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The Relation Between Academic Workloads in Science and Mental Health Outcomes Among Middle School Learners

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ABSTRACT

The study determined how academic workloads in science affect the mental well-being of middle school learners. A qualitative research methodology was employed, encompassing 37 participants (19 males and 18 females), with data gathered via focus group interviews. The qualitative findings indicated that substantial academic demands, including ambiguous project guidelines, protracted experiments and conflicting deadlines, disrupt learners' routines and hinder academic performance. They also highlighted common mental health problems like stress, irritability, emotional exhaustion, and feelings of loneliness, especially when academic workloads get in the way of personal time. It became clear that the stress of heavy academic workloads not only makes it harder for students to manage their time but also causes long-term psychological strain, which can show up as anxiety and emotional withdrawal. This highlights the necessity of enhanced task management to promote academic achievement and emotional well-being. The study reveals that excessive academic demands result in significant emotional distress and underscores the necessity for prompt interventions in educational institutions, including clearer assignment guidelines, a more balanced curriculum, emotional support systems and structured skill development strategies to protect learners' psychological well-being and academic engagement.

INTRODUCTION

Science has always been a subject of both excitement and challenge. For many sixth graders in Ghana, it is the first time they encounter complex experiments, long projects, and advanced concepts. Some rise to the challenge with enthusiasm. Others find themselves drained, anxious, and unsure of their own abilities. Stress from assignments, examinations and projects is a prevalent issue in schools, particularly in sixth grade and other upper elementary grades (Cooper *et al.*, 2006). The researcher personally seen the differential effects that different kinds of science assignments have on students' attitudes, levels of involvement, and stress. Students are not only growing academically, but also emotionally and socially. At this age, pressure from school does not stay in the classroom; it spills into their sleep, their moods, and their relationships. Stress from heavy science workloads can cause headaches, stomachaches, irritability, and even emotional withdrawal. The joy of learning gets buried under the burden of surviving assignments.

Grade 6 serves as a pivotal educational milestone for primary school learners, marked by considerable progress in academic, emotional, and cognitive areas. This level presents students with more intricate scientific concepts, specialized terminology, and more challenging analytical tasks than in earlier grades (Eccles & Roeser, 2011). Learners must not only master the scientific method but also conduct experiments accurately, meticulously analyze and interpret data, and articulate their findings effectively (National Research Council [NRC], 2012). Advanced cognitive skills, often less emphasized in

earlier educational stages such as analytical thinking, critical reasoning, precision in measurement, and systematic investigative abilities, are essential to fulfil these heightened expectations (Hmelo-Silver *et al.*, 2007; Osborne, 2014).

Research indicates that increased cognitive demands significantly impact learners' mental health and overall psychological well-being (Putwain, 2007). Research indicates that academic stressors, including challenges with complex subjects, high-stakes examinations, and extensive memorization demands, frequently lead to emotional issues such as anxiety, reduced self-esteem, feelings of inadequacy, and academic burnout (Suldo *et al.*, 2009; Putwain *et al.*, 2010). The desire for precise results and the burden of elevated academic expectations can exacerbate emotional stress, particularly among learners with diminished self-efficacy or those who perceive science as intrinsically challenging (Bandura *et al.*, 2001). Nonetheless, learners have markedly diverse experiences about the demands of science. Certain learners thrive under pressure, finding motivation in the intellectual difficulties posed by demanding academic assignments, while others view same responsibilities as onerous and unpleasant (Meece *et al.*, 2006). Wigfield *et al.* (1998) emphasize the need to acknowledge individual differences, such as learners' self-perceptions academically, their coping mechanisms for stress, and their interests, while examining their emotional and mental responses to academic tasks. Thus, comprehending the factors contributing to favorable engagement in specific activities and the apprehension elicited by others might

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profoundly influence the development of curriculum and pedagogical strategies in scientific education. Substantial data indicates that excessive workload can adversely affect mental health across many demographics.

Bakker and Demerouti (2017) shown in their Job Demands-Resources model that an excessive workload leads to psychological strain, emotional exhaustion, and burnout, especially when inadequate resources are present to alleviate these consequences. This discovery has been regularly corroborated in academic and professional environments. Galloway *et al.* (2013) found that a significant academic load is associated with increased stress, worse sleep, and reduced desire for learning. Their research on high-achieving learners revealed that individuals handed over 3.5 hours of homework nightly had exacerbated physical health problems, challenges in balancing other activities, and elevated anxiety levels.

Suldo *et al.* (2013) assert that mental health textbooks and educational research consistently highlight the dynamic interplay of factors such as task complexity, instructional strategies, learner engagement, and emotional responses in influencing learners' well-being. To enhance both academic achievement and mental well-being, educational researchers and psychologists increasingly concur that schools must achieve a balance between rigorous academic expectations and supportive learning environments (Putwain *et al.*, 2010; Suldo *et al.*, 2009). Therefore, it is crucial to look at how different science assignments impact the stress levels, emotional health, self-confidence, and academic attitudes of sixth-grade learners. This study aims to investigate these linkages by examining the effects of academic workloads on the mental health and the mental health conditions of sixth-grade learners in relation to the workloads.

Problem Statement

In the weeks leading up to major tests and projects, sixth-grade learners often displayed signs of feeling overworked. This included frequent complaints of

fatigue, a decline in class involvement, and heightened anxiety over their performance. Learners' emotional outbursts and increased unhappiness were also seen by teachers and parents, particularly when they were balancing challenging laboratory work, project-based assignments, and memory exercises with tight deadlines. These are more than fleeting complaints; instead, they reveal a growing tension between academic demands and children's emotional capacity. Therefore, it is crucial to identify the workloads of these learners that impact on their mental health and also determine the specific mental health conditions commonly associated with the heavy academic workloads of learners in science.

Research Questions

The study sought to answer the following questions;

- i. What are the science workloads of learners that affect their mental health?
- ii. Which mental health conditions are commonly associated with the heavy academic workloads of learners in science?

Theoretical Framework

This research leans on Lazarus and Folkman's (1984) Transactional Model of Stress and Coping, which reminds us that stress is not just about the task itself, but it is about how the individual perceives and responds to it. A science project may excite one learner but overwhelm another. A deadline may motivate one child but paralyze another with fear.

For sixth graders, whose cognitive and emotional skills are still developing, the way they interpret these challenges is critical. When support systems are present, they may see a project as achievable. When they feel alone, the same project can feel impossible. This framework helps us see the invisible link between workloads and mental health: the same assignment can either build resilience or erode confidence, depending on how it is experienced.

Conceptual Framework

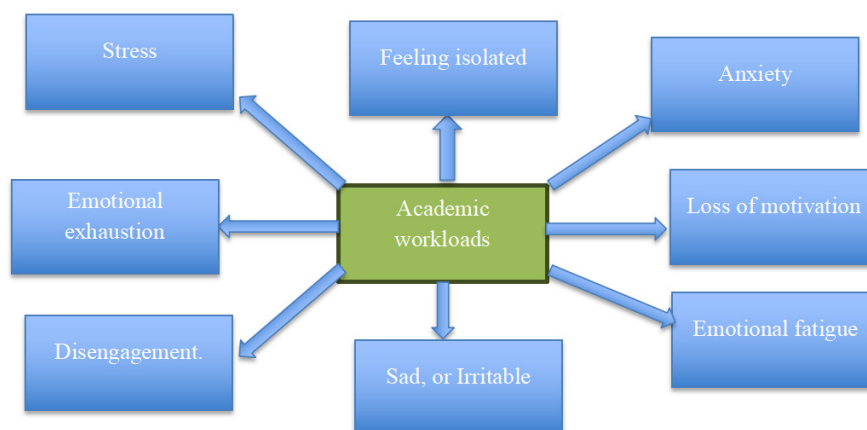


Figure 1: Authors own construct (2025)

The framework shown in figure 1 shows the chain reaction that heavy workloads trigger. Tasks like overlapping assignments, endless memorization, or unclear projects act as sparks. These sparks ignite stress, which in turn fuels feelings of exhaustion, anxiety, irritability, and isolation. Over time, the flame grows into disengagements. Then children begin to lose interest in science, and sometimes in learning altogether. In simple terms: when schoolwork steals time, energy, and joy, children's mental health suffers.

MATERIALS AND METHODS

Design

The interpretivist model, which aims to comprehend the meanings learners ascribe to their academic experiences, served as the foundation for this study's qualitative research design. The design was selected to offer comprehensive, contextual insights into how sixth-grade students, especially those studying science, react emotionally and behaviorally to academic burden. To truly understand how children feel about their science workloads, this study chose a qualitative design. Numbers can tell us how many assignments were given, but they cannot capture the sighs, the tears, or the excitement in a child's voice. By sitting with learners and listening to their stories, we gain insights that are often hidden in statistics. This design allowed themes to arise inductively from the data while supporting the goal of identifying cognitive and behavior patterns within a naturalistic classroom setting.

Setting

The study took place in a private school in the Kpone Katamanso District of Ghana's Greater Accra Region. Founded in 2005, the school has built its philosophy around learner-centered and practical education, while still following the Ghana Education Service curriculum (Ghana Education Service, 2023). Over the years, it has created a safe and welcoming environment for its community by providing well-organized classrooms, recreational areas, internet access, 24-hour security, and a standby generator to keep learning uninterrupted. Today, the school is home to about 1,000 students and 26 dedicated teachers, who work together to support both individual and group learning. With its strong sense of community and commitment to student well-being, the school offers a meaningful space to explore how academic pressures shape the mental health and everyday experiences of learners.

Population, Sample And Sampling Techniques

About 1,000 learners and a staff of 26 teachers make up the school's population. All Grade 6 learners enrolled at the chosen school made up the target group. The primary sample for the study consisted of 37 learners who were invited to participate and who all returned signed parental consent forms. This also indicated that 37 learners constitute the accessible population. Purposive sampling was used to gather qualitative data through focus-group

interviews (Patton, 2015).

Data Collection Instrument

A focus group interview approach was used in the study. To guide the discussion, the researchers prepared ten questions, divided into two sections (Part 1 and Part 2), each aligned with the purpose of the study. The questions were designed to first identify aspects of the science workload that negatively affect learners' mental health and then explore the types of mental health challenges most commonly linked to heavy academic demands in science. The participants were organized into six groups, with six learners in each group. Because the class had a total of 37 students, the final group included seven learners. With the consent of both the learners and their guardians, the researcher recorded the sessions to ensure that no important details were missed and to allow for careful reflection during analysis.

Data Collection Procedures

The researchers used detailed and concise procedures for data collection and also used six weeks for the data collection. The qualitative data for this study was gathered through focus group interviews conducted during Weeks 3 and 4 of a six-week data collection period. Interviews were held privately during lunch breaks. These interviews were pre-structured with finalized questions and recorded using digital devices to ensure accuracy. The focus was on understanding learners' personal experiences and perceptions regarding academic workload, particularly in relation to science. The researchers began analyzing the interview recordings, identifying emerging patterns and key themes related to academic workload and mental health challenges.

Data Analysis Approach

Focused-group interviews were transcribed verbatim to ensure accuracy, and the data was thoroughly reviewed to identify recurring themes. These themes were then categorized to reflect key patterns in the participants' responses. Representative student quotes were included to illustrate and deepen understanding of these themes, providing insight into learners' engagement. The study offered a holistic perspective on how learners interact with science tasks and highlights strategies to enhance their educational experiences.

Ethical Considerations

This study adhered strictly to ethical research standards to ensure the protection, dignity and welfare of all participants. Approval was initially sought from the relevant authorities including informed consent from parents or guardians. Learners were assured of anonymity and confidentiality and were informed of the nature of the study and their choice to either participate or not. Learners were treated with respect and empathy while any signs of distress during data collection were immediately addressed.

RESULTS AND DISCUSSIONS

Table 1 depicts learners' responses to the interview

items and are grouped by similar themes to enhance understanding.

Table 1: Learners' Experiences and Perceptions of Academic Workloads and their Impact

Group	Key Responses (with Question Numbers)
Group 1	Q1, Q2: Science assignments are generally appropriately challenging, but some topics (e.g., experiments) take longer to grasp and finish.
Quote: "Experiments are fun, but we take so much time to complete them."	
Group 2	Q3, Q4: Specific assignments (e.g., research projects) are stressful due to unclear instructions or limited time for completion.
Quote: "We don't always understand what we're supposed to do in projects."	
Group 3	Q7: Deadlines cause anxiety, particularly for written reports with overlapping due dates.
Quote: "It feels like everything is due at the same time, and we can't keep up."	
Group 4	Q9: Workload impacts social time, leaving learners feeling isolated and disconnected from friends and family.
Quote: "We barely get to play with our friends because we're always doing homework."	
Group 5	Q8, Q10: Heavy workloads often lead to low motivation and moments of sadness, along with increased irritability at home.
Quote: "Sometimes we feel so tired we just want to give up."	
Group 6	Q6: Learners' reports feel stressed when managing overlapping academic tasks, particularly when these involve complex or time-intensive assignments.
Quote: "Having two big assignments at once is too much for us."	

The qualitative findings, including those summarized in Table 1, reveal that heavy academic workloads particularly in science affect learners' ability to complete tasks effectively and maintain a balanced daily routine. Students in Groups 1 and 2 shared that while assignments can sometimes be interesting, activities like experiments and projects with unclear guidelines consume a lot of time, often leaving them confused and delayed. Group 3 pointed out that overlapping deadlines add extra pressure, making students feel rushed and overwhelmed. Taken together, these insights suggest a clear pattern: when schoolwork is excessive or poorly structured, students find it difficult to stay organized and motivated, which directly affects both their performance and time management.

Learners also spoke openly about how their schoolwork impacts their emotional well-being. As shown in Table 1, members of Groups 4 and 5 described how academic demands often cut into time with family and friends, leading to feelings of isolation, sadness, and irritability. Group 6 added that managing several demanding tasks at once raised their stress levels significantly. These

reflections echo wider research that links academic overload to anxiety, burnout, and disengagement. The recurring themes of emotional fatigue, loss of motivation, and reduced personal time highlight the real psychological burden students carry, underscoring the importance of schools addressing not only the way workloads are structured but also the emotional needs of learners.

The findings of this study reveal that Grade 6 learners experience significant mental health challenges as a result of their academic workloads in science. It is important to note that the heavy demands of subjects like science can also be intensified by teachers' own stress, which may further affect students' mental health outcomes (Konadu, 2025).

Learners described a wide range of emotional responses to their workloads, including tension, anxiety, exhaustion, and loss of motivation. These feelings were especially pronounced when they had to juggle multiple subjects at once, with science being singled out as particularly demanding. Focus group discussions highlighted how conflicting deadlines, difficulty understanding complex

assignments, and fear of poor performance contributed to constant worry and stress. Tasks such as time-consuming experiments and research-based projects were especially overwhelming. These experiences reflect the findings of Conley and You (2017), who argued that when academic demands exceed students' coping abilities, emotional distress and reduced self-efficacy are common outcomes. Students' frequent use of words like "worried" and "rushed" suggests that they are not only dealing with short-term anxiety but also ongoing psychological strain. Another recurring theme was emotional and physical exhaustion. Learners often described feeling drained even before the school day began, largely due to late nights spent completing homework or preparing for exams. This fatigue negatively affected their focus and classroom participation. Similar to Salmela-Aro and Upadaya's (2014) definition of academic burnout, students reported signs of emotional exhaustion, disengagement, and reduced performance. For some, stress also disrupted daily routines such as sleep and leisure, further reducing their overall well-being.

The impact of academic overload extended beyond individual emotions to behavioral and social dimensions. Groups 4 and 5, for instance, shared that heavy workload drastically reduced the time they could spend with family and friends. Several learners expressed missing out on opportunities to socialize and feeling isolated from their peers. These experiences were often accompanied by sadness, loneliness, and lack of enthusiasm. Suldo *et al.* (2009), similarly observed that excessive academic demands can undermine students' ability to maintain meaningful relationships, increasing the risk of emotional imbalance and internalized struggles like depression and anxiety.

Another concerning effect was on learners' motivation and self-worth. Many felt discouraged when they worked hard yet still fell short of expectations, especially with assignments that were unclear or overly complex. This reflects the concept of learned helplessness, where repeated failure leads students to believe that effort no longer matters, thereby reducing motivation and increasing withdrawal from academic pursuits. Such thinking not only hampers academic growth but also weakens resilience and self-confidence. The absence of strong emotional support systems in schools appeared to intensify these challenges. While some learners found comfort in talking to peers or teachers, there was little evidence of structured support networks such as counseling or teacher-led emotional check-ins.

Overall, the results point to a sobering conclusion: the mental health of Grade 6 learners is significantly strained by excessive and poorly organized academic demands. The combination of anxiety, fatigue, social disconnection, low self-esteem, and limited support creates an environment that is emotionally unsustainable, even if academically rigorous. Without intervention, these conditions could have long-term negative effects on both educational outcomes and psychological well-being.

In light of this, it is crucial for teachers and school leaders to place mental health at the center of academic planning. Practical strategies such as flexible and customized instruction, staggered deadlines, scheduled downtime, and the integration of emotional well-being programs into the curriculum can help create a healthier school environment. Ultimately, supporting students' mental health is not just about protecting their well-being in the present; it is also essential for enabling meaningful, long-term academic success.

Limitations

This study is limited by its reliance on self-reported data from participants. This is a common challenge in research exploring the link between academic workloads and mental health. While learners' reflections provide meaningful insight into their lived experiences, self-reports can also be influenced by biases such as social desirability, exaggeration, or underreporting of emotional distress and academic struggles (Cooper, 2021; Pascoe *et al.*, 2020). Another limitation lies in the study's scope, as it did not account for differences in learners' family environments or socioeconomic backgrounds. These factors may shape both academic expectations and the emotional resources available to students, potentially influencing how workloads are experienced and managed. Together, these limitations highlight the need for future studies to adopt longitudinal designs and incorporate broader contextual factors. Doing so would deepen understanding of how academic demands interact with the personal, social, and economic realities of learners' lives, offering a fuller picture of the complex relationship between schoolwork and mental health.

Implications Of The Study

The study emphasizes the critical need to address the impact that science-related academic workloads have on middle school learners' mental health. It indicates that academic expectations, such as overlapping deadlines, complex tasks, and time-consuming assignments, can lead to increased stress, anxiety, and emotional tiredness when they surpass learners' developmental limits. To lessen psychological stress, teachers and curriculum designers are urged to carefully consider the type, quantity, and timing of science tasks. The results also highlight how crucial it is to create learning environments in schools that are attentive to early warning signs of emotional discomfort in young learners. This entails making sure that task instructions are more explicit, minimizing workload clustering, and implementing structured breaks. While schools can support classroom practices that lower anxiety and foster candid conversations about mental health, policymakers should match curriculum demands with learners' cognitive and emotional preparation. Stakeholders can contribute to the development of more balanced and encouraging learning environments that safeguard the wellbeing of learners.

CONCLUSION

The study confirms that science-related workloads, particularly hands-on and time-intensive tasks, play a significant role in contributing to academic stress among middle school learners. These demands often trigger emotional responses such as anxiety, fatigue, and self-doubt, reflecting the heavy toll of balancing complex assignments with everyday school responsibilities. Research indicates that overly demanding or unclear assignments increase stress levels in young learners and decrease motivation. Balancing academic rigor with mental well-being is crucial. Careful attention to structure, volume, and clarity of science-related tasks can ease strain while maintaining high educational standards. Addressing workload challenges can create supportive learning environments, protect emotional health, and foster curiosity and academic growth. The study suggests several measures to reduce science-related academic stress and safeguard the mental health of middle school learners. These include structured academic schedules, minimizing overlapping assignments, incorporating regular breaks, and providing clear instructions. Policy guidelines should be developed to match academic demands with learners' developmental, cognitive, and emotional capacities. Teachers should receive professional development to recognize early signs of academic stress and respond with supportive teaching practices. Schools should also expand access to mental health resources, including counseling services, and create safe spaces for students to share their struggles. These recommendations emphasize the importance of balancing academic rigor with well-being in science education.

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