and focusing on the most important ones first. This method is useful for managing large assignments or projects with tight deadlines. Example: A student working on multiple assignments might prioritize tasks by deadlines or complexity, handling the most urgent ones first. Students in higher education use a wide range of strategies to solve problems. These approaches often combine logical thinking, creativity, and collaboration. The choice of methods depends on the problem, the student's learning style, the subject, and available resources. By improving these strategies, students can become better at solving academic challenges and handling real-world problems.

Cultural Factors on Problem-Solving Approaches in Higher Education Students: Worldwide Perspective

Problem-solving is a complex mental process shaped by several factors, including personal abilities, the environment, and cultural influences. Cultural factors are particularly important in

determining how students solve problems in higher education. The different ways students from various cultural backgrounds approach academic challenges offer valuable insights into global educational practices and results. Geert Hofstede's Cultural Dimensions Theory (1980) provides a helpful framework for understanding how cultural differences affect cognitive processes like problem-solving. Hofstede identified several cultural dimensions that influence how students approach problems, such as individualism vs. collectivism, power distance, uncertainty avoidance, and long-term vs. short-term orientation. In individualistic cultures (e.g., the United States, Western Europe), students tend to work independently when solving problems, focusing on personal achievement and accountability. In contrast, students from collectivist cultures (e.g., many Asian countries, Latin America) often prioritize group harmony and teamwork. For example, students from Japan or China may tackle academic issues by discussing them with peers or teachers, reflecting the cultural value of collective learning (Hofstede, 1980). In cultures with high power distance (e.g., India, Brazil, Mexico), students are less likely to challenge authority and may solve problems by strictly following the teacher's instructions. They may view the teacher as the main source of knowledge. In cultures with low power distance (e.g., Denmark, Sweden), students take a more active role in their learning, asking questions and engaging in independent or group problem-solving (Hofstede, 1980). Students from cultures with high uncertainty avoidance (e.g., Greece, Japan) prefer well-defined tasks with clear instructions. They avoid ambiguity and tend to be cautious. On the other hand, students from cultures with low uncertainty avoidance (e.g., the United States, the United Kingdom) may be more comfortable with open-ended problems and tend to take more creative or experimental approaches to solving them (Hofstede, 1980). Cultures that value long-term orientation (e.g., East Asian cultures like China, Japan, Korea) emphasize perseverance, patience, and the pursuit of future rewards. Students from these cultures may approach problems with careful planning and persistence. In contrast, cultures with a short-term orientation (e.g., the United States, many African countries) may prioritize quick and practical solutions over long-term planning (Hofstede, 1980). Vygotsky's Sociocultural Theory (1978) also provides valuable insights into how social and cultural contexts influence problem-solving. Vygotsky emphasized the importance of social interaction and cultural tools in cognitive development, suggesting that students' problem-solving strategies are shaped by the resources available in their culture. For example, in cultures with strong community ties, students may rely on group learning and discussions, while in individualistic societies, they might prefer working alone. Research has examined how collectivist and individualistic approaches to problem-solving differ across cultures. In countries like South Korea, China, and India, students are expected to engage in collective problem-solving, which often involves group study and peer discussions. In contrast, students in Western cultures are more likely to work independently, with rewards often tied to individual achievement (Kohn, 1994). Cultural factors also influence the cognitive strategies used in problem-solving. Studies have shown that students from different cultures use different approaches to academic tasks. For example, students from East Asian countries like Japan and China often use holistic thinking, considering the broader context and relationships between variables when solving problems (Nisbett, 2003). In contrast, students from Western countries like the United States or Germany tend to break problems into smaller parts and solve them step by

step. Language and communication styles are also important. In some cultures, indirect communication is common, and students may rely on subtle cues when discussing academic challenges. In more direct communication cultures, students may feel more comfortable openly discussing problems and questioning assumptions (Hall, 1976). Recognizing how cultural influences shape problem-solving strategies in higher education is essential for educators. As educational environments become more global, students from diverse backgrounds are interacting more frequently. Educators must understand the importance of cultural sensitivity and flexibility in fostering effective problem-solving. For instance, educators in Western countries might consider incorporating more collaborative learning activities, similar to those in collectivist cultures, to better support students who may not be used to working individually. Cultural factors significantly affect how students in higher education approach problem-solving. Cultural values influence cognitive strategies, communication styles, and attitudes toward authority and teamwork. By understanding the cultural impact on problem-solving, educators can better support students from different backgrounds and create inclusive learning environments that encourage effective problem-solving for all.

West Bengal Perspective:

Problem-solving is an important skill, especially in higher education, where students need to apply their knowledge and skills to unfamiliar and complex situations. In places like West Bengal, India, cultural factors have a big influence on how students approach problem-solving. This essay looks at how cultural aspects like collectivism, family influence, and education shape problem-solving strategies among higher education students in West Bengal. In West Bengal, and India more broadly, people value community and family over individualism. This collectivist mindset influences students' approach to problem-solving. According to Hofstede's theory of cultural dimensions, societies with high collectivism stress cooperation and interdependence (Hofstede, 2001). In education, this often leads to students favoring group problem-solving strategies rather than working alone. Group discussions and collaborative learning are common in higher education, where students solve problems together, drawing from shared knowledge and perspectives. While this can help students benefit from different viewpoints, it can also create challenges if group dynamics affect individual critical thinking. Research shows that in collectivist cultures, students tend to approach academic tasks based on the approval of others (Choi et al., 2007). In West Bengal, relying on group-based strategies may sometimes limit students' ability to think independently, as they might prioritize agreement over critical thinking. While cooperation is important, it may not always lead to the most creative or effective solutions, particularly in situations where individual initiative or innovative thinking is needed. In West Bengal, family plays a crucial role in shaping students' academic behavior and problem-solving methods. Education is highly valued, both for personal growth and as a way to bring honor to the family. This cultural value creates strong pressure on students to perform well academically, which in turn affects how they solve problems. Vygotsky's sociocultural theory suggests that social interactions, like those within the family, influence learning and cognitive growth (Vygotsky, 1978). The pressure to meet family expectations can push students to use traditional, structured problem-

solving methods that match their parents' or teachers' views, potentially limiting their exploration of new or creative solutions. Additionally, the family structure in West Bengal is often hierarchical, meaning students respect and follow authority figures, like parents and teachers, when solving problems. This respect for authority may lead students to rely on traditional problem-solving methods, following established rules and instructions without critically evaluating the situation. While this respect helps maintain discipline and focus, it may also discourage independent thinking or problem-solving in unfamiliar situations (Nisbett, 2003). The educational system in West Bengal, like much of India, has traditionally focused on rote learning and memorization. In many institutions, particularly at the undergraduate level, students are taught to memorize information instead of focusing on creative problem-solving. This emphasis on rote learning can limit the development of critical thinking and problem-solving skills, as students are more concerned with remembering information than understanding how to apply it to real-world problems. Piaget's cognitive development theory suggests that problem-solving skills improve when students actively engage with their environment through exploration and reflection (Piaget, 1972). The heavy reliance on memorization in traditional Indian education can hinder students' ability to think critically and come up with innovative solutions. However, recent changes in educational policies and the growth of interactive learning have started to challenge this traditional approach. There is now more focus on project-based learning, case studies, and hands-on experiences in many West Bengal institutions, encouraging students to engage in active problem-solving. These changes are gradually promoting more dynamic problem-solving strategies, but it remains unclear how widely these approaches will be adopted across all educational levels. Language is another key cultural factor influencing problem-solving in West Bengal. The region is linguistically diverse, with Bengali being the main language used in schools, although English is also taught. Language affects how problems are understood and discussed, and being able to express a problem in one's native language can make it easier to find solutions, as it helps students think more clearly in a culturally familiar context. However, for students who are not as proficient in English, bilingualism can create cognitive challenges, making it harder to engage in complex problem-solving, especially in subjects that use specialized or technical vocabulary (Sweller, 1988). Cultural factors in West Bengal, such as collectivism, family expectations, traditional education systems, and linguistic diversity, have a big impact on how higher education students approach problem-solving. While these cultural influences encourage cooperation, respect for authority, and discipline, they can also limit independent and creative problem-solving. As education in the region continues to evolve, it's important to consider these cultural factors to help create an environment that encourages both innovative problem-solving and respect for cultural traditions.

Educational Implications:

The influence of cultural factors on problem-solving approaches among higher education students in West Bengal carries important implications for education. Elements such as collectivism, family expectations, traditional educational practices, and language all shape how students handle academic challenges. It is crucial for educators and policymakers to recognize these factors to improve teaching and learning outcomes. Here are some significant educational implications: Due

to the collectivist culture in West Bengal, where students often prefer group-based problem-solving, it is vital to promote independent thinking. Over-dependence on group work can prevent students from developing their individual problem-solving skills. To address this, educational institutions should: Provide opportunities for students to engage in individual learning activities, such as assignments or case studies, that require independent problem-solving. Use methods that encourage critical thinking and decision-making, like problem-based learning, debates, and research projects, to help students think from multiple perspectives. Family expectations in West Bengal can pressure students to follow traditional and structured problem-solving methods. Educators can support students in navigating these pressures by: Teachers should recognize the strong influence of family expectations, especially regarding rote memorization and academic performance. A balanced approach that includes creative problem-solving alongside traditional methods will be beneficial. It's important to foster an environment that encourages exploration and creativity, while respecting students' cultural backgrounds. Students should feel encouraged to take risks and innovate. The West Bengal education system, which traditionally focuses on rote learning, may limit students' ability to solve problems effectively. However, there are signs of change as interactive learning methods are being introduced. To ease this transition, educators should: Active learning strategies such as project-based learning, flipped classrooms, and case studies should be introduced to engage students and help them solve real-world problems. PBL encourages students to solve complex issues through collaboration and critical thinking, aligning with contemporary educational goals and bridging the gap between traditional and modern learning. Teachers should receive professional development to effectively implement these new pedagogies. Training educators to design problem-solving tasks that challenge students' cognitive abilities is crucial. West Bengal's linguistic diversity presents challenges for problem-solving, especially for students who are not fluent in English. Educators can help by: Teachers should be aware of linguistic challenges, particularly when students need to engage with academic language in English. Providing language support, such as writing workshops or bilingual resources, can help students engage more effectively in problem-solving. Allowing students to first discuss problems in their native language (Bengali) before switching to English can reduce cognitive load and improve understanding. This bilingual approach can help students express ideas more clearly. Group-based problem-solving is common in West Bengal, but educators can make it more effective by considering cultural dynamics. To improve collaborative learning, teachers should: Group work benefits from varied viewpoints. Teachers should encourage students to engage with peers from different disciplines, backgrounds, and cognitive styles to broaden their problem-solving methods. Assign specific roles in group tasks that ensure individual accountability. This encourages both collaboration and individual reflection. In collectivist cultures, group dynamics might hinder individual expression. Teachers should help students develop communication skills so all group members can contribute their ideas confidently. To make learning more relevant to students, educators can integrate local cultural contexts into the curriculum. This can be done by: Using examples from local traditions, history, and current issues in West Bengal can make problem-solving tasks more relatable and engaging for students. Incorporating discussions on cultural values and regional challenges can deepen students' understanding of how culture shapes their

problem-solving approaches. This will create a more inclusive and culturally responsive learning environment. By taking these steps, educators can better address the cultural factors influencing students' problem-solving strategies in West Bengal, helping them develop both independent and collaborative skills needed to succeed in higher education.

Conclusion:

Cultural factors have a significant impact on the problem-solving approaches of higher education students in West Bengal. The region's collectivist culture, strong family expectations, traditional educational practices, and linguistic diversity all shape how students approach academic challenges. While collectivism encourages collaboration and group-based learning, it may also limit independent thinking and creative problem-solving. The pressure to meet family expectations often pushes students towards conventional, structured methods, reinforcing traditional education models that prioritize rote memorization over critical thinking. However, the educational landscape in West Bengal is evolving, with a growing emphasis on active learning, critical thinking, and problem-based learning. These shifts provide opportunities to promote more innovative and diverse problem-solving approaches. To fully support students' growth, educators and policymakers must be mindful of the cultural factors influencing academic performance and adapt teaching methods to nurture both collaborative and independent problem-solving skills. This can be achieved by creating an inclusive environment that embraces bilingualism, respects cultural traditions, and encourages critical thinking. Ultimately, understanding how culture influences problem-solving is key to improving educational practices. By recognizing the intersection of culture and problem-solving, higher education institutions in West Bengal can better prepare students to tackle complex, real-world problems. By integrating culturally relevant teaching methods and helping students navigate cultural pressures, West Bengal can cultivate a generation of problem solvers who are both culturally aware and intellectually equipped.

References

- Anderson, J. R. (1982). The architecture of cognition. Harvard University Press.
- Atmaja, T., Yustitia, V., Naim, S., F., Santosa, T., M., & Pasaribu, D. (2024). Meta-analysis Problem Based Learning on Students' Problem-Solving Skills in Higher Education. Indonesia Journal of Engineering and Education Technology (IJEET). <https://doi.org/10.61991/ijeet.v2i2.73>.
- Banerjee, A. (2018). Educational challenges in rural India: Bridging the gap between theory and practice. Calcutta University Press.
- Bartlett, F. C. (1932). Remember: A study in experimental and social psychology. Cambridge University Press.
- Bhattacharya, S., & Sanyal, A. (2016). A study on the impact of educational reforms in West Bengal: A case for creativity in the classroom. Journal of Education and Development, 32(2), 47-61.

- Boudiaf, M. (2024). Using the problem-solving method and its role in developing some social aspects among secondary school students from a point of view Physical education teachers. INTERNATIONAL JOURNAL OF EARLY CHILDHOOD SPECIAL EDUCATION. <https://doi.org/10.48047/intjecsc/v16i2.8>.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. Educational Researcher, 18(1), 32-42.
- Burke, A., & Stewart, S. (2022). Learning problem solving to manage school-life challenges: The impact on student success in college. Active Learning in Higher Education, 25, 169 - 183. <https://doi.org/10.1177/14697874221112879>.
- Chakraborty, M., & Das, S. (2020). Mindfulness and critical thinking interventions in higher education: Exploring possibilities in West Bengal. Journal of Indian Education, 45(3), 112-125.
- Chattopadhyay, P., & Singh, R. (2015). Traditional educational systems and their impact on problem-solving in Bengal. Indian Journal of Education, 40(4), 55-72.
- Chattopadhyay, S. (2019). Cultural dynamics in the Indian education system: A comparative study of West Bengal's higher education reforms. Journal of South Asian Education, 45(2), 120-134.
- Choi, I., Nisbett, R. E., & Norenzayan, A. (2007). Causal attribution across cultures: Variation and universality. Psychological Bulletin, 133(4), 697-721.
- Csapó, B., & Molnár, G. (2017). Potential for Assessing Dynamic Problem-Solving at the Beginning of Higher Education Studies. Frontiers in Psychology, 8. <https://doi.org/10.3389/fpsyg.2017.02022>.
- Dasgupta, R. (2020). Family values and educational outcomes: A study of academic pressures in West Bengal's middle-class families. Sociological Review, 63(1), 40-57.
- Ennis, R. H. (1985). A logical basis for measuring critical thinking skills. Educational Leadership, 43(2), 44-48.
- Feldman, D. H. (2002). From behavior to cognition: How humans solve problems. Cambridge University Press.
- Ghosh, S. (2011). Cultural norms and their influence on cognitive processes in West Bengal. Indian Journal of Psychology, 23(1), 78-92.
- Guilford, J. P. (1967). The nature of human intelligence. McGraw-Hill.
- Gupta, N., & Vaish, S. (2007). Cultural perspectives on cognitive development in India. International Journal of Cross-Cultural Studies, 22(3), 89-102.
- Hall, E. T. (1976). Beyond culture. Anchor Press.
- Kohn, A. (1994). The race between education and technology. Harvard University Press.

- Hofstede, G. (1980). Culture's consequences: International differences in work-related values. Sage Publications.
- Hofstede, G. (2001). Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations (2nd ed.). Sage Publications.
- Hofstede, G. (2001). Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations (2nd ed.). Sage.
- Hsu, J., Sung, R., Swarat, S., Gore, A., Kim, S., & Lo, S. (2024). Variations in Student Approaches to Problem Solving in Undergraduate Biology Education. CBE Life Sciences Education, 23. <https://doi.org/10.1187/cbe.23-02-0033>.
- Kahneman, D. (2011). Thinking, fast and slow. Farrar, Straus and Giroux.
- Kongkhan, T., & Sitti, S. (2018). The Research and Development of the Instructional Model for Enhancing the Creative Problem Solving Abilities of Students in Higher Education. , 12, 83-96.
- Luchins, A. S. (1942). Mechanization in problem-solving: The effect of Einstellung. Psychological Monographs: General and applied, 54(6), 1-95.
- Minaee, A., Tanha, Z., & Jalili, R. (2024). Designing a Problem-Solving Skills Model Among Students in Khorramabad City (A Grounded Theory Study of High School Students). Journal of Adolescent and Youth Psychological Studies. <https://doi.org/10.61838/kman.jayps.5.9.16>.
- Newell, A., & Simon, H. A. (1972). Human problem solving. Prentice-Hall.
- Niedelman, M. (1991). Problem Solving and Transfer. Journal of Learning Disabilities, 24, 322 - 329. <https://doi.org/10.1177/002221949102400601>.
- Nisbett, R. E. (2003). The Geography of Thought: How Asians and Westerners Think Differently...and why. Free Press.
- Nisbett, R. E. (2003). The geography of thought: How Asians and Westerners think differently...and why. The Free Press.
- Nisbett, R. E. (2003). The geography of thought: How Asians and Westerners think differently...and why. Free Press.
- Piaget, J. (1972). The psychology of the child. Basic Books.
- Polya, G. (1945). How to solve it: A new aspect of mathematical method. Princeton University Press.
- Ray, A., & Ghosh, P. (2013). Cognitive styles and bilingualism in West Bengal: A cross-linguistic perspective. Language and Cognition, 9(1), 19-33.

- Russell, M., & Chiappetta, E. (1981). The effects of a problem-solving strategy on the achievement of earth science students. *Journal of Research in Science Teaching*, 18, 295-301.
<https://doi.org/10.1002/TEA.3660180404>.
- Russell, M., & Chiappetta, E. (1981). The effects of a problem-solving strategy on the achievement of earth science students. *Journal of Research in Science Teaching*, 18, 295-301.
<https://doi.org/10.1002/TEA.3660180404>.
- Sternberg, R. J. (2003). *Wisdom, intelligence, and creativity synthesized*. Cambridge University Press.
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257-285.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.
- Vintere, A. (2019). Pedagogical approaches to problem-solving in higher education. <https://doi.org/10.22616/rrd.25.2019.077>.
- Vygotsky, L. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wertheimer, M. (1959). *Productive thinking*. Harper & Row.