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Comparative Study on Psychological Characteristics and Academic Achievement of First Year Students across Research, Applied and Comprehensive Universities

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Abstract

The objective of the study was to compare the psychological characteristics and academic achievement of first-year students enrolled in research, applied, and comprehensive universities. In doing so, the study included 436 first-year university students. A quantitative approach through a comparative cross-sectional survey design was applied. Three universities, one from each typology, were selected at random, and participants were selected by means of a multi-stage probability sampling procedure. Multivariate Analysis of Variance (MANOVA) was applied as the method of data analysis. The results demonstrated that a statistically significant difference was found, F (418, 2) = 11.151, p = .000, in academic achievement; F (418, 2) = 3.816, p = .023, in academic self-concept; and F(418, 2) = 5.863, p = .003, in anxiety-free learning. The mean score of the students from the research university outperformed that of the students from the applied university in academic achievement (p = .000), in academic self-concept (p = .024), and in anxiety-free learning (p = .003). On the other hand, a statistically significant difference was found in academic motivation, F (418, 2) = 4.639, p = .010, and in academic social skills, F (418, 2) = 5.731, p = .004. In that, students from the research university showed better academic motivation (p = .008) and academic social skills (p = .002), respectively. Thus, the study results imply that there should be speedy implementation of the differentiation process and the establishment of unique standards for each differentiated university in student placement, teaching-learning processes, and assessment procedures.

1 Introduction

Ethiopia has witnessed a significant increase in educational opportunities (Akalu, 2014; Bishaw & Melesse, 2017). As of 2020, there were 50 public higher education institutions (PHEIs) in the country. The historical and contextual expansion of these universities is ongoing, with some being senior institutions established several decades ago, some two decades ago, and others emerging just one and a half decades ago.

In 2021, the Ethiopian Ministry of Education (MoE) launched an ambitious new initiative to classify higher education institutions into four categories: 8 research, 15 applied, 21 comprehensive/general, and 3 specialized institutions. This classification aims to foster institutional distinctiveness and excellence (MOSHE, 2020). According to Van Vught *et al.* (2018), differentiation is a progressive and transformative step in the global education landscape. It enhances both global and international competitiveness by promoting horizontal (distinct institutional profiles and missions) and vertical (varied levels of study) diversification. Furthermore, differentiation enhances efficiency by encouraging institutions to capitalize on their unique strengths

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and by avoiding unnecessary duplication (Pizarro Milian *et al*., 2016; Weingarten & Deller, 2012).

Research universities are a crucial component of the tertiary education system, as they generate new knowledge, support national innovation systems, and train professionals, specialists, scientists, and researchers required by the economy (World Bank, 2011). Research universities worldwide, including those in the United States and India, have significantly contributed to knowledge creation, innovation, economic growth, human capital development, societal well-being, and overall quality of life (Tripp *et al*., 2018). Atkinson and Blanpied (2008) also argue that U.S. research universities are key hubs of research across all science and engineering disciplines. They stimulate both national and regional economies and serve as models for global communities, including East Asian nations with similar experiences. Accordingly, in pursuit of transforming science into market-driven innovation, the Ethiopian Ministry of Education has designated eight institutions as research universities. These universities are characterized by their seniority, urban settings, experienced academic staff, staff diversity (ranging from technical assistants to full professors), and well-developed infrastructure. However, despite these advantages, little is known about how their institutional status correlates with student typologies, particularly in terms of psychosocial dispositions and academic achievement.

Applied universities aim to develop high-level practical skills and are particularly important in systems that prioritize skilled labor for national development (Tamrat, 2019). The Western educational model values such practice-oriented institutions, particularly in countries like Germany and Switzerland (DAAD, 2019; de Weert *et al*., 2009; Tamrat, 2019). Drawing from global experiences, Ethiopia has identified fifteen PHEIs as applied universities, dedicated to translating academic knowledge into practical solutions in dynamic work environments. For example, it has been recommended that Ethiopian colleges strengthen ties with industrial parks to enhance their science and technology training programs. Salmi *et al*. (2017) noted that industrial parks provide practical opportunities for 63% of undergraduate students enrolled in public engineering and technology programs to integrate theory with practice. Compared to research institutions, applied universities differ in age, scope, staff composition, location, and student intake. Tamrat (2022) further explains that applied universities are tasked with delivering professional, practice-oriented teaching, forming strong industry connections, and engaging in collaborative applied research. Typically, they have a history of around fifteen years, offer fewer programs than research institutions, are located further from urban centers, and have less diverse staff, with a greater proportion of graduate assistants and fewer advanced degree holders. Additionally, they tend to have less developed infrastructure and fewer essential facilities, such as laboratories and workshops. Despite these differences, there is still a lack of understanding regarding the psychosocial dispositions and academic achievement of students in applied universities compared to those in research and comprehensive institutions.

The third category comprises comprehensive or general universities. These institutions generally offer broad-based programs with limited specialization (Mokiy, 2019) and focus on training graduates for direct service delivery in the labor market. The former MoSHE classified twenty-one universities under this category, emphasizing multidisciplinary undergraduate teaching (which accounts for 80% of enrollment) and mandating that at least 3% of their budget be allocated to research (Tamrat, 2022b). Comprehensive institutions differ from research and applied universities in terms of their historical development, location, staff makeup, infrastructure, and student capacity. Most were established during the recent expansion of higher education into rural areas. These institutions often enroll fewer students than research and applied universities and have less diverse staff. Nevertheless, they may feature sizable infrastructure and skilled personnel. Their development has accelerated urbanization and significantly improved the lives of residents in their respective regions. Still, little is known about the psychosocial typologies of students attending these institutions or how their academic performance compares to students at research and applied universities.

Although the concept of differentiation in Ethiopian higher education was introduced with strong theoretical justifications, there is a notable lack of empirical evidence on how students' generic psychosocial dispositions and academic performance differ within this classification. Obtaining such data from Africa—especially Ethiopia—is particularly challenging. This study is the first of its kind and aims to encourage further research on student profiling in higher education to improve academic outcomes. Specifically, this study seeks to identify whether differences exist among students enrolled in research, applied, and comprehensive universities in terms of generic psychosocial dispositions—including academic self-concept, motivation, academic practices, academic social skills, and anxiety-free learning—and academic achievement.

In Ethiopia, there is a scarcity of data and literature illustrating the extent and nature of students' distribution across research, applied, and comprehensive universities in terms of their academic performance and psychosocial traits. Some studies suggest that first-year students in Ethiopia face academic challenges. For instance, Yimer *et al*. (2022) observed that despite a sharp rise in enrollment, graduation rates at Ethiopian universities have remained stagnant. Evidence from Jimma and Hawassa universities shows that female students drop out at higher rates than their male counterparts (Bekele *et al*., 2007; Semela, 2007). At Arba Minch University, one study found that 38% of students were highly prone to attrition, with another 9% being moderately vulnerable (Fassil *et al*., 2018). In this context, Tamrat (2022) argues that the high attrition rate at Ethiopia's public universities signifies a substantial loss, undermining the nation's goal of expanding higher education through improved student success and retention.

Several factors contribute to student attrition in Ethiopia. A study at Gonder University cited inadequate facilities, difficulties adapting to campus life, and a lack of professional support services as reasons for student dropout (Sewasew, 2014). Similarly, Ali (2019), reporting from Haramaya University, identified poor assessment practices, unclear grading, challenging curricula, and peer influence from senior students as contributing factors. Additionally, affective, behavioral, and cognitive factors—such as anxiety and low self-esteem—can significantly hinder academic success. Kinde (2011) found that university students at Jimma University were especially vulnerable to academic struggles due to these issues.

While previous research has acknowledged academic shortcomings and their causes, the present study stands out in its scope and depth. Earlier findings have not adequately addressed the extent to which psychosocial variables—including academic self-concept, motivation, anxiety, and academic practice, and social skills— impact student success. Therefore, the present study incorporates these five psychosocial dimensions to comprehensively assess students' affective, behavioral, and cognitive characteristics alongside academic achievement.

2 Methods and Materials

2.1 Research Design

The study employed a quantitative methodology using a comparative cross-sectional survey design. This design was selected to facilitate the comparison of key variables at a single point in time across the three different types of public higher education institutions: research, applied, and comprehensive universities.

2.2 Population of the Study

The population of the study consisted of regular first-year students enrolled in 2023 across three universities in Ethiopia, each representing one of the differentiated types: research, applied, and comprehensive. The total population was approximately 7,264 students, distributed as follows: 2,672 students from a research university, 2,573 students from an applied university, and 2,019 students from a comprehensive university. The detailed population breakdown is presented in Table 1.

Table 1: Population Frame

Applied University						Research University						Comprehensive University					
Natural science			Social sciences			Natural science			Social sciences			Natural sciences			Social sciences		
M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
1284	424	1710	601	262	863	1,336	625	1,961	504	207	711	810	240	1,050	720	249	969
Grand Total: 2,573						Grand Total =2,672						Grand Total = 2,019					

2.3 Sample and Sampling Techniques

The total sample size was n = 436. A multistage probability sampling technique was employed to ensure both randomness and proportional representation across the study population.

Initially, students were stratified based on the type of university (applied, research, and comprehensive) and their academic streams. The number of participants from each university and stream was determined proportionally. Subsequently, simple random sampling was used within each stratum to select participants who would provide the necessary data.

The sample size was calculated using the Krejcie and Morgan (1970) formula, assuming a 95% confidence level and a maximum allowable error (e) of 5%. The formula used is:

$n = \frac{N}{1+N(e)^2}$ Equation 1. Formula to estimate sample size from the given population size

Where, n = the desired sample size, N = total population, and e = the maximum discrepancy (.05).

Therefore, $n = \frac{7264}{1+7264(0.05)^2}$ = 379.

Considering response rate 15% of the sample size (n = 379*.15 = 57). Hence, the sample size accounts for 379 + 57 = 436. Having this into account samples will be drawn proportionally from each university where

$\frac{n}{N} = \frac{436}{7264}$ = 0.060 Equation 2. Formula to estimate proportional sample size from each stratum

In this regard, applied university has = 155 students, research university has= 160 students, and comprehensive university has = 121 students. The following Table 2 displays the sample frame.

Table 2: Sample Frame

Applied university						Research University						Comprehensive University					
Natural science			Social sciences			Natural science			Social sciences			Natural sciences			Social sciences		
M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
77	26	103	36	16	52	80	38	118	30	12	42	49	14	63	43	15	58
Grand Total: 155						Grand Total = 160						Grand Total = 121					

2.4 Data Collection Instruments

The data collection instruments were selected based on the nature of the variables examined in this study. A questionnaire was used to gather information on demographic and predictive characteristics, including academic self-concept, motivation, anxiety, academic practice, and social skills. In addition, record analysis was used to collect students' cumulative grade point averages (CGPA) from their first and second semesters.

2.4.1 Questionnaire

2.4.1.1 Academic Self-Concept

Academic self-concept refers to first-year university students' perception of their academic strengths and weaknesses. The instrument was adapted from Yorke (2013) and consists of 18 items rated on a five-point Likert scale ranging from "strongly agree (5)" to "strongly disagree (1)". Its validity and reliability have been widely confirmed. For example, Liu *et al*. (2005) reported a reliability coefficient

of 0.82, Liu and Wang (2008) found 0.83, and Liu (2009) reported 0.89.

2.4.1.2 Academic Anxiety

Academic anxiety is defined as the psychological distress experienced by first-year university students due to personality traits or academic tasks such as math, writing, or testing. The instrument was adapted from Pizzie and Kraemer (2019) and includes 40 items divided into four sub-scales: trait anxiety, math anxiety, writing anxiety, and test anxiety, with 10 items per sub-scale. Participants rated each item on a five-point scale from "always true for me (5)" to "not true at all for me (1)". The instrument has demonstrated strong validity and a high internal consistency, with sub-scale reliabilities exceeding 0.90.

2.4.1.3 Academic Motivation

Academic motivation refers to the internal drive that propels first-year university students to strive for academic success. The instrument was adapted from Silva *et al*. (2018) and includes 28 items, rated on a five-point scale from "always true for me (5)" to "not true at all for me (1)". The instrument has good content validity and high internal consistency. Ratelle *et al*. (2004) reported a Cronbach's alpha of > 0.80 among Canadian students, while Silva *et al*. (2018) reported 0.83 among Portuguese students.

2.4.1.4 Academic Skills Practice

Academic skills practice refers to students' ongoing participation in academic activities and development of study habits. The instrument was adapted from AlFaris *et al*. (2018) and Gresham (1988) and consists of 35 items divided into two sub-scales: academic skills (13 items) and study skills (22 items). It uses a five-point rating scale from "always true for me (5)" to "not true at all for me (1)". The instrument demonstrated acceptable reliability, with a total scale Cronbach's alpha of 0.84, and sub-scale alphas ranging from 0.65 to 0.76.

2.4.1.5 Academic Social Skills

Academic social skills refer to the interpersonal abilities that first-year students use to enhance academic performance, such as social initiation, cooperation, and peer reinforcement. The instrument was adapted from Clark *et al*. (1985) and is known as the Teacher Rating of Social Skills – Children (TROSS-C). It contains 37 items across three subscales: peer initiation (12 items), cooperation (17 items), and peer reinforcement (6 items). Participants responded on a five-point scale ranging from "frequently (5)" to "never (1)". The internal consistency reliability of the instrument is high, with a Cronbach's alpha of 0.96 (Clark *et al*., 1985).

2.4.2 Record Analysis

Record analysis involved reviewing actual academic records of the participants. Specifically, data on the cumulative grade point average (CGPA) for both the first and second semesters of first-year university students were obtained from official university records.

2.5 Pilot Study

A pilot test was conducted using 25% of the total sample size, with participants selected without replacement. The goal was to test the appropriateness and clarity of the instruments before full-scale data collection.

2.5.1 Validity of the Instruments

Validity refers to how well an instrument measures the intended construct. In this study, expert judgment was used to evaluate the content validity of the instruments. Faculty members from the Department of Psychology reviewed the instruments for relevance, adequacy, clarity, and appropriateness for the socio-cultural context of the participants. Feedback led to modifications where necessary.

In addition, language experts from both the English and Amharic departments evaluated the linguistic accuracy of the items. For instruments originally developed in English and translated into Amharic, back-translation procedures were employed to ensure semantic equivalence. Both language versions were administered to the participants as appropriate. The data collection was conducted by trained professionals, and responses were carefully monitored and documented.

2.5.2 Reliability of the Instruments

The reliability of each instrument was assessed using the pilot study data, analyzed with SPSS Version 20. The final Cronbach's alpha coefficients for each instrument—used during the actual data collection—are presented in Table 3.

Table 3: Reliability Statistics of the Variable

Variables	Items in the original scale	Cronbach Alpha	Items removed	Items accepted	Cronbach Alpha
Self-concept	18	.630	5	13	.670
Motivation	28	.647	18	10	.745
Anxiety	40	.808	21	19	.811
Practice	35	.834	12	23	.859
Social skills	35	.776	18	19	.877

2.6 Methods of Data Analysis

2.6.1 Descriptive Statistics

Descriptive statistics, including measures of central tendency (mean) and dispersion (standard deviation), were used to summarize the variables: academic self-concept, motivation, anxiety, practice, social skills, and academic achievement. These values provided a basis for subsequent inferential statistical analyses.

2.6.2 Multivariate Analysis of Variance (MANOVA)

A Multivariate Analysis of Variance (MANOVA) was employed to examine differences in academic self-concept, anxiety, motivation, academic practice, social skills, and academic achievement among students from three types of universities: research, applied, and comprehensive. University type was treated as a categorical variable, while the other variables were continuous. All assumptions necessary for conducting MANOVA were satisfied.

2.7 Procedures

2.7.1 Data Gathering

Participants were given clear instructions on how to complete the questionnaires, and assurances were provided regarding the confidentiality of their responses. Participants were strongly encouraged to complete the surveys independently, answer honestly, and seek clarification when needed.

2.7.2 Data Analysis

Data preparation began with organizing and entering the data into SPSS software. Incomplete responses were removed during the data cleaning phase. Reverse-coded (negatively worded) items were recoded into positive items to standardize interpretation. All five continuous variables were then scaled for compatibility with students' CGPA (maximum of 4.00). Outliers were identified and removed using box plots as part of the data normalization process. Finally, analyses were conducted in the following order: frequency distribution, descriptive statistics, correlation analysis, and inferential statistics.

2.7.3 Ethical Approval

Ethical clearance was granted by the Research Ethics Committee of the Institute of Educational and Behavioral Sciences. Informed consent was obtained from all participants. To protect confidentiality, the names of the universities were anonymized and referred to as Research University, Applied University, and Comprehensive University.

3 Results

Following data entry, several steps were undertaken to ensure data quality. First, incomplete responses were removed—five from Applied University and three from Research University. Then, reverse-coded items were transformed into positive statements to facilitate accurate interpretation. Outliers were identified and excluded using box plots. Specifically, seven cases with scores below the 25th

percentile were removed (two from Applied University, two from Research University, and three from Comprehensive University). These steps helped ensure data integrity and that statistical assumptions were met. The final response rate was 96.56%, which is considered adequate based on benchmarks such as the 80% minimum threshold recommended by Fincham (2008).

3.1 Demographics

Demographic variables, such as age and place of residence (urban vs. rural), were included to assess their influence on academic achievement. Age differences were examined to determine whether they contributed to variations in academic performance. Likewise, students' residential backgrounds were considered to evaluate whether disparities in academic achievement were associated with their living environments. These demographic factors were essential in analyzing the extent of their impact on student outcomes.

Table 4: Demographic Characteristics

Variable	Category	N	%
Gender	Male	300	71.3
	Female	120	28.5
	Common	1	.2
	Total	421	100
Age	Early adulthood (18-25)	415	98.6
	Middle adulthood (26-32)	6	1.4
	Total	421	100
University	Applied	148	35.2
	Research	155	36.8
	Comprehensive	118	28.0
	Total	421	100
Home area	Urban	237	56.3
	Rural	184	43.7
	Total	421	100
Religion	Orthodox	186	44.2
	Protestant	152	36.1
	Catholic	4	.1
	Muslim	55	13.1
	Wakefeta	2	.5
	Neutral	20	4.8
	Other	2	.2
	Total	421	100
Stream	Natural science	271	64.4
	Social science	150	35.6
	Total	421	100

3.2 Demographic Characteristics of the Participants

Table 4 presents the demographic information of the participants. The total number of participants was 300. In terms of gender, male students comprised 71.3% of the sample, indicating a significant gender imbalance. This suggests a need for greater institutional support and targeted interventions to encourage female participation and promote gender equity in higher education. With regard to age, 415 participants (98.5%) were categorized as young adults, aligning with the expected age range of university students who are typically in their developmental phase toward academic and professional maturity.

In terms of religious affiliation, most students, 186 (44.20%), identified as Orthodox Christians. A very small proportion (0.20%) reported belonging to other religious groups, suggesting a relatively homogeneous religious composition.

Regarding university type, 155 participants (36.6%) were enrolled at the Research University, followed by students at the Applied and Comprehensive Universities. This may be attributed to the more established infrastructure and higher intake capacity of the Research University.

Examining place of residence, 237 participants

(56.3%) reported coming from urban areas, indicating that students from rural backgrounds continue to face barriers in accessing higher education. This highlights the importance of implementing special programs and policy initiatives aimed at improving access and retention of students from rural communities.

Finally, concerning academic streams, 150 participants (35.60%) were enrolled in social science disciplines, while 271 participants (64.40%) were from natural sciences. This distribution reflects a broader trend in response to the growing demand for scientific and technological expertise in today's rapidly evolving world.

3.3 Descriptive Statistics for the Variables

The study included six key variables. Academic achievement was the dependent variable, while academic self-concept, academic practice, academic motivation, academic anxiety, and academic social skills served as the independent variables. Descriptive statistics were computed using the transformed dataset to summarize the central tendencies and dispersions of these variables. The results are presented in Table 5 below.

Table 5: Descriptive Statistics

Variable	N	Range	Minimum	Maximum	Mean	Std. Deviation
Academic achievement	421	2.50	1.50	4.00	2.96	.611
Academic self-concept	421	1.97	2.03	4.00	3.42	.442
Academic skills practice	421	2.02	1.98	4.00	3.34	.437
Academic motivation	421	1.92	2.08	4.00	3.56	.423
Academic anxiety	421	1.93	1.89	3.82	3.06	.469
Academic social skills	421	2.14	1.81	3.95	3.32	.449

3.4 Descriptive Statistics for the Key Study Variables

Table 5 presents the descriptive statistics for the primary study variables, based on data from 421 participants. Among the variables, academic motivation recorded the highest mean score (M = 3.56), whereas academic achievement had the lowest mean score (M = 2.96). This indicates that, on average, participants demonstrated higher levels of motivation compared to other measured attributes.

Measures of dispersion—including range and standard deviation—were also calculated to assess variability within the data. Academic achievement exhibited the widest range and the largest standard deviation, suggesting a greater variability in student performance. In contrast, academic motivation showed the narrowest range and the smallest standard deviation, implying that students' motivational levels were relatively consistent across the sample.

These findings highlight that while motivation levels were generally high and uniform among participants, academic achievement varied substantially, suggesting that other factors may influence student performance beyond motivation alone.

3.5 Correlations among the Variables

The study examined the relationships among six key variables: academic achievement, academic self-concept, academic skills practice, academic motivation, academic anxiety, and academic social skills. Pearson product-moment correlation coefficients were computed to determine the strength and direction of the relationships between each pair of variables. The results are summarized in Table 6 below.

Table 6 shows the correlation coefficient between the studied variables. Academic achievement and academic anxiety were shown to have a strong positive relationship (r = .69), as were academic

self-concept and academic anxiety (r = .70), academic self-concept and academic skills practice (r = .68), academic skills practice and academic anxiety (r = .67), and academic self-concept and academic achievement (r = .64). The remaining data showed that there was a moderately positive association between them all.

Table 6: Correlation among the study variables

Variables	1	2	3	4	5	6
Academic achievement	-					
Academic self-concept	.64**	-				
Academic skills practice	.53**	.68**	-			
Academic motivation	.40**	.53**	.56**	-		
Academic anxiety	.70**	.69**	.67**	.48**	-	
Academic social skills	.50**	.52**	.56**	.60**	.56**	-

**p< .01

3.6 Academic Achievement and Psychosocial Dispositions among Differentiated Universities

This section outlines the impact of three differentiated universities as an independent variable on the academic performance, academic self-concept, academic practice, academic motivation, academic anxiety, and academic social skills of the students. Multivariate Analysis of Variance (MANOVA) was applied to examine the impact of three categorical variables on six continuous variables.

A. Levene's Test of Equality of Error Variances

The Levene's Test of Equality of Error Variances is one of the assumptions of the MANOVA test. It refers to the population variances (i.e., the distribution, or "spread," of scores around the mean) of two or more groups being considered equal. According to a non-significant Levene's Test of Equality of Error Variances result, the variance across the groups is approximately equal, and the homogeneity of variance assumption is met.

As in Table 7, the Levene's Test of Equality of Error Variances reveals that F (418) = 1.46, p =.234 for academic self-concept, F (418) =.92, p =.400 for academic skills practice, F (418) = 2.90, p =.056 for academic motivation, F (418) =.31, p =.734, for academic anxiety, F (418) = 1.30, p =.274 for academic social skills and F (418) = 2.42, p = .091 for academic achievement. All of the non-significant findings demonstrate that the groups are comparable and that MANOVA is sound for data analysis.

Table 7: Levene's Test of Equality of Error Variances

Variables	F	df1	df2	Sig.
Academic self-concept	1.46	2	418	.234
Academic skills practice	.92	2	418	.400
Academic motivation	2.90	2	418	.056
Academic anxiety	.31	2	418	.734
Academic social skills	1.30	2	418	.274
Academic achievement	2.42	2	418	.091

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + University

B. Descriptive statistics

The means, standard deviations, and standard errors of the means for each of the six variables were particularly highlighted by the descriptive statistics of the three universities. In the section that follows, the results are presented.

Table 8: Descriptive Statistics

		N	Mean	SD	SE	95% CI. for Mean	
						Lower Bound	Upper Bound
Self-concept	Applied University	148	3.36	.451	.037	3.29	3.43
	Research University	155	3.49	.406	.033	3.42	3.56
	Comprehensive University	118	3.39	.464	.043	3.30	3.47
	Total	421	3.42	.442	.022	3.37	3.46
Practice	Applied University	148	3.32	.436	.036	3.25	3.39
	Research University	155	3.41	.417	.033	3.34	3.47
	Comprehensive University	118	3.29	.456	.042	3.21	3.37
	Total	421	3.34	.437	.021	3.30	3.39
Motivation	Applied University	148	3.57	.427	.035	3.50	3.64
	Research University	155	3.62	.397	.032	3.55	3.68
	Comprehensive University	118	3.46	.437	.040	3.38	3.54
	Total	421	3.56	.423	.022	3.51	3.60
Anxiety	Applied University	148	2.96	.461	.038	2.89	3.04
	Research University	155	3.15	.461	.037	3.07	3.22
	Comprehensive University	118	3.05	.471	.043	2.97	3.14
	Total	421*	3.06	.469	.023	3.01	3.10
Social skills	Applied University	148	3.31	.449	.037	3.24	3.38
	Research University	155	3.40	.414	.033	3.34	3.47
	Comprehensive University	118	3.22	.473	.044	3.14	3.31
	Total	421	3.32	.449	.023	3.28	3.36
CGPA	Applied University	148	2.78	.553	.045	2.69	2.87
	Research University	155	3.10	.622	.050	2.10	3.19
	Comprehensive University	118	3.02	.616	.057	2.90	3.13
	Total	421	2.96	.611	.030	2.90	3.02

Table 8 above gives the descriptive statistics for the six variables. In comparison to the other students at the two universities, Research University students scored higher on tests of academic self-concept (mean = 3.49), academic practice (3.41), academic motivation (3.62), anxiety-free learning (3.15), academic social skills (3.40), and academic achievement (3.10). Applied University students were determined to be the second best of the three universities in terms of academic motivation and academic social skills. The same study also revealed that Comprehensive University students ranked second in terms of academic achievement, anxiety-free learning, and academic self-concept.

C. Multivariate Tests

The multivariate analysis here indicates whether there is a significant group difference across the six groups of dependent variables concurrently. Taking this into account, the result of the current study is depicted in Table 9 below.

Table 9 shows significant multivariate test results. Pillai's Trace is used to report the result because it is a robust and powerful test statistic for unequal group sizes. In this regard, Pillai's Trace = 0.101,

F(2, 418) = 3.68, p = .000, partial η^2 = .051. This indicates that university variation has a statistically significant combined effect on the students' academic-related self-concept, skills practice, motivation, social skills, anxiety, and achievement.

Table 9: Multivariate Tests

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial η^2
Intercept	Pillai's Trace	.989	6440.163	6.000	413.000	.000	.989
	Wilks' Lambda	.011	6440.163	6.000	413.000	.000	.989
	Hotelling's Trace	93.562	6440.163	6.000	413.000	.000	.989
	Roy's Largest Root	93.562	6440.163	6.000	413.000	.000	.989
University	Pillai's Trace	.101	3.68	12.000	828.000	.000	.051
	Wilks' Lambda	.901	3.69	12.000	826.000	.000	.051
	Hotelling's Trace	.108	3.70	12.000	824.000	.000	.051
	Roy's Largest Root	.078	5.35	6.000	414.000	.000	.072

a. Design: Intercept + University

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

D. Tests of Between-Subjects Effects

Tests of Between-Subjects Effects demonstrate the impact of the independent variable on each of the dependent variables. In this study, the impact of university variation on students' academic-related self-concept, skills practice, motivation, anxiety, social skills, and achievement is examined. Table 10 below summarizes the result.

Table 10 below shows that university variation has a statistically significant effect, except on academic skills practice. Significant effects were found on academic self-concept, F(2, 418) = 3.82, p = .023, Partial η^2 = .018; motivation, F(2, 418) = 4.64, p = .010, Partial η^2 = .022; anxiety, F(2, 418) = 5.86, p = .003, Partial η^2 = .027; social skills, F(2, 418) = 5.73, p = .004, Partial η^2 = .027; and achievement, F(2, 418) = 11.15, p = .000, Partial η^2 = .051.

E. Multiple Comparisons

Bonferroni correction as post hoc analysis was applied to determine in which pairs of universities statistically significant differences were found. Table 11 summarizes the results.

Table 11 below displays a statistically significant difference between Research University students and Applied University students in academic self-concept, anxiety-free learning, and academic achievement. In all three variables, students from Research University were found to be better than students from Applied University: p = .027 for self-concept, p = .002 for anxiety-free learning, and p = .000 for academic achievement. On the other hand, a statistically significant difference was found between Research University students and students from Comprehensive University in academic motivation, p = .008, and academic social skills, p = .002, where students from Research University demonstrated better academic motivation and social skills than students from Comprehensive University.

Table 10: Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Sq.	df	Mean Sq.	F	Sig.	Partial η^2
Corrected Model	Self-Concept	1.469[a]	2	.735	3.82	.023	.018
	Skills practice	1.012[b]	2	.506	2.68	.070	.013
	Motivation	1.629[c]	2	.814	4.64	.010	.022
	Anxiety	2.520[d]	2	1.260	5.86	.003	.027
	Social skills	2.255[e]	2	1.127	5.73	.004	.027
	Achievement	7.940[f]	2	3.970	11.15	.000	.051
Intercept	Self-Concept	4831.847	1	4831.847	25095.78	.000	.984
	Skills practice	4629.735	1	4629.735	24485.47	.000	.983
	Motivation	5224.068	1	5224.068	29754.48	.000	.986
	Anxiety	3871.654	1	3871.654	18013.42	.000	.977
	Social skills	4553.380	1	4553.380	23145.22	.000	.982
	Achievement	3648.804	1	3648.804	10249.53	.000	.961
University	Self-Concept	1.469	2	.735	3.82	.023	.018
	Skills practice	1.012	2	.506	2.68	.070	.013
	Motivation	1.629	2	.814	4.64	.010	.022
	Anxiety	2.520	2	1.260	5.86	.003	.027
	Social skills	2.255	2	1.127	5.73	.004	.027
	Achievement	7.940	2	3.970	11.15	.000	.051
Error	Self-Concept	80.480	418	.193			
	Skills practice	79.036	418	.189			
	Motivation	73.389	418	.176			
	Anxiety	89.841	418	.215			
	Social skills	82.234	418	.197			
	Achievement	148.807	418	.356			
Total	Self-Concept	4991.965	421				
	Skills practice	4788.809	421				
	Motivation	5395.520	421				
	Anxiety	4023.686	421				
	Social skills	4725.184	421				
	Achievement	3853.910	421				
Corrected Total	Self-Concept	81.950	420				
	Skills practice	80.048	420				
	Motivation	75.018	420				
	Anxiety	92.362	420				
	Social skills	84.488	420				
	Achievement	156.746	420				

a. R Squared = .018 (Adjusted R Squared = .013)

b. R Squared = .013 (Adjusted R Squared = .008)

c. R Squared = .022 (Adjusted R Squared = .017)

d. R Squared = .027 (Adjusted R Squared = .023)

e. R Squared = .027 (Adjusted R Squared = .022)

f. R Squared = .051 (Adjusted R Squared = .046)

Table 11: Multiple Comparisons

Dependent Variable	(I) University	(J) University	Mean Diff. (I-J)	SE	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Academic Self-Concept	Comprehensive	Applied	.0268	.05415	1.000	-.1034	.1570
		Research	-.1056	.05361	.149	-.2344	.0233
	Applied	Comprehensive	-.0268	.05415	1.000	-.1570	.1034
		Research	-.1324*	.05043	.027	-.2536	-.0112
	Research	Comprehensive	.1056	.05361	.149	-.0233	.2344
		Applied	.1324*	.05043	.027	.0112	.2536
Academic Skills Practice	Comprehensive	Applied	-.0308	.05367	1.000	-.1598	.0982
		Research	-.1156	.05312	.090	-.2433	.0121
	Applied	Comprehensive	.0308	.05367	1.000	-.0982	.1598
		Research	-.0848	.04997	.271	-.2050	.0353
	Research	Comprehensive	.1156	.05312	.090	-.0121	.2433
		Applied	.0848	.04997	.271	-.0353	.2050
Academic Motivation	Comprehensive	Applied	-.1055	.05171	.126	-.2298	.0188
		Research	-.1545*	.05119	.008	-.2775	-.0314
	Applied	Comprehensive	.1055	.05171	.126	-.0188	.2298
		Research	-.0490	.04816	.929	-.1647	.0668
	Research	Comprehensive	.1545*	.05119	.008	.0314	.2775
		Applied	.0490	.04816	.929	-.0668	.1647
Academic Anxiety	Comprehensive	Applied	.0876	.05722	.379	-.0499	.2252
		Research	-.0947	.05664	.286	-.2309	.0414
	Applied	Comprehensive	-.0876	.05722	.379	-.2252	.0499
		Research	-.1824*	.05328	.002	-.3104	-.0543
	Research	Comprehensive	.0947	.05664	.286	-.0414	.2309
		Applied	.1824*	.05328	.002	.0543	.3104
Academic Social Skills	Comprehensive	Applied	-.0891	.05474	.313	-.2207	.0425
		Research	-.1826*	.05419	.002	-.3129	-.0524
	Applied	Comprehensive	.0891	.05474	.313	-.0425	.2207
		Research	-.0935	.05098	.202	-.2161	.0290
	Research	Comprehensive	.1826*	.05419	.002	.0524	.3129
		Applied	.0935	.05098	.202	-.0290	.2161
Academic Achievement	Comprehensive	Applied	.2347*	.07364	.005	.0577	.4116
		Research	-.0796	.07290	.827	-.2548	.0956
	Applied	Comprehensive	-.2347*	.07364	.005	-.4116	-.0577
		Research	-.3142*	.06857	.000	-.4791	-.1494
	Research	Comprehensive	.0796	.07290	.827	-.0956	.2548
		Applied	.3142*	.06857	.000	.1494	.4791

Based on observed means.

The error term is Mean Square (Error) = .356.

* The mean difference is significant at the .05 level.

4 Conclusions and Recommendations

4.1 Conclusions

The study revealed a significant difference in academic achievement results across students attending different types of universities. Specifically, students at Research University outperformed their counterparts at Applied and Comprehensive Universities. This trend was also observed in various psychological characteristics related to academic success, such as self-concept, anxiety-free learning, motivation, and social skills. Participants from Research University displayed higher levels of academic self-concept, engaged in stress-free learning, demonstrated greater motivation, and exhibited stronger social skills compared to students at Applied and Comprehensive Universities. These findings suggest that attending a research university might have a positive impact on students' psychological characteristics, which serve as driving forces for academic performance. The study's contribution to the scientific community lies in its unique findings, which shed light on the variation in academic achievement results and psychological characteristics among students at different types of institutions. The authors encountered a notable gap in existing literature, which prompted them to explore and confirm these variations across the three types of universities.

The differences in students' psychological characteristics and academic achievement results across the three tertiary institutions can be attributed to various factors. One possible reason for this variation is the issue of placement. It is widely known that high-performing students choose institutions that offer better infrastructure, are centrally located, and are led by experienced teachers. Another significant factor is the advantage of location. Most research universities in Ethiopia are situated in urban areas, and students with higher grades tend to prefer these institutions.

That said, the study provides a basis for demonstrating the current state of students' academic-prone psychological characteristics and academic performance across research, applied, and comprehensive institutions; nonetheless, more in-depth investigation or analysis is required by other scholars. Because of the topic's novelty, one of the main gaps was the lack of prior research that might offer comparisons and analysis.

4.2 Recommendations

Based on the conclusions made from the findings, the following major recommendations are forwarded:

1. Apply meticulous, authentic, and holistic assessments to place students in higher institutions based on the students' academic performance, extracurricular activities, individual strengths (unique talent, interest, and aptitude), personal essays, and recommendations.

2. Ensure fair access to facilities and resources for all differentiated universities based on the unique characteristics of the students placed and the training programs in the applied and comprehensive higher institutions.

3. Enhance the academic self-concepts, motivation, practice, and social skills of students placed in applied and comprehensive universities. This requires organizing and administering a supportive and engaging learning environment, focusing on efforts and growth, fostering a sense of belongingness and self-efficacy, leveraging technology, designing an interactive learning environment, and addressing individual students' needs through tutoring and individualized instructions.

4. Organize student support mechanisms for students placed in applied and comprehensive universities on effective time management, developing study habits, and self-care practices to help students manage academic anxieties.

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Conflict of Interests

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References

AlFaris, E., Irfan, F., AlSayyari, S., AlDahlawi, W., Almuhaideb, S., Almehaidib, A., Almoqati, S., Ahmed, A. M. A., Ponnamperuma, G., Al-Mughthim, M., Ahamed, S. S., Maflehi, N. Al, & van der Vleuten, C. (2018). Validation of a new study skills scale to provide an explanation for depressive symptoms among medical students. *PLoS ONE*, 13(6), 1–12. https://doi.org/10.1371/journal.pone.0199037

Ali, W. (2019). Assessment on Factors Causing Female Students Attrition at Haramaya University, Ethiopia. *Scientific Research Journal*, 07(11), 1–7. https://doi.org/10.31364/scirj/v7.i11.2019.p1119719

Bekele, A., Melesse, K., MIKRE, F., Chibssa, G., & Nemeta, M. (2007). Retrospective Analysis of Academic status of Female students in Jimma University Main Campus : from 1993 to. *Ethiopian Journal of Education and Sciences*, 3(1), 23–43.

Clark, L., Gresham, F. M., & Elliott, S. N. (1985). Development and validation of a social skills assessment measure: The trossc. *Journal of Psychoeducational Assessment*, 3(4), 347–356. https://doi.org/10.1177/073428298500300407

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334. https://doi.org/10.1007/BF02310555

Fincham, J.E. (2008). Response rates and responsiveness for surveys, standards, and the Journal. *American Journal of Pharmaceutical Education*, 72(2):43. doi:10.5688/aj720243.

Gresham, F. M. (1988). Social skills: Conceptual and applied aspects of assessment, training, and social validation. *Handbook of Behavior Therapy in Education.*, 523–546. http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=1988-98041-020&site=ehost-live

Kinde, A. A. (2011). Student related determinants of the first semester academic status: the case of 2006/7 first year students at some selected faculties of Jimma university. *Ethiopian Journal of Education and Sciences*.

Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, 30(3), 607–610. https://doi.org/10.1177/001316447003000308

Liu, H. (2009). Exploring Changes in Academic Self-Concept in Ability-Grouped English Classes. *Social Sciences*, 2 (October), 411–432.

Liu, W. C., Wang, C. K. J., & Parkins, E. J. (2005). A longitudinal study of students' academic self-concept in a streamed setting: The Singapore context. *British Journal of Educational Psychology*, 75(4), 567–586. https://doi.org/10.1348/000709905X42239

Mokiy, V. (2019). Training generalists in higher education: Its theoretical basis and prospects. *Informing Science*, 22 (September), 55–72. https://doi.org/10.28945/4431

Pizzie, R. G., & Kraemer, D. J. M. (2019). The Academic Anxiety Inventory: Evidence for dissociable patterns of anxiety related to math and other sources of academic stress. *Frontiers in Psychology*, 9(JAN), 1–20. https://doi.org/10.3389/fpsyg.2018.02684

Ratelle, C. F., Guay, F., Larose, S., & Senécal, C. (2004). Family correlates of trajectories of academic motivation during a school transition: A semiparametric group-based approach. *Journal of Educational Psychology*, 96(4), 743–754. https://doi.org/10.1037/0022-0663.96.4.743

Sekaran, U., & Bougie, R. (2016). Research Methods for Business: A Skill-Building Approach. In *Leadership & Organization Development Journal* (7^{th} ed.). John Wiley & Sons Ltd. https://doi.org/10.1108/lodj-06-2013-0079

Semela, T. (2007). Identification of Factors Contributing to Gender Disparity in an Ethiopian University. *Eastern Africa Social Science Research Review*, 23(2), 71–93. https://doi.org/10.1353/eas.2007.0013

Sewasew, D. T. (2014). Attrition causes amon university students: the case of Gondar University, Gondar, North West Ethiopia. *Innovare Journal of Social Sciences*, 2(2), 27–34. https://innovareacademics.in/journals/index.php/ijss/article/view/892/669

Silva, R., Rodrigues, R., & Leal, C. (2018). Academic motivation scale: Development and validation for portuguese accounting and marketing undergraduate students. *Proceedings of the European Conference on Games-Based Learning*, 2018-Octob(11), 600–607. https://doi.org/10.5539/ijbm.v13n11p1

Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education*, 48(6), 1273–1296. https://doi.org/10.1007/s11165-016-9602-2

Tamrat, W. (2022). The indelible challenges of student attrition in Ethiopian higher education: imperatives for a closer scrutiny. *Widening Participation and Lifelong Learning*, 24(1), 86–113. https://doi.org/10.5456/wpll.24.1.86

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Yimer, B. M., Demissie, M. M., Herut, A. H., & Bareke, M. L. (2022). *Higher Education Enrolment, Graduation, and Employment Trends in Ethiopia: An Empirical Analysis*. June. https://doi.org/10.20944/preprints202206.0093.v1

Yorke, L. (2013). *Young Lives School Survey Validation of the Academic Self-Concept Questionnaire in the Vietnam School Survey*. July, 1–17.