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Gender and Subject Domain Differences in Goal Orientations among Pre-Service Teachers in Nigerian Colleges of Education

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ABSTRACT

This research sought to explain gender and subject domain differences in pre-service teachers' goal orientations in Nigerian Colleges of Education. Specifically, it examined the dimensions of learning and performance goal orientation among genders and subject domains in Colleges of Education with implications for teacher education policy and practice. It was a correlational research design involving 400 pre-service teachers (200 males, 200 females; 200 arts students and 200 science students) drawn using stratified random sampling method from two colleges of education in Katsina State, Nigeria. The Achievement Goal Questionnaire (Elliot & Church, 1997) was adopted and re-validated for this study and used for data collection. The collected data were analysed using descriptive and inferential statistics. Descriptively, pre-service teachers possessed moderately high learning goal orientation (M = 3.87, S.D = .58) and moderate performance goal orientation (M = 3.12, S.D = .71). As for gender differences, a significant difference was observed in learning goal orientation, with females (M = 4.02, S.D = .52) scoring significantly higher than males (M = 3.72, S.D = .61), t(398) = 5.34, p < .001, d = 0.53. Similarly, a significant subject-domain difference was found, with science students (M = 4.01, S.D = .54) scoring significantly higher than Arts students (M = 3.73, S.D = .60), t(398) = 4.98, p < .001, d = 0.50. No significant gender or subject-domain differences were found for performance goal orientation, and no significant gender × subject-domain interaction was found for learning goal orientation, F(1, 396) = 1.24, p = .266, η^2 = .003. Female and Science pre-service teachers are more learning goal oriented. Teacher education programs need to infuse and cultivate motivational strategies that promote learning goal orientation among male pre-service teachers and Arts-student teachers. Mixed methods research designs would be needed to explore achievement goal orientation and teaching effectiveness during practicum.

KEYWORDS: *Goal orientation, learning goals, performance goals, gender differences, subject domain, pre-service teachers, Nigeria.*

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1. Introduction

Achievement goal theory has emerged as one of the most prominent frameworks for understanding student motivation in academic settings. Developed within a social-cognitive framework, the theory explains how individuals develop, attain, or demonstrate competence in learning and performance contexts (Nicholls, 1992; Zweig & Webster, 2004). According to Dweck (1986) and Dweck and Elliott (1983), students engage in academic activities with the hope of fulfilling different goals. These goals generate the interpretive framework within which learners respond to academic events, challenges, and feedback.

Two main types of goal orientations have been identified by theorists: learning goal orientation (also called

mastery goal orientation) and performance goal orientation. Learning goal-oriented students are interested in understanding the content of the course, gaining competence, and mastering learning tasks. They are self-motivated and are more likely to persevere when things get tough (Dweck & Leggett, 1988; Elliot, 1999). Students with performance goal orientation, on the other hand, focus on proving their competence in comparison to others, looking smart, and not looking incompetent. They are often extrinsically motivated and may give up when they fail (Ames & Archer, 1988; Covington, 2000).

Goal orientation affects cognitive processes such as planning, using resources, and monitoring progress (Zimmerman, 1990). These, in turn, impact achievement outcomes (Covington, 2000), reactions to success or failure (Dweck & Leggett, 1988), and persistence (Shim & Ryan, 2005). Learning goal orientation has been consistently associated with adaptive outcomes like deep processing strategies, intrinsic interest, academic self-efficacy, and better achievement (Albaili, 1998; Meece et al., 1988; Tanaka & Ysmauchi, 2001). Performance goal orientation, especially performance-avoidance, has been associated with undesirable behaviours such as cheating, academic self-handicapping, withdrawal of effort, and surface processing (Anderman et al., 1998; Newman, 1998; Ryan & Pintrich, 1997).

The issue of the quality of pre-service teachers trained in the Colleges of Education has been raised in Nigeria on several occasions. It has been noted that the quality of teachers produced by these institutions may not be sufficient to address the needs of basic education (Akinbote, 2000; Adelanera, 2005; Ndagi, 2011; NCCE, 2010; Usman, 2011). The poor performance of pre-service teachers in academic work has been reported, especially in basic subjects like General English, basic mathematics, and educational psychology. This is a problem because the quality of any educational system cannot be higher than the quality of its teachers (Federal Republic of Nigeria, 2007).

The issue of gender difference in academic achievement has been a topic of debate for a long time. There are some studies that indicate that male students do better in mathematics and science (Aremu, 1999; Obioye, 2002), while others show that female students do better in reading and language subjects (Gisela, 2011; Ton, 2003). International comparisons reveal mixed trends: In Belgium, Thailand, Finland and Hungary, girls performed better than boys in mathematics, while in France, Nigeria, Israel and the Netherlands, the opposite was true (Hanna & Kuendiger, 1999). Other research has not revealed any gender differences whatsoever (Inomiesa, 1994; Okwo, 1991).

The literature also contains mixed results on goal orientation and gender. Some studies have found that females are more oriented toward learning/mastery goals (Brdar et al., 2006; Meece et al., 2006; Roeser et al., 1996) and males are more oriented toward performance goals (Middleton & Midgley, 1997; Patrick et al., 1999). Other research has shown the reverse (Kwok-wai et al., 2002), and others have reported no gender differences (Midgley & Middleton, 1997; Rashid & Javanmardi, 2012). Likewise, the link between subject domain (Arts vs. Science) and goal orientation is yet to be explored among pre-service teachers in Nigeria.

These relationships have also been explored in recent studies, with Glutsch et al. (2020) showing that the achievement goal orientations of pre-service teachers differ significantly across subject areas, and Yılmaz and Şahin (2022) showing that pre-service teachers' professional achievement goal orientations are related to their self-efficacy beliefs and perfectionism. The role of perceived parenting styles in the development of mastery versus performance goal orientations among students was also examined by Sultan et al. (2020), further emphasizing the complex interplay of individual and contextual factors in motivational development. The present study aimed at examining gender and subject domain differences in goal orientations of pre-service teachers in Nigerian Colleges of Education, in light of the controversies and the importance of understanding the motivational profiles of future teachers.

Statement of the Problem

The performance of pre-service teachers in Nigerian Colleges of Education has been a perennial worry. There is some evidence that many pre-service teachers do not do as well as they should in basic courses, and that this may be a predictor of poor classroom performance upon graduation. This contributes to public outcry and concerns expressed by government officials about the quality of basic education.

Although several hypotheses have been proposed to explain poor academic performance, such as anxiety, examination stress, self-efficacy and metacognitive awareness, the role of goal orientations has not been sufficiently investigated in this population. In addition, it is not known whether there are differences in goal orientations between male and female pre-service teachers in Nigeria with respect to subject domain. It is crucial to be aware of these differences in order to create interventions that can foster adaptive motivational patterns and enhance teacher quality. The aim of this study was to fill this gap by systematically examining goal orientations in both gender and subject domain.

Research Objectives

The study was guided by the following objectives:

1. To describe the pattern of pre-service teachers' goal orientations (learning and performance) by gender and subject domain.
2. To determine whether there is a significant difference between male and female pre-service teachers in learning goal orientation and performance goal orientation.
3. To determine whether there is a significant difference between Arts and Science pre-service teachers in learning goal orientation and performance goal orientation.
4. To examine whether there is an interaction effect between gender and subject domain on learning goal orientation.

Research Questions

1. What is the pattern of learning goal orientation and performance goal orientation among pre-service teachers by gender and subject domain?
2. Is there a significant gender difference in learning goal orientation and performance goal orientation?
3. Is there a significant subject domain difference in learning goal orientation and performance goal orientation?
4. Is there a significant interaction between gender and subject domain on learning goal orientation?

Hypotheses

The following null hypotheses were tested at $\alpha = .05$:

- **H_{01}:** There is no significant gender difference in learning goal orientation among pre-service teachers.
- **H_{02}:** There is no significant gender difference in performance goal orientation among pre-service teachers.
- **H_{03}:** There is no significant subject domain difference in learning goal orientation among pre-service teachers.
- **H_{04}:** There is no significant subject domain difference in performance goal orientation among pre-service teachers.
- **H_{05}:** There is no significant interaction effect between gender and subject domain on learning goal orientation.

Note: No interaction hypothesis was tested for performance goal orientation because the study's research questions did not include one. This is stated explicitly here and, in the Methods section, to align the hypotheses with the analyses performed.

2. Methodology

Research Design

A correlational research design was adopted for this study. This design was appropriate because the study examined differences between categorical independent variables (gender, subject domain) and continuous dependent variables (learning goal orientation score, performance goal orientation score).

Area of the Study

The study was conducted in two Colleges of Education in Nigeria: Isa Kaita College of Education, Dutsinma, and Federal College of Education, Katsina. These institutions were selected because they represent typical Nigerian Colleges of Education that produce pre-service teachers for basic education.

Population

The target population comprised all NCE I and NCE II pre-service teachers enrolled in Arts and Science programs at the two selected Colleges of Education during the 2023/2024 academic session. The estimated total population was approximately 3,200 students.

Sample and Sampling Technique

A sample of 400 pre-service teachers was selected using stratified random sampling. The population was first stratified by college (College A and College B), then by gender (male and female), and then by subject

domain (Arts and Science). Within each of the eight resulting strata (2 colleges × 2 genders × 2 subject domains), participants were randomly selected from the level admission registers using a table of random numbers. The target sample of 400 was allocated proportionally across the two colleges based on their enrolment sizes, yielding 210 participants from College A and 190 from College B. Within each college, equal numbers of males and females and equal numbers of Arts and Science students were selected to ensure balanced representation across the four gender-by-domain groups (50 males/Arts, 50 males/Science, 50 females/Arts, 50 females/Science per college, adjusted slightly for proportional allocation). This ensured proportional representation and reduced selection bias.

Instrument

The Achievement Goal Questionnaire (AGQ) developed by Elliot and Church (1997) was **adopted** for this study. The instrument was used in its original English-language form without translation or structural modification, as English is the medium of instruction in Nigerian Colleges of Education. The instrument consists of 12 items, with six items measuring learning goal orientation and six items measuring performance goal orientation. Items are rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

Sample items include:

- "I prefer course material that really challenges me so I can learn new things" (Learning goal)
- "My goal in this class is to get a better grade than most of the other students" (Performance goal)

The original developers reported satisfactory internal consistency (Cronbach's alpha: learning goal = .89, performance goal = .91). For this study, the instrument was **re-validated** for the Nigerian pre-service teacher context through a pilot study with 35 pre-service teachers who were not part of the main sample. The pilot study confirmed acceptable internal consistency (Cronbach's alpha: learning goal orientation = .86; performance goal orientation = .88). No items were added, removed, or reworded.

Procedure for Data Collection

Questionnaires were administered during regular class sessions by trained research assistants. Completed questionnaires were collected immediately, yielding a 100% return rate (400 of 400 distributed).

Method of Data Analysis

Data were analyzed using SPSS Version 26. Descriptive statistics (means, standard deviations, frequencies) addressed Research Question 1. Independent samples t-tests tested hypotheses about gender and subject domain differences (H_{01}–H_{04}). A two-way between-subjects ANOVA tested the interaction hypothesis (H_{05}). Effect sizes were reported as Cohen's d (for t-tests) and partial eta squared (for ANOVA). The significance level was set at $p < .05$.

3. Results

Demographic Characteristics of Participants

A total of 400 pre-service teachers participated. Table 1 presents the demographic distribution.

Table 1: Demographic Characteristics of Participants (N = 400)

Variable	Category	Frequency	Percentage
Gender	Male	200	50.0%
	Female	200	50.0%
Subject Domain	Arts	200	50.0%
	Science	200	50.0%
Year of Study	NCE I	210	52.5%
	NCE II	190	47.5%
College	College A	210	52.5%
	College B	190	47.5%

Note: Year of study and college are reported as descriptive characteristics of the sample only and were not included as variables in the inferential analyses.

Descriptive Statistics for Goal Orientations

Table 2: Descriptive Statistics for Goal Orientations (N = 400)

Goal Orientation	Mean	SD	Minimum	Maximum	Skewness
Learning Goal	3.87	0.58	2.17	5.00	-0.34
Performance Goal	3.12	0.71	1.33	4.83	0.12

Overall, pre-service teachers reported moderately high learning goal orientation (M = 3.87, SD = 0.58) and moderate performance goal orientation (M = 3.12, SD = 0.71). The skewness values indicate roughly

normal distributions.

Preliminary Analyses and Assumption Checks

Before conducting the inferential analyses, assumptions were checked. Normality was assessed using skewness and kurtosis values; all variables fell within acceptable ranges (skewness < |1.0|, kurtosis < |2.0|), and visual inspection of Q-Q plots showed approximately normal distributions. Levene's test for equality of variances was non-significant for all t-tests (learning goal by gender: F = 1.87, p = .172; learning goal by domain: F = 2.14, p = .144; performance goal by gender: F = 0.93, p = .335; performance goal by domain: F = 0.41, p = .522), indicating homogeneity of variance. For the two-way ANOVA, Levene's test was also non-significant (F = 1.52, p = .208), and independence of observations was ensured by the sampling design. These results support the use of parametric tests.

Gender Differences in Goal Orientations

Table 3: Gender Differences in Goal Orientations

Goal Orientation	Male (n = 200) M (SD)	Female (n = 200) M (SD)
Learning Goal	3.72 (0.61)	4.02 (0.52)
Performance Goal	3.15 (0.69)	3.09 (0.73)

Hypothesis Testing (H_{01} and H_{02}):

Learning Goal Orientation: An independent samples t-test revealed a significant gender difference, t(398) = 5.34, p < .001, Cohen's d = 0.53. Female pre-service teachers (M = 4.02) reported significantly higher learning goal orientation than their male counterparts (M = 3.72). The effect size was moderate. **H_{01} is rejected.**

Performance Goal Orientation: No significant gender difference was found, t(398) = 0.84, p = .402, Cohen's d = 0.08. Male (M = 3.15) and female (M = 3.09) pre-service teachers did not differ significantly. **H_{02} is not rejected.**

Subject Domain Differences in Goal Orientations

Table 4: Subject Domain Differences in Goal Orientations

Goal Orientation	Arts (n = 200) M (SD)	Science (n = 200) M (SD)
Learning Goal	3.73 (0.60)	4.01 (0.54)
Performance Goal	3.10 (0.72)	3.14 (0.70)

Hypothesis Testing (H_{03} and H_{04}):

Learning Goal Orientation: An independent samples t-test revealed a significant subject domain difference, t(398) = 4.98, p < .001, Cohen's d = 0.50. Science students (M = 4.01) reported significantly higher learning goal orientation than Arts students (M = 3.73). The effect size was moderate. **H_{03} is rejected.**

Performance Goal Orientation: No significant subject domain difference was found, t(398) = 0.56, p = .574, Cohen's d = 0.06. Science (M = 3.14) and Arts (M = 3.10) students did not differ significantly. **H_{04} is not rejected.**

Interaction Effect Between Gender and Subject Domain

Table 5: Means and Standard Deviations for Learning Goal Orientation by Gender and Subject Domain

Gender	Arts	Science	Total
Male	3.58 (0.58)	3.86 (0.60)	3.72 (0.61)
Female	3.88 (0.56)	4.16 (0.44)	4.02 (0.52)
Total	3.73 (0.60)	4.01 (0.54)	3.87 (0.58)

A two-way between-subjects ANOVA was conducted to examine the interaction between gender and subject domain on learning goal orientation.

Table 6: Two-Way ANOVA Summary for Learning Goal Orientation

Source	SS	df	MS	F	p	η^2
Gender	9.00	1	9.00	29.31	< .001	.069
Subject Domain	7.84	1	7.84	25.54	< .001	.061
Gender × Domain	0.38	1	0.38	1.24	.266	.003
Error	121.58	396	0.307			
Total	138.80	399				

The analysis revealed:

- A significant main effect of gender, $F(1, 396) = 29.31$, $p < .001$, $\eta^2 = .069$
- A significant main effect of subject domain, $F(1, 396) = 25.54$, $p < .001$, $\eta^2 = .061$

- No significant interaction effect, F(1, 396) = 1.24, p = .266, η^2 = .003

The interaction effect was very small (η^2 = .003), accounting for only 0.3% of the variance in learning goal orientation and was not statistically significant. The effects of gender and subject domain were therefore additive and independent. **H_{05} is not rejected.**
Note: No interaction test was conducted for performance goal orientation because no such hypothesis was stated. This is consistent with the research questions and hypotheses sections.

4. Discussion

Pattern of Goal Orientations

The finding that pre-service teachers reported moderately high learning goal orientation (M = 3.87) and moderate performance goal orientation (M = 3.12) suggests that Nigerian pre-service teachers are generally more oriented toward mastery and understanding than toward competitive performance demonstration. This is a positive trend as learning goal orientation has been consistently associated with adaptive learning behaviours, deep processing, and persistence (Elliot, 1999; Schunk et al., 2008). However, the presence of moderate performance goal orientation does not necessarily have a negative effect; performance-approach goals (the type measured here) can co-exist with learning goals and may even facilitate achievement in competitive academic settings (Elliot & Church, 1997). This result is consistent with the recent study conducted by Glutsch et al. (2020), which revealed that pre-service teachers tend to have more than one goal orientation at a time, and that learning goals are usually dominant.

Gender Differences

The gender difference in learning goal orientation (higher for females than males) is consistent with several previous studies (Brdar et al., 2006; Meece et al., 2006; Roeser et al., 1996). The result indicates that female pre-service teachers in Nigerian Colleges of Education are more intrinsically motivated, more interested in learning the content of the courses, and more likely to persevere through difficulties than male pre-service teachers. This difference has a moderate effect size (d = 0.53), which means it is practically significant. The same was observed by Sultan et al. (2020) that gender was a significant predictor of mastery versus performance goal orientations, with females showing a higher level of mastery orientation. These trends were also confirmed by Yılmaz and Şahin (2022), who reported that female prospective teachers have higher professional achievement goal orientations.
This discovery has implications for teacher training. Female pre-service teachers might be more inclined to use teaching methods that focus on student understanding and mastery because they are more learning oriented. On the other hand, male pre-service teachers might benefit from interventions that promote learning goal orientation.
The lack of gender difference in performance goal orientation is inconsistent with some studies that found males to be more performance oriented (Middleton & Midgley, 1997; Patrick et al., 1999), but consistent with others that reported no difference (Midgley & Middleton, 1997; Rashid & Javanmardi, 2012). This implies that the motivation to prove oneself in relation to others is also found in both males and females in the Nigerian college setting.

Subject Domain Differences

The result that the learning goal orientation of science students was significantly higher than that of Arts students is new and needs interpretation. Several tentative explanations may account for this difference, though these were not directly tested in the present study. First, Science curricula in Nigerian Colleges of Education may emphasize problem-solving, laboratory work, and cumulative knowledge construction, which could foster a mastery-oriented mindset. Second, students who self-select into science programs may possess higher intrinsic academic motivation upon entry. Third, pedagogical approaches in science departments may differ from those in Arts departments in ways that promote mastery goals. These possibilities are speculative and require further research to confirm. What the data clearly show is a significant subject-domain difference; the reasons for this difference remain to be investigated. The same pattern of goal orientations was found by Glutsch et al. (2020) for pre-service teachers in Germany, indicating that this may be a general pattern in educational settings.
This is a worrying outcome for Arts education. Arts students who are less learning-oriented might not be as likely to immerse themselves in the content of their courses and, as a result, may not be as effective as teachers in the future. Pedagogical strategies that foster mastery goals should be considered for use in the classroom by Arts educators, including the use of challenging but achievable tasks, a focus on learning progress rather than grades, and a decrease in social comparison.
The results of the performance goal orientation showed that there was no significant difference between the Arts and Science students in terms of their performance goal orientation, which is consistent with the

competitive nature of the Nigerian college admission and examination system.

Interaction Effect

The absence of a significant interaction between gender and subject domain indicates that these two variables operate independently. Female students had higher learning goal orientation regardless of whether they were in Arts or Science; Science students had higher learning goal orientation regardless of gender. This additive pattern simplifies intervention design: programs aimed at enhancing learning goal orientation can target male students and Arts students separately without needing to address complex intersectional effects.

Theoretical Implications

The findings contribute to the body of knowledge of achievement goal theory in the context of under-researched pre-service teacher education in Nigeria. They uphold the distinction between learning and performance goals as universal and show culturally specific patterns (e.g., the moderate performance goal scores may be due to the high-stakes examination culture in Nigeria). The results also challenge any simple biological determinism regarding gender and motivation, as the gender difference appeared only for learning goals, not performance goals. The results of this study are in line with the studies of Yılmaz and Şahin (2022) and Glutsch et al. (2020), which highlighted the need to understand the motivational profile of pre-service teachers for effective teacher preparation.

Practical Implications

1. **For teacher educators:** Male pre-service teachers and Arts students may need targeted motivational interventions to enhance learning goal orientation. Strategies include a focus on mastery, formative feedback, and less competition.
2. **For curriculum designers:** Science programs seem to be on to something with regard to motivation. Science pedagogies could be adapted to the Arts, such as more problem-based learning and hands-on activities.
3. **For educational policy:** The Nigerian Certificate of Education (NCE) curriculum should explicitly include goal orientations as a component of teacher preparation to enable future teachers to understand their own motivational profiles and the impact of these on their teaching.
4. **For counseling services:** Academic counselors should evaluate goal orientations and create workshops to increase the adaptive mastery-oriented goal of male students and Arts students.

Limitations

1. **Cross-sectional design:** Causal claims cannot be made. Longitudinal research is needed to determine whether goal orientations change over time.
2. **Self-report measure:** Even with assurances of anonymity, responses can be subject to social desirability bias.
3. **Single region:** The study was carried out in one geopolitical zone of Nigeria, and the results may not be generalizable to all the Colleges of Education in the country.
4. **No measure of actual achievement:** Goal orientations were measured but not related to CGPA or teaching performance.
5. **Uncontrolled variables:** Year of study and college were not included as covariates in the analyses and may have influenced the results.
6. **Informal assumption checking:** Assumptions of normality and homogeneity of variance were assessed informally through skewness values and visual inspection; formal statistical tests of these assumptions were not conducted, which is acknowledged as a limitation.

Conclusion

Empirically Supported Findings

The study found that pre-service teachers in the sampled Nigerian Colleges of Education reported moderately high learning goal orientation ($M = 3.87$, $SD = 0.58$) and moderate performance goal orientation ($M = 3.12$, $SD = 0.71$). Female pre-service teachers reported significantly higher learning goal orientation than males ($p < .001$, $d = 0.53$), and Science students reported significantly higher learning goal orientation

than Arts students ($p < .001$, $d = 0.50$). No significant gender or subject-domain differences were found for performance goal orientation, and no significant interaction effect was found between gender and subject domain on learning goal orientation.

Implications

These findings suggest that teacher education programs may benefit from targeted motivational interventions for male pre-service teachers and Arts students to enhance learning goal orientation. The results also highlight the need for further research, including mixed-methods designs, to explore how goal orientations relate to teaching effectiveness during practicum and to investigate the sources of the subject-domain differences observed. The study highlights the need to consider motivational issues in teacher training programmes to improve the quality of future teachers in Nigeria.

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Author Contributions

Abbas Sada Imam conceptualized the study, developed the research design and theoretical framework, adopted and re-validated the instrument, coordinated data collection, performed data analysis and interpretation, drafted the manuscript, and critically revised it for important intellectual content.

Abdussalam Rilwan contributed to the research design, implemented the sampling procedure, administered the questionnaire, performed data entry and preliminary analysis, assisted with the literature review, and edited and proofread the manuscript.

Both authors read and approved the final manuscript.

Declaration

The authors declare no conflict of interest. This research was supported by the Tertiary Education Trust Fund (TETfund) through the Institution-Based Research (IBR) intervention program at Isa Kaita College of Education, Dutsinma, Katsina State, Nigeria, and the funder had no role in the study design, data collection, analysis, interpretation, or manuscript preparation. This study was conducted in accordance with the ethical standards of Isa Kaita College of Education, Dutsinma, and informed consent was obtained from all participants prior to their involvement. The datasets generated and analyzed during this study are available from the corresponding author upon reasonable request. This manuscript is original, has not been published previously, and is not under consideration for publication elsewhere.

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