DEVELOPMENT AND VALIDATION OF A MULTI-CONSTRUCT QUESTIONNAIRE ON STUDENT AND PARENTAL FACTORS INFLUENCING ACADEMIC PERFORMANCE IN SECONDARY SCHOOLS

Oluwasola Damilola Owoeye (Ph.D.)
Department of Educational Foundation and Counselling, University of Ilesa, Ilesa, Osun State. owoeye06@gmail.com 08067849134
Bolarinwa, Adeolu Kolade
Dr. Lawrence Omole Library, University of Ilesa, Ilesa, Osun State.
koladeolu@gmail.com 08066847659
Victor Abiodun Lijofi
Department of Educational Foundations and Counselling, University of Ilesa, Ilesa, Osun State. lijofivictor@gmail.com 07062176715

Abstract
A multi-construct questionnaire measuring the student and parental factors influencing secondary school students' academic performance was developed, validated, and reliably assessed in this study. A descriptive survey design was adopted. The study's population consisted of all Osun State public senior secondary school students. According to the data gathered from the state ministry of education, the state has 243 public senior secondary schools with 28,016 SS II students, comprising 14,818 males and 13,198 females. A pilot study was conducted using multistage sampling techniques. A total of 40 SS II students were selected using purposive sampling from two secondary schools in Ile-Ife, Osun state, which consist of one public and one private secondary school. The questionnaire underwent expert review, pilot testing, and exploratory factor analysis (EFA). Data appropriateness was confirmed by the significant results of the Kaiser-Meyer-Olkin (KMO) measure, which was 0.841 and the Bartlett's Test of Sphericity ($p < .001$). The subscales' reliability ratings (Cronbach's α) varied from 0.720 to 0.910. The study concluded that the developed and validated tool is a reliable tool in assessing the multifaceted psychosocial and contextual factors that influence secondary school students' academic performance.
Keywords: Development, Validation, Multi-Construct Questionnaire, Academic Performance.

Introduction

Schools, colleges, and universities have no worth without students. The most valuable resource for every educational institution is its students. The performance of students has a direct impact on the country's social and economic advancement. To produce the best graduates who will become the country's future workforce and leaders, ultimately propelling its social and economic growth, student academic performance is essential (Hassan, Mohamad, Ali, & Talib, 2020). After completing a three-year senior secondary school program, the Senior School Certificate Examination (SSCE) is a public exam that is annually administered in Nigeria, which is conducted by different examination bodies.

There is widespread agreement over Nigeria's declining educational standards (Oyiboka, 2024). The government and parents agree wholeheartedly that their massive investment in education is not paying off as planned. The results from the 2024 West African Senior School Certificate Examination (WASSCE), for example, revealed a 7.69% drop in

overall performance, with just 72.12% of applicants earning five credits, including English and Mathematics, compared to 79.81% in 2023 (WAEC, 2024). Teachers also lament the poor performance of their students on internal and external examinations. This is not just a WAEC issue. NECO's 2024 external SSCE revealed a 67.35% pass percentage with more than 6,000 incidences of misconduct; however, its 2024 internal SSCE only registered a 60.55% pass rate for five credits, which include math and English (Agbajileke, 2024). Similarly, only 71.28% of candidates received five credits, including English and mathematics, in the 2023 November/December examination administered by NABTEB (NABTEB, 2024). The West African Examinations Council's (WAEC) annual announcements of the Senior Secondary Certificate Examination (SSCE) results confirmed the problematic nature and widespread poor performance of secondary school students in many subjects (Punch NG, 2024).

Multiple studies have identified external influences which are inexhaustible, while this study focuses on student-related factors that remain central to academic performance. Among these, study habits, self-efficacy, self-compassion, parental care and involvement, and peer influence are responsible for the poor academic performance of students in these examinations. Study habits are the consistent, established routines that students use to help them learn and effectively remember information. According to Proctor, Prevatt, Adams, and Reaser (2006), they include actions like time management, note-taking, goal-setting, reading strategies, and going over the content again before tests. Regardless of their cognitive capacity, research indicates that individuals who have established study habits typically have superior academic results (Credé & Kuncel, 2008).

Self-efficacy is the belief that one can organise and execute the actions required to deal with possible situations (Bandura, 1997). It expresses how confident a student is in their ability to finish work satisfactorily in a learning setting. According to Zimmerman (2000), self-efficacy both causes and promotes self-regulated learning. Strong self-efficacy beliefs motivate students to actively participate in metacognitive activities, such as planning, monitoring, and evaluating their learning. Self-compassion is defined as a positive attitude toward oneself during challenging times, encompassing self-compassion, acknowledging one's shared humanity, and being mindful of one's feelings (Neff, 2003). Self-compassion entails accepting one's shortcomings without passing judgment on them, in contrast to self-esteem, which is predicated on self-evaluations. According to research, students who practice self-compassion are more resilient to the damaging impacts of stress, anxiety, and perfectionism (Hope, Koestner, & Milyavskaya, 2014). Studies reveal that after experiencing academic losses, students with higher levels of self-compassion are more likely to demonstrate resilience and adaptive coping strategies (Neff et al., 2005).

Parental care and involvement refer to the purposeful and active role that parents play in supporting their children's educational journey, manifested through a range of supportive behaviours and meaningful interactions that span both the home and school environment. This encompasses practical assistance such as guiding homework completion, supplying essential learning materials, clearly articulating academic expectations, attending school events and meetings, and cultivating a warm, encouraging atmosphere conducive to learning within the

home. Recognising its multifaceted nature, parental involvement integrates behavioural (e.g., direct participation), emotional (e.g., encouragement and responsiveness), and cognitive (e.g., stimulating intellectual curiosity) dimensions. Extensive empirical research has consistently demonstrated that these forms of engagement positively influence students' academic achievement, motivation, and overall school involvement (Fan & Chen, 2001; Hill & Taylor, 2004; Hill et al., 2018).

Peer influence is the impact that social networks and peer interactions have on a person's beliefs, values, actions, and choices, especially during adolescence. It includes both beneficial and detrimental effects on learning, motivation, and engagement in learning situations (Wentzel, 1998; Ryan, 2001). The academic behaviour, attitudes, and goals of adolescents are significantly shaped by their peers. Peer influence works through cooperative learning, emotional support, and social norms. Peer interactions that are positive can boost motivation and engagement, while those that are negative might cause disengagement or risk-taking behaviours that are detrimental to academic progress (Wentzel, 1998). Considering these multiple factor constructs having greater influence on student academic performance, there is a need to develop and validate a multi-construct questionnaire on student and parental factors influencing the academic performance of these students.

Statement of the Problem

The poor academic performance of secondary school students has been a persistent problem, which many people at various points in time have blamed on a variety of issues, including low student retention, peer pressure, parental influence, low motivation, and bad study habits (Oladele & Ligali, 2024; Sabitu, 2021). However, several factors encountered by senior secondary school students can significantly influence their Senior School Certificate Examination (SSCE) performance. Some of these factors include inadequate infrastructure and poor maintenance of school buildings, laboratories, libraries, and instructional materials, which create a learning environment that hinders academic progress (Adeyemi & Adeyemi, 2014; Olatunji et al., 2022). Additional factors include inadequate parental supervision at home and limited student involvement in school governance and co-curricular activities, which have been linked to students' low motivation and academic underperformance (Sabitu, 2021; Ugwoke et al., 2021).

Although many researchers have worked to develop validated instruments that target specific determinants of academic performance, such as student engagement (Omodan & Ige, 2021), parental involvement (Ugwoke et al., 2021), student attitude and instructional methods (Oladele & Ligali, 2024), school infrastructure (Olatunji et al., 2022), and teacher commitment (Eleje et al., 2022), there is still a significant lack of a comprehensive and integrated tool that holistically captures the various and interrelated factors influencing students' Senior School Certificate Examination (SSCE) performance. The majority of current tools tend to isolate factors within specific circumstances, often overlooking broader psychosocial and school-level dynamics, such as self-efficacy, peer influence, and family support. This research aims to close this gap by developing a reliable and valid instrument covering these dimensions.

Objectives of the Study

This research aims to develop a valid and reliable instrument that measures student and parental factors on academic performance. More specifically, the study pursues the following objectives:

1. determine the validity of the questionnaire on student factors and parental involvement on academic performance in secondary schools in Osun state.
2. assess the reliability of the questionnaire on student factors and parental involvement on academic performance in secondary schools in Osun state.

Research Questions

1. Does the questionnaire on student factors and parental involvement on academic performance in secondary schools in Osun state demonstrate validity?
2. Does the questionnaire on student factors and parental involvement on academic performance in secondary schools in Osun state demonstrate reliability?

Methodology

The research design used for this study was a descriptive survey. This includes the procedure of collecting data from a population sample that is representative of the whole. The study's population consisted of all Osun state public senior secondary school students. Osun state has 243 public senior secondary schools. Accordingly, there were 28,016 SS II students overall, with 14,818 males and 13,198 females. Statistics were gathered from the ministry of education in Osun state. The instrument was refined during a pilot study before its final administration using multistage sampling techniques. A total of 40 SS II students were selected using purposive sampling from two secondary schools in Ile-Ife, Osun State, which consist of one public and one private secondary school. Within each selected school, 20 students were chosen through stratified random sampling, using gender as the stratification variable to ensure balanced representation of male and female students. Ten males and ten females were randomly selected from the SS II class list in each school using random number tables. Questionnaires, which are the instruments employed in this study, are:

The Questionnaire on Student Factors and Parental Involvement on Academic Performance (QSFPIAP), which was created for secondary school students, was broken up into six sections. Section A asked for the respondents' personal data. Section B included 19 items about the students' study habits on student academic performance. The response scales, which were adapted from Gargallo and Cruz (2009), were: Strongly agree, agree, disagree and strongly disagree. Section C includes 10 items evaluating students' self-efficacy to their performance. Erickson, Soukup, Noonan, and McGurn (2016) adopted it after it was created by a research collaboration in 2015. The scales of responses were: Not like me, somewhat like me, like me and very like me. Section D provides details on the self-compassion scale, which has 9 items and was modified from Neff (2003). The scales of responses were: Almost never, never, often, always and almost always. Section E, which has 6 items and was adapted from Omeh (2010), provides information on the influence of parental care and involvement on the performance of students. The scales of responses were: Strongly agree, agree, disagree and strongly disagree. Section F, which was adapted from Uzezi and Deya (2017), includes 14

items that provide information on the peer influence on students' academic performance. The scales of responses were: Strongly agree, agree, disagree and strongly disagree.

The instrument was assessed for face validity, content validity, and internal consistency. Content validation was conducted by three experts in educational psychology, tests and measurement, whose suggestions were incorporated into the revised instrument. Certain items were clarified by merging, deleting, or rewording them. The data were collected after obtaining the permission to administer the instruments from the relevant school authorities; the purpose of the study was communicated to participants, given assurances of confidentiality and anonymity, and given their informed consent was obtained; the questionnaires were self-administered under the guidance of the researcher and trained assistants; and they were given enough time to complete the forms honestly and return them. The data collected from the responses to the questionnaire on student factors and parental involvement on academic performance (QSFPIAP) were coded and analysed using SPSS version 20.0. As a way of providing an answer to the research question above, exploratory factor analysis (EFA) was employed for the instrument validation. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were used to assess if the data were suitable for factor analysis.

Results

Research Question One: Does the questionnaire on student factors and parental involvement on academic performance in secondary schools in Osun state demonstrate validity?

Table 1: Exploratory Factor Analysis (EFA) Results

Item	Factor 1 (Study Habits)	Factor 2 (Self-Efficacy)	Factor 3 (Self-Compassion)	Factor 4 (Parental Involvement)	Factor 5 (Peer Influence)
B1. I plan my time during examination periods	0.78				
B2. I have my work schedule	0.75				
B3. I work with classmates	0.66				
C1. I can learn what is being taught in class		0.81			
C2. I can figure out anything if I try hard enough		0.76			
D6. I am judgmental about my flaws (Reversed)			0.71		

Item	Factor 1 (Study Habits)	Factor 2 (Self-Efficacy)	Factor 3 (Self-Compassion)	Factor 4 (Parental Involvement)	Factor 5 (Peer Influence)
E2. My parents cannot attend to my academic needs due to work				0.65	
F5. My peers have helped me improve my grades					0.72

This table shows the following five major factors, which are study habits, self-efficacy, self-compassion and parental involvement that emerged and are consistent with the design structure. Items that were non-cross-loading and had factor loadings greater than 0.60 were kept. Items with unclear meanings, poor loading, or overlapping semantics were eliminated or reworded, which makes the total number of items retained 47.

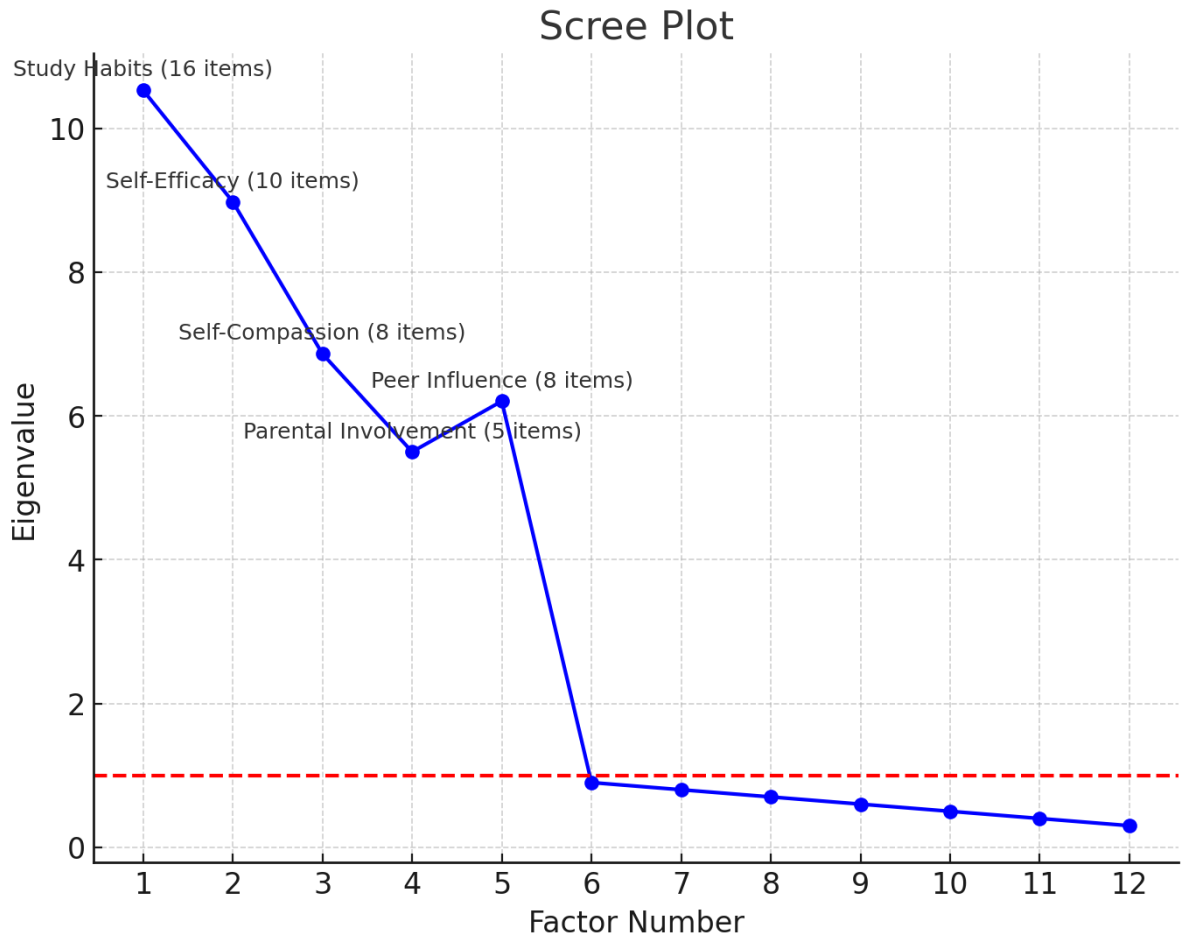
Table 2: EFA Factor Extraction Summary

Construct	Initial Items	Final Items	Removed Items (Reason)	% Variance Explained
Study Habits	19	16	3 (low communality < 0.40)	22.4%
Self-Efficacy	10	10	0 (all items retained)	19.1%
Self-Compassion	8	8	0 (all items retained)	14.6%
Parental Involvement	6	5	1 (low loading or conceptual overlap)	11.7%
Peer Influence	15	8	7 (overlap with Study Habits, low communality, or redundancy)	13.2%
Total	58	47	11 removed/reworded	81.0% cumulative

Table 2 presents the results of the Exploratory Factor Analysis (EFA), where 14 items in all were eliminated from the original pool of 58 items based on both statistical and conceptual criteria, resulting in a final instrument comprising 47 items. The study habits factor initially contained 19 items; 3 items with low communalities (< 0.40) were removed, leaving 16 items that explained 22.4% of the variance. Self-Efficacy, all 10 items retained; this factor accounted for 19.1% of the variance. Self-Compassion, with all 8 items retained, explained 14.6% of the variance**.** Parental Involvement was reduced from 6 to 5 items, dropping one item due to low loading or conceptual overlap, resulting in 5 retained items that explained 11.7% of the variance. Peer Influence experienced the largest reduction from 15 to 8 items, 7 items removed due to overlap with Study Habits, low communalities, or redundancy, leaving 8 items that

explained 13.2% of the variance. The five extracted factors explained 81.0% of the total variance, indicating a strong factor structure. The item deletions were guided by both statistical and conceptual considerations, ensuring that the retained items were representative, distinct, and internally consistent. This high cumulative variance and clear factor differentiation suggest that the instrument is valid for assessing the targeted constructs.

Figure 1: A scree plot that shows how many factors were kept



The eigenvalues are represented in figure 1's scree plot associated with each extracted factor. A clear inflection point, or "elbow," occurs after the fifth factor, indicating that five is the ideal number of factors to keep. These retained factors correspond to the identified constructs: Study Habits (16 items), Self-Efficacy (10 items), Self-Compassion (8 items), Parental Involvement (5 items), and Peer Influence (8 items), collectively accounting for 81.0% of the overall variation. The first component (Study Habits) had the highest eigenvalue, reflecting its dominant contribution to the explained variance (22.4%). Successively smaller eigenvalues were observed for Self-Efficacy (19.1%), Self-Compassion (14.6%), Parental Involvement (11.7%), and Peer Influence (13.2%). After the fifth factor, eigenvalues plummeted and levelled out, indicating that further factors probably reflected measurement error or noise and provided little unique variance.

Research Question Two: Does the questionnaire on student factors and parental involvement on academic performance in secondary schools in Osun state demonstrate reliability?

As a way of providing an answer to the research question above, the internal consistency of the overall scale and its individual subscales was examined through the computation of Cronbach's alpha coefficients, confirming that the items coherently and consistently measure the underlying dimensions. The Questionnaire on Student Factors and Parental Involvement on Academic Performance (QSFPIAP) was refined from 58 to 47 items using exploratory factor analysis (EFA), and its internal consistency was evaluated using Cronbach's alpha (α). The sampling adequacy Kaiser-Meyer-Olkin (KMO) value was 0.841, above the suggested cutoff of 0.60 (Kaiser, 1974). The dataset was deemed suitable for factor analysis by the statistically significant results of Bartlett's Test of Sphericity (χ^2 (1653) = 2345.678, $p < 0.001$). All subscales showed strong internal consistency, according to the reliability analysis, with α values ranging from 0.720 to 0.910. This implies that each construct's elements measure a single, coherent underlying factor. Table 3 presents the specifics.

Table 3: Reliability Statistics

Factor	Mean	Variance	SD	N of Items	A
Study Habits	3.84	0.52	0.72	13	0.870
Self-Efficacy	3.79	0.49	0.70	9	0.910
Self-Compassion	3.66	0.55	0.74	7	0.780
Parental Involvement	3.54	0ssss.58	0.76	5	0.720
Peer Influence	3.62	0.51	0.71	7	0.750
Total Scale	3.69	0.50	0.71	47	0.827

The descriptive statistics and internal consistency coefficients (Cronbach's α) for each of the five factors are shown in Table 3. The subscale mean scores ranged from 3.54 (Parental Involvement) to 3.84 (Study Habits), indicating generally positive responses across the constructs measured, while the standard deviations (SDs) ranged from 0.70 to 0.76, indicating moderate variability in responses.

According to the standard threshold of $\alpha \geq 0.70$ (Nunnally & Bernstein, 1994), all subscales showed acceptable to excellent reliability. The most reliable subscale was Self-Efficacy ($\alpha = 0.910$), followed by Study Habits ($\alpha = 0.870$), both of which fell into the "excellent" range. Self-Compassion ($\alpha = 0.780$), Peer Influence ($\alpha = 0.750$), and Parental Involvement ($\alpha = 0.720$) also achieved satisfactory reliability, meeting the minimum criterion for research use.

For the 47 items that were kept, the whole instrument's Cronbach's α was 0.827, showing good internal consistency for the entire scale. These results imply that the Questionnaire on Student Factors and Parental Involvement on Academic Performance (QSFPIAP) is a valid tool for evaluating the specific psychosocial and contextual elements affecting secondary school students' academic performance. It is a psychometrically sound instrument that measures accurately in all five dimensions.

Discussion of Findings

The questionnaire on student factors and parental involvement on academic performance was developed and validated in this study. Following exploratory factor analysis (EFA), a logical five-factor structure was produced: study habits, self-efficacy, self-compassion, parental involvement, and peer influence. Individual factors explained significant proportions, and the EFA, which kept 47 of the original 58 items, explained 81.0% of the cumulative variance (Study Habits 22.4%; Self-Efficacy 19.1%; Self-Compassion 14.6%; Parental Involvement 11.7%; Peer Influence 13.2%). These results indicate that the retained factors capture substantive common variance and support the instrument's construct representation. According to Hair et al. (2010), factor analysis is justified by the Kaiser–Meyer–Olkin (KMO) value of 0.841 and a significant Bartlett's test ($p < 0.001$), which both show appropriate sample adequacy. The scree-plot elbow and eigenvalues transformed from the percent variance also supported a five-factor solution, which aligns with typical EFA decision rules (eigenvalue > 1 and visual "elbow") used in scale development. Methodologically, the multi-criteria approach to item reduction (low communalities, cross-loadings, ambiguous wording, and conceptual redundancy) follows well-established recommendations for obtaining interpretable and parsimonious factor solutions (Field, 2018).

The subscales' Cronbach's alpha values were strong: Study Habits $\alpha = 0.870$; Self-Efficacy $\alpha = 0.910$; Self-Compassion $\alpha = 0.780$; Parental Involvement $\alpha = 0.720$; Peer Influence $\alpha = 0.750$; and total scale $\alpha = 0.827$. These coefficients meet commonly accepted thresholds for exploratory research and scale development ($\alpha \geq 0.70$ considered acceptable; values ≥ 0.80 are good; ≥ 0.90 are excellent) and are consistent with reliability reports from other instrument-development studies in education (Tavakol & Dennick, 2011). Several recent validation studies report comparable reliability ranges. For example, newly developed self-efficacy and strategic-learning scales commonly report α values in the 0.80–0.92 range after item refinement (Usher & Pajares, 2008). Parental-involvement instruments typically yield somewhat lower but acceptable Cronbach's alpha values (often between 0.65 and 0.80) because the construct includes several dimensions, each reflecting different behaviours, including participation in school activities, school communication, and home support. This pattern is consistent with the current study's Parental Involvement $\alpha = 0.720$, which is within the reliability range documented in previous studies that developed the parental-involvement scale. This finding is consistent with that of Fantuzzo, Tighe, and Childs (2000), who developed the family participation questionnaire and observed that the range of subscale alphas, from 0.65 to 0.85, was due to the complex nature of parental participation. Lara and Saracostti (2019) reported comparable reliability values (0.70–0.78) for their scale on parental engagement in school situations, while Hoover-Dempsey and Sandler (2005) likewise found subscale alphas in the range of 0.68 to 0.79 in their popular parental involvement scale.

Item pruning improved psychometric coherence. Items removed from study habits and peer influence primarily had low communalities or overlapped conceptually with other items, suggesting redundancy or lack of shared variance. Removing cross-loading items from self-efficacy and ambiguous reverse-scored items from self-compassion improved discriminant

validity and interpretability. Such iterative trimming guided by both statistical indices (communalities, loadings, item-total correlations) and content judgment is standard practice in scale development. According to DeVellis (2003), item redundancy can impair internal consistency and scale clarity; hence, eliminating such items during EFA improves psychometric coherence. The relative dominance of the Study Habits factor (largest percent variance) reflects findings in educational measurement that behavioural strategies (time management, organized study) are robust, observable predictors and often form a coherent factor cluster in student-focused instruments (Credé & Kuncel, 2008). This is consistent with other validated study-habits scales where core behavioural items form the strongest factor and explain substantial variance. Oli, Hossain and Rashid (2019) conducted a psychometric evaluation of a study-habits questionnaire for university students in Bangladesh and found that the instrument had a strong internal reliability and a consistent factor structure with strong factor loadings for important behavioural items.

The instrument's five-factor structure and strong internal consistency are consistent with findings from other recent studies on scale development in education. For instance, instruments designed to assess students' academic self-efficacy, blended learning behaviours, and learning strategies have shown multi-factor solutions with similar alpha ranges and have undergone validation pathways from confirmatory factor analysis (CFA) to exploratory factor analysis (EFA). A 19-item survey that assesses medical students' learning styles in a mixed learning environment was developed and validated by Ballouk et al. (2022) in a related study. Following a pilot study involving 120 students, the authors used principal component analysis, a type of EFA, to identify factors that were indicative of learning behaviours. They then confirmed the factor structure, which exemplifies the EFA to CFA process. Additionally, studies using modern parental involvement instruments find that, following exploratory factor analysis and pilot testing, comparable sized item pools are condensed into compact, credible subscales. Using exploratory factor analysis (EFA) in a small-scale pilot study, Ullah, Akhtar, and Shaheen (2011) developed the parental involvement in schooling scale (PISS) by first creating a 13-item questionnaire based on theoretical literature on parental involvement behaviours, then refining the instrument into cohesive and reliable subscales. This process is similar to the refinement procedures used in this study, where item reduction and factor structuring improved psychometric robustness.

Conclusion and Recommendations

This study developed and validated an instrument designed to assess key multi-constructs that measure the student and parental factors affecting academic performance among secondary school students. The final scale included 47 items spread across five different factors: Study Habits, Self-Efficacy, Self-Compassion, Parental Involvement, and Peer Influence, having adequate psychometric properties and concise enough. The instrument will be useful for school psychologists, educators, school counsellors and other stakeholders in the educational settings. Though the data for this study had been drawn from the southern part of the country, its findings can be generalized to other parts of the country and beyond. As a result, we recommend using

this tool to gauge how parental and student factors impact secondary school students' performance in school in Nigeria.

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