

PREVAILING INFLUENCE OF SUPERSTITIOUS BELIEFS ON SECONDARY SCHOOL STUDENTS' LEARNING OF BIOLOGY IN OTUOCHA EDUCATION ZONE, ANAMBRA STATE

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ABSTRACT

This study investigated the prevailing influence of superstitious beliefs on secondary school students' learning of Biology in Otuocha Education Zone, Anambra State. Guided by three research questions, the study adopted a descriptive survey research design. A sample of 120 Senior Secondary Two (SS2) students was drawn from a population of 520 SS2 students in the zone during the 2024/2025 academic session using a simple random sampling technique. Data were collected using a questionnaire developed by the researcher based on relevant literature. The instrument was validated by three experts, and its reliability was established using Cronbach's Alpha, yielding a reliability coefficient of 0.85. Data were analyzed using frequency counts, percentages, and mean scores to answer the research questions. The findings revealed that superstitious beliefs are widespread among secondary school students in Biology and have a negative influence on their academic performance. Based on the findings, it was recommended, among others, that educational stakeholders should enhance teacher training programmes and explicitly address superstitious beliefs in schools. This will help foster an environment that promotes rational inquiry and evidence-based learning, thereby reducing misconceptions in science education.

Keywords: Biology, Education, Learning, Students, Superstition.

INTRODUCTION

Biology is one of the major branches of science subjects studied in Nigerian secondary school. It is a subject introduced to students at the senior secondary school level, as an opening ground for human development, where career abilities are groomed, and potentials and talents are discovered and energized. According to Science Teachers Association of Nigeria (STAN, 2013) the term "Biology" is derived from two Greek words "bios" and "logos" which means "life" and "study" respectively. It is a natural science concerned with the study of life and living organisms, function, growth, evolution, origin and taxonomy. Karthik (2022) defined biology as the study of living organisms, their origins, anatomy, morphology, physiology, behaviour, and distribution.

The importance of biology to man cannot be overemphasized as it deals with all the physiochemical aspects of life. Ango (2019) stated that biology has several branches which contribute immensely to national development. Learning Biology equips learners with knowledge and skills that help them to face challenges in society especially those related to common diseases, pollution, and genetics. Similarly, Kareem (2018) posited that the knowledge of biology leads to self-understanding and how the body works. Ziyadulla (2019), "Biology" contributes to the formation of a scientific worldview among students, that is, the system of the most general views on the world and man, on the relationship between man and the world, determines the personality's life program, ideals and beliefs, interests and values. Ghumdia and Adams (2017), in their study, asserted that biology is essential for many fields of learning as it contributes to other fields of study such as medicine, agriculture, biotechnology, and nursing that aid economic growth and development. In light of the above advantages, one can categorically state that biology is a subject whose impact on man and his environment cannot be ignored as it fosters man's understanding of his body system and environment.

Superstitious belief is the practice generally regarded as irrational beliefs resulting from ignorance or fear of unknown. It implies a belief in unseen and unknown forces which has the power of influencing the behaviour of its adherents. Vyse (2019) defined it as a belief rooted in manipulation which exists in the realms of mystic or supernatural. Superstitious belief is defined as irrational beliefs or practices that are based on the assumption that certain actions or events will influence one's fate or future, despite a lack of empirical evidence or logical reasoning (Sagone & Caroli, 2015). Hinton and Carter (2017) defined superstitious beliefs as the practice that involves the belief in supernatural forces or entities that can affect outcomes in an individual's life. Superstition is a belief or a practice that is not based on facts or events that can be proved (Kagan, 2012).

Hayashi and Modico (2018) quoting Skinner opined that behavior is said to be superstitious if it is modified or maintained in the absence of a dependent relation between the responses and the reinforcers (Skinner,

2019). Superstitions are irrational beliefs that influence the emotional states of people who hold them. They are learned forms of behavior, or dispositions about objects or situations, that direct that holder toward some preferred response (Hollander, 2017). Superstitions can take various forms and manifest in different ways, but they generally share some common characteristics. One characteristic of superstitions is that they are often irrational and illogical. Superstitious beliefs are typically based on anecdotal evidence or personal experiences rather than empirical data or scientific research. For example, a person might believe that wearing a specific garment or performing a particular ritual can bring them good luck, even though there is no logical reason to believe so. Another characteristic of superstitions is that they are often passed down from generation to generation.

Superstitious beliefs can significantly hinder students' understanding of biological concepts by creating cognitive dissonance between scientific explanations and traditional beliefs. For instance, certain cultural beliefs may contradict the scientific explanations of diseases, reproduction, and evolution, leading to confusion and rejection of scientific facts. Students who hold strong superstitious beliefs may struggle to reconcile these with the scientific explanations provided in biology classes, resulting in a superficial understanding of the subject (Adeyemo, 2013).

Teachers in regions where superstitious beliefs are prevalent often face challenges in delivering biology content effectively. These challenges can stem from the need to navigate between respecting cultural beliefs and promoting scientific literacy. Teachers may encounter resistance when discussing topics that conflict with students' or the community's superstitious beliefs, leading them to either avoid these topics or present them in a diluted manner (Kudakwashe & Shumba, 2015). In some cases, teachers themselves may hold superstitious beliefs, which can further complicate the teaching process. If a teacher believes in the supernatural explanations of certain biological phenomena, they may unconsciously convey these beliefs to their students, thereby perpetuating misconceptions. The presence of superstitious beliefs among teachers can lead to a biased or incomplete presentation of biological content, undermining the students' ability to develop a scientific understanding of the subject (Ndlovu & Bhukuvhani, 2013).

The presence of superstitious beliefs in educational settings can also hinder the development of critical thinking and scientific inquiry, which are central to biology education. The scientific method relies on observation, experimentation, and evidence-based reasoning, all of which may conflict with superstitious thinking that favors anecdotal evidence and untestable claims (Ngwacho, 2014). Students who accept superstitious explanations without question may struggle with the rigorous analytical thinking required in biology, particularly in complex topics like evolution.

However, while biology is a critical field that underpins many aspects of modern science and medicine, its teaching and learning can be significantly influenced by superstitious beliefs. These beliefs can create cognitive dissonance, hinder the effective delivery of content by teachers, and impede the development of essential critical thinking skills among students. Addressing these challenges is crucial for fostering a comprehensive understanding of biology in educational settings. Considering the premise, the study sought to investigate influence of superstitious beliefs on secondary school students' learning of biology.

Biology as a science subject has a lot of complexities that put a lot of students on constant fear, mostly on how to approach the subject in examination, be it classroom assessment or standard examinations. This constant fear of biology over the years has been attributed to several factors such as political interference, quality of teaching time, deplorable state of facilities and others, which in turn has led to a great decline in students' academic performances in biology in external examinations. To curtail this ugly trend, efforts has been made in the past and present by researchers, federal and state government, professional bodies such as, STAN, and educational stakeholders through provision of amenities, restructuring of the curriculum as well as organizing conferences, seminars and workshops to educate teachers on approaches and strategies to be employed in the classroom to foster learning of biology in secondary schools. Despite these efforts, little and inconsistent improvement has been recorded over the years. In this light, the study sought out to investigate the impact of superstitious beliefs on academic achievement of biology students in Otuocha Education Zone.

Conceptual Framework

The conceptual framework showing the interactions between the variables of interest in the study influence of superstitious beliefs on the learning biology in secondary schools is represented in the schema, superstitious beliefs of students, which is the independent variable, was investigated to ascertain their influence in their learning of biology, the dependent variable, in secondary schools.

Theoretical Framework

The study is anchored on Cognitive Dissonance Theory by Leon Festinger

Cognitive Dissonance Theory

Cognitive Dissonance Theory, developed by Leon Festinger in 1957, provides a psychological framework to understand how individuals strive for consistency in their beliefs, attitudes, and behaviors. The theory posits that when individuals hold conflicting beliefs or are confronted with information that contradicts their existing beliefs, they experience psychological discomfort, known as cognitive dissonance (Festinger, 1957).

Cognitive dissonance is described as the mental disturbance people feel when their beliefs and actions are inconsistent and contradictory, ultimately encouraging some change (often either in their beliefs or actions) to align better and reduce this dissonance (Harmon-Jones, 2019). Relevant items of information include peoples' actions, feelings, ideas, beliefs, values, and things in the environment. Cognitive dissonance is typically experienced as psychological stress when persons participate in an action that goes against one or more of those things. According to this theory, when an action or idea is psychologically inconsistent with the other, people do all in their power to change either so that they become consistent. The discomfort is triggered by the person's belief clashing with new information perceived, wherein the individual tries to find a way to resolve the contradiction to reduce their discomfort (Harmon-Jones, 2019).

In the context of education, Cognitive Dissonance Theory is particularly relevant when considering how students reconcile scientific knowledge with superstitious beliefs. For instance, students studying Biology may encounter scientific explanations that contradict their superstitious beliefs related to health, luck, or academic success. This discrepancy can create cognitive dissonance, where students feel compelled to either reject the scientific information or modify their superstitious beliefs to reduce psychological discomfort (Harmon-Jones, 2019). Moreover, cognitive dissonance theory helps explain the persistence of superstitious beliefs despite contradictory evidence. Individuals may selectively attend to information that supports their superstitions while dismissing or rationalizing away evidence that contradicts them. This selective attention and interpretation serve to maintain cognitive consistency and reduce the discomfort associated with conflicting beliefs.

Theoretical Studies

Biology: Meaning and Importance to National Development

The word Biology is derived from two Greek words *βίος* (*bios*), meaning "life" and from the Greek *Λογία* (*logia*) meaning study and is defined as the study of living things which include plants and animals. Biology is often regarded as the scientific study of organisms. It is the study of living things and their vital processes (Sarojini, 2018). Umar (2015) described biology as a neutral science that deals with the living world, how the world is structured, how they react to one another and with their environment. Obialor, Ezeobi and Ezenwuba (2020) defined it as a science subject which describes how living organism carry out their life activities and how they interact with their environment. According to Okeke (2013), Biology is the branch of science that primarily deals with the structure, function, growth, evolution, and distribution of organisms. As a science, it is a methodological study of life and living things. It determines verifiable facts or formulates theories based on experimental findings on living things by applying the scientific method.

Biology is a wide-ranging field because it encompasses various fields in science, such as chemistry, physics, mathematics, and medicine. Neteiyin (2014) and Abubakar (2016) observed that biology as a discipline has contributed tremendously to financial, physical, and aesthetic benefits of humanity and to nation building. Thus, the importance of Biology cannot be overemphasized as it helps us understand how living things work and how they function and interact on multiple levels, according to the Encyclopedia Britannica (2022), Advances in biology have helped scientists do things such as develop better medicines and treatments for diseases, understand how a changing environment might affect plants and animals, produce enough food for the growing human population and predict how eating new food or sticking to an exercise regimen might affect our bodies. Biology also helps individual to understanding himself, his/her environment, appreciate the nature and also control environmental pollution. It exposes man on how to maintain good health through clean water, clean air, good hygiene and sanitation, balanced diet, vaccination against infectious diseases, exercise and adequate rest (Obialor, 2016).

Superstitious Beliefs and Educational Psychology

Superstitious beliefs are defined as irrational beliefs or practices that are based on the assumption that certain actions or events will influence one's fate or future, despite a lack of empirical evidence or logical reasoning (Sagone and Caroli, 2015). They often involve the belief in supernatural forces or entities that can affect outcomes in an individual's life (Hinton & Cater, 2020). Superstitions are typically culturally specific and may influence individuals' behaviors, decisions, and perceptions of risk and reward (Lerman, 2014).

Superstitious beliefs, characterized by irrational attributions of causality, play a significant role in shaping behaviors and perceptions within educational contexts. Educational psychology offers valuable insights into how these beliefs impact students' cognitive processes, learning outcomes, and academic achievement. Superstitions can be seen as a form of magical thinking where individuals attribute outcomes to unrelated causes, such as luck or ritualistic behaviors, rather than understanding them through rational or empirical means (Sagone & Caroli, 2015). In the realm of education, these beliefs can influence students' attitudes towards learning and their academic performance. For instance, students may engage in superstitious behaviors, such as wearing lucky charms during exams or avoiding certain actions they believe may bring bad luck, which can affect their psychological state and concentration levels during critical academic tasks.

Educational psychologists argue that superstitions may arise as coping mechanisms in situations where individuals feel uncertain or lack control over outcomes. This is particularly relevant in educational settings where academic success is often perceived as dependent on factors beyond one's direct control, such as luck or fate. Festinger's Cognitive Dissonance Theory (1957) suggests that when confronted with conflicting information (e.g., scientific explanations vs. superstitious beliefs), individuals may experience discomfort, prompting them to rationalize their beliefs or actions to maintain psychological consistency. Moreover, superstitious beliefs can influence students' motivation and self-efficacy beliefs, which are critical determinants of academic achievement (Afreen, 2018). Students who hold strong superstitious beliefs may attribute their successes or failures to external factors rather than their own efforts or abilities, potentially impacting their perseverance and engagement in learning tasks.

Types of Superstitious Beliefs

Superstitious beliefs can be broadly categorized into several types, each reflecting different aspects of human psychology and cultural practices:

1. Avoidance Superstitions

These are beliefs centered on avoiding actions or events that are thought to bring bad luck. Examples include avoiding walking under ladders, not breaking mirrors, or refraining from certain activities on specific days (Vaughan & Hube, 2008). These superstitions are often rooted in the belief that certain actions will cause misfortune or adverse outcomes.

2. Propitiation Superstitions

These involve performing specific actions to appease supernatural entities or forces believed to influence one's fortune. This might include rituals, offerings, or prayers intended to gain favor or avoid punishment (Langer, 2015). For instance, lighting candles for good luck or performing rituals before important events are common practices.

3. Amulet and Charm Superstitions

Beliefs that physical objects have the power to influence luck or protect against negative forces fall under this category. Examples include carrying lucky charms, wearing specific gemstones, or possessing talismans (Goodman, 2015). These objects are often imbued with cultural or personal significance.

4. Numerology and Symbolic Superstitions

These superstitions are based on the belief that certain numbers or symbols carry inherent powers or meanings. For example, the number 13 is often considered unlucky in Western cultures, while the number 7 is associated with good fortune (Hsu, 2017). Similarly, specific symbols, such as horseshoes or four-leaf clovers, are believed to bring good luck.

5. Environmental and Situational Superstitions

These involve beliefs about how environmental factors or specific situations can influence luck or outcomes. For example, the position of objects in a room or the direction one faces during certain activities might be thought to impact success or failure (Schachter, 2018).

Historical and Cultural Context of Superstitious Beliefs

Superstitious beliefs have been a part of human culture for centuries, often evolving from ancient practices and religious rituals. Early superstitions were closely tied to animistic and shamanistic traditions, where natural phenomena and objects were believed to possess spiritual significance. For instance, ancient civilizations such as the Egyptians, Greeks, and Romans had elaborate systems of beliefs surrounding omens, rituals, and prophecies (Frazer, 2019). In medieval Europe, superstitious beliefs were deeply intertwined with religious and cultural practices. The period saw the rise of witchcraft trials and the persecution of individuals accused of practicing harmful superstitions. These events were driven by a combination of fear, social control, and the desire to explain unexplained phenomena through supernatural means (Levack, 2018). With the advent of modern science and the Enlightenment era, many superstitious beliefs were challenged and scrutinized. However, despite advancements in scientific understanding, superstitions persisted in various forms, reflecting their deep-rooted nature in human psychology and culture (Campbell, 2019).

Superstitious beliefs vary widely across cultures and are often shaped by historical, social, and religious factors. In many cultures, superstitions serve as a way to cope with uncertainty and control over life unpredictable aspects. For example: In East Asian Cultures: Superstitions often involve beliefs in the influence of spirits and ancestors. Practices Such as Feng Shui, which aims to harmonize individuals with their environment, and the use of lucky numbers and colors, reflect these cultural beliefs (Cheng, 2017). In Western Cultures: Superstitions often revolve around symbols and rituals related to luck and misfortune. For instance, beliefs about black cats, broken mirrors, and the number 13 are prevalent in many Western societies (Hsu, 2017). In African Cultures: Superstitious beliefs frequently involve ancestral spirits and traditional healing practices. Rituals and taboos are often employed to seek protection or influence outcomes, reflecting a deep connection to spiritual and communal practices (Nnoli, 2013). In Indigenous Cultures: Superstitions are often integrated into broader belief systems that

include animism and shamanism. These beliefs are expressed through rituals, ceremonies, and the use of symbolic objects (Smith, 2015).

Prevalence and Impact of Superstitious Beliefs

Superstitious beliefs are widespread across different cultures and societies, and their prevalence can vary based on geographical, cultural, and demographic factors. The persistence of superstitions in modern times, despite advancements in science and rational thought, indicates their deep-rooted nature in human psychology and cultural practices. Globally, superstitious beliefs are prevalent and manifest in various forms across different regions. In Western cultures, common superstitions include beliefs in luck and bad omens, such as the fear of the number 13 or the belief that a black cat crossing one's path is an ill omen (Cohen, 2019).

These beliefs are often tied to cultural rituals and practices aimed at mitigating perceived risks or influencing outcomes. In contrast, Eastern cultures have superstitions related to Feng Shui, numerology and ancestral worship. For example, in Chinese culture, the number 8 is considered highly auspicious due to its phonetic similarity to the word for wealth, while the number 4 is associated with misfortune (Cheng, 2016). Similarly, practices such as arranging furniture according to Feng Shui principles reflect deep-rooted superstitious beliefs about harmonizing one's environment to influence luck and well-being. In African and Indigenous cultures, superstitions often involve beliefs in spirits, ancestors, and traditional practices. For instance, in many African cultures, rituals and taboos are employed to seek protection or favor from supernatural forces (Nnoli, 2013). Indigenous cultures around the world often incorporate superstitions into their spiritual and cultural practices, using rituals and symbols to influence their lives and environment (Smith, 2015).

Superstitious beliefs also vary by demographic factors such as age, education level, and socioeconomic status. Research indicates that older individuals and those with lower levels of education are more likely to hold superstitious beliefs compared to younger and more educated individuals (Lerner & Tetlock, 2019). This variation may be attributed to differences in exposure to scientific reasoning and educational experiences. Socioeconomic factors can also influence the prevalence of superstitions. In some societies, economic instability and uncertainty can increase reliance on superstitious beliefs as a means of coping with life's unpredictability (Barrett, 2015). Conversely, in more economically stable and scientifically advanced societies, superstitious beliefs may be less prevalent, though they still persist in various forms.

Impact of Superstitious Beliefs

Superstitious beliefs can have significant impacts on individuals and societies, affecting behavior, decision-making, and mental health. These impacts can be both positive and negative, depending on the context and the nature of the beliefs.

1. Behavioral Impact

Superstitions can influence behavior in various ways. For example, individuals may engage in specific rituals or practices to avoid bad luck or attract good fortune. These behaviors can range from everyday habits, such as carrying lucky charms or avoiding certain activities, to more elaborate rituals performed for significant life events (Langer, 2019). While such practices may provide psychological comfort and a sense of control, they can also lead to irrational decision-making and avoidance of beneficial opportunities due to fear of negative outcomes (Hamerman & Morewede, 2015).

2. Psychological Impact

The psychological impact of superstitious beliefs can be profound. On one hand, superstitions can provide a sense of comfort and control in uncertain situations. Beliefs in luck or supernatural protection can reduce anxiety and improve mental well-being by giving individuals a perceived sense of agency (Levy, 2018). For instance, carrying a lucky charm may boost confidence and reduce stress in high-pressure situations. On the other hand, superstitious beliefs can also contribute to anxiety and fear, especially if individuals perceive that their actions or inactions could lead to negative consequences. This fear can lead to compulsive behaviors, such as obsessive rituals or avoidance of certain situations, which may interfere with daily functioning and overall quality of life (Salkovskis et al., 2019).

3. Social Impact

Superstitions can also have social implications, influencing interpersonal relationships and social interactions. In some cultures, superstitions are deeply embedded in social norms and practices, shaping community behaviors and rituals. For example, communal rituals and ceremonies based on superstitious beliefs can strengthen social bonds and cultural identity (Turner, 2016). However, superstitions can also create social divisions or conflicts, particularly if differing beliefs lead to misunderstandings or disagreements within communities.

4. Economic Impact

Economically, superstitions can influence consumer behavior and financial decisions. For example, individuals may make purchasing decisions based on superstitious beliefs, such as choosing specific dates for

significant investments or avoiding certain financial transactions due to perceived bad luck (Belk et al., 2018). These behaviors can have implications for market trends and economic stability.

Influence of Superstitious Beliefs on Students Behavior

Superstitious beliefs are deeply ingrained in many cultures and can have a profound impact on various aspects of life, including education. In educational settings, superstitious beliefs can significantly influence students' behavior, shaping how students approach learning, interact with peers and teachers, and respond to academic challenges.

1. Ritualistic Behaviors

One of the most common ways that superstitious beliefs influence student behavior is through the performance of ritualistic actions. These rituals can take many forms, such as wearing a specific piece of clothing, using a particular pen, or sitting in a certain seat during exams. Students may also develop elaborate routines that they feel must be followed precisely to ensure academic success. These behaviors are driven by the belief that deviation from the ritual could lead to failure or bad luck (Vyse, 2013). For example, a student might believe that wearing a certain "lucky" shirt during exams will help them perform better. If the student experiences success while wearing the shirt, the belief is reinforced, leading to a reliance on the ritual in future situations. Over time, these ritualistic behaviors can become habitual, with students feeling anxious or uncomfortable if they are unable to perform their rituals, which can detract from their focus on academic tasks.

2. Avoidance and Procrastination

Superstitious beliefs can also lead to avoidance behaviors, where students actively avoid certain situations or tasks they believe could bring bad luck or negative outcomes. For instance, a student might avoid studying on a particular day of the week that they consider unlucky, or they might procrastinate on an assignment because they believe that starting it at a specific time could result in a poor grade (Wegner, 2022). These avoidance behaviors can have a detrimental impact on academic performance, as they often lead to missed deadlines, last-minute cramming, and reduced time spent on important tasks. The psychological need to avoid perceived bad luck can override rational decision-making, leading students to prioritize superstitions over effective study habits and time management.

3. Social Interactions and Peer Influence

Superstitious beliefs can also shape students' social interactions, both with their peers and with their teachers. In some cases, students may pressure their peers to conform to certain superstitious practices, either out of a shared belief or a desire to maintain group cohesion. For example, a group of students might insist on always sitting in the same seats during exams because they believe that changing seats would bring bad luck to the entire group (Sotala, 2017). This peer pressure can lead to conformity, where students feel compelled to adopt the superstitious beliefs of their classmates, even if they do not personally subscribe to them. Additionally, students who do not conform to these beliefs may be ostracized or ridiculed, leading to social isolation or conflict. Teachers, too, may be influenced by students' superstitious behaviors, either by accommodating them in ways that reinforce the beliefs or by challenging them, which could create tension in the classroom (Rosenthal & Jacobson, 2018).

4. Attribution of Success and Failure

Superstitious beliefs can influence how students attribute their academic success or failure. Students who hold strong superstitious beliefs may be more likely to attribute positive outcomes to their rituals or lucky charms rather than to their own abilities, effort, or study strategies. Conversely, they may attribute failures to a lack of adherence to their superstitious practices rather than to gaps in their knowledge or preparation (Foster, Weigand, & Baines, 2016). This external attribution can undermine students' development of a growth mindset, which is the belief that intelligence and abilities can be developed through effort and learning. Instead of recognizing that their academic performance is within their control, students may come to believe that their success is dependent on factors outside their influence. This mindset can lead to a lack of motivation, reduced effort, and a tendency to give up more easily when faced with academic challenges.

The influence of superstitious beliefs on academic performance also has broader implications for educational equity. Students from different cultural backgrounds may be more or less likely to hold superstitious beliefs, depending on the cultural significance of these beliefs in their communities. As a result, students from cultures with strong superstitious traditions may be disproportionately affected by the negative academic consequences of these beliefs. This disparity can contribute to achievement gaps and perpetuate inequalities in educational outcomes (Smith, 2005).

Summary of Review of Related Literature

The literature reviewed in this study was organized the following subheadings: conceptual framework, theoretical framework, theoretical studies and empirical studies. Under the conceptual framework, a schema was drawn to show the relationship between the major interacting variables in the study. The theoretical framework of this study hinged on Leon Festinger theory of Cognitive Dissonance. This theory shows how individual strive for consistency in their beliefs, attitudes and behaviors. This theory further explained mental disturbance people

feel when their beliefs and actions are inconsistent and contradictory ultimately encouraging some change (often either in their beliefs or actions) to align better and reduce this dissonance.

The theoretical studies of the study were revealed under the following subheadings: Biology; meaning and Importance to man, superstitious beliefs and educational psychology, types of superstitious beliefs, historical and cultural context of superstitious beliefs, prevalence and impact of superstitious beliefs, manifestation of superstitious beliefs on students' behavior and influence of superstitious beliefs on academic performance. Finally, empirical studies related to the present study were also reviewed to give the work its empirical base. Based on the reviewed studies, one can assert that a lot of studies have been carried on influence of superstitious beliefs on students' learning outcomes. However, none have been carried out specifically in Otuocha Education Zone, Anambra State. The current study intends to fill this gap.

Conclusion

The research investigated the influence of superstitious beliefs on the learning of Biology in secondary schools in Otuocha Education Zone. Based on the findings, the study concluded that superstitious beliefs are widespread among secondary school students and negatively influence their academic performance. Therefore, it is essential to implement strategies that promote scientific literacy, critical thinking, and evidence-based reasoning in order to mitigate these misconceptions.

Recommendations

Based on the findings of the study, the following recommendations were made.

- A. Teacher Training institutes should implement regular training programs for educators aimed at equipping them with strategies to address and challenge superstitious beliefs in the classroom effectively. Teachers should be encouraged to foster an environment that promotes rational inquiry and evidence-based learning.
- B. Professional bodies such as STAN should promote scientific literacy among students by organizing workshops, seminars, and extracurricular activities that emphasize the importance of evidence-based reasoning and skepticism towards superstitions. Engaging students in hands-on scientific experiments and activities can also reinforce these concepts.
- C. Scientific communities should foster partnerships with local communities and parents to educate them about the impact of superstitions on educational outcomes. Encourage open discussions on cultural beliefs while emphasizing the benefits of scientific knowledge in shaping future opportunities for students.
- D. Government should advocate for the inclusion of policies at the state and national levels that support evidence-based educational practices and discourage the perpetuation of superstitions within educational settings. Policy frameworks should aim to promote a balanced approach that respects cultural beliefs while prioritizing scientific education.

REFERENCES

- Adeyemo, S. A. (2013). The effects of teachers' perception and students' perception of physics classroom learning environment on their academic achievements in senior secondary school.
- Afreen, F. (2018). Social and psychological factors for superstition: A brief literature review. *International Journal of Advance Study and Research Work*, 1(5), 81.
- Craig, Nancy (2014). *Molecular Biology, Principles of Genome Function*. OUP Oxford.
- Damisch, L., Stoberock, B., and Mussweiler, T. (2010). Keep Your Fingers Crossed!: How Superstition Improves Performance.*Psychological Science*, 21 (7), 1014-1020.
- Hamerman, E.J., and Morewede, C.K. (2015). Reliance on luck: Identifying which achievement goals elicit superstitious behavior. *Personality and Social Psychology Bulletin*, 41(3), 323-335.
- Harmon-Jones, Eddie, ed. (2019). *Cognitive dissonance: reexamining a pivotal theory in psychology* (second ed.). Washington, DC: American Psychological Association.
- Hayatul, H., Siska, N., and Elza, S. (2023). Analysis of student difficulties in learning biology. *Journal of Biology Education Research*, 4(1), 1-8.
- Hillis, D.M., Heller, H.C., Hacker, S.D., Laskowski, M.J., and Sadava, D.E. (2020). Studying life. *Life: The Science of Biology* (12th ed.).
- Karthik, O. (2022). Definition, history and importance of Biology. *Frontiers in Psychology*. 9, 17-28.*udice and discrimination* (3rd ed.). Routledge
- Levy, S. (2018). *The effects of rule-induced superstition on operant performance*. The Chicago School of Professional Psychology ProQuest Dissertation & Theses, 10787562.
- Magner, Lois N. (2002). *A History of the Life Sciences, Revised and Expanded*. CRC Press. pp. 133-44.
- Mandal, F.B. (2018). Superstitions: A culturally transmitted human behavior. *International Journal of Psychology and Behavioral Sciences*, 8(4), 65-69.

- Modell, H., Cliff, W., Michael, J., McFarland, J., Wenderoth, M.P., and Wright, A. (2015). A physiologist's view of homeostasis. *Advances in Physiology Education*, 39 (4), 259–266.
- Onuoha, E. (2007). Superstition and witchcraft in Africa. *International Humanities News*, 14 (38), 56-66.
- Otti, N. (2022). *Cultural practices and students' academic performance in selected secondary schools in Nebbi district*. Dissertation, University of Kisubi.
- Pearce, Ben K.D.; Tupper, Andrew S.; Pudritz, Ralph E.; et al. (2018). Constraining the Time Interval for the Origin of Life on Earth. *Astrobiology*, 18 (3), 343–364.
- Samba, R.M.O (2017). Promoting students' understanding of photosynthesis and Respiration: An Evaluation of the potency of a conceptual change instructional strategies.
- Science Teachers Association of Nigeria (STAN, 2013) Biology as a natural science.
- Sagone, E., and Caroli, M.E.D. (2015). Beliefs about superstitious and luck in external believers university students. *Procedia – Social and Behavioral Sciences*, 191, 366-371.
- Tosyali, Furkan; Aktas, Busra (2021). Does training analytical thinking decrease superstitious beliefs? Relationship between analytical thinking, intrinsic religiosity, and superstitious beliefs. *Personality and Individual Differences*, 183, 111122.
- Urry, L., Cain, M., Wasserman, S., Minorsky, P., and Reece, J. (2017). Evolution, the themes of biology, and scientific inquiry. *Campbell Biology* (11th ed.). New York: Pearson. pp. 2–26.
- Vyse, S. (2014). *Believing in Magic: The Psychology of Superstition*. Oxford university press.
- Wolchover, N. (19 September 2011). *livescience.com*. Archived from the original on 27 November 2020. Retrieved 28 July 2022.
- Ziyadulla, M. (2019). The importance of biological education at school. *European Journal of Research and Reflection in Educational Sciences*, 7(12), 909-912.