



Neuroscience Perspectives on Gender and Learning Difficulties: A Literature Review

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ABSTRACT

This study aims to examine the neuroscience perspective in understanding gender differences and their relationship to learning difficulty behaviors through a library research approach. The study examines three main issues: differences in the structure and function of the male and female brain according to neuroscience, factors influencing differences in learning styles and strategies based on gender, and their implications for effective learning practice. The findings indicate that there are significant anatomical differences in the male and female brain, particularly in the corpus callosum, hypothalamus, inferior parietal lobe, and hippocampus, which directly influence learning styles, language abilities, spatial skills, and emotional regulation in each gender. Learning difficulties are understood as a multidimensional condition not solely caused by low intelligence, but also by neurological, psychological, and environmental factors. Hormonal differences between testosterone and estrogen further reinforce different learning behavior patterns between male and female students. These findings imply the need for adaptive, gender-responsive, and child-centered learning strategies so that each student's learning potential can develop optimally.

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INTRODUCTION

The science of education also holds that although every child has differences, they remain the same in being children. Therefore, when dealing with a child, the first thing to consider is the child's personal character rather than their difficulties. Education thus views children from a positive perspective, with the hope of development based on the belief that every child possesses potential. As an educator, it is important to be optimistic, and education places the child at the center. In the learning process, consideration must be given to what obstacles exist and what the child's needs are. If these can be identified, educational activities will be focused on what the child needs, not on what others desire. Such a stance holds that one of the functions of education is to center activities on what a child needs, not on what others want.

One of the crucial processes in a child's development is education, which greatly influences the future. Once this developmental process ends, the right learning approach must be used to maximize learning outcomes. Differentiation-based learning is one method that can be employed, aiming to account for differences in the brains of male and female students during the educational process. Its goal is to help students achieve their potential and improve overall learning effectiveness (Hadiyanto & Suyadi, 2023).

Research in the field of neuroscience (the science of the neural/nervous/brain system) has also shown remarkable progress. However, research on the brain from a gender perspective has largely been limited to a general comparison of male and female brains, or at most to differences in language between men and women. Purwanti's research on gender differences in Mathematics learning using the right brain deserves special attention, as the perspective used is not merely gender, but also neuroscience (Suyadi, 2018).

Allah SWT created the human brain as the control center of all activity. Neuroscience is the body of knowledge that uncovers the mystery of the brain's special role as the determinant of a person's quality of life. To understand changes in learning behavior and learning difficulties, understanding how the brain works is essential. A brain used correctly enables a person to think intelligently and behave well; therefore, brain readiness greatly influences a person's receptiveness to knowledge. Damage to nerve cells in either the right or left hemisphere of the brain will cause a student to experience difficulties in learning (Sumiati & Gumiandari, 2022).

In addressing learning problems, an educator must truly understand all aspects of the child's character. For example, in fostering learning motivation, an educator should understand that motivation can improve academic achievement, yet not everyone knows how to stimulate a child's motivation to learn, as children possess different levels of intelligence.

According to data from Indonesia's Ministry of Social Affairs in 2011, approximately 7 million Children with Special Needs were recorded, representing about 3% of the total Indonesian population. Of these 7 million, the majority were slow learners, children with autism, and those with intellectual disabilities. This data provides sufficient reason for in-depth research into the educational challenges

surrounding children with special needs so that they receive equal rights in education. This study aims to provide information to educators, parents, and society regarding the special handling needed for slow learner students. Similarly, parents and communities who understand their children's characteristics will understand how to treat them (Sumiati & Gumiandari, 2022).

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METHODS

In this qualitative study, the authors attempt to present a scientific construction from several interrelated facts. The authors employed a library research approach. This study was conducted through a review of books, literature, and scientific articles on gender, brain anatomy, and learning patterns. Data and findings from various research results and literature reviews constitute the data for this study. These data were then processed and synthesized into a scientifically structured framework of information.

RESULT AND DISCUSSION

How Does Neuroscience Explain Differences in Brain Structure and Function Between Males and Females in Relation to Learning Difficulties?

The brain is a small organ housed within the skull that serves as the center of the nervous system, functioning as the control and coordination center for all biological, physical, and social activities of the entire body. The human skull can accommodate an average volume of approximately 1,700 ml, containing 1,400 ml (80%) of brain, 150 ml (10%) blood, and 150 ml (10%) cerebrospinal fluid. Humans are born with a perfect brain structure weighing approximately 1,300–1,400 grams (2% of body weight). The brain is the source of all thought, feelings, and desires, and also serves as the keeper of our memory. Inside the brain are 100 billion neuron cells and 1 trillion neuroglia cells. Each neuron can build 10,000 dendritic branches and can even reach 100,000, forming 1,000 trillion synapses (communication connections). Anatomically, the brain is divided into 3 main parts: the cerebrum, the cerebellum, and the brainstem (Amin, 2018).

The brain is divided into three parts: the cerebrum, the cerebellum, and the brainstem. Structural differences between male and female brains exist in the

following areas: (1) Corpus callosum: a white matter structure consisting of fibers that connect the two hemispheres of the brain. Its primary function is to facilitate coordination, communication, and information exchange between the left and right hemispheres. The female corpus callosum is approximately 30% thicker than the male's specifically in the areas associated with linguistic skills (the isthmus and splenium) which enables women to engage in simultaneous processing and multitasking, allowing them to handle two or more completely unrelated tasks at once. (2) Hypothalamus: the brain region that releases hormones to regulate body organs and cells; it controls the autonomic nervous system (regulating body temperature, food and air intake, and thirst), manages daily cycles and physiological behaviors, controls emotional responses, and governs key functions such as behavioral regulation. The male hypothalamus particularly the preoptic region is 2.5 to 3 times larger than the female's. Men tend to be more responsive to external stimuli (sound, touch, etc.) than to emotions. (3) Inferior parietal lobe: the region responsible for spatial abilities. MRI scans show that the inferior parietal lobe is 6% larger in men than in women. Consequently, men possess superior abilities regarding mental imagery and the construction of three-dimensional mental models. (4) Hippocampus: the region responsible for memory, encompassing both long-term and short-term memory. The memory center (hippocampus) is larger in the female brain than in the male brain. However, during the aging process, hippocampal and parietal lobe cells in women are lost (die off) more rapidly, making women more prone to forgetfulness as they age. These factors contribute to the behavioral differences observed between men and women. The cerebrum is divided into four lobes: the frontal, temporal, parietal, and occipital lobes. The frontal lobe plays a role in thinking, planning, and conceptualization. The temporal lobe is responsible for the perception of sounds and noises. The parietal lobe is primarily responsible for memory-related cognitive functions. The occipital lobe regulates visual functions (Warsanto & Sulastrri, 2024).

Several studies indicate that the prefrontal cortex (PFC) is one part of the brain capable of influencing self-control. The adolescent brain undergoes significant changes, particularly in connectivity between subcortical areas related to motivation and emotion and the prefrontal cortex associated with self-control and rational decision-making. The connections within the prefrontal cortex grow stronger with increasing age and experience, thereby enabling control over emotionally driven subcortical behavior. The PFC has extensive connections with various other parts of the brain, including the amygdala, hypothalamus, midbrain, and pons, allowing the PFC to integrate higher-order brain functions with more basic brain activities such as emotion and visceral function (Warsanto & Sulastrri, 2024).

Learning difficulties are a condition in which students experience obstacles in acquiring, understanding, or applying the information needed in the learning process. It is explained that learning difficulties are not always related to low intelligence; they can also occur in students with good intellectual potential. These obstacles can be triggered by neurobiological factors, inappropriate learning strategies, and unsupportive learning environments. This condition is multidimensional and must be understood comprehensively so that the interventions provided can be tailored to the

needs of each individual. Learning difficulties are obstacles that arise when students are unable to achieve learning outcomes commensurate with their academic potential, creating a gap between the ability that should be achieved and the actual results obtained. Learning difficulties can be caused by various factors, both academic and psychological, such as low motivation, discomfort in learning, or lack of social support from the environment. It is emphasized that learning obstacles are not always explicitly visible, yet they can significantly impact the learning process and outcomes. Iman et al. explain that learning difficulties occur when students experience barriers in achieving optimal learning outcomes. These difficulties can stem from neurological, psychological, or social disorders, and are often accompanied by symptoms of low motivation or high dependency on teacher assistance. They emphasize that learning difficulties appear as a real gap between a student's potential and academic achievement, requiring strategic intervention from both teachers and the learning environment (Nasution et al., 2025).

Learning difficulties are closely linked to external conditions such as unsupportive parenting patterns, social pressure, and unconducive learning environments. It is stated that learning obstacles can emerge even when students have good academic potential but receive insufficient attention and support from teachers and the environment. As a result, students exhibit passive behavior in class, low motivation to learn, and declining achievement. Learning difficulties are obstacles that are not always visible from the outside, as even highly intelligent students can experience them. These obstacles usually manifest as an inability to understand material, low motivation, or lack of support from the learning environment. They are characterized by academic achievement below expectations and behavioral symptoms such as difficulty concentrating and low active participation in class (Khairiyah et al., 2023).

These obstacles can come from within the student, such as attitudes that do not support the learning process, or from outside, such as inappropriate teaching methods or lack of parental support. It is also emphasized that learning difficulties can affect the understanding of basic concepts, calculations, and students' ability to complete academic tasks. Learning difficulties are the inability of students to achieve learning outcomes consistent with their intellectual potential. These difficulties can stem from impairments in listening, reading, writing, or understanding information, often caused by inappropriate teaching methods, curricular pressure, or the student's psychological condition. It is also emphasized that this condition is not only influenced by intelligence but also by various complex internal and external factors (Akmal & Fitriani, 2024).

From the various definitions of learning difficulties above, it can be understood that learning difficulties are not merely a student's failure to achieve good academic results, but rather a complex and multidimensional condition. These difficulties can arise due to disturbances in understanding, processing, or applying information, whether originating from within the learner (such as lack of motivation, emotional disorders, or inappropriate learning styles) or from outside (such as inappropriate teaching methods, unsupportive environments, and social pressures).

Even students with normal or high intellectual ability can experience learning barriers. Therefore, a holistic, empathetic, and adaptive approach is essential in handling learning difficulties. It is not sufficient to focus only on outcomes; it is also necessary to explore the processes and conditions underlying the emergence of these difficulties so that the interventions provided truly match individual needs.

Etymologically, neuroscience is the discipline that studies the nervous system through a multidisciplinary approach. Certain parts of the human brain are responsible for specific types of intelligence. The brain functions by capturing stimuli or inputs to be processed by nerve cells. The left brain is responsible for language and mathematics development, the right brain is responsible for musical and spatial intelligence, and the cerebral cortex in the frontal area is responsible for the development of kinesthetic intelligence. Intrapersonal and interpersonal intelligence are located in the limbic system, which is connected to the prefrontal and temporal lobes. Human actions consisting of cognitive, affective, and psychomotor aspects are influenced by the structure of the nervous system.

As a guide and way of life for Muslims, the Qur'an provides solutions to all problems, including those concerning the human brain, particularly in addressing delays in education and learning. When humans use their brains and intellect to think well and correctly, they will produce and create new ideas for solving life's problems. By understanding the brain and intellect more deeply, human faith and piety will greatly increase due to awe at the extraordinary creation of God. New neural connections can form with the help of stimuli even in adulthood. All learning conducted with a brain-based approach can enhance intelligence limitlessly with appropriate stimulation.

Male and female brains do not follow the same developmental patterns. Generally, in males, the right hemisphere develops first, followed by the left; in contrast, female brain development is more balanced between the left and right hemispheres. Between the ages of 0 and 6, the right and left hemispheres of a female's brain develop at a balanced pace, whereas in males, the right hemisphere is dominant during this stage. Consequently, we often observe that high-achieving students of school age those excelling in reading, writing, and academic rankings are predominantly female. This developmental pattern also contributes to why many male students are perceived as mischievous or prone to acting out. Between the ages of 6 and 12, the male brain begins to develop in a more balanced manner across both hemispheres; by age 18 (adulthood), the developmental rates of the left and right hemispheres in males have fully matured. It is at this stage that a male's identity begins to emerge; they start to formulate frameworks and set goals, envision the future, assume leadership roles (such as in student councils or organizations), articulate ideas, and engage in communication (through speeches, discussions, etc.). Concurrently, hormonal differences further reinforce the distinct developmental expressions of male and female brains. Testosterone in males fosters a preference for challenges, competition, and the clashing of ideas and concepts, making them comfortable and even engaged in discussions or meetings. While women also enjoy social gatherings, their hormonal profile dominated by estrogen and progesterone inclines them toward

peace and relaxation. Thus, when they gather, they value the act of gathering itself rather than the specific subject matter or substance of the meeting, as the gathering serves as a means to collect information. These factors also influence their choices regarding activities and roles; generally, at this stage, women tend to gravitate toward activities aligned with their innate inclinations, such as serving as secretaries, treasurers, or coordinators for logistics and refreshments (Amin, 2018).

We cannot deny the differences between the brains of boys and girls; these physiological distinctions inevitably lead to differences in their learning styles and methods. Parents and educators must take these differences into account when tailoring instruction to students and children. Michael Gurian, author of *Boys and Girls Learn Differentially*, notes that these brain differences while not absolute determinants—play a significant role in shaping learning patterns and cognitive processing. Based on developmental stages and structural brain differences, boys tend to grasp concepts better through visuals such as images and graphs or hands-on activities like practical work, assembly, design, and simulations that involve physical movement; at school age, they often rely more on their right-brain functions to process information. Girls, conversely, are often more comfortable learning concepts through reading, writing, collaboration (discussion), or communicative activities like drama and theater, as their language skills mature earlier and their capacity in this area is generally greater than that of boys. However, at the secondary and higher education levels, male students often find greater engagement in learning or problem-solving when faced with novel or challenging tasks particularly those requiring a hands-on approach. This behavior stems from effective left-brain functioning and the influence of testosterone. Consequently, educators should design material delivery that consistently challenges them for instance, by incorporating simulations, competitions, or debates. The approach differs for girls; they tend to enjoy the learning process and grasp concepts or solve problems through methods that prioritize "persuasive" and communal communication, such as collaborative study, reading, casual discussion, formulating shared understandings, presentations, and lectures. During lessons, male students may appear indifferent, inattentive, or restless, yet they are often listening intently and actively processing the information conveyed by the teacher. When making a mistake, male students are more likely to recognize it through stimuli such as a voice, a reprimand, or a touch rather than through emotional expressions. This is attributed to the fact that their hypothalamus structure is larger than that of females. Female students are more easily corrected; a simple gesture such as a stern glare or a shake of the head often suffices. Thanks to their superior memorization skills, female students tend to enjoy learning and excel through methods that prioritize communication (speaking, writing, discussion, etc.). In contrast, since boys do not possess the same memorization aptitude, they prefer and require learning approaches that help them construct mental conceptual models such as through practical experiments, hands-on activities, and object design rather than relying solely on the reading and discussion methods favored by female students. (Amin, 2018).

Males have a hypothalamus that is 12.5–3 times larger than in females, meaning they are more sensitive to sound. They also have an inferior parietal area that

is 6% larger than females, enabling them to more easily imagine or visualize things. Therefore, an auditory learning style—supported by the Hypothalamus and Inferior Parietal sensitivity to sound and enhanced by the ability to visualize and imagine—is considered more suitable for teaching in male-dominant or all-male classes. Strategies used in learning that match students' learning styles can help them feel more comfortable and interested in the subject. This can lead to greater student engagement and activity during learning, and can also help reduce stress and boredom (Hadiyanto & Suyadi, 2023). Therefore, understanding the differences in learning styles between male and female students is very important for teachers, so that they can develop better lesson plans and maximize students' learning potential.

Factors Influencing Differences in Learning Styles and Strategies Based on Gender

Most research also reveals that female students more frequently experience anxiety in learning related to tests or academic assessments, even though they have higher learning motivation than male students. This is related to social pressure and higher expectations regarding female academic achievement in many cultures (Fatahillah, 2024).

Female students generally exhibit calmer, more diligent, and more obedient learning attitudes toward teacher guidance. They tend to follow instructions with discipline, take neat notes, and show a high sense of responsibility toward school assignments. For example, when a teacher assigns writing or drawing tasks, female students are more patient in completing them thoroughly while attending to neatness. Meanwhile, male students display more expressive, physically active learning characteristics with high curiosity, but are sometimes less focused and easily distracted by things around them. They are faster in making decisions but often less thorough or hasty in completing work. These differences should not be viewed in black and white. The obedient and careful attitude of female students does not mean they are superior, nor does the activeness of male students mean they are careless. Both forms of learning attitudes are manifestations of differences in psychological and social characteristics formed through the process of gender development and socialization. Male children are typically encouraged to be independent, brave, and active from an early age, while female children are accustomed to being careful, obedient, and responsible. These parenting patterns then carry over into the school environment and influence how children interact with teachers and classmates. In terms of learning motivation, female students generally show stronger intrinsic motivation—the drive to learn arising from within, such as the desire to obtain good grades, a sense of responsibility toward tasks, or personal satisfaction when successfully understanding a lesson. Conversely, male students more frequently show extrinsic motivation triggered by external factors such as praise from teachers, competition with peers, or the desire to outperform others. This aligns with the learning motivation theory of Chou and Luo, which differentiates between internal (intrinsic) and external (extrinsic) drives in determining a person's learning behavior (Supriyanti et al., 2025).

Several studies show that male and female students have different psychological states. Females have greater motivation than male students. This motivational difference is influenced by behavioral differences between male and female students. Learning interest has a close relationship with one's personality. Male personalities tend to be indifferent, while female personalities tend to be attentive. Therefore, females' interest in learning is higher than males' due to their attentive nature. The emotional intelligence of students shows different results in male and female students. Females have higher emotional intelligence than males. Females tend to have maternal qualities, empathy, and use feelings more in their actions, resulting in higher emotional intelligence. In addition, female students are also able to think more clearly, and their emotions are more visible compared to male students (Munawarah, 2021).

The discipline factor also shows significant differences. Female students are more consistent in adhering to school rules and study schedules, while male students often show more flexible behavior toward regulations. For example, in observations it was found that male students more often speak without permission in class or play while the teacher is explaining, whereas female students tend to listen and take notes seriously. However, when given practical activities or group projects, male students tend to appear more enthusiastic and actively participate, while female students focus more on preparing reports and organizing tasks neatly. These differences indicate that students' learning styles and sense of responsibility are not only influenced by gender but also by the type of learning activity provided by the teacher. In terms of relationships with teachers, female students more often build emotional closeness, while male students tend to maintain distance and interact functionally. Teachers often assess female students as "diligent" because they are easy to manage and quick to understand instructions, while male students are sometimes labeled "naughty" or "overly active" due to their inability to sit still in class. These labels inadvertently create gender bias in teachers' perceptions of students' learning abilities. Yet both groups have equal potential when given a learning space suited to each group's character (Supriyanti et al., 2025).

Many factors contribute to the success of a learning process, one of which is the use of specific learning strategies. The aim of a learning strategy is to create an instructional environment that facilitates the teaching-learning process, resulting in instruction that is effective, efficient, engaging, and humanistic. Learning strategies encompass the methods and procedures that prioritize student activity within the learning process to achieve specific objectives. They serve as external factors capable of supporting the internal processes of learning. Furthermore, the relationship between learning and gender within the instructional context is a matter that warrants significant attention

These differences are not meant to show who is superior, but to give educators an understanding that each gender has its own potential and distinctive learning style. Teachers are expected to implement adaptive and inclusive learning strategies, paying attention to the psychological needs and learning styles of each student. For example, by balancing activities requiring precision and activities

stimulating exploration, so that both male and female students can develop their optimal potential. Furthermore, this research affirms the importance of implementing gender-responsive education at the elementary school level. Through an understanding of differences in learning attitudes, teachers can create a fairer classroom environment that respects diversity (Supriyanti et al., 2025).

The implementation of appropriate learning strategies will improve student academic achievement, thus minimizing failures in the learning process. Learning strategies are divided into two groups: direct learning strategies and indirect learning strategies. In direct learning strategies, lesson materials are presented to students in a ready-made form, and students are required to master the material. The teacher's role in this strategy is as an information conveyor. In indirect learning strategies, lesson materials are sought and discovered by students themselves through various activities, and the teacher's role is more as a facilitator and guide (Hardy et al., 2015).

Children who use learning strategies that do not match their learning style for example, only memorizing without understanding, or passive learning without interaction will find the learning process ineffective. The right strategy requires self-awareness, metacognitive skills, and support from a responsive learning environment.

Implications of Gender and Learning Difficulty Behaviors for Effective Learning Practice

As stated at the outset, education aims to humanize human beings. Therefore, the educational process must be carried out in accordance with human characteristics. In the preceding discussion, it has been established that the differences in brain structure between males and females necessitate different educational patterns. Axiologically, understanding the differences in brain structure between males and females provides a basis for making adjustments in educational practice that are better aligned with students' characteristics. Some approaches that can be taken include: (1) At the elementary education level, teachers should predominantly be female, as female teachers are more patient and friendly when dealing with students, while at the secondary school level more male teachers or a balanced number can be employed; (2) Separating students into male and female classes, so they can more easily learn according to their character; (3) Assigning male teachers for male classes, and vice versa; (4) If classes remain mixed, teachers must teach in a combined manner to facilitate the different learning styles of male and female students; (5) The brain absorbs information optimally in a relaxed state, so before learning begins, students should be invited to engage in relaxation activities such as dhikr, self-reflection, and so on. Neuroscience learning is combined with various disciplines so that it becomes integrated and enters the mainstream of character formation (Amin, 2018).

These factors are often interrelated and influence the development of cognitive functions and children's learning abilities. The following outlines the causes of learning difficulties according to the research findings (Nasrun & Yeli, 2026) :

- a) Hereditary or Congenital Factors. Some children experience learning difficulties that are genetically inherited from parents or family members with a similar history of learning disorders. This hereditary factor can affect brain structure and

function involved in thinking, reading, writing, and arithmetic. Thus, children with a family history of dyslexia, dysgraphia, or language processing disorders have a higher potential for experiencing the same condition.

- b) Disorders During Pregnancy, Birth, or Prematurity. Learning difficulties can also be caused by disturbances that occur from the time of pregnancy, particularly when the fetus experiences oxygen deficiency (hypoxia) or a lack of essential nutrients such as folic acid, iron, and protein. Conditions in which the mother experiences complications during pregnancy or childbirth, such as high blood pressure or severe infection, can affect fetal brain development. Premature babies also have a higher risk of experiencing disruptions in central nervous system development, which can affect learning ability later in life.
- c) Oxygen or Nutritional Deficiency and Exposure to Harmful Substances During Pregnancy. A fetus that does not receive sufficient oxygen and nutrients will experience disruptions in brain development. In addition, unhealthy habits of pregnant women such as smoking, consuming alcoholic beverages, or using illegal drugs can also cause damage to the fetal nervous system. These harmful substances can inhibit brain cell growth and affect the child's cognitive function after birth.
- d) Post-Birth Trauma. Physical trauma experienced by a child after birth, such as prolonged high fever, head injury, or near-drowning, can cause damage to brain tissue. Damage to certain areas of the brain will affect the child's ability to process information, understand language, and coordinate motor movements. This condition can become one of the main triggers for the emergence of learning difficulties during school years.
- e) Recurrent Ear Infections in Infancy and Early Childhood. Middle ear infections that frequently occur during infancy or early childhood can disrupt a child's hearing ability. Prolonged hearing impairment will affect language development and communication ability. In addition, children with weak immune systems are more susceptible to infections, which can ultimately affect concentration and learning ability.
- f) Exposure to Toxic Substances in Early Childhood. Children who are frequently exposed to hazardous chemicals such as aluminum, arsenic, mercury, and various other types of neurotoxins are at high risk of experiencing brain development disorders. These toxic substances can impair nerve function, reduce concentration, and affect thinking and memory abilities. In the long term, exposure to these environmental toxins can cause persistent learning disorders (Nasrun & Yeli, 2026).

The causes of learning difficulties can be categorized into two groups, internal factors and external factors:

1. Physical weaknesses: sensory organs, nerves, disabilities due to illness, etc.
2. Mental weaknesses: intelligence factors such as intellect and aptitude, which can be identified through psychological testing.
3. Emotional disorders.
4. Incorrect habits and attitudes in studying subject matter.

5. Lack of the foundational knowledge and skills needed to understand further subject matter
6. Learning or teaching situations that do not stimulate students to be actively anticipatory (insufficient allowance for active student learning).
7. A curriculum that is insufficiently flexible.
8. An excessively heavy study load.
9. Teaching methods that are insufficiently engaging.
10. Lack of tools and resources for learning activities.
11. A home situation that is not conducive to learning (Khairiyah et al., 2023).

To obtain the various information above, various methods can be employed and cooperation with various relevant parties can be sought. For example, to obtain information about students' physical condition, cooperation with a doctor or school clinic is needed; to obtain data about students' potential abilities, cooperation with a guidance and counseling officer (counselor) or psychologist can be arranged; to understand students' learning attitudes and habits, they can be observed directly in class.

An educator serving as a learning facilitator cannot avoid the diversity of students in a class, particularly when deciding what strategies to use in learning. As times progress, today's teachers are required to be innovative and creative in selecting and developing teaching methods, so that the learning process is effective, meets students' learning needs, and maximizes their learning potential. Student success in a learning process can be seen from students' ability to learn independently, so that the learning outcomes represent knowledge they have mastered themselves. The role of the teacher today is very important; teachers are not merely teaching material that resembles a transfer of knowledge to students, but also educating, directing, and shaping students' character, attitudes, and mindset. Physical and psychological approaches can be applied by teachers in the learning process to create a good relationship between teachers and students (Fairus et al., 2024).

CONCLUSION

Neuroscience studies prove that male and female brains have clear structural differences: females excel in multitasking and language skills due to a thicker corpus callosum, while males are stronger in spatial abilities and physical stimulus sensitivity due to a larger inferior parietal lobe and hypothalamus. These differences also shape distinctive learning styles in each gender, influenced in a complex manner by biological, psychological, and sociocultural factors, such that females tend to learn more effectively through communication and discussion, while males learn through hands-on activity and visual-imaginative stimulation.

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