Research Article

University Students' Intentions to Develop Competences and its Influencing Factors: A Nigerian Context

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Abstract

Based on an extensive review of literature pertaining to student competencies, this study addresses a critical gap by examining the determinants influencing university students' intentions to enhance their competencies. Specifically, utilizing structural equation modeling with AMOS, the research investigates the roles of attitudes, autonomy support, and perceived behavioral control among 381 postgraduates enrolled in the education department across three public universities in Nigeria. The findings underscore that positive attitudes towards extracurricular activities and the level of autonomy support received significantly bolster students' intentions to develop competencies. However, the impact of perceived behavioral control on the intention to develop competences was negative but significant. This investigation thus provides nuanced insights into the psychological dynamics that shape competence development intentions within the academic sphere, particularly among university students.

Keywords: *Intention to develop competences, Attitude, Autonomy support, Perceived behavioral control, University student*

1. Introduction

In the context of widespread unemployment, students face increasing pressure to acquire competencies that are crucial for achieving success in their future endeavors (Malmström & Öqvist, 2018). Students' intentions play a crucial role in guiding their academic pursuits and career goals (Ajzen, 1991; Gu et al., 2017; Anjum et al., 2020; Harb et al., 2021). Higher education institutions offer a

variety of non-academic activities, such as extracurricular programs, which students often perceive as time-consuming and potentially distracting from their core academic responsibilities (Buckley & Lee, 2021). However, these activities may enhance academic performance and foster the development of subject-specific skills and competencies, potentially influencing students' intentions (Buckley & Lee, 2021).

Additionally, The dynamic between students and their supervisors during academic supervision is multifaceted. Students' perceptions of their ideal supervisor's qualities and those they observe can significantly influence their engagement with feedback, sense of responsibility, overall learning experience, and intentions. Research suggests that effective supervision, including academic, personal, and autonomy support, could be crucial for students' development, particularly in cultivating research skills and facilitating thesis completion (AlGhamdi et al., 2014; Overall et al., 2011; Gu et al., 2017; Yang et al., 2022). Academic support ensures timely feedback and guidance, while personal support addresses emotional challenges. Autonomy support encourages independent thinking and problem-solving, which might be essential for fostering research self-efficacy and creativity (Overall et al., 2011; Fan et al., 2019; Yang et al., 2022).

Learner autonomy gives students the opportunity to make their own decisions, which has been highlighted as crucial in today's rapidly changing academic environment. It enhances motivation, fosters self-regulated learning, and could improve overall academic performance by encouraging independent thinking and responsibility for one's own educational journey. This aligns with the increasing emphasis on personalized and lifelong learning in the digital age. This autonomy, combined with positive attitudes towards both academic and extracurricular activities, may significantly shape students' intentions to develop essential competencies. Although these concepts have been extensively studied in Asian contexts, their impact in African settings, particularly in Nigeria, remains insufficiently explored.

Globally, perceived behavioral control emphasizes controllability, including factors like access to resources, capability, and situational constraints that affect one's ability to perform a behavior (Ajzen, 1991). Access to educational opportunities significantly shapes students' actions and aspirations. In Nigeria, with its substantial population in sub-Saharan Africa, there are significant challenges in internet connectivity that hinder effective teaching and learning experiences (Adomi, 2015; Ajanaku, 2019). Limited internet access and infrastructure constraints continue to present obstacles to educational advancement, thereby affecting students' educational experiences and competency development.

Prior research predominantly focuses on how factors like students' attitude, subjective norms, and perceived behavioral control (PBC) influence entrepreneurial intentions (Anjum et al., 2020; Arranz et al., 2017; Agu, 2021). However, there is a gap in understanding how these factors specifically influence students' intentions to develop competencies across broader academic and professional domains, particularly in developing countries like Nigeria. Demographic characteristics, including age, gender, and education level, also play significant roles in shaping competency-seeking behaviors among students (Zhu, 2019).

This study aims to investigate the influence of attitude towards extracurricular activities, autonomy support, and perceived behavioral control on students' intentions to develop competencies, aiming to understand their unique characteristics in fostering growth. Guided by the Theory of Planned Behavior, the research seeks to enhance higher education practices that promote competency development and effectively prepare students for future career opportunities. The following are the study's research questions:

RQ 1: What is the predictive effect of attitude, autonomy support, and perceived behavioral control on students' intention to develop academic competences?

RQ 2: How do age, gender, and education level differences influence these relationships?

1.1 Research Problem and Study Context

The World Economic Forum (2018) identifies essential skills crucial for future graduates, including cognitive flexibility, generic, soft, and research skills (Murtonen et al., 2008; Teng et al., 2019; Nwajiuba et al., 2020). These competencies are pivotal for postgraduate students aiming for higher degrees, employment, or entrepreneurial ventures. Competences encompass knowledge, skills, and abilities (Tuononen & Parpala, 2021; Zhu, 2019), categorized into cognitive, functional, and social domains (Zhu, 2019).

In Sub-Saharan Africa, including Nigeria, enhancing competencies is crucial for achieving Sustainable Development Goals by 2030. However, Nigerian universities face challenges in cultivating generic competencies and employable skills (Schendel et al., 2023; Nsengimana et al., 2020). Educational reforms like Competence-Based Education aim to address these issues but underutilize psychological factors such as attitude, autonomy support, and perceived behavioral control (PBC), known to enhance competencies (Pitan, 2017; Okolie et al., 2019). Many Nigerian graduates lack critical research and generic competencies, contributing to high youth unemployment rates (Nwajiuba et al., 2020; Pitan, 2017; Igwe et al., 2022).

Challenges in Nigerian higher education include governance issues, faculty welfare, and increasing student numbers (Igwe et al., 2022). Efforts to bridge these gaps by expanding class sizes and eliminating irrelevant programs have yielded limited improvements in employment outcomes (Nwajiuba et al., 2022). Addressing these challenges requires actionable strategies to effectively align student skills with industry and academic demands.

1.1.1 Nigerian Higher Education Context

Nigerian higher education faces significant challenges in fostering comprehensive competence development, echoing global concerns raised by organizations like OECD and UNESCO (OECD, 2018; Tahirsylaj & Sundberg, 2020; Johanson & Adams, 2004). Historically esteemed for producing highly skilled graduates, contemporary Nigerian universities grapple with funding shortages, outdated curricula, and limited research opportunities (Farayibi & Folarin, 2021).

The 2004 National Policy on Education aims to equip students with essential physical and intellectual skills for self-reliance and societal contribution. However, the persistence of colonial-era priorities, which emphasize liberal arts such as the training of the mind over technical and competency-based programs, continues to prevail (Adebisi, 2014). These challenges limit Nigerian universities' ability to align with global knowledge trends and meet evolving labor market demands.

To achieve Sustainable Development Goal 4 (Quality Education), Nigerian higher education must address systemic challenges hindering competency development. This involves reevaluating educational strategies, promoting interdisciplinary approaches, research-driven methodologies, and fostering industry-academia collaborations. These efforts are crucial for preparing graduates to excel in Nigeria's dynamic economic and social environment.

This comprehensive background integrates interdisciplinary approaches, research-driven methodologies, and industry-academia collaborations, essential for advancing competence development in Nigerian higher education. It provides actionable insights for enhancing educational outcomes and fostering student success in a competitive global landscape.

2. Theoretical Framework

The Theory of Planned Behavior (TPB) is widely cited in the literature as a robust model for understanding the relationship between attitudes and behaviors. Historically, scholars noted a disconnect between people's attitudes and their behaviors, necessitating the establishment of additional determinants such as subjective norms and individual intentions. This led to the development of the Theory of Reasoned Action (TRA) and subsequently the Theory of Planned

Behavior (Fishbein & Ajzen, 1977; Ajzen, 1991).

The TPB extends the TRA by incorporating control beliefs, addressing the influence of perceived behavioral control (PBC) on behavior. PBC is a critical component in predicting both intentions and behaviors, particularly in scenarios where individuals do not have complete volitional control over their actions. While TRA effectively predicts behaviors under volitional control, the addition of PBC in TPB accounts for potential barriers to behavior, explaining why intentions sometimes fail to predict actions (Ajzen, 1991).

Armitage and Conner (2001) highlighted that many studies adopting TPB do not measure factors directly related to intentional constructs. They argue for incorporating additional support for behavioral intentions, including self-prediction, to enhance the predictive power of the model. Behavioral intention refers to an individual's intention to perform a given behavior, whereas self-prediction indicates the extent to which an individual is willing to perform the behavior. Self-predictions have shown significant influence on behavior.

According to Khuram et al. (2021), intentions are motivational factors explaining the level of an individual's willingness to perform the behavior in question. Attitudes, defined as the readiness to perform a behavior, subsequently translate into intentions to act. Both attitudes and subjective norms exhibit significant variance as determinants of intentions (Armitage & Conner, 2001).

2.1 Intention to Develop Competences

In this study, competencies intention, intention for competencies, and academic competencies intention are used interchangeably. These terms also mutually align with the intention to develop competences. Students' interest in acquiring skills during their study is considered a well-planned behavior (Malmström & Öqvist, 2018; Khuram et al., 2021). Intention-based research typically focuses on motivation, intention, cognition, and perception (Agu, 2021). Khuram et al. (2021) argue that motivation is appropriately measured as intention in the Theory of Reasoned Action. Intention to develop competences is defined as the degree of willingness and effort an individual plans to invest in acquiring skills (Ajzen, 1991, p. 181; Khuram et al., 2021).

The concept of individual intention is also integral to the entrepreneurial event model (Shapero & Sokol, 1982). The Theory of Planned Behavior posits that social influences, such as autonomy support, significantly affect an individual's intention (Khuram et al., 2021), and this has been extensively explored within higher education contexts (Agu, 2021). Research employing the entrepreneurial event model often focuses on the intention to start a business (Krueger et al., 2000). However, many students may have little or no intention to start a business after graduation, indicating that an entrepreneurial focus alone may be insufficient. Student outcomes should be assessed by their intention to develop diverse competencies to meet various needs. Given the uncertainty of future resources and the potential favorability toward job seekers, the intention to acquire skills for job opportunities is more critical than limited business-oriented agendas.

2.2 The Relationship Between Academic Competence Intention and the Three TPB Factors

In the Theory of Planned Behavior, attitude, subjective norms, and perceived behavioral control (PBC) are the three primary determinants of intentions, while intention directly predicts behavior (Ajzen, 2020). Fishbein and Ajzen (1975) define attitude as a person's positive or negative evaluation of performing a particular behavior. In an academic context, attitude can be defined as the evaluation of the extent to which engaging in university activities (e.g., extracurricular activities) would be favorable or unfavorable to an individual (Ajzen, 2020; Khuram et al., 2021). Positive attitudes toward professional skills indicate a desire among students to use these skills in the future (Jansen et al., 2022). Attitudes drive students to participate in extracurricular activities such as conferences, student unions, religious gatherings, music clubs, sports, and charity events. These activities expose individuals to developing generic, soft, and research skills (Teng et al., 2019; Overall et al., 2011). The

more positive an individual's attitude toward extracurricular activities, the stronger the intention to participate (Arranz et al., 2017). Conversely, negative outcome expectancies related to competence-building activities can adversely impact the intention for growth (Ozaralli & Rivenburgh, 2016). Although some studies have confirmed the relationship between attitude and intention (Arranz et al., 2017; Khuram et al., 2021), others have shown that education for sustainable entrepreneurship also influences students' entrepreneurial intentions (Agu, 2021).

Subjective norms refer to the social pressure from significant others that guide one's beliefs (Khuram et al., 2021). In postgraduate education, the supervisor is the most influential figure. Supervisors adopt various strategies to encourage students to think critically and creatively (Khuram et al., 2021). They are crucial in motivating students to become competent researchers and develop social skills (Osman, 2016; Overall et al., 2011; Gu et al., 2017). Autonomy support from supervisors is a vital element of effective supervision (Overall et al., 2011). It fosters autonomy-oriented behavior, enhancing students' professional skills (Osman, 2016; Anjum, 2020; Yang et al., 2022). Autonomy support involves respecting students' perspectives, improving opportunities for them, and encouraging confidence in their ideas (Overall et al., 2011). In university settings, such support motivates students to participate in university activities, leading to competence development (Harb et al., 2021). This support also drives students' intentions to conduct research, fostering creativity and innovation (Overall et al., 2011; Gu et al., 2017; Yang et al., 2022). However, supervisors often face heavy academic workloads, limiting their capacity to provide adequate research supervision (Osman, 2016). A lack of autonomy support can hinder innovation (Yang et al., 2022). Khuram et al. (2021) demonstrated that supervisor support moderates the effect of intention on performance. Existing literature has confirmed that perceived autonomy support contributes to intention (Ford et al., 2019; Khuram et al., 2021).

The constructs of PBC and self-efficacy are often considered interchangeable, though some scholars argue they are distinct. Bandura (1992) insisted they are not synonymous, suggesting that while PBC relates to the cognitive view of control over external factors, self-efficacy focuses on internal factors. External control pertains to controllability (Vamvaka et al., 2020). Some studies have shown self-efficacy to be more influential than PBC in affecting intentions and actions (Vamvaka et al., 2020). Comparative studies of the Theory of Reasoned Action (TRA), TPB, and cognitive theory have reported that self-efficacy rather than PBC often has a direct effect on behavior (Armitage & Conner, 2001). According to Vamvaka et al. (2020), research on the relationship between PBC and intention is less prevalent due to inconsistent findings. In some studies, PBC has shown a negative and non-significant relationship with students' intentions (Malmström & Öqvist, 2018; Agu, 2021). However, in situations involving controllability, PBC is expected to influence behavioral intention either negatively or positively (Moksness & Olsen, 2017). Several authors have found that PBC significantly and positively influences intention (Armitage & Conner, 2001; Ozaralli & Rivenburgh, 2016; Agu, 2021). Previous research suggests that PBC's impact on intention may vary depending on the situation, context, and type of behavioral intention (Armitage & Conner, 2001).

The aforementioned studies scrutinize distinct factors influencing intention, such as attitude, subjective norms, and PBC. Therefore, in light of the Theory of Planned Behavior model, we hypothesize that:

H1: Attitude will positively and significantly influence students' intention to develop competences.

H2: Autonomy support will positively and significantly influence students' intention to develop competences.

H3: PBC will positively and significantly influence students' intention to develop competences.

2.3 Control Variables

Demographic variables are related to behavioral intention (Nguyen, 2018; Omar & Addruce, 2019; Osman, 2016). Omar and Addruce (2019) reveal that age, gender, and education significantly impact

behavioral intention. More recent findings also indicate that gender affects intention (Armuña et al., 2022). In some studies, females exhibit lower intentions compared to males (Nguyen, 2018). Santos (2016) states that men are more likely than women to develop positive behavioral intentions. However, Osman (2016) found no significant relationship between gender and intention. According to Hatak (2014), age is positively related to intention. Davidsson and Honig (2003) suggest that education level is a means for individuals to fulfill their desires. Since intention may be influenced by various factors not included in this model (Ajzen, 1991), we incorporated control variables such as age, gender, and education level (Agu, 2021; Nguyen, 2018).

3. Methods

3.1 Instruments

The questionnaire used in this study consists of five scales. Scale 1 asked respondents to provide their gender, age, and education level, which were used as control variables in this study. Scale 2 measured students' attitudes towards extracurricular activities with four items (Narayan & Steele-Johnson, 2007; Khuram et al., 2021). A sample item is, "I enjoy participating in the current research-based learning activities offered at the university." Scale 3 included four items on supervisory autonomy support (Overall et al., 2011); a sample item is, "My supervisor encourages me to ask questions." Scale 4 assessed PBC-controllability with four items (Yan et al., 2020; Vamvaka et al., 2020). A sample item is, "I can handle the situation of my campus WiFi coverage (e.g., speed and connectivity)." Scale 5 measured students' intentions to develop competencies with three items (Lai et al., 2014); an example item is, "I intend to seek knowledge through my degree program." All 19 items were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). These items were adapted from previous studies and some were modified to fit the research context.

3.2 Sampling and Participants

An empirical study was conducted using purposive sampling based on three public universities located in Eastern Nigeria. The eastern geopolitical zone of Nigeria is home to many recognized and top-ranked universities. However, there is a paucity of research conducted in this region, which faces a higher unemployment crisis. A total of 420 master's and Ph.D. students from education department in their first to final year of university education participated in the study. Of these, 12 were excluded from the final analysis due to incomplete and missing information. Thus, the final sample consisted of 381 students who completed the questionnaire over a three-month period, resulting in a 90% response rate. Detailed demographic information of the participants is presented in Table 1 (see Table 1: Descriptive Statistics of Demographics).

Table 1. Descriptive statistics of demographic (n = 381)

	N	*Percentage*
Gender		
Male	155	40.7
Female	226	59.3
Age		
20-24	80	21
25-30	99	26
31-35	181	47.5
More than 36	21	5.5
Education level		

	N	*Percentage*
Master	224	58.8
PhD	157	41.2

3.3 Data Collection

A pilot test was administered to 40 university students from the selected universities. The Ethics Committee of the university approved this study. Once the necessary permissions were obtained from the relevant authorities, informed consent was secured from all participants. Participants formally agreed to the consent terms and willingly took part in the study. We ensured the anonymity and confidentiality of respondents, and every question was framed appropriately.

The instrument was administered in the university during normal class hours with the assistance of lecturers and research assistants. A dyadic strategy was employed in administering the questionnaire. Initially, approximately 20 minutes were allocated for distributing and completing the questionnaire in the classroom. Subsequently, students were given 2-3 days to complete the questionnaire, having consented to be contacted again for a follow-up study.

3.4 Data Analysis

Descriptive statistics (frequency analysis) were performed for the three variables (attitude, autonomy support, and PBC) using SPSS. The structural equation model (SEM) was employed to confirm the theoretical models (Schumacker & Lomax, 2004). It is crucial to verify whether the hypothesized model fits the data. SEM was used to test path analysis and the influence of multiple variables on intention. Figure 1 presents the conceptual model of the study (see Figure 1: Conceptual Model of the study).
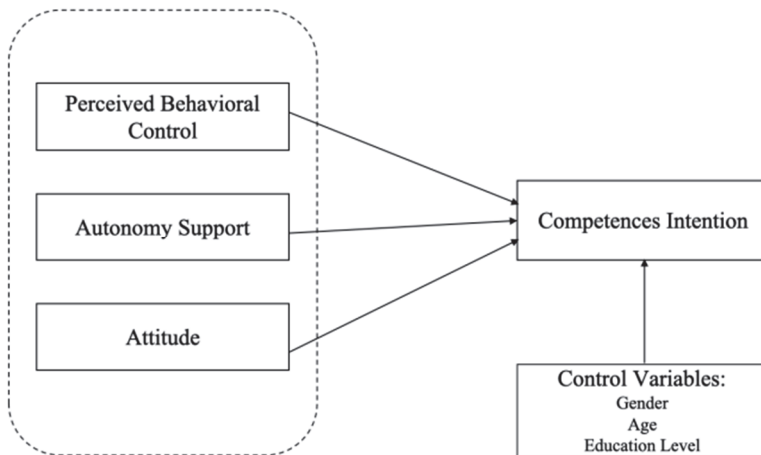

Figure 1: Conceptual model of the study.

4. Results

4.1 Descriptive Statistics

Table 2 presents the frequency results for each observed variable. This analysis identifies the proportion of students who are open to participating in extracurricular activities, believe that their supervisors support autonomy, are aware of behavioral control, and intend to acquire competencies. The percentage of students participating in extracurricular activities were 62.5%, 62.7%, 72.9%, and 73.4%. Most students perceive that their supervisors encourage autonomy, with agreement levels of 82.4%, 82.7%, 91.8%, and 94.2%. Low agreement on perceived behavioral control indicates the limited resources available at the selected universities, with percentages of 36.5%, 55.1%, 55.5%, and 57.2%. Lastly, a significant proportion of students intend to develop competencies, with agreement levels of 80.3%, 85.3%, and 83.2%, respectively (see Table 2: Descriptive Statistics of Each Observed Variable).

Table 2. Descriptive statistics of each observed variable (n = 381).

	F	Percent
Attitude		
AT_1	280	73.4
AT_2	278	72.9
AT_3	238	62.5
AT_4	239	62.7
Autonomy support		
AU_1	359	94.2
AU_2	350	91.8
AU_3	314	82.4
AU_4	315	82.7
Perceived behavioral control		
PBC_1	210	55.1
PBC_2	139	36.5
PBC_3	218	57.2
PBC_4	199	55.2
Academic competences intention		
IN_1	306	80.3
IN_2	325	85.3
IN_3	317	83.2

4.2 SEM Analysis

The measurement model's reliability, convergent validity, and discriminant validity were assessed as depicted in Table 3. Convergent validity was evaluated through factor loadings, average variance extracted (AVE), composite reliability (CR), and Cronbach's α. In this study, AVE exceeded 0.5, while CR surpassed 0.7, indicating satisfactory convergent validity. Additionally, Cronbach's α values exceeded 0.6, meeting the threshold for acceptable construct reliability (Fornell & Larcker, 1981). The square root of AVE was greater than the correlations between constructs, confirming discriminant validity (Sarstedt et al., 2021). Table 3 provides details on construct reliability, convergent validity, and discriminant validity (see Table 3: Construct Reliability, Convergent Validity, and Discriminant Validity).

Table 3. Construct reliability, convergent validity, and discriminant validity

Construct	Items	Loadings	AVE	CR	α	Correlation matrix			
						AT	AS	PBC	IN
Attitude(AT)	AT1-AT4	.957 – .961	.919	.978	.848	**.959**			
Autonomy support (AS)	AS1-AS4	.849 – .883	.754	.924	.888	.464	**.868**		
PBC	PBC1-PBC4	.808 – .861	.525	.815	.695	-0.064	-.170	**.725**	
Intention (IN)	IN1-IN3	.749 – .894	.701	.874	.765	.374	.306	-.317	**.837**

 **p < 0.01; the bold figure in the parenthesis are the square root of the AVEs.

The structural model's goodness-of-fit indices, presented in Table 4, indicate a strong fit: Goodness-of-Fit Index (GFI) = 0.991, Adjusted Goodness-of-Fit Index (AGFI) = 0.977, Normed Fit Index (NFI) = 0.946, Relative Fit Index (RFI) = 0.898, Incremental Fit Index (IFI) = 0.994, Tucker Lewis Index (TLI) = 0.989, Comparative Fit Index (CFI) = 0.994, Root-Mean-Square Error of Approximation (RMSEA) = 0.017, Discrepancy divided by Degrees of Freedom (CMIN/DF) = 1.112, and p-value = 0.347. These indices collectively indicate that the hypothesized model fits the data well (Schumacker & Lomax, 2004). Detailed indicators of model fitness are presented in Table 4 (see Table 4: Model Fit Indices).

Table 4. Indicators of model fitness

P	GF1	AGFI	RMSEA	NFI	RFI	IFI	TLI	CFI
.347	.991	.977	.017	.946	.898	.940	.989	.994

The results presented in Table 5 indicate that attitude (β = 0.248, p < 0.05) and autonomy support (β = 0.154, p < 0.05) significantly and positively predict the intention to develop academic competences. Conversely, perceived behavioral control (β = -0.313, p < 0.05) demonstrates a negative and significant relationship with intention. However, the model's R² suggests that only 24.3% of the variation in intention can be explained by attitude, autonomy support, and perceived behavioral control.

Furthermore, the control variables—gender, age, and education level—do not significantly impact intention, as indicated by path coefficients of -0.047, 0.048, and 0.038, respectively (see Table 5: Regression Results and Control Variables).

Table 5. Results of multiple regression and control variables

			Estmate (Unstandardised)	Estimate (Standardised)	S.E	t-value	P
Attitude	—>	Intention	.248	.299	.042	5.868	.***
Autonomy support	—>	Intention	.154	.121	.066	2.341	.020
PBC	—>	Intention	-.313	-281	.051	-6.130	.***
Gender	—>	Intention	-.047	-.031	.070	-.677	.499
Age	—>	Intention	.048	.060	.036	1.331	.184
Education level	—>	Intention	.038	.070	.025	.554	.587

*** *P* < 0.001; .020 *P* < 0.05

5. Discussion

In this study, we explore the application of the Theory of Planned Behavior (TPB) in understanding university students' intentions to develop competencies within the Nigerian higher education system, shedding light on a relatively new ideology in this context.

Our findings underscore the significant role of attitudes towards extracurricular activities in shaping students' intentions to acquire competencies. Previous research, such as that by Abun et al. (2019), supports our assertion by demonstrating a strong correlation between cognitive and affective attitudes towards research and the intention to engage in research activities. Similarly, Griffioen (2019) highlights that students' future career intentions are closely tied to their perceptions and attitudes towards research practices. Moreover, Arranz et al. (2016) have shown that active involvement in extracurricular activities fosters entrepreneurial intentions among university students, emphasizing the broader impact of positive attitudes.

In line with these insights, our study suggests that cultivating a positive attitude towards extracurricular engagement is crucial for fostering competence intentions among Nigerian university students. This aligns with the findings of Doanh & Bernat (2019), who argue that positive attitudes play a pivotal role in motivating students towards educational pursuits. Therefore, nurturing a perception among students that extracurricular activities are integral to personal and professional growth is essential. This perception may influence students' engagement in activities like conferences, seminars, and collaborative projects, potentially impacting their commitment to acquiring and developing competencies essential for their academic and career trajectories.

In this research, autonomy support plays a pivotal role in shaping students' intentions to develop academic competencies, as highlighted by Black & Deci (2000). Their research underscores that perceived autonomy support from instructors correlates positively with perceived competencies, interest, autonomy, and self-control among students, particularly benefiting those with low autonomous self-regulation. Building on this foundation, our study aligns with recent findings by Khuram et al. (2021), which emphasize the significant impact of perceived subjective norms from supervisors on students' intention to seek knowledge. Our analysis further substantiates these claims by demonstrating that students' perceived autonomy support from supervisors positively influences their intention to develop competencies. Moreover, insights from Fan et al. (2019) reinforce our hypothesis, illustrating that supportive supervision not only enhances students' research innovation endeavors but also fosters citizenship behavior and creativity. This notion is echoed in the study by Zhang et al. (2023), where strong desires to acquire skills are attributed to perceived autonomy support from supervisors, emphasizing its critical role in competence intention. Thus, our findings contribute to existing literature (Overall et al., 2011; Gu et al., 2017; Khuram et al., 2021; Fan et al., 2019) by highlighting the essentiality of autonomy support in fostering students' willingness, resilience, and optimism towards engaging in activities aimed at developing academic competencies.

Lastly, our results supported all the proposed hypotheses except for the direct negative relationship between perceived behavioral control (PBC) and intention. This finding is intriguing because PBC is widely accepted as a significant correlate of intention. Our study found that while the effect of PBC on intention is significant, it is negative. Agu (2021) also reported a negative but non-significant influence of PBC, contrasting with the positive relationships documented in past studies (Doanh & Bernat, 2019; Hagger et al., 2022; La Barbera & Ajzen, 2018).

Doanh and Bernat (2019) posited that PBC moderates the intention-behavior relation and the effects of attitude and subjective norms on intention. La Barbera and Ajzen (2018) further supported the significance of PBC. However, our study's findings suggest that persistent issues such as inadequate funding, outdated curricula, limited research opportunities, and poor staff development at Nigerian universities hinder student development, leading to a negative perception of their control over developing competencies. This is exacerbated by inadequate Wi-Fi coverage, which restricts students' ability to engage in research and develop generic skills, despite positive attitudes and autonomy support from supervisors.

The contrast with previous studies could be attributed to the different educational environments and resources available. For instance, in well-resourced contexts, students might experience higher PBC due to better institutional support and infrastructure, aligning with the positive correlations found in other studies. In Nigeria, however, systemic issues significantly impede students' perceived control, highlighting the need for structural improvements in the higher education system to enhance students' PBC and their overall competence development.

Our study also provides insights into global variations in competence development intentions across cultural and educational settings. European countries like England, Germany, France, and the Netherlands emphasize competence development in vocational education through structured qualifications and interventions like England's Fast Forward Master Scheme, enhancing educational outcomes systematically (Weigel et al., 2007). However, the limited integration of Theory of Planned Behavior (TPB) factors such as attitude, subjective norms, and perceived behavioral control may indicate gaps in understanding their influence on competence development intentions (Cagliesi & Hawkes, 2023).

In contrast, our study in Nigeria underscores how attitudes towards extracurricular activities significantly influence competence intentions, reflecting nuanced influences shaped by cultural and educational contexts. Similarly, in Asia, countries like China, Japan, and South Korea highlight various competencies. In China, emotional intelligence is pivotal for fostering entrepreneurial intentions among students engaged in social entrepreneurship projects (Chien-Chi et al., 2020). This aligns partially with our findings on affective competence's role in shaping aspirations beyond entrepreneurship to encompass broader academic and professional competencies.

In Japan, online problem-based learning (PBL) enhances global competencies among science and engineering undergraduates by promoting skills in global awareness, problem-solving, and multicultural communication (Ota &Murakami-Suzuki, 2022). This differs from Nigeria's challenges with infrastructure and curriculum limitations that may hinder similar advancements through technologically mediated learning experiences, despite both contexts aiming to integrate sustainable development goals (SDGs) into education.

Comparatively, South Korea and Finland explore 21st-century skills like digital and information literacy, influencing technology adoption intentions among students (Jang et al., 2021). Our study aligns with their exploration of attitudes towards extracurricular activities shaping competence development intentions, albeit with a focus on broader skill sets encompassing academic, entrepreneurial, and professional domains.

In Sub-Saharan Africa, including South Africa and Nigeria, research highlights factors influencing entrepreneurial skills acquisition among rural university students, emphasizing university support systems, entrepreneurial networks, and curriculum design (Olumuyiwa et al., 2023). Our study in Nigeria focuses on attitudes towards extracurricular activities and autonomy support from supervisors as critical influencers of competence development intentions among university students.This offers insights into motivational factors distinct from regional emphases on entrepreneurship, contributing to a broader understanding of competence development in diverse educational contexts. Table 6 presents the hypothesized results of our structural equation modeling analysis, illustrating outcomes that contribute to understanding competence development within diverse educational contexts.

Table 6. Results of structural equation modeling

Hypothesized relationship	Path coefficients	SE	t-Values	Supported?
Attitude → Intention	.248	.042	5.927**	Yes
Autonomy support → Intention	.154	.065	2.367**	Yes
PBC → Intention	-.313	.051	-.6.198**	No

Note: the hypotheses tested is supported at 0.05 level of significance

The findings suggest that the influence of attitude and autonomy support on competence intention does not vary significantly by age, gender, or education level. This conclusion aligns with previous research by Osman (2016) and Zhu (2019), highlighting the pivotal role of attitude and autonomy support in fostering competence among higher education students, particularly in developing countries such as Nigeria.

6. Theoretical and Practical Implications

Theoretically, this study significantly advances our understanding of the determinants of competence development intentions. It expands the applicability of the Theory of Planned Behavior (TPB) in educational contexts. While existing literature emphasizes the influence of subjective norms on intention formation, our findings specifically illuminate how targeted supervision approaches can further amplify students' intentions to achieve competences.

To maximize the impact of these findings, this study offers practical insights to guide educational policymakers, university administrators, and educators in Nigeria in effectively implementing targeted strategies to enhance competence development among university students. The positive impact of attitude and autonomy support on students' intentions to develop competences highlights the importance of fostering a supportive academic environment and providing adequate resources in Nigerian universities.

For Educational Policymakers, it is crucial to prioritize the improvement of ICT infrastructure in Nigerian universities. Investing in high-speed, reliable Wi-Fi across campuses can significantly enhance students' research capabilities and overall academic performance. Policymakers should develop and implement policies that ensure equitable access to technological tools and platforms that facilitate research and learning. For example, creating a national framework to standardize and fund ICT improvements across universities can provide a consistent learning environment for all students. Additionally, focusing on curriculum reform to incorporate 21st-century courses like artificial intelligence, machine learning, robotics, and deep learning is critical. Reviewing and updating the 2004 educational policies to reflect current competency initiatives is also imperative, as existing policies may not meet the contemporary needs of higher education students.

For University Administrators, allocating sufficient funds and resources to ensure robust Wi-Fi connectivity across all areas of the campus is essential. This will facilitate seamless access to digital resources, which is crucial for research and competence development. Administrators should consider specific measures such as increasing the bandwidth and number of access points to reduce connectivity issues. Additionally, establishing and maintaining support services, such as technical support centers, training workshops, and dedicated helpdesks, can assist students in overcoming technical barriers and enhance their research experience and competence acquisition.

Proper funding of higher education can trigger students' intentions to pursue and attain research competencies, innovation competencies, generic skills, and technical and vocational competencies. Adequate funding can support employing qualified teachers, building research laboratories, innovation centers, research institutes, think tanks, and entrepreneurial hubs for engagement in entrepreneurship and innovation. Implementing these initiatives can elevate students' competencies and productivity in all necessary areas.

For Educators, integrating the use of digital tools and online resources into the curriculum is vital to foster an environment where students can develop competences using modern technology. This can be achieved by incorporating online databases, virtual labs, and collaborative platforms into teaching practices. For instance, educators can use learning management systems to provide interactive and up-to-date materials, promoting digital literacy and research skills. Additionally, promoting and facilitating student engagement in extracurricular activities is important, as these activities have been shown to positively influence their intention to develop competences. Educators can organize and support clubs, workshops, and seminars that provide practical experience and

opportunities for skill development outside the traditional classroom setting.

Encouraging students to actively engage in conferences, research collaborations, volunteering, academic clubs, seminars, and sports is essential for fostering their academic competencies. Additionally, enhancing autonomy support in supervision is crucial. This involves improving supervisor training to effectively nurture students' positive intentions, thereby significantly boosting their overall competence development.

7. Limitations and Suggestions for Future Studies

This study acknowledges several limitations that should be considered in interpreting the findings and suggests avenues for future research. First, while this study contributes to understanding competence intention in higher education, it primarily focuses on perceived rather than actual competence development. Future research could explore how perceived intentions align with actual competence outcomes.

Second, this study established directional relationships among variables. Future studies could delve deeper into the mediating and moderating roles that may influence these relationships, providing a more comprehensive understanding of competence intention formation.

Third, the cross-sectional nature of this study limits the ability to establish causal relationships. Longitudinal studies would offer insights into how attitudes, autonomy support, and perceived behavioral control evolve over time and influence competence intention.

Fourth, the study was conducted in three universities within a specific region of Nigeria due to practical constraints. Exploring diverse contexts across different regions could enhance the generalizability of the findings and provide a broader perspective on competence intention in higher education.

In conclusion, while this study advances knowledge in the field, addressing these limitations in future research endeavors will contribute to a more nuanced understanding of competence development and intention in higher education settings.

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Appendix: Questionnaire

Table 7: Items of the questionnaire along with their sources and their theoretically designated factors

Scales	Items	Sources
Attitude	I enjoy participating in my current research-based learning program offered at the university	Khuram et al., 2021
	I am interested in trying to improve my skill as a result of volunteer activity I have attended at my university.	Narayan & Steele-Johnson, 2007
	I have had many opportunities to use the skills I have learned during the university extracurricular activity	
	The extracurricular activities offered at my university are a waste of time.	

Autonomy support	My supervisor encourages me to ask questions	Overall et al., 2011
	My supervisor listens to how I would like to do things	
	My supervisor provides me with choices and options encourages me to work independently	
	My supervisor encourages me to be open about my own ideas and any issues that concern me	
PBC	I can control the campus Wi-Fi coverage (e.g the speed and connectivity).	Vamvaka et al., 2020
	The number of events outside my control which could prevent me from developing skills are very few.	
	As a student, I would have complete control over the situations	
	I have the freedom whether or not to develop skills	Yan et al., 2019
Intention to develop competences	I intend to develop skill through my degree program	Lai et al., 2014
	I will try to develop skill with my peers at my university	
	I plan to develop skill from my field of study	