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A Quantitative Study of Graduate Students' Enculturation Using a Disposition Scale

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Abstract

This study evaluates graduate students' enculturation in graduate schools using a dispositional scale. Earlier studies reveal the intersection among learning taxonomy, disposition, and enculturation; however, instruments for evaluating students' enculturation appear to be lacking, creating an assessment gap. Therefore, this study focuses on three learning domains: knowledge, skills, and attitude through which students' enculturation can be assessed. Using a quantitative approach, Minitab Statistical Software 22 was used for data analysis to address three research questions that guided this study, which included four groups of students in social science graduate programs across the Midwest, based on a 4-point scale, representing Phases 1–4. Descriptive statistics and ANOVA were employed. Results revealed that Year 1 students' ratings did not align with their milestones, compared with those of Year 3 and Year 4 students in procedural and metacognitive dimensions. Further, the two-sample t-test was used to compare student and faculty ratings, and the results were not statistically significant in six of seven categories. Accordingly, the test subjects' ratings were closely aligned, except in ownership, with a p-value of 0.019, which is < alpha of 0.05. However, only Year 3 students were included in the initial test. Finally, when examining the relationships among the categories tested across all four groups using Pearson's correlation, results revealed high to moderate positive correlations for Year 1 in the following areas: motivation and professionalism, ownership and motivation, professionalism and norms, and motivation and scholarship. Year 2 yielded positive correlations among ownership and norms, ownership and communication, ownership and persistence, persistence and professionalism, persistence and motivation, ownership and professionalism, and persistence and norms. For Year 3, communication and norms, ownership and norms, and motivation and professionalism were positively correlated. Among the Year 4 group, high to moderate correlations occurred between scholarship and norms, professionalism and norms, motivation and norms, persistence and norms, ownership and norms, professionalism and scholarship, persistence and scholarship, ownership and scholarship, and persistence and motivation.

Keywords: enculturation, disposition of graduate students, graduate school culture

1. Introduction

Since the inception of post-secondary education, questions have been raised about the attributes of collegiate students and the characteristics of those who complete the requirements for graduation. Many studies examined indicators such as students' grades, persistent enrollment, attendance, extracurricular activities, learning styles, and aptitude to address these questions (Gardner, Hayes & Neider, 2007). However, they yielded inconclusive results and raised even more questions about student *disposition*.

Further, earlier research suggests that a key difference between undergraduate and graduate college students is their level of learning maturity. For example, Schafer (1974) examined educational maturity in terms of individual development and enculturation, particularly focusing on their awareness of social systems. Some scholars suggest that enculturation is the primary purpose of education, particularly in modern society (Kelly, 2002). Additionally, individual development and awareness of social systems benefit both the student and society. Furthermore, schools and graduate learning programs facilitate both enculturation and individual development, thereby supporting students' success. The current study uses a dispositional scale to examine graduate students' enculturation across three learning domains: knowledge, skills, and attitudes.

2. Literature Review

Enculturation

The term enculturation was first used in the fields of anthropology and sociology (Grant, 2012); however, today, it is widely used in various disciplines. Tan (2014) defined enculturation as the "acquisition of culture, values, behaviors, beliefs, understandings, social norms, customs, rituals, and languages" (p. 393). In this study's context, acquisition is learning to socialize in the collegiate setting, where the graduate faculty models normative social standards. In such a setting, graduate students learn the standards to become "insiders" of the academic and graduate culture and attain a sense of identity. A person bearing the graduate faculty designation both performs a teaching function and supervises student research. Accordingly, enculturation occurs because of both "conscious and unconscious conditioning, through formal and informal means, and is often regarded as an ongoing, lifelong process" (p. 393).

In examining the evidence of enculturation, research has pointed to four phases: (a) *learning*, which is the acquisition of culture; (b) *remembering*, or the storage of culture; (c) *thinking*, or the processing of culture; and (d) *acting*, which is based on the use of culture (Lizardo et al., 2016). These phases appear to intersect with Bloom's taxonomy of learning levels (Krathwohl, 2002; Figure 1).

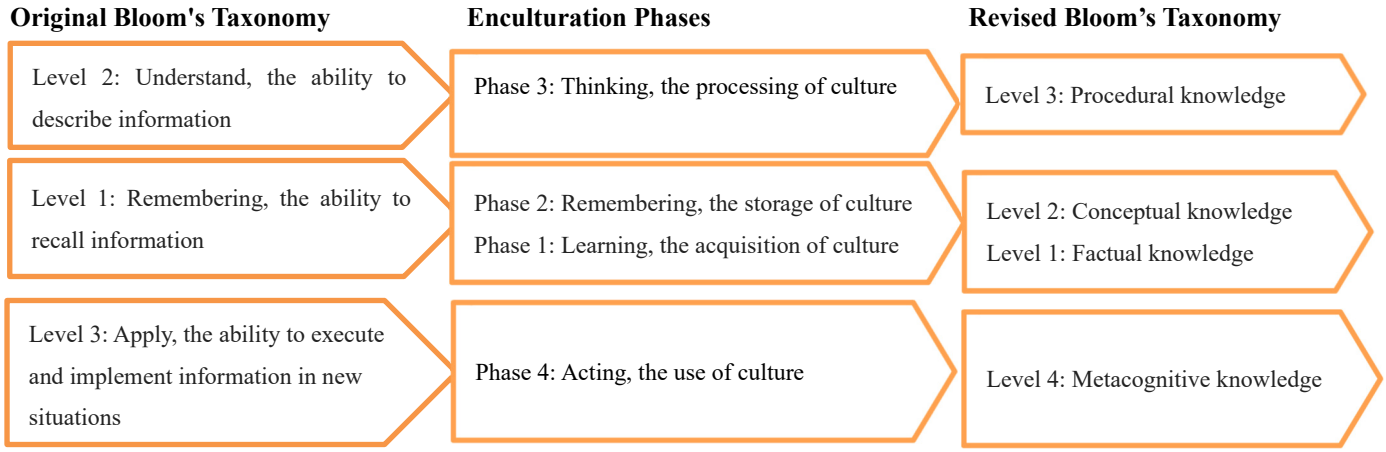


Figure 1. Graphical illustration of the intersectionality of the original Bloom's taxonomy, enculturation phases, and the revised Bloom's taxonomy

The academic community considers certain aspects of graduate culture unique, often centered on adult learners and faculty relationships. For instance, graduate students show greater attention to and engagement with *scholarship* than undergraduate students (Madsen, 1982). Therefore, the norms for being part of graduate culture are considered more rigorous, given certain expectations of maturity, particularly in academic discourse. Based on field evidence, norms are an important part of a community of practice, which, according to Cox (2005), are standards used to guide informal relations and understandings that "develop in mutual engagement on an appropriate joint enterprise" (p. 527). At the graduate level, learning often occurs through contestation, making norms a crucial part of the learning process. Norms refer to the expectations that govern behavior in classrooms and other learning spaces, both online and traditional face-to-face modalities. They vary from one faculty to another, even when established at the departmental level. These variations are observed across institutions of higher education, as well, and are occasionally field-specific. For the purpose of this work, this research is situated in the social sciences.

Enculturation, which is subsumed under the paradigm of culture, encompasses a group's social norms and values (Gardner et al., 2007). Further, it possesses certain properties (which will be examined in this study) that affect people, specifically graduate students (adult learners) and graduate faculty. Similarly, *communication* refers to the language spoken, unspoken, and written, and the shared understanding that serves as a vehicle for the exchange of ideas, which is one of the most important topics in the social sciences. Yet another aspect of this study is *professionalism,* which indicates the mode of interaction, both informal and formal, and forward-facing factors such as dress code.

Scholarship, from knowledge consumer to producer. Bloom's taxonomy is well known among the learning community, including adult learners at the graduate level (Krathwohl, 2002). Bloom's taxonomy is typically used at the graduate level to assess students as *consumer*s of existing knowledge bodies. Five of the taxonomy's six levels are knowledge, comprehension, application, analysis, and evaluation, and the sixth level, which indicates creation, is a property of new knowledge *production* that enables students to take *ownership* of their work.

Communication. Wlodkowski and Galbraith (2004) state that the "ways in which we communicate cannot be separated

from cultural practices and cultural context" (p. 142). For instance, citation, that is, giving credit to other researchers, is a general practice in the graduate learning environment. Most students demonstrate their learning by developing their awareness of the research that has already been conducted in their area of study. Accordingly, scholars write literature reviews to acknowledge the research that has already been conducted, and citing the sources used to support a claim is a way social scientists communicate what is known, particularly in writing.

When graduate students transition from knowledge consumption to production, their graduate learning experience undergoes a shift, whereby the students transform from using the existing body of knowledge to creating knowledge and taking ownership of their work. Table 1 depicts this aspect in the attitude category under ownership, with the starting point being awareness of the existing body of knowledge, followed by data collection, analysis, and use. This learning phase generally occurs when graduate students become familiar with various aspects of their research after understanding their research predecessors and themselves as leaders. Accordingly, this marks the students' transition from consumers to producers, which often changes how they explain and share their work.

Most graduate researchers are required to ensure clear articulation of their work in both written and verbal forms. Although rules pertaining to verbal communication are very limited at the graduate level, most graduate faculty members opine that one should make their claim with clarity and concision (Brookfield & Preskill, 2012). However, the associated writing expectation involves several rules. Graduate programs subscribe to several conventions, which are enforced as a requirement for writing papers, including manuscripts. Some commonly followed conventions in social sciences are compiled in the American Psychological Association (APA) manual, which conveys the full gamut of expectations for crediting other works, including citation style, the look and feel of academic papers, face validity, source types, and their use in academic spaces. Similarly, the Modern Language Association of America (MLA) offers a compilation of conventions typical to the field of linguistics and literature. Finally, despite being similar to the APA style, the Chicago style differs from APA in terms of formatting and citation style conventions.

Professionalism

Formal and informal approaches. Today, the name tent use is commonplace among graduate students. Generally, first names are used on name tents; however, dignitary titles are required in formal addresses and communications. Further, in the online platform, students are required to write their names, similar to how they write on a name tag in a face-to-face setting.

Appearance. Students have different expectations regarding dress code. Most program handbooks usually articulate this aspect vaguely, and it is usually not enforced unless there is any severely inappropriate conduct. However, faculty members and coaches usually remind their students to dress appropriately for the job they plan to occupy after graduation. Accordingly, graduate students typically dress in business casuals but wear more formal attire for presentations.

Some expectations remain regarding formality and informal exchanges, which include producing an argument paper or manuscript and communicating through email and in person. The members of a community of practice typically resort to informality during icebreakers and while exchanging pleasantries, whereas students and faculty espouse formality in their tones when writing correspondence, including academic papers and email.

Adult Learners

Knowles (1970) spearheaded many debates on the teaching of both young students and adult learners. Whereas pedagogy is the art and science of teaching young students, andragogy concerns adult learners; hence, pedagogy and andragogy differ in their learning and teaching approaches, yet they share some intersections not examined in this paper. Several researchers have extended Knowles's work, including Wlodkowski and Ginsberg (2017), who posited that adult learners take *ownership* of their learning, which indicates a significant shift that typically manifests in the relationship between faculty as research advisors and students as developing scholars (Kamler & Thomson, 2014). Such a shift occurs when the faculty's initiation is low, because the student, who is the scholar, assumes the responsibility of requesting a consultation with the faculty member, usually to present some evidence or information and to discuss how it seems to be shaping their research or changing the research trajectory.

Norms

Modern-day conflicts reflect some of the contestations manifested in the graduate learning discourse, which requires the communication of ideas or positions and sometimes results in negotiations to ensure understanding. Therefore, *respect* is often a norm in adult learning classrooms (Bohm, 2004). Consequently, students gain in-depth knowledge, develop a deep appreciation for the span of knowledge, and see learning as a social process (Brookfield & Preskill, 2012).

Scholars develop an awareness of aspects such as convergence and divergence, which necessitates *openness* and *tolerance* (Hacke, 2010). This is consistently mentioned along with diversity, whereby graduate students are required to consider positions that differ from their own. *Equity,* along this vein, is a challenge that graduate students are asked to consider, especially when it comes to who is left out. Even when complete inclusion is impractical, students can make appropriate

moral decisions while demonstrating an awareness of the limitations and ethical implications of such decisions. Further, the *ethics* course, which is generally consistent across graduate programs, is a crucial *leadership* framework, and many researchers opine that *mission* is the impetus for effective leadership (Shapiro & Stefkovich, 2016).

Graduate Student Disposition

Monette (1979) cited Paulo Friere's words, saying education is inherently political. As such, one of its purposes is to liberate. People and mannerisms cannot be separated from culture; they are not mutually exclusive either. Higher education institutions uphold social justice, partially because they highly value diversity. The rights of individuals enshrined in the United States Constitution, such as the First Amendment, create opportunities for rich learning through the contestation encountered by students and faculty in their learning and teaching experiences. When Asoodar et al. (2014) clarified that the learning community is a community of practice, they highlighted the importance of establishing rules and guidelines and ensuring a shared understanding of these practices that students are expected to "learn to adapt themselves to the norms, rules, and etiquette of the corresponding community" (p. 292). Accordingly, disposition is an imperative metric of graduate experience. The meta-analysis by Hattie (2016) supports the potential effect of disposition on students' learning outcomes, arguing that it is related to openness to learning, motivation to learn, persistence, and self-concept. This is typified by students taking *ownership* of their success.

According to Murrell et al. (2010), disposition is the "attitudes, values, moral commitment, and social justice" that they identify as the combination of knowledge and skills associated with "conceptual understanding, refinement of skills in guided application, and thoughtful reflection on practice" (p. 14,15). A deconstruction of this school of thought indicates that Murrell's definition is grounded in teacher preparation, recalling the study by Gardner et al. (2007) that focused on students' skills, habits, and dispositions in a doctoral program. Gardner et al. (2007) claimed that culture comprised activities, whereas "socialization is the process through which individuals acquire and incorporate an understanding of those activities" (p. 289). Putting culture (activities), enculturation (acquisition of knowledge of culture), and disposition (knowledge, skills, and attitude) into perspective, it is evident that there is an amalgamation, which has to do with the juxtaposition of what constitutes disposition. According to Murrell et al. (2010), disposition has a cognitive dimension, in which skill is an ability residing at the nexus of the cognitive and psychomotor domains (Popham, 2000). Further, disposition has an attitudinal component, reflecting individuals' affective responses, particularly in the graduate learning environment, where they, especially adult learners, acquire knowledge and skills through their motivation for learning (Hattie, 2016; Knowles, 1970). Research on adult learners links learner motivation and self-efficacy to learner success (Macakova & Wood, 2022). Moreover, it is clear that the goal of enculturation is the embodiment of graduate culture, which involves being an active member of the community of practice.

Definition of Terms

This study draws on several bodies of research, including the revised version of Bloom's taxonomy discussed by Krathwohl (2002), phases of enculturation (Lizardo et al., 2016), and other research on educational assessment (Murrell, 2010 & Popham, 2000), in order to construct the learning continuum used in designing the research instrument (see Appendix A). The terms below are used as part of the assessment language in the Graduate Student Disposition Rubric: Instructor version and the Student Assessment Scale. These are the operational definitions of the terms used in the four phases of the disposition instrument:

(1) Learning: Develop factual awareness, that is, the basic aspects one must know to become acquainted with or solve problems within a discipline.

(2) Remembering: Have conceptual knowledge, which is typified by the interrelationships among basic elements within a larger structure that enable them to function together.

(3) Thinking: The ability to describe procedural knowledge of how to do things, including methods, criteria, and techniques.

(4) Acting: Metacognitively demonstrates awareness and knowledge of one's own cognition; this supports appropriate adaptation of the manner in which one thinks and operates.

Research Questions

1. How do first-year doctoral students rate on the enculturation scale compared with second, third, and fourth-year students?

2. What is the degree of relationship among the categories tested in the instrument at the end of years 1, 2, 3, and 4?

3. Is there a statistically significant difference between students' and the instructor's ratings?

Research Context

First, this study began with a literature review of enculturation, examining the social learning process underlying graduate students' dispositions. Secondly, students' acquisition of knowledge, skills, and attitudes regarding graduate culture was explored. Third, based on the reviewed literature, a construct informing the Graduate Student Disposition Rubric was developed. The rubric was converted into the Student Assessment Scale to encapsulate students' knowledge, skills, and attitudes toward graduate culture and considered the process of enculturation, in an assessment mode, based on Bloom's taxonomy. Fourth, this study addressed three research questions and used the Student Assessment Scale as a data collection instrument. However, the scale's validity properties, which had been grounded in the literature, resulted in the construct validity matrix in Appendix A. The instrument was distributed among the social science graduate faculty of multiple higher education institutions, and their feedback was used to improve the instrument's clarity. Further, using the instrument, the graduate students rated themselves, and the graduate faculty members rated 10 of their students in the social sciences. The initial survey targeted 30 participants in the first test. Then, data collection was extended beyond the reliability testing phase by continuing to collect data from students at multiple higher education institutions in the Midwest using the instrument's student version.

Research Significance

Many aspects of graduate culture remain unknown because of the limited availability of research on this topic. Furthermore, research on the alignment between enculturation and disposition is lacking. This aspect is considered in the first and second research questions. It was Hattie's (2016) opinion that a set of dispositions can potentially influence students' schooling outcomes, and this claim is well documented. Accordingly, evaluating the association between graduate student disposition and enculturation is imperative, particularly for graduate faculty who teach, mentor, and coach students through the research process. The graduate faculty can use the Graduate Student Disposition Rubric (Table 1) to assess their students, whereas the students can use the Student Assessment Scale. Subsequently, the two sets of results can be compared. The rubric and scale are tools that can support faculty–student mentoring. Conversely, they can facilitate open dialogue and determine the best way to support students on their learning journey. Since learning is not static but a continuum, the results from this scale should inform teaching and mentoring and be repeated throughout the graduate learning experience. That said, this research contributes to the body of knowledge.

3. Method

Based on evidence from earlier studies, indices to assess graduate student disposition were compiled. The indices were used to develop the assessment instrument and were validated by field experts, including graduate faculty members in the social sciences from multiple institutions in the Midwest, to ensure clarity and representativeness of criteria.

The student assessment instrument comprised seven questions, each with four response options. The first two questions targeted knowledge, the third and fourth addressed skills, and the fifth through seventh targeted attitude. The response options a and b represented phases one and two, respectively, and were classified as learning and remembering on the enculturation side; they were related to levels one and two of the revised Bloom's taxonomy and described as having factual and conceptual knowledge. Option C on the scale represented phase three, which was thinking in the enculturation process, attributed to level two of Bloom's taxonomy: understanding, known as having a procedural understanding. Similarly, option d represented an action in the enculturation process. This was related to application, in the original Bloom's taxonomy, and level four, adapting and operating metacognitively based on one's awareness of self and others, in the revised version (Krathwohl 2002; Lizardo et al., 2016).

After data collection, the instrument was converted into a 4-point Likert scale with a=Phase 1 (Learning), b=Phase 2 (Remembering), c=Phase 3 (Thinking), and d=Phase 4 (Acting). The completed instruments were categorized into year 1, year 2, year 3, and year 4 students. Using Minitab Statistical Software 22, descriptive statistics were used to test the mean of the students in years 1, 2, 3, and 4. Additionally, one-way analysis of variance (ANOVA) was conducted to assess group variance and determine whether a statistically significant difference existed among the groups for the categories tested using the instrument. In this vein, a hypothesis test was included in the analysis to further inform the groups' results (H_0 assumes all means are equal, while H_1 assumes not all means are equal). These results showed the students' rates by group on the enculturation scale, as required by research question 1. Subsequently, to address research question 2, item analysis was conducted to examine survey characteristics, and Pearson's correlation was used to examine relationships among variables. For research question 3, to compare the assessments conducted by students and faculty, a two-sample t-test was used to determine the statistical significance of the difference in ratings, with a 95% confidence interval (CI). The following formula was used to test the hypothesis: H_0: $\mu_1 - \mu_2 = 0$ vs. H_1: $\mu_1 - \mu_2 \neq 0$, to further determine the difference between the students' and instructors' ratings. The students' tests were performed under the teaching of the participating faculty members. Each participating faculty member selected volunteer students to be assessed and to assess his/herself using the scale. The faculty and student data points were labeled as instructor (I) or student (S), and the results were compared.

Further, purposive sampling ensured that only the participants at the end of years 1, 2, 3, and 4 of the graduate programs were included in the study. A spreadsheet listing all the graduate students was created, and each subject was assigned a sample ID, which was attached to their instrument and used to track returned surveys. The instrument was disseminated through Google Forms and required only electronic responses. Finally, data were collected over a 3-month period from multiple higher education institutions considering specific program criteria, a 4-year start-to-completion structure, and the graduate-level social science programs offered in the Midwest.

Table 1. Instructors' Version of the Graduate Student Disposition Rubric

Disposition	**Phase 1: Learning**	**Phase 2: Remembering**	**Phase 3: Thinking**	**Phase 4: Acting**
Knowledge	Norms; gain factual awareness of the norms of the setting (*Openness, Respect/tolerance, Equity, Ethics, Mission)*	Having conceptual recollection of the norms of the setting (*Openness, Respect/tolerance, Equity, Ethics, Mission)*	Ability to describe procedural norms of the setting (*Openness, Respect/tolerance, Equity, Ethics, Mission)*	Put the norms in action, by demonstrating metacognitive knowledge using appropriate contextual and conditional mastery of the setting (*Openness, Respect/tolerance, Equity, Ethics, Mission)*
	Communication; possessing factual knowledge of writing and verbal conventions of the field	Display conceptual knowledge in recalling the principles of writing and verbal conventions of the field	Demonstrate procedural knowledge through the ability to translate and extrapolate from written material and verbal information	Espouse metacognitive knowledge; using the conventions of the field, produce written and verbal information that is conceptually and contextually appropriate
Skills	Scholarship; having factual awareness of research terminology, details, and elements used by earlier researchers on a subject matter	Having a conceptual recollection of research taxonomies and the theoretical base (episteme) used by earlier researchers on a subject matter	Can procedurally draw on earlier knowledge of research using an appropriate method based on the field knowledge of valid criteria and subject matter	Use metacognitive knowledge of research practices in student's scholarship, paying thorough attention to oneself as a researcher and evidence of contextual and conditional knowledge
	Professionalism; having an awareness of forward-facing interaction with others, and things with knowledge of details and elements concerning self-presentation (appearance) and interaction with others	Having a recollection of models and structure pertaining to forward-facing interaction with others and things with knowledge of details and elements concerning self-presentation (appearance) and interaction with others	Demonstrate procedural knowledge of techniques to determine an appropriate method pertaining to forward-facing interaction with others and things with knowledge of details and elements concerning self-presentation (appearance) and interaction with others	Use a metacognitive approach to forward-facing interaction with others and things with knowledge of details and elements concerning self-presentation (appearance) and interaction with others
Attitudes	Motivation; having an awareness of learning opportunities of interest, to engage	Conceptually, and self-efficaciously, seek learning resources	Procedurally accept essential/reject nonessential contributions	Metacognitively adapt multidimensional solutions to complement one's position
	Persistence; being aware of the importance of consistent classroom meetings; peer and student–faculty engagement; and accounting for dates, schedules, and learning activities	Showing conceptual accountability in attending classroom meetings; peer and student–faculty engagement; and accounting for dates, schedules, and learning activities culminating in task completion	Use procedural knowledge of planning and inviting others to participate in learning activities, ensuring the recognition of individual contribution to the community of practice	Metacognitively use a proactive approach to plan activities for self and others using available resources
	Ownership; gain awareness of learning opportunities in the program in an effort to expand self-knowledge of leadership, organization, professional ethics, and existing research based on program-provided resources	Identify learning opportunities in leadership, organization, professional ethics, and data collection beyond the classroom, including collaboration with peers and using the resources within the system	Navigate micro and macro systems to self-support the learning and practice of leadership, organization, professional ethics, and data collection and analysis by partnering with faculty members	Use various, yet, appropriate forms of learning to independently realize the goals of leadership, organization, professional ethics, and data collection and analysis and use

Students' Version of the Student Assessment Scale

Among the research subjects, students were asked to indicate their year, among years 1, 2, 3, and 4, in the program. Further, they were required to identify their graduate program and indicate whether they were interested in the study's results and if they wanted the results to be provided at the conclusion of the study. The survey questions are as follows:

1. Norms

(a) I have factual awareness of the norms of the setting (e.g., *Openness, Respect/tolerance, Equity, Ethics, Mission*).

(b) I have a conceptual recollection of the norms of the setting (e.g., *Openness, Respect/tolerance, Equity, Ethics, Mission*).

(c) I am able to describe the procedural norms of the setting (e.g., *Openness, Respect/tolerance, Equity, Ethics, Mission*).

(d) I can put the norms in action by demonstrating metacognitive knowledge through appropriate contextual and conditional mastery (e.g., *Openness, Respect/tolerance, Equity, Ethics, Mission*).

2. Communication

(a) I possess factual knowledge of the writing and verbal conventions of the field.

(b) I have conceptual knowledge in recalling the principles of writing and verbal conventions of the field.

(c) I can demonstrate procedural knowledge through my ability to translate and extrapolate from written materials and verbal information.

(d) I espouse metacognitive knowledge by using conventions of the field to produce written and verbal information that is conceptually and contextually appropriate.

3. Scholarship

(a) I have a factual awareness of the research terminology, details, and elements used by earlier researchers on my subject matter.

(b) I have a conceptual recollection of research taxonomies and the theoretical base (episteme) used by earlier researchers on a subject matter.

(c) I can procedurally draw on earlier research knowledge using an appropriate method based on my field knowledge of valid criteria and subject matter.

(d) I can employ the metacognitive skills of research practices in my scholarship by paying thorough attention to the self as a researcher and evidence of contextual and conditional knowledge.

4. Professionalism

(a) I am aware of forward-facing interactions with others and things with knowledge of details and elements concerning self-presentation (appearance) and interactions with others.

(b) I have a recollection of models and structures pertaining to forward-facing interactions with others and things, with the knowledge of details and elements pertaining to self-presentation (appearance) and interactions with others.

(c) I can demonstrate procedural knowledge of techniques to determine the appropriate method pertaining to forward-facing interactions with others and things, with knowledge of details and elements concerning self-presentation (appearance) and interaction with others.

(d) I use various approaches in forward-facing interactions with others and things, with knowledge of details and elements concerning self-presentation (appearance) and interaction with others.

5. Motivation

(a) I am aware of learning opportunities of interest, to engage.

(b) I have knowledge of learning resources that support my interest.

(c) I can accept essential/reject nonessential contributions.

(d) I can adapt multidimensional solutions to complement my position.

6. Persistence

(a) I am aware of the importance of having consistent classroom, peer, and student–faculty engagements, taking into account dates, schedules, and learning activities.

(b) I take accountability for attending classroom meetings; ensuring peer and student–faculty engagement; and accounting for dates, schedules, and learning activities that culminate in task completion.

(c) I have procedural knowledge of planning and inviting others to participate in learning activities, ensuring recognition for individual contribution to the community of practice.

(d) I use a proactive approach to plan activities involving the self and others using available resources.

7. Ownership

(a) I am aware of the program's learning opportunities to expand my knowledge of leadership, organization, professional ethics, and existing research based on school-provided resources.

(b) I can identify learning opportunities for leadership, organization, professional ethics, and data use beyond the classroom, which include collaborating with peers and using the resources within the system.

(c) I can navigate internal and external systems to support the learning and practice of leadership, organization, professional ethics, and data collection and analysis while partnering with faculty members.

(d) I use various appropriate forms of learning to independently realize my goals of leadership, organization, professional ethics, and data collection, analysis, and use.

Ethical Considerations

Research participants comprised adult learners in graduate programs and faculty members. Their participation was strictly voluntary. Both the faculty and student versions of the assessment instrument required an average of 8–10 minutes to complete. This was not a significant time commitment, being offset by the benefit of contributing to the body of knowledge and enhancing awareness of growth and the needs of graduate students. The instrument was reviewed by faculty members from not only the researcher's home institution but also other institutions that teach and support graduate students with a similar structure, namely, four-year social science graduate programs in the Midwest. Their feedback was also used to modify the instrument. In one instance, the term appearance was recommended for inclusion in the dress code section. In other instances, feedback was provided to enhance clarity and research construct.

This study was not intended to focus on a specific institution because the goal was not to assess a specific program. Therefore, the instrument was not tallied by institution; rather, the data were aggregated, and the results centered on the students' enculturation, based on their year in the program and progression on the disposition scale.

4. Results and Discussion

Demographics of respondents: Sample by year

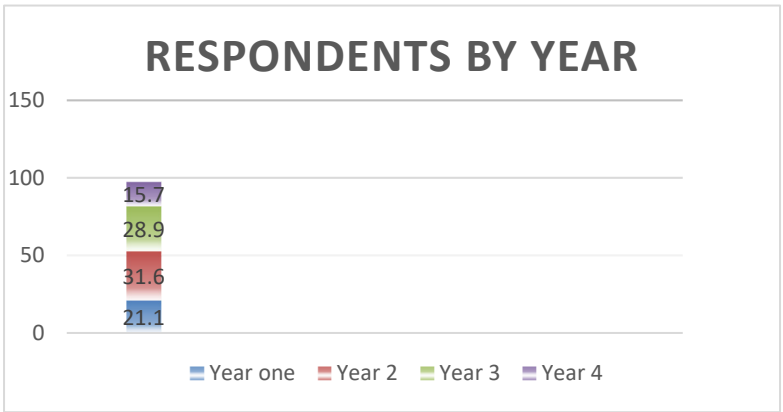


Figure 2. Demographic representation of study groups by percentage: Group 1: year 1 students=21.1, Group 2: year 2 students=31.6, Group 3: year 3 students=28.9, and Group 4: year 4 students=15.7

The student's version of the survey was administered to 100 graduate students from multiple higher education institutions in the Midwest. The survey targeted students at the end of the academic year to ensure that their rankings aligned with their year of study. All the participants were enrolled in a 4-year-long social science graduate program. In this study, participants' personal information, such as gender and other demographic data, was not collected. Among the respondents, 15.7% were at the end of year 4 of their graduate studies, 28.9% were at the end of year 3, 31.6% were at the end of year

2, and 21.1% were at the end of year 1. Incomplete responses, as well as the responses in the All But Dissertation (ABD) category, were eliminated. For research question three, which comprised the test version of determining whether a significant gap existed between instructors' and students' assessments, only the data from year 3 students were used, representing 28.9% of the entire study sample.

Addressing the first research question

Table 2. Descriptive Statistics for Year 1

Variable	Mean	SE Mean	St. Dev.	Minimum	Q1	Median	Q3	Mode	N for Mode
Norms	3.33333	0.372678	1.11803	1	2.5	4	4	4	6
Communication	3.11111	0.423099	1.26930	1	2	4	4	4	5
Scholarship	2.88889	0.484322	1.45297	1	1	4	4	4	5
Professionalism	2.88889	0.423099	1.26930	1	1.5	3	4	4	4
Motivation	2.88889	0.388889	1.16667	1	2	3	4	3	4
Persistence	3.11111	0.454742	1.36423	1	1.5	4	4	4	6
Ownership	3	0.5	1.5	1	1	4	4	4	6

SE = standard error; St. Dev. = standard deviation; Q1 first quarter, lowest of the dataset; Q3 third quartile, upper limit of the dataset.

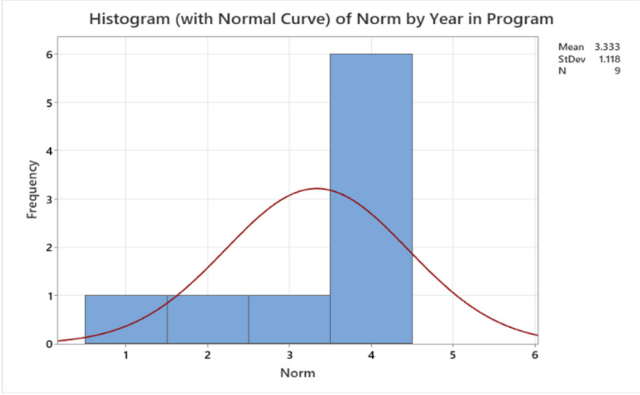


Figure 3. Histogram (with normal curve) of norms by year in program: Horizontal x-axis shows categories of interest, with Phases 1 (learning), 2 (remembering), and 3 (thinking) having 1 in each category and Phase 4 (acting) having 6. The vertical y-axis represents the frequency of selecting the categories being measured. The bell curve indicates how the data points are showing up in relation to the mean; these data are skewed left.

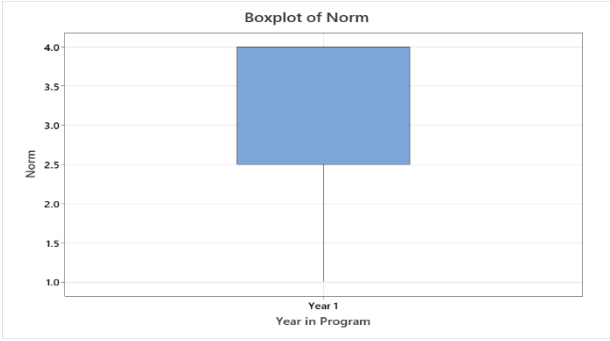


Figure 4. Boxplot presents the distribution of responses: The whisker shows a minimum of 1, first quartile 2.5, and third quartile 4

Descriptive statistics (see Table 2) and the graphical representations specific to the norms category in Figures 3 and 4 show the distribution of responses among year 1 students: most samples fell in Phase 4, the metacognition phase in the knowledge domain. The illustrations in Figure 4's boxplot indicate that the minimum rating is 1; however, the interquartile range is 2.5-4, which clarifies the spread of the middle of the reported data and is determined by the difference between Q1 and Q3. Furthermore, in analyzing the rate at which the responses were spread between phases 1 and 4, results indicate a mean of 3.3. Therefore, the average graduate student will probably acquire procedural knowledge, indicating Phase 3 of the domain, by the end of year 1.

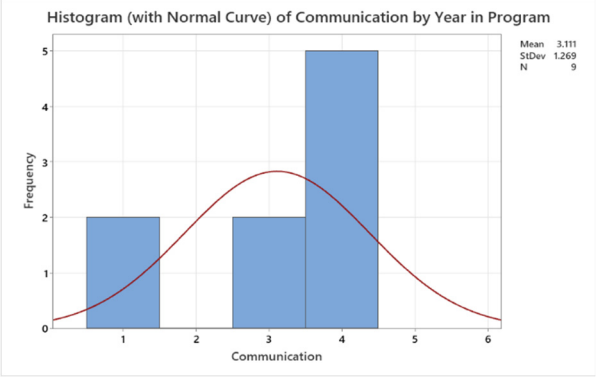


Figure 5. Histogram (with normal curve) of communication by year in program: The y- and x-axes indicate that Phases 1, 2, 3, and 4 had frequencies 2, 0, 2, and 5, respectively

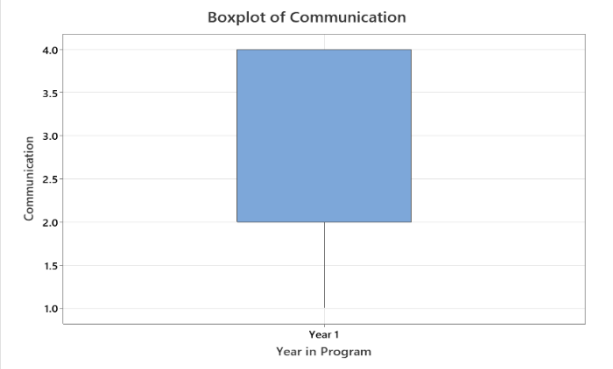


Figure 6. Boxplot distribution indicating a minimum of 1, first quartile 2, and third quartile 4

The results of the enculturation study's communication category indicate a mean of 3.1 on the 1–4 scale (see Table 2). It is noted that the majority of the responses were in the acting category, that is, phase 4, which indicates metacognition. The remaining responses were ranked in Phase 1 (learning) and Phase 3 (thinking). Based on the data, the students at the end of year 1 of their graduate studies were unlikely to score under Phase 2 (remembering; Figures 5 and 6).

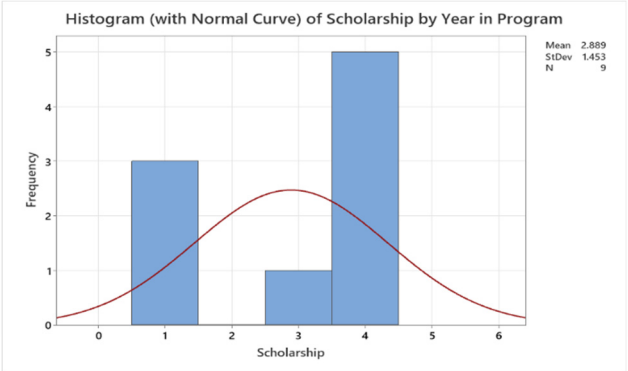


Figure 7. Histogram (with normal curve) of scholarship by year in program: The y- and x-axes indicate that the frequencies of Phases 1, 2, 3, 4 were 3, 0, 1, and 5, respectively.

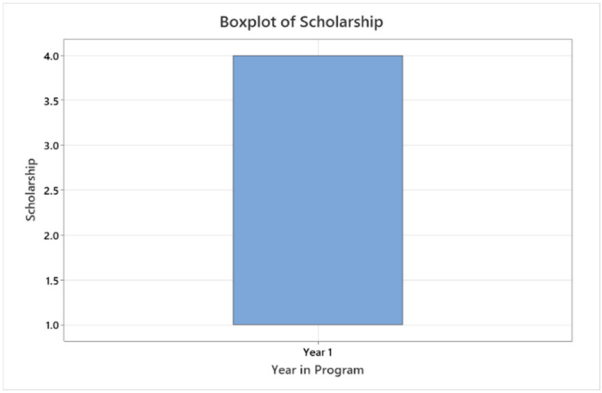


Figure 8. Boxplot distribution revealing the first quartile of 1 and the third quartile of 4

Based on the study results depicted in Table 2, the average year 1 student scored 2.8 on the scholarship side of the scale. Figures 7 and 8 illustrate the spread of ratings; however, most respondents rated themselves in Phase 4 at the end of year 1 and adopted the metacognitive skills, focusing on themselves as researchers and obtaining evidence of contextual and conditional knowledge. Further, there were no ratings under Phase 2, which involved a conceptual recollection of research taxonomies and the theoretical base (episteme).

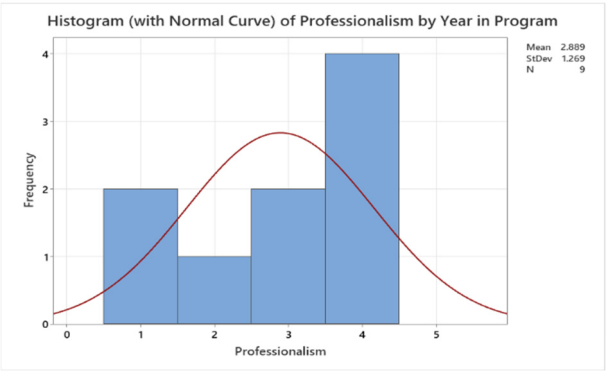


Figure 9. Histogram (with normal curve) of professionalism by year in program: The y- and x-axes indicate that Phases 1, 2, 3, and 4 had frequencies 2, 1, 2, and 4, respectively

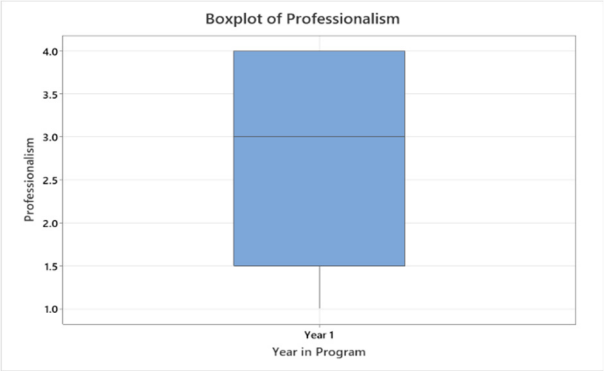


Figure 10. Boxplot distribution of professionalism indicates a minimum of 1, first quartile of 1.5, median of 3, and third quartile of 4

Year 1 students' mean score for professionalism skills was 2.8 on the 4-point scale. Figures 9 and 10 indicate that the spread of the responses, and the boxplot clarify that the minimum was 1, lower quartile 1.5, median 3, and upper quartile 4. Nonetheless, the majority ranked in Phase 4 using a metacognitive approach in forward-facing interactions with others and things and having a knowledge of the details and elements related to self-presentation (appearance) and interaction with others.

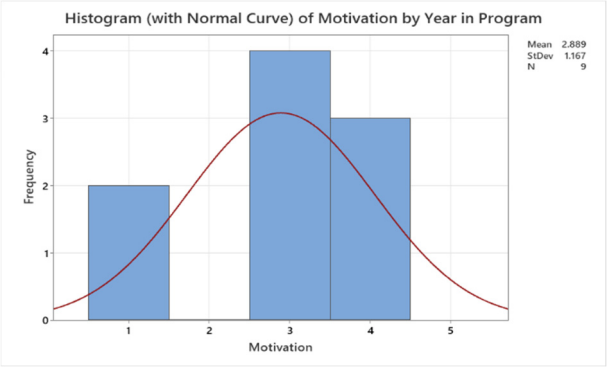


Figure 11. Histogram (with normal curve) of motivation by year in program: The y- and x-axes indicate that Phases 1, 2, 3, and 4 had frequencies 2, 0, 4, and 5, respectively

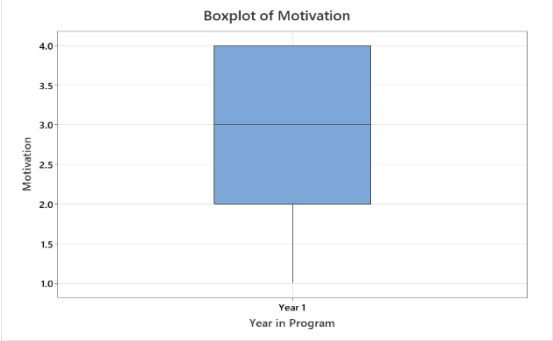


Figure 12. Boxplot distribution of motivation indicates a minimum of 1, first quartile of 2, median of 3, and third quartile of 4

Regarding the study's attitudinal dimension, the average score for the year one sample in this category was 2.8. However, Figures 11 and 12 show that there were more responses in the Phase 3 category, that is, the ability to demonstrate procedural responses to others through questioning.

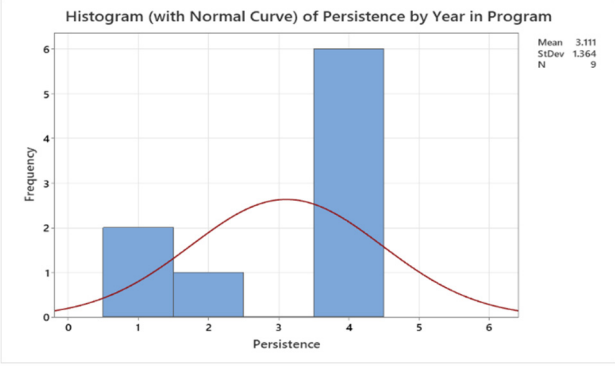


Figure 13. Histogram (with normal curve) of persistence: The y- and x-axes indicate that Phases 1, 2, 3, and 4 had frequencies 2, 1, 0, and 6, respectively

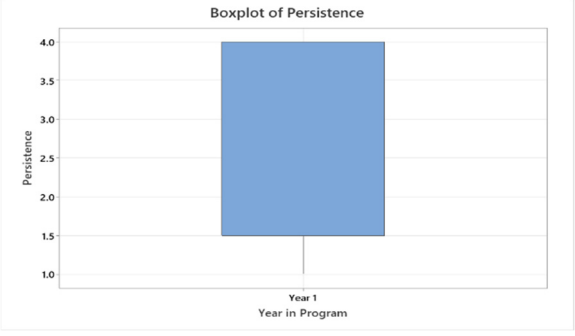


Figure 14. Boxplot distribution of persistence showing a minimum of 1, first quartile 1.5, and third quartile 4

The second attitudinal scale category was persistence. The majority of the respondents at the end of year one were in Phase 4 (Figures 13 and 14), that is, a proactive approach to planning activities with respect to the self and others, using available resources. The interquartile range was 1.5-4. Nonetheless, the samples' mean score was 2.8 on the 4-point scale.

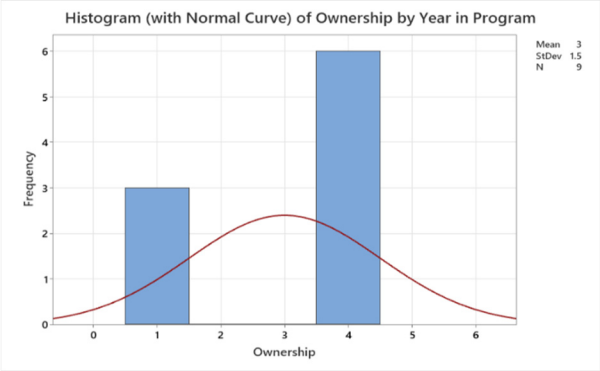


Figure 15. Histogram (with normal curve) of ownership: The y- and x-axes indicate that Phase 1 had 3, Phases 2 and 3 had 0, and Phase 4 had 6

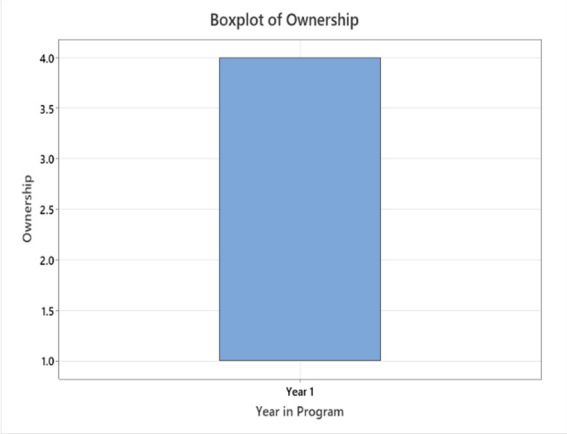


Figure 16. Boxplot distribution of ownership depicting the first quartile of 1 and the third quartile of 4

The last category in the attitudinal scale is ownership. Based on the results depicted in Table 2, students, on average, ranked three on the 4-point scale at the end of Year 1. The boxplot in Figure 16 indicates the spread of data across the four rankings. However, Figure 15 highlights more specific data points, including gaps in responses. However, the majority of responses were at a 4 on the scale, indicating the use of appropriate and varied learning strategies to independently achieve the goals of leadership, organization, professional ethics, and data collection, analysis, and utilization. The other responses fell under Phase 1, which focused on increasing awareness of learning opportunities in the program to expand self-knowledge of leadership, organization, professional ethics, and existing research based on school-provided resources.

Table 3. Descriptive Statistics for Year 2

Variable	Mean	SE Mean	St. Dev	Minimum	Q1	Median	Mode	N for Mode
Norms	3.25	0.278660	0.965307	2	2	4	4	7
Communication	3.33333	0.256235	0.887625	2	2.25	4	4	7
Scholarship	3.08333	0.192996	0.668558	2	3	3	3	7
Professionalism	2.58333	0.357990	1.24011	1	1.25	2.5	4	4
Motivation	2.75	0.304636	1.05529	1	2	2.5	2	5
Persistence	2.83333	0.297294	1.02986	1	2	3	2, 4	4
Ownership	2.91667	0.336162	1.16450	1	2	3	4	5

SE = standard error; St. Dev. = standard deviation

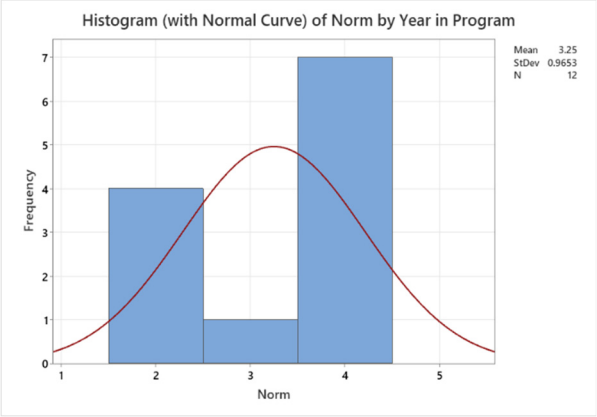


Figure 17. Histogram (with normal curve) of norms by year in program: The y- and x-axes indicate that Phases 1, 2, 3, and 4 had frequencies 0, 4, 1, and 7, respectively

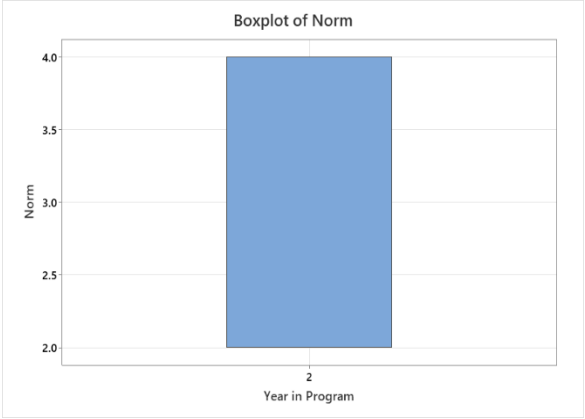


Figure 18. Boxplot distribution of norms depicting the first quartile of 2 and the third quartile of 4

In the knowledge domain, the average norms score for students at the end of year 2 was 3.5 (see Table 3). This signifies the thinking phase, typified by students' ability to describe the procedural norms of the setting (openness, respect/tolerance, equity, ethics, and mission). Figure 17 shows no ratings in Phase 1, consistent with the illustration in Figure 18. Moreover, the majority of the ratings were in Phase 4, with three receiving the lowest ranking (Figure 17).

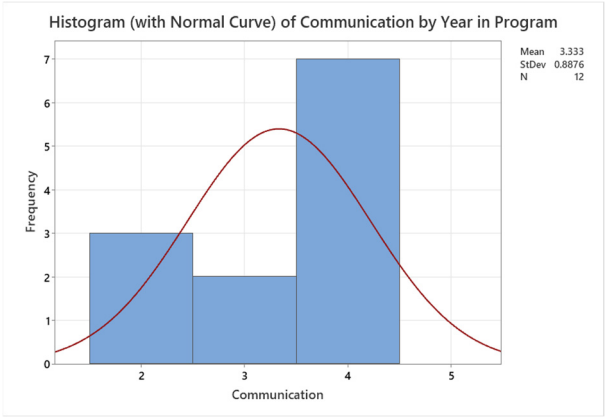


Figure 19. Histogram (with normal curve) of communication by year in program: The y- and x-axes indicate that Phase 1 had 0, Phase 2 had 3, Phase 3 had 2, and Phase 4 had 7

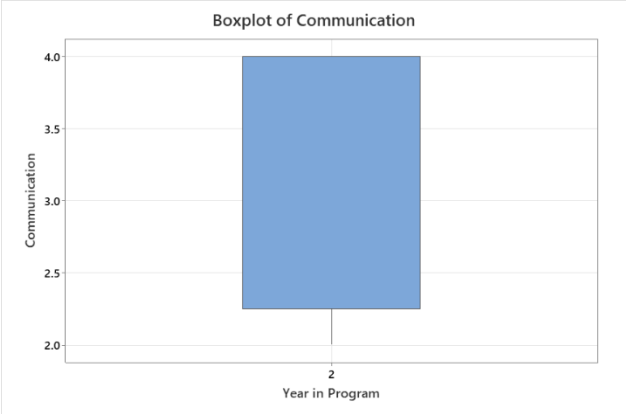


Figure 20. Boxplot distribution of communication showing a minimum of 2, first quartile of 2.25, and third quartile of 4

Regarding the communication aspect of the test, the results of the students at the end of year 2 had a mean of 3.3 (Table 3), indicating their ability to demonstrate procedural knowledge by translating and extrapolating from written and verbal material. Figures 19 and 20 indicate that the ratings ranged from 2 to 4.

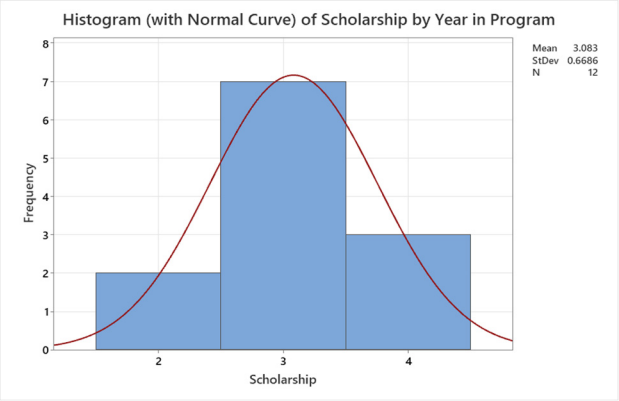


Figure 21. Histogram (with normal curve) of scholarship by year in program: The y- and x-axes indicate that Phase 1 had 0, Phase 2 had 2, Phase 3 had 7, and Phase 4 had 3

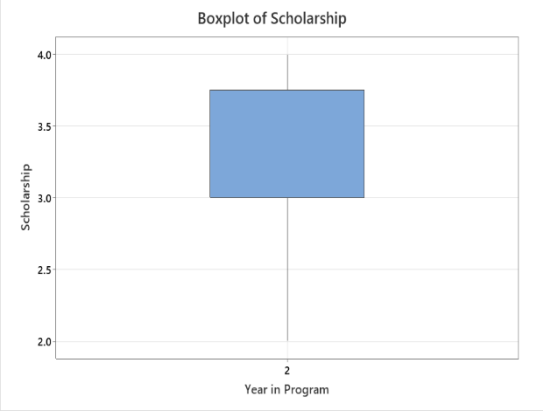


Figure 22. Boxplot distribution of scholarship, indicating a minimum of 2, a first quartile of 3, a third quartile of 3.75, and an upper limit of 4

For the skills category, the results from students at the end of year 2 revealed the average to be 3.8, indicating their ability to procedurally draw on earlier research knowledge using an appropriate method based on the field knowledge of valid criteria and subject matter. According to Figures 21 and 22, the most prominent rating on the scale was 3; however, the minimum was 2. The interquartile range was narrow, between 3 and 3.75, as shown in the boxplot (Figure 22).

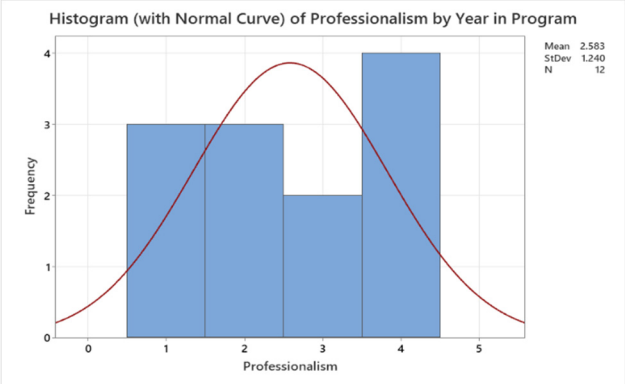


Figure 23. Histogram (with normal curve) of professionalism by year in program: The y- and x-axes indicate that Phase 1 had 3, Phase 2 had 3, Phase 3 had 2, and Phase 4 had 4

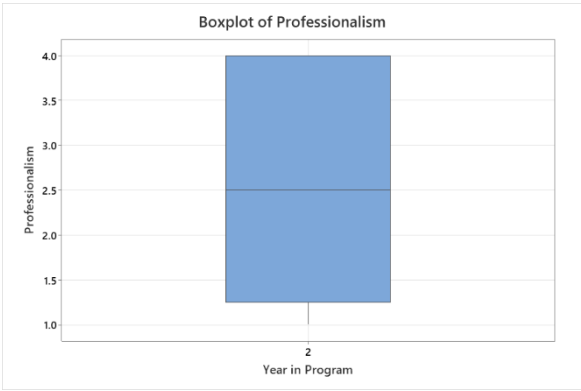


Figure 24. Boxplot distribution of professionalism, indicating a minimum of 1, a first quartile of 1.25, a median of 2.5, and a third quartile of 4

Professionalism is an aspect of the skills dimension. The average for students at the end of year 2 was 2.5, indicating their recollection of models and structures pertaining to forward-facing interactions with others and things, and the knowledge of details and elements related to self-presentation (appearance) and interaction with others. The interquartile range from low 1.25, the median was 2.5, and the upper quartile was 4 (Figure 24). However, Figure 23 indicates that 4 was the most commonly selected rating on the rating scale.

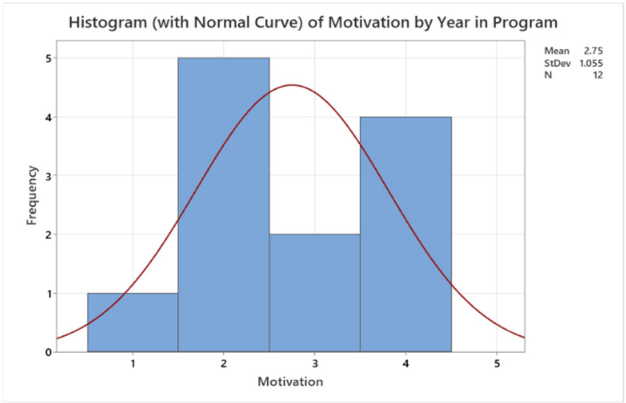


Figure 25. Histogram (with normal curve) of communication by year in program: The y- and x-axes indicate that Phase 1 had 1, Phase 2 had 5, Phase 3 had 2, and Phase 4 had 4

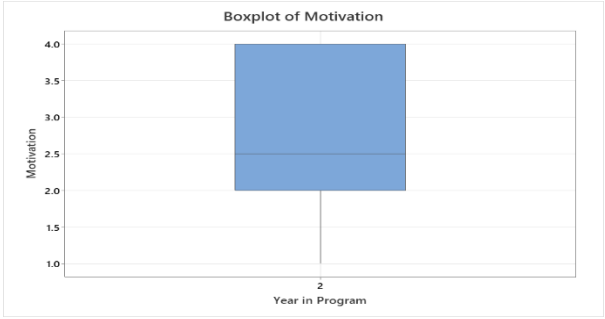


Figure 26. Boxplot distribution of motivation reveals a minimum of 1, first quartile of 2, median of 2.5, and third quartile of 4

In the attitudinal region, the result on motivation from students at the end of year 2 was 2.75 (see Table 3), which is in the remembering phase. This is also true of most students' ratings. Remembering was followed by Phase 4 (acting) and then Phase 3 (thinking), whereas Phase 1 (learning) received the lowest rating (Figure 25). According to Figure 26, the lower quartile was 2, the median was 2.5, and the upper quartile was 4.

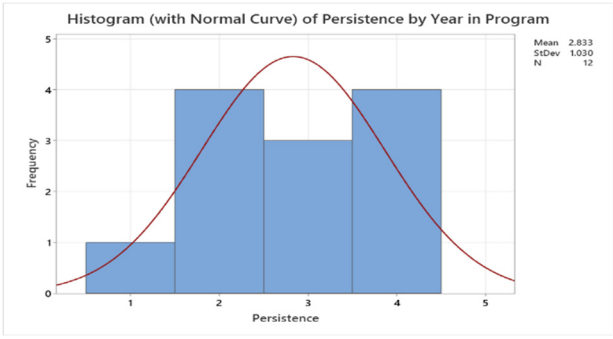


Figure 27. Histogram (with normal curve) of persistence by year in program: The y- and x-axes indicate that Phase 1 had 1, Phase 2 had 4, Phase 3 had 3, and Phase 4 had 4

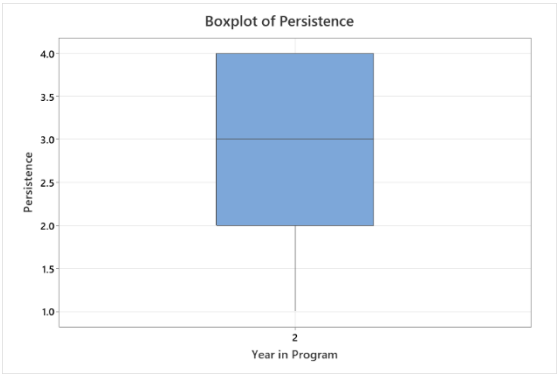


Figure 28. Boxplot distribution of persistence depicting a minimum of 1, first quartile of 2, median of 3, and third quartile of 4

Persistence, the second category in the attitudinal area, received a mean score of 2.8 and was in the remembering phase (Table 3). Figure 27 indicates that 2 and 4 were similarly selected, 1 received the lowest response, and 3 was slightly close to the selections of 2 and 4. The spread of responses indicated a median score of 3 (Figure 28).

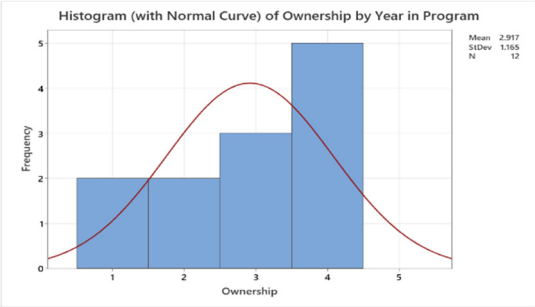


Figure 29. Histogram (with normal curve) of ownership by year in program: The y- and x-axes indicate that Phase 1 had 2, Phase 2 had 2, Phase 3 had 3, and Phase 4 had 5

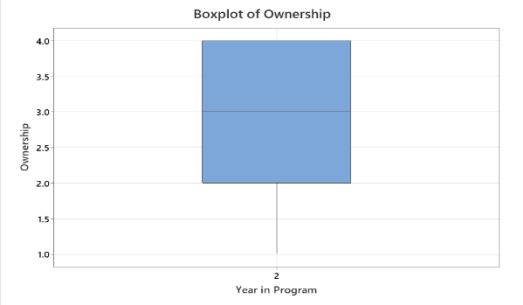


Figure 30. Boxplot distribution of ownership, indicating a minimum of 1, first quartile of 2, median of 3, and third quartile of 4

Ownership is the attitudinal area of this study. The results for students at the end of year 2 indicate a mean of 2.9 (Table 3), which is in the remembering phase. Therefore, the students can identify learning opportunities for leadership, organization, professional ethics, and data use beyond the classroom, including collaborating with peers and using the resources within the system. However, 1 and 2 had similar response rates, 3 was slightly higher than the others, and 4 received the most responses (Figure 29). Figure 30 shows that the median score was 3, indicating a wider spread of data points between 2 and 4 than in other groups.

Table 4. Descriptive Statistics for Year 3

Variable	Mean	SE Mean	St. Dev.	Minimum	Q1	Median	Q3	Mode	N for Mode
Norms	3.54545	0.312283	1.03573	1	4	4	4	4	9
Communication	3.54545	0.247299	0.820200	2	3	4	4	4	8
Scholarship	3.36364	0.203279	0.674200	2	3	3	4	3, 4	5
Professionalism	3.18182	0.295979	0.981650	1	3	3	4	4	5
Motivation	3.54545	0.281672	0.934199	1	3	4	4	4	8
Persistence	3.81818	0.181818	0.603023	2	4	4	4	4	10
Ownership	3.27273	0.304240	1.00905	1	3	4	4	4	6

SE = standard error; St. Dev. = standard deviation

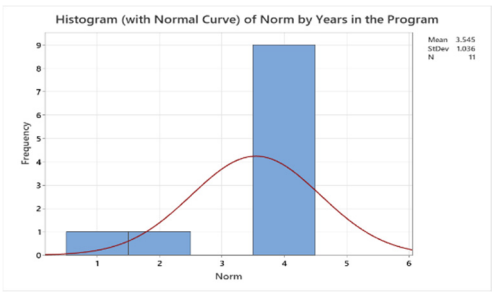


Figure 31. Histogram (with normal curve) of norms by year in program: The y- and x-axes indicate that Phases 1 and 2 had 1 each, Phase 3 had 0, and Phase 4 had 9

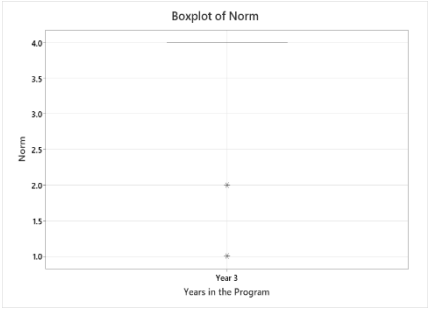


Figure 32. Boxplot distribution of norms showing outlier asterisks corresponding to 1 and 2, and an upper limit of 4

In the instrument's knowledge domain, norms for the students at the end of year 3 received an average of 3.5 (see Table 4), indicating the thinking phase (the ability to describe the procedural norms of the setting). Figures 31 and 32 reveal that data points did not spread out. Respondents mostly selected Phase 4 (acting) and rarely selected Phases 1 and 2; further, none selected Phase 3 (Figure 32).

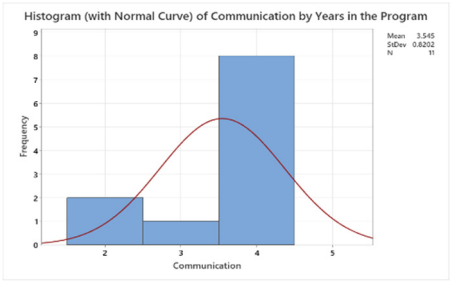


Figure 33. Histogram (with normal curve) of communication by year in program: The y- and x-axes do not show Phase 1, but indicate that Phase 2 had 2, Phase 3 had 1, and Phase 4 had 8

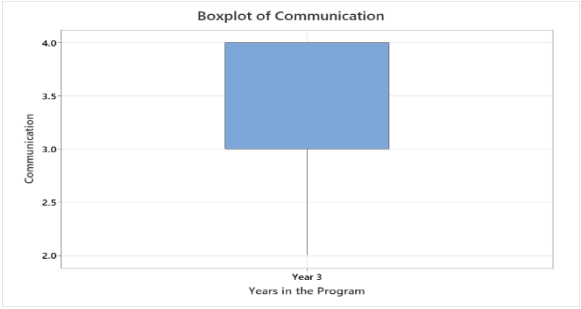


Figure 34. Boxplot distribution of communication, indicating a minimum of 2, first quartile of 3, and third quartile of 4

In the knowledge domain, communication for students at the end of year 3 had a mean score of 3.5 (see Table 4), indicating the Thinking phase (typified by students' ability to demonstrate procedural knowledge by translating and extrapolating from written and verbal information). Figures 33 and 34 indicate that Phase 4 was mostly selected, whereas Phase 3 was rarely selected; further, two had low selection, and one had no selection. The boxplot indicates that the data were mostly spread out between 3 and 4, whereas the minimum value on the selected scale was 2.

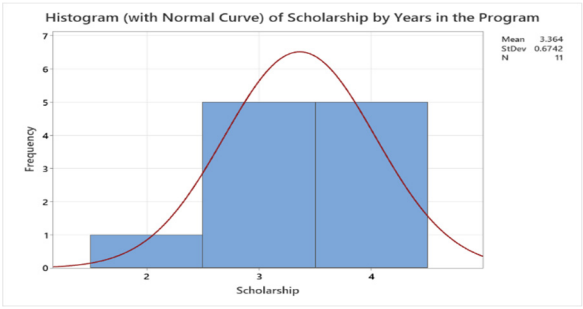


Figure 35. Histogram (with normal curve) of scholarship by year in program: The y- and x-axes do not show Phase 1, but indicate that Phase 2 had 1, and Phases 3 and 4 each had 5

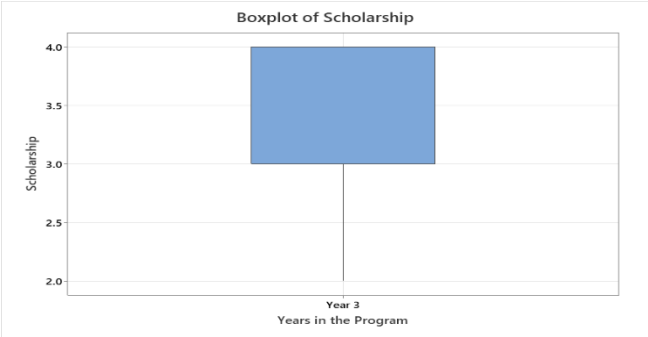


Figure 36. Boxplot distribution of scholarships depicting a minimum of 2, first quartile of 3, and third quartile of 4

In the skills dimension, students at the end of year 3 had a mean score of 3.3 (Table 4), which is the thinking phase. The indicators were students' ability to procedurally draw on prior research knowledge, using an appropriate method informed by field knowledge of valid criteria and subject matter. Figures 35 and 36 indicate that Phases 3 and 4 were equally high in scale selection, with scale selection rarely 2 and never 1. The boxplot indicates that the spread was contained between 3 and 4.



Figure 37. Histogram (with normal curve) of professionalism by year in the program. The y- and x-axes depict Phases 1 and 2, each had 1, Phase 3 had 4, and Phase 4 had 5

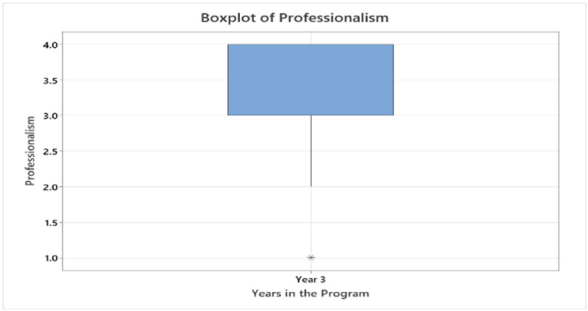


Figure 38. Boxplot distribution of professionalism depicting an outlier asterisk corresponding to 1, a minimum of 2, the first quartile 3, and the third quartile 4

Another aspect in the skills dimension is professionalism. The average score for students at the end of year 3 is 3.1, which is in the thinking phase (typified by the students' ability to demonstrate procedural knowledge of techniques to determine the appropriate method pertaining to forward-facing interaction with others and things, with knowledge of details and elements concerning self-presentation, appearance, and interaction with others). According to Figures 37 and 38, Phase 4 was the most frequently selected phase, Phase 3 was the second-most selected, and Phases 1 and 2 were the least selected. The interquartile range was 3–4.



Figure 39. Histogram (with normal curve) of motivation by year in program: The y- and x-axes indicate that Phase 1 had 1, Phase 2 had 0, Phase 3 had 2, and Phase 4 had 8

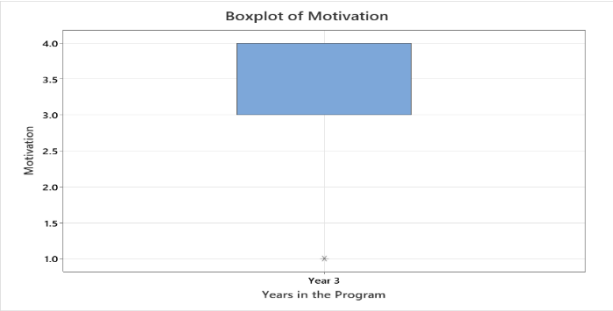


Figure 40. Boxplot distribution of motivation, having an outlier asterisk corresponding to 1, first quartile 3, and third quartile 4

Regarding the study's attitudinal angle, the average score of students at the end of year 3 was 3.5 (see Table 4); this is the thinking phase. However, regarding the frequency of selection on the scale, one was rarely selected, two were never selected, three were infrequently chosen, and four were the most favored (see Figure 39). The boxplot in Figure 40 indicates that the data spread was between 3 and 4.

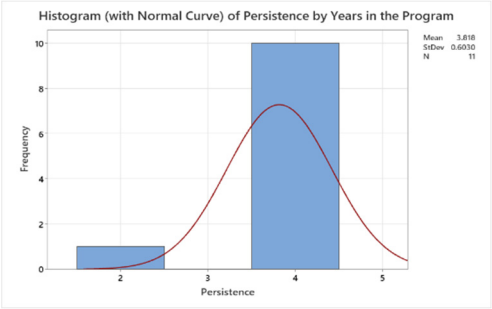


Figure 41. Histogram (with normal curve) of persistence by year in program: The y- and x-axes do not show Phase 1 but indicate that Phase 2 had 1, Phase 3 had 0, and Phase 4 had 10

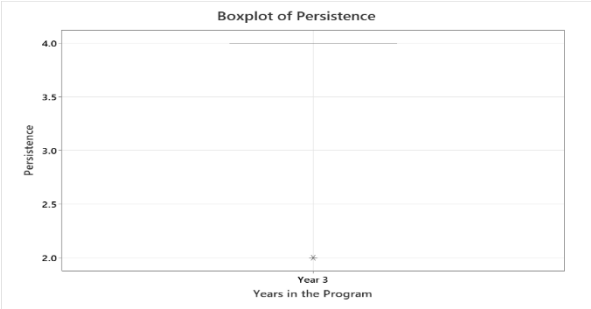


Figure 42. The boxplot distribution of persistence shows an outlier asterisk at 2 and an upper limit of 4

The next consideration on this study's attitudinal aspect is persistence. The students' end-of-year 3 average was 3.8 (see Table 4), which is in the thinking phase, as evidenced by their ability to use procedural knowledge of planning and to

invite others to participate in learning activities, recognizing individual contributions to the community of practice. Figures 41 and 42 reveal that the most prominent selection on the scale was 4; 2 was rarely and 1 and 3 were never selected.

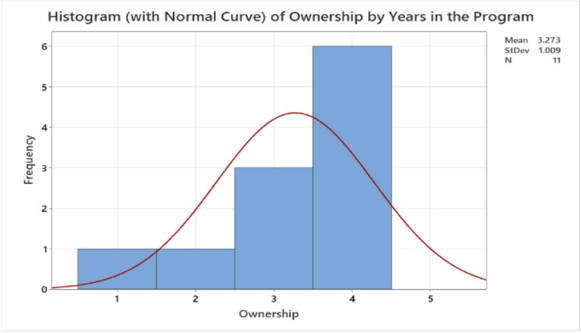


Figure 43. Histogram (with normal curve) of ownership by year in program: The y- and x-axes indicate that Phases 1 and 2 each had 1, Phase 3 had 3, and Phase 4 had 6

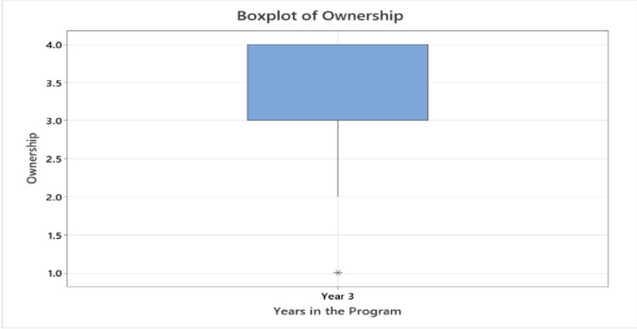


Figure 44. Boxplot distribution of ownership, indicating an outlier corresponding to 1, a minimum of 2, a first quartile of 3, and a third quartile of 4

For students at the end of year 3, the average score was 3.2 (see Table 3). This is the thinking phase, during which students can navigate internal and external systems to self-support their learning and practice leadership, organization, professional ethics, and data collection and analysis while partnering with faculty members. The most frequently selected rating was 4, followed by 3; 1 and 2 were similarly low. Accordingly, data were mostly contained between 3 and 4 (Figures 43 and 44).

Table 5. Descriptive Statistics for Year 4

Variable	Mean	SE Mean	St. Dev.	Minimum	Q1	Median	N for Mode
Norms	3.83333	0.166667	0.408248	3	3.75	4	5
Communication	3.83333	0.166667	0.408248	3	3.75	4	5
Scholarship	3.5	0.341565	0.836660	2	2.75	4	4
Professionalism	3.83333	0.166667	0.408248	3	3.75	4	5
Motivation	3.16667	0.477261	1.16905	1	2.5	3.5	3
Persistence	3.5	0.5	1.22474	1	3.25	4	5
Ownership	3.5	0.5	1.22474	1	3.25	4	5

SE = standard error; St. Dev. = standard deviation; Mode=4.

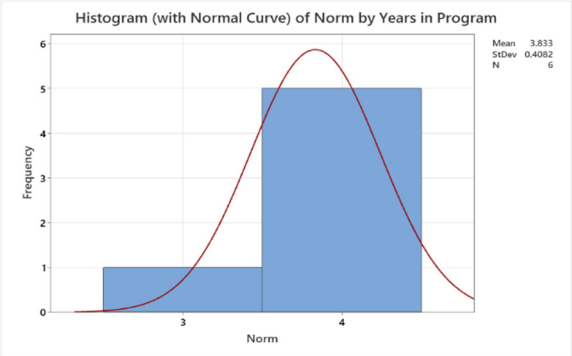


Figure 45. Histogram (with normal curve) of norms by year in program: The y- and x-axes do not indicate Phases 1 and 2 but show that Phase 3 had 1 and Phase 4 had 5

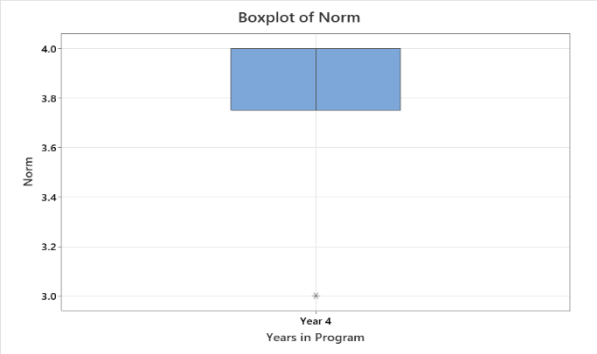


Figure 46. Boxplot distribution of norms, indicating an outlier corresponding to 3 and having a normal distribution, with the first and third quartiles ranging between 3.7 and 4

In the knowledge dimension for students at the end of year 4, the average for norms was 3.8 (see Table 5). Figures 45 and 46 indicate that the most selected rank was 4 (the acting phase). Conversely, the least selected was 3 (the thinking phase), whereas Phases 1 and 2 (learning and remembering) remained unselected. The interquartile range was 3.8-4.

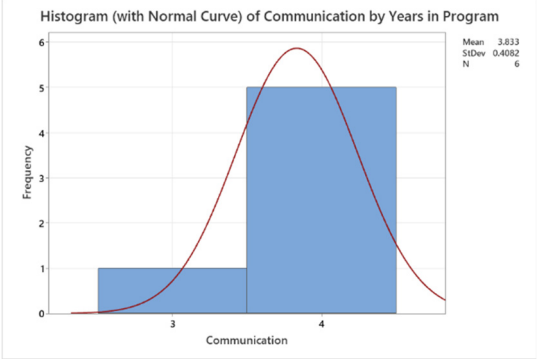


Figure 47. Histogram (with normal curve) of communication by year in program: The y- and x-axes do not show Phases 1 and 2, but indicate that Phase 3 had 1 and Phase 4 had 5

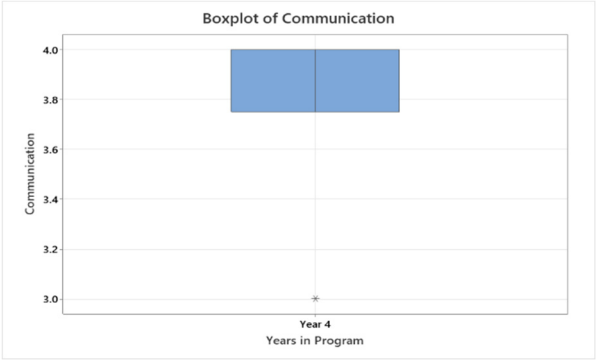


Figure 48. Boxplot distribution of communication, indicating an outlier corresponding to 3 and having a normal distribution, with the first and third quartiles ranging between 3.7 and 4

Additionally, communication, which is in the knowledge dimension, ranked an average of 3.8 (see Table 5); hence, it is in the thinking phase. The data was also closely aligned with phases 3 and 4 and did not show data in phases 1 and 2. Further, this is the reason why the boxplot interquartile range was between 3.8 and 4 (Figures 47 and 48).

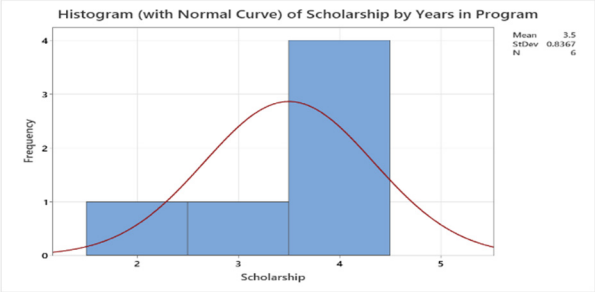


Figure 49. Histogram (with normal curve) of scholarship by year in program: The y-axis does not show Phase 1, but does show that both Phases 2 and 3 had 1, and Phase 4 had 4

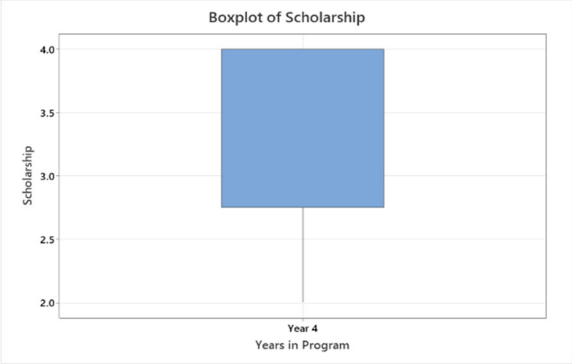


Figure 50. Boxplot distribution of scholarship, indicating a minimum of 2, the first quartile of 2.75, and the third quartile of 4

On the scholarship side of the skills domain, the mean score for students at the end of year 4 was 3.5 (see Table 5), that is, the thinking phase. However, Figure 49 shows that 4 was the most selected response, corresponding to the option 'acting'. Similarly, 2 and 3 were low, and 1 was not selected from the samples. The boxplot in Figure 50 shows an interquartile range of 2.75-4.



Figure 51. Histogram (with normal curve) of professionalism by year in program: The y- and x-axes do not show Phases 1 and 2, but do show that Phase 3 had 1 and Phase 4 had 5

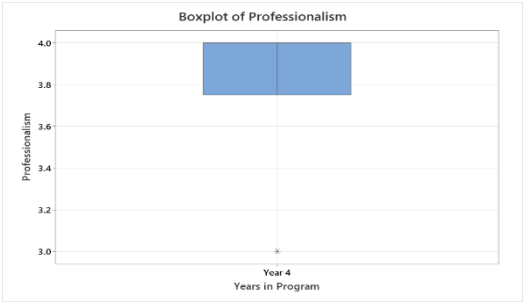


Figure 52. Boxplot distribution of professionalism, indicating an outlier corresponding to 3, a normal distribution, and the first and third quartiles ranging between 3.7 and 4

Additionally, in the skills dimension, professionalism has an average score of 3.8 (see Table 5), corresponding to the thinking phase. Further, 4 (acting) had the highest selection rate on the rating scale. However, 1 and 2 were not selected from the scale for students at the end of year 4. Finally, the interquartile range is 3.75-4 (Figures 51 and 52).



Figure 53. Histogram (with normal curve) of motivation by year in program: The y- and x-axes do not show that Phases 1 had 1, 2 had 0, 3 had 2, and 4 had 3

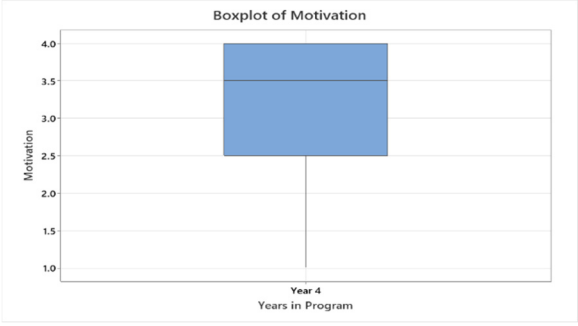


Figure 54. Boxplot distribution of motivation showing a minimum of 1, first quartile of 2.5, median of 3.5, and third quartile of 4

In the attitudinal dimension, motivation for students at the end of year 4 had an average score of 3.1 (Table 5), corresponding to the thinking phase; however, Figure 53 shows that 4 was the most selected rank, followed by 3 and 1, in that order; however, 2 was not selected. The interquartile range had a minimum of 1, lower quartile of 2.5, median of 3.5, and third quartile of 4 (Figure 54).

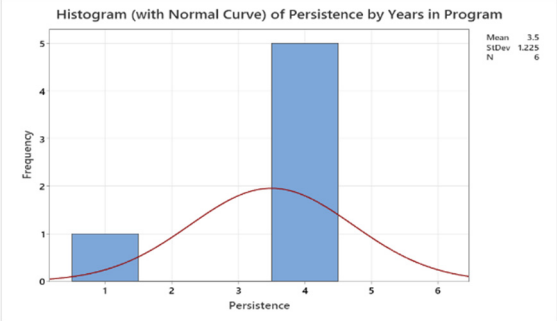


Figure 55. Histogram (with normal curve) of persistence by year in program: The y- and x-axes indicate that Phase 1 had 1, Phases 2 and 3 had 0, and Phase 4 had 5

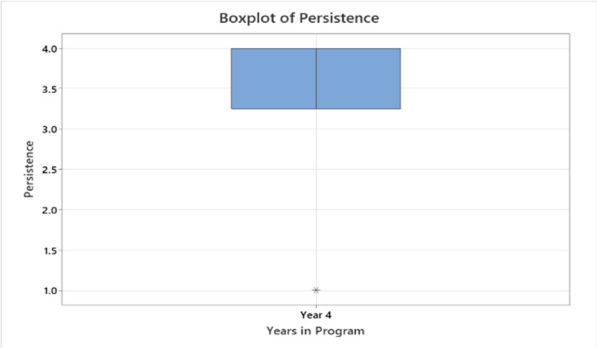


Figure 56. Boxplot distribution of persistence, having an outlier corresponding to 1 and a normal distribution, with the first and third quartiles ranging between 3.25 and 4

For persistence on the study's attitudinal dimension, the average score for students at the end of year 4 was 3.5, corresponding to the thinking phase (Table 5). However, 4 was the most selected ranking, and it involved metacognition, that is, using a proactive approach to plan activities, considering the self and others using available resources. Whereas 1 had a very low response, 2 and 3 were not selected on the scale (Figure 55). Figure 56 shows that the interquartile range was 3.25-4.

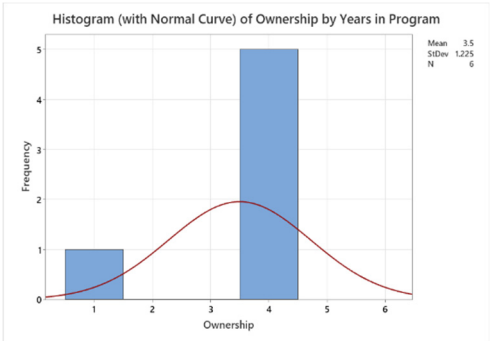


Figure 57. Histogram (with normal curve) of ownership) by year in program: The y- and x-axes indicate that Phase 1 had 1, Phases 2 and 3 had 0, and Phase 4 had 5

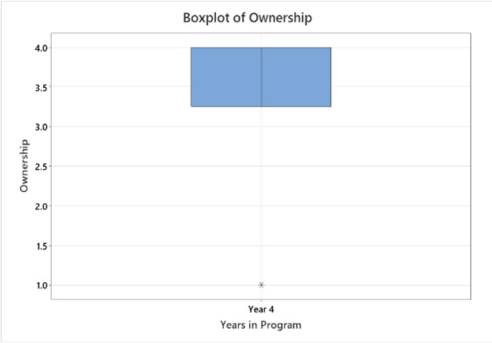


Figure 58. Boxplot distribution of ownership, indicating an outlier of 1 and a normal distribution, with the first and third quartiles ranging between 3.25 and 4

Finally, ownership, which is in the attitudinal dimension, had a mean score of 3.5 for students at the end of year 4 (Table 5). Figure 57 reveals that 4 was the most selected rating. It corresponds to acting, typified by students' use of various, yet appropriate, forms of learning to independently achieve the goals of leadership, organization, professional ethics, data collection, analysis, and use. Figure 58 shows a narrow interquartile range of 3.25-4.

Based on the evidence from this study, Year 1 students were rated closer to Phases 3 and 4 more frequently than expected. Therefore, year 1 students' ratings were not necessarily aligned with the year of study. However, the data for year 4 students were closely aligned with the year of study, as reflected in the prominence of selections 3 and 4 on the rating scale. For year 4 students, 1 or 2 were rarely selected on the test instrument.

Analysis of Variance

At this stage of the data analysis, one-way ANOVA was used to determine whether there was a statistically significant difference in the means of the four groups (years 1, 2, 3, and 4) across the seven categories tested in this study. The norms category was first examined to determine whether any significant difference existed between the groups. The same process was followed for the remaining six categories, as well.

Method

Null hypothesis	All means are equal
Alternative hypothesis	Not all means are equal
Significance level	$\alpha = 0.05$

Equal variances were assumed.

Table 6. Factor Information for Norms

Factor	Level	Value
Factor	4	Norms, Norms 2, Norms 3, Norms 4

Analysis of Variance of the Norms Category for Years 1, 2, 3, and 4 Students

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	1.584	0.5280	0.56	0.642
Error	34	31.811	0.9356		
Total	37	33.395			

DF= Degrees of freedom; Adj SS., MS.=Adjusted sum of square, mean square

Model Summary

S	R-sq	R-sq (adj)	R-sq (pred)
0.967267	4.74%	0.00%	0.00%

Means

Factor	N	Mean	St. Dev.	95% CI
Norms	9	3.333	1.118	(2.678, 3.989)
Norms 2	12	3.250	0.965	(2.683, 3.817)
Norms 3	11	3.545	1.036	(2.953, 4.138)
Norms 4	6	3.833	0.408	(3.031, 4.636)

CI = confidence interval; St. Dev. = standard deviation; Pooled St. Dev. = 0.967267; S

For the Norms category, the results from years 1–4 students yielded a p-value of 0.64 in Table 6, which was larger than the significance level (alpha = 0.05). Based on this p-value, the result is in favor of the alternate hypothesis, which means not all the group means are the same. Furthermore, to determine the model's fit to the data based on the model summary result, the factor explained 4.74% of the response variation. S indicates that the standard deviation between datapoints and fitted values is approximately 0.95. The pooled standard deviation of 0.967 shown in Table 6 indicates the existence of some variability among groups.

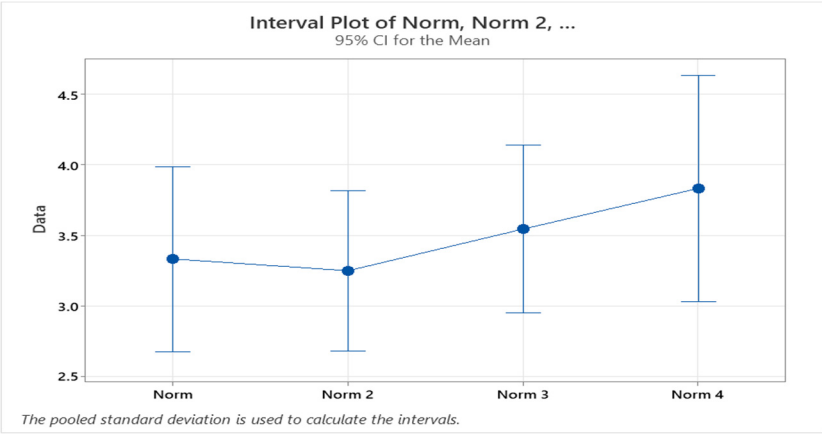


Figure 59. Interval plot for the four groups in the study: Norms year 1 mean = 3.3, year 2 mean = 3.2, year 3 mean = 3.5, and year 4 mean = 3.8. Statistical significance was determined by the confidence interval for the difference in means (Table 6)

Figure 59 indicates that norms 2 mean was slightly lower for year 2 students, mean of 3.2, than year 1 students, mean of 3.3. However, norms 4, representing year 4 students, had the highest average of 3.8, and norms 3, representing year 3 students, had 3.5. Because the interval plot was not sufficient to determine whether these differences were statistically significant, a confidence interval was applied to determine the statistical difference in mean among the four groups.

Table 7. Factor Information for Communication

Factor	Level	Values
Factor	4	Communication, Communication 2, Communication 3, Communication 4

Analysis of Variance of the Communication Category for Years 1, 2, 3, and 4 Students

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	2.147	0.7157	0.84	0.484
Error	34	29.116	0.8564		
Total	37	31.263			

DF= Degrees of freedom; Adj SS., MS.=Adjusted sum of square, mean square

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.925396	6.87%	0.00%	0.00%

Means

Factor	N	Mean	St. Dev.	95% CI
Communication	9	3.111	1.269	(2.484, 3.738)
Communication 2	12	3.333	0.888	(2.790, 3.876)
Communication 3	11	3.545	0.820	(2.978, 4.112)
Communication 4	6	3.833	0.408	(3.066, 4.601)

St. Dev. = standard deviation; CI = confidence interval; Pooled St. Dev. = 0.925396

For the communication category, using a significance level alpha = 0.05, the results for years 1–4 students yielded a p-value of 0.48 (Table 7), which was larger than the alpha value. Therefore, the difference between the groups is not statistically significant, and the result favors the alternate hypothesis, indicating that not all the group means are the same. Furthermore, to determine the model's fit to the data, the model summary indicates that the factor explains 6.87% of the response variation. S indicates that the standard deviation between datapoints and fitted values is approximately 0.92. The pooled standard deviation of 0.925, depicted in the table, clarifies that variability exists among the groups.

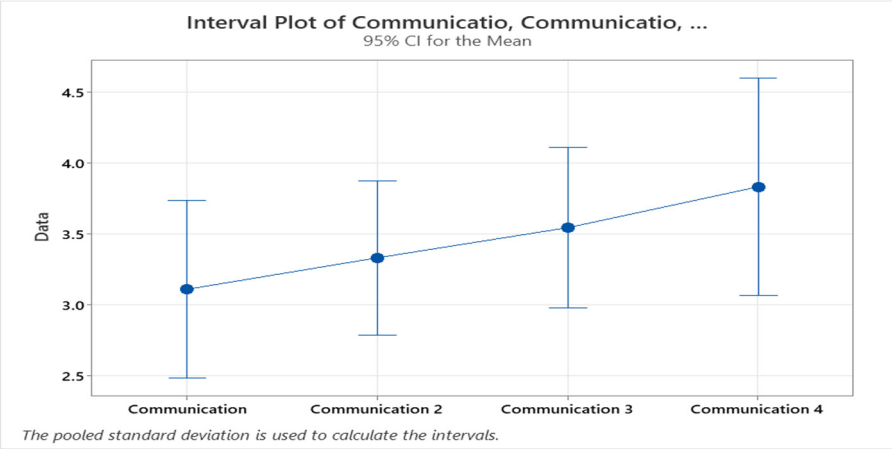


Figure 60. Interval plot for the four groups: For communication, year 1 mean = 3.1, year 2 mean = 3.3, year 3 mean = 3.5, and year 4 mean = 3.8. Statistical significance was determined using a confidence interval (see Table 7)

Figure 60 clarifies that Communication 1, representing year 1 students, had a slightly lower mean (3.1) compared to Communication 2, representing year 2 students (3.3). On the other hand, Communication 3, representing year 3 students, had a mean of 3.5, whereas Communication 4, representing year 4 students, had a mean of 3.8.

Table 8. Factor Information for Scholarship

Factor	Level	Values
Factor	4	Scholarship, Scholarship 2, Scholarship 3, Scholarship 4

Analysis of Variance of the Scholarship Category for Years 1, 2, 3, and 4 Students

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	1.860	0.6198	0.71	0.555
Error	34	29.851	0.8780		
Total	37	31.711			

DF= Degrees of freedom; Adj SS., MS.=Adjusted sum of square, mean square

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.937001	5.86%	0.00%	0.00%

Means

Factor	N	Mean	St. Dev.	95% CI
Scholarship	9	2.889	1.453	(2.254, 3.524)
Scholarship 2	12	3.083	0.669	(2.534, 3.633)
Scholarship 3	11	3.364	0.674	(2.789, 3.938)
Scholarship 4	6	3.500	0.837	(2.723, 4.277)

St. Dev. = standard deviation; CI = confidence interval; Pooled StDev = 0.937001

For the scholarship category, using a significance level of alpha = 0.05, the results from years 1–4 students yielded a p-value of 0.55 (Table 8), which was larger than the alpha value. Accordingly, the difference between the groups was not statistically significant. The result does support accepting the alternate hypothesis, indicating that the mean of all the groups are not the same. Furthermore, to determine the model's fit to the data, the model summary indicates that the factor explains 5.86% of the response variation. S indicates that the standard deviation between datapoints and fitted values was approximately 0.93. The pooled standard deviation of 0.937 (Table 8) indicates some variability among the groups.

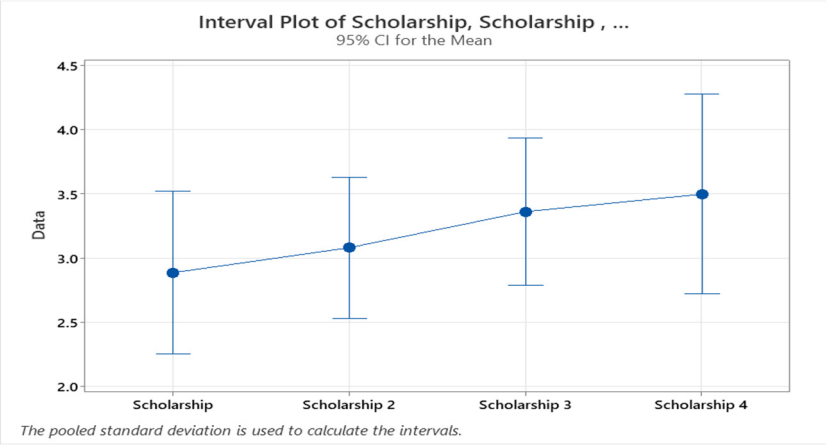


Figure 61. Interval plot for the four groups: For scholarship, year 1 mean = 2.8, year 2 mean = 3.0, year 3 mean = 3.3, and year 4 mean = 3.5. Statistical significance was determined using the confidence interval (see Table 8).

Figure 61 indicates that Scholarship 1, for year 1 students, had a mean of 2.8, whereas Scholarship 2, for year 2 students, had a mean of 3.0. Contrastingly, Scholarship 3, representing year 3 students, had an average of 3.3, whereas Scholarship 4, representing year 4 students, had a mean of 3.5.

Table 9. Factor Information for Professionalism

Factor	Level	Values
Factor	4	Professionalism, Professionalism 2, Professionalism 3, Professionalism 4

Analysis of Variance of the Professionalism Category for Years 1, 2, 3, and 4 Students

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	6.698	2.233	1.88	0.151
Error	34	40.275	1.185		
Total	37	46.974			

DF= Degrees of freedom; Adj SS., MS.=Adjusted sum of square, mean square

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
1.08838	14.26%	6.69%	0.00%

Means

Factor	N	Mean	St. Dev.	95% CI
Professionalism	9	2.889	1.269	(2.152, 3.626)
Professionalism 2	12	2.583	1.240	(1.945, 3.222)
Professionalism 3	11	3.182	0.982	(2.515, 3.849)
Professionalism 4	6	3.833	0.408	(2.930, 4.736)

St. Dev. = standard deviation; CI = confidence interval; Pooled StDev = 1.08838

For professionalism, based on a significance level of alpha = 0.05, the results from years 1–4 students yielded a p-value of 0.15 (Table 9), which was larger than the alpha value. This shows that the result is in favor of the alternate hypothesis, indicating that the mean of the groups are not the same. Thus, the difference between the groups was not statistically significant. Furthermore, to determine the model's fit to the data, the model summary indicates that the factor explains 6.69% of the response variation. Further, S indicates that the standard deviation between datapoints and fitted values was approximately 1.088. The pooled standard deviation of 1.088 (Table 9) indicates that variability exists among the groups.

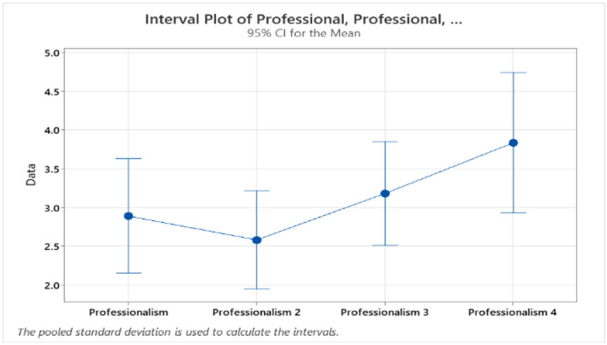


Figure 62. Interval plot for the four groups: For professionalism, year 1 mean = 2.8, year 2 mean = 2.5, year 3 mean = 3.1, and year 4 mean = 3.8. Statistical significance was determined using the confidence interval (see Table 9)

According to Figure 62, year 2 students, indicated as Professionalism 2, had a mean of 2.58, whereas year 1 students had a mean of 2.88. Conversely, Professionalism 3, representing year 3 students, had an average of 3.18, whereas Professionalism 4, representing year 4 students, had a mean of 3.83.

Table 10. Factor Information for Motivation

Factor	Level	Values
Factor	4	Motivation, Motivation 2, Motivation 3, Motivation 4

Analysis of Variance of the Motivation Category for Years 1, 2, 3, and 4 Students

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	4.064	1.355	1.19	0.328
Error	34	38.699	1.138		
Total	37	42.763			

DF= Degrees of freedom; Adj SS., MS.=Adjusted sum of square, mean square

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
1.06687	9.50%	1.52%	0.00%

Means

Factor	N	Mean	St. Dev.	95% CI
Motivation	9	2.889	1.167	(2.166, 3.612)
Motivation 2	12	2.750	1.055	(2.124, 3.376)
Motivation 3	11	3.545	0.934	(2.892, 4.199)
Motivation 4	6	3.167	1.169	(2.282, 4.052)

St. Dev. = standard deviation; CI = confidence interval; Pooled StDev = 1.06687

For the motivation category, based on a significance level of alpha = 0.05, the results from years 1–4 students yielded a p-value of 0.32 (Table 10), which was larger than the alpha value. Thus, the result is not statistically significant, which also supports accepting the alternate hypothesis – meaning the averages for the groups are not the same. Accordingly, the difference between the groups was not statistically significant. Furthermore, to determine the model's fit to data, based on the model summary result, the factor explained 9.50% of the response variation. Further, S indicates the standard deviation between datapoints and fitted values to be approximately 1.066. This pooled standard deviation value (Table 10) indicates that some variability exists among the groups.

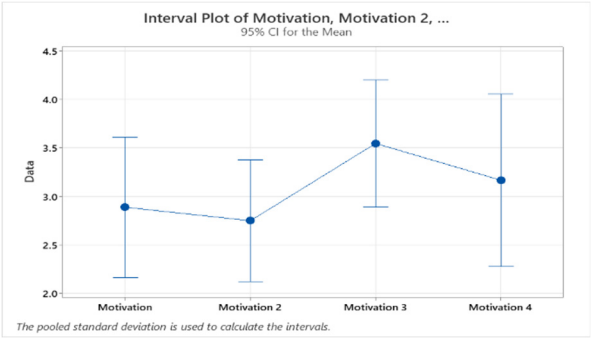


Figure 63. Interval plot for the four groups: For motivation, year 1 mean = 2.8, year 2 mean = 2.7, year 3 mean = 3.5, and year 4 mean = 3.1. Statistical significance was determined using the confidence interval (Table 10)

From Figure 63, year 2 students, represented by Motivation 2, had a slightly lower mean of 2.75 than year 1 students, which was 2.88. Conversely, Motivation 3, representing year 3 students, had an average of 3.54, which was slightly higher than Motivation 4, representing year 4 students, which had a mean of 3.16.

Table 11. Factor Information for Persistence

Factor	Level	Values
Factor	4	Persistence, Persistence 2, Persistence 3, Persistence 4

Analysis of Variance of the Persistence Category for Years 1, 2, 3, and 4 Students

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	6.124	2.041	1.84	0.158
Error	34	37.692	1.109		
Total	37	43.816			

DF= Degrees of freedom; Adj SS., MS.=Adjusted sum of square, mean square

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
1.05289	13.98%	6.39%	0.00%

Means

Factor	N	Mean	St. Dev.	95% CI
Persistence	9	3.111	1.364	(2.398, 3.824)
Persistence 2	12	2.833	1.030	(2.216, 3.451)
Persistence 3	11	3.818	0.603	(3.173, 4.463)
Persistence 4	6	3.500	1.225	(2.626, 4.374)

St. Dev. = standard deviation; CI = confidence interval; Pooled StDev = 1.05289

For the persistence category, based on a significance level of alpha = 0.05, the results for years 1–4 students yielded a p-value of 0.15 (Table 11), which was larger than the alpha value. Hence, the difference between the groups was not statistically significant, and does support accepting the alternative hypothesis – indicating the mean for the groups are not the same. Furthermore, to determine the model's fit to data, based on the model summary result, the factor explained 13.9% of the response variation. S indicates that the standard deviation between data points and fitted values is approximately 1.052. This pooled standard deviation (Table 11) indicates that variability exists among the groups.

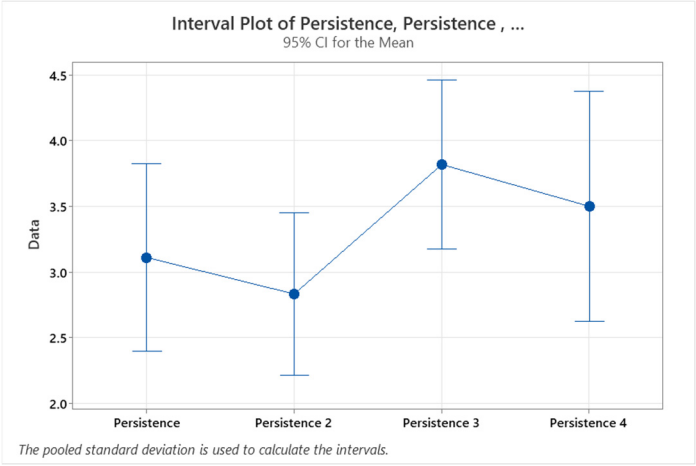


Figure 64. Interval plot for the four groups: For persistence, year 1 mean = 3.1, year 2 mean = 2.8, year 3 mean = 3.8, and year 4 mean = 3.5. Statistical significance was determined by the confidence interval (see Table 11)

From Figure 64, year 2 students, represented by Persistence 2, had a slightly lower mean of 2.83 than year 1 students, whose mean was 3.11. Contrastingly, Persistence 3, representing year 3 students, had an average of 3.81, which was slightly higher than Persistence 4, representing year 4 students, which had a mean of 3.50.

Table 12. Factor Information for Ownership

Factor	Level	Values
Factor	4	Ownership, Ownership 2, Ownership 3, Ownership 4

Analysis of Variance of the Ownership Category for Years 1, 2, 3, and 4 Students

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	1.744	0.5812	0.39	0.761
Error	34	50.598	1.4882		
Total	37	52.342			

DF= Degrees of freedom; Adj SS., MS.=Adjusted sum of square, mean square

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
1.21991	3.33%	0.00%	0.00%

Means

Factor	N	Mean	St. Dev.	95% CI
Ownership	9	3.000	1.500	(2.174, 3.826)
Ownership 2	12	2.917	1.165	(2.201, 3.632)
Ownership 3	11	3.273	1.009	(2.525, 4.020)
Ownership 4	6	3.500	1.225	(2.488, 4.512)

St. Dev. = standard deviation; CI = confidence interval; Pooled StDev = 1.21991

For Ownership, based on a significance level of alpha = 0.05, the results from years 1–4 students yielded a p-value of 0.76 (Table 12), which was larger than the alpha value. Hence, the difference between the groups was not statistically significant, which does support accepting the alternate hypothesis – indicating that the mean of the groups are not the same. Furthermore, to determine the model's fit to data, the model summary result, the factor explained 3.33% of the response variation. S indicates that the standard deviation between datapoints and fitted values is approximately 1.21991. Similarly, the pooled standard deviation of 1.21991 (Table 12) indicates that variability exists among the groups.

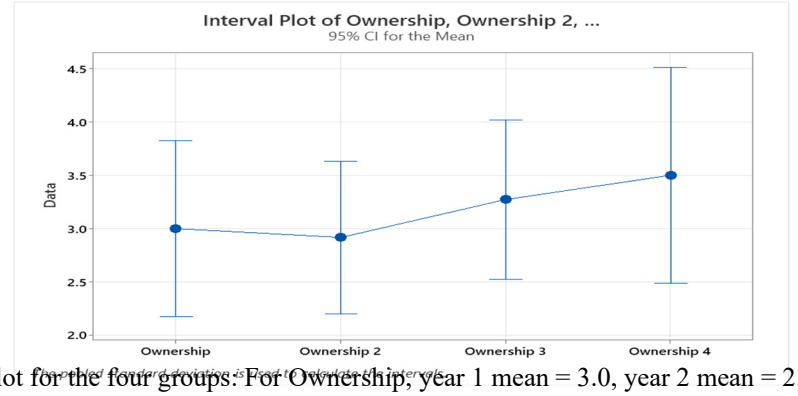


Figure 65. Interval plot for the four groups. For Ownership, year 1 mean = 3.0, year 2 mean = 2.9, year 3 mean = 3.2, and year 4 mean = 3.5. Statistical significance was determined using the confidence interval (see Table 12)

From Figure 65, year 1 students, indicated by Ownership 1, had a slightly higher mean of 3.0 compared to the year 2 students, whose mean was 2.91. Contrastingly, Ownership 3, representing year 3 students, had an average of 3.27, whereas Ownership 4, representing year 4 students, had the highest mean of 3.50.

Addressing the second research question

The multivariate item analysis function in Minitab was used to determine whether multiple items in the survey measured the same characteristics, particularly to correlate multivariate responses (Cai et al., 2016). This technique identifies patterns and associations.

Item Analysis for Year 1 Students

Table 13. Correlation Matrix for Year 1 Students

	Norms	Communication	Scholarship	Professionalism	Motivation	Persistence
Communication	0.851					
Scholarship	0.641	0.821				
Professionalism	0.734	0.862	0.670			
Motivation	0.894	0.938	0.729	0.919		
Persistence	0.792	0.930	0.953	0.802	0.873	
Ownership	0.671	0.853	0.459	0.722	0.786	0.611

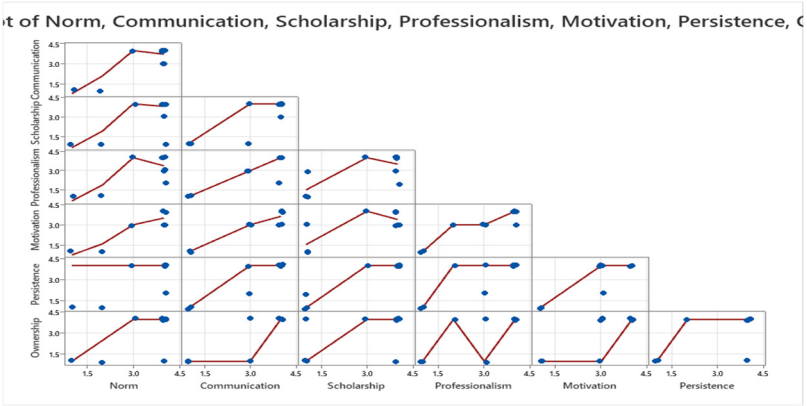


Figure 66. Correlation matrix items for year 1 group: Norms and Communication =.85, Norms and Scholarship = .64, Norms and Professionalism = .73, Norms and Motivation = .89, Norms and Persistence = .79, Norms and Ownership = .67, Communication and Scholarship = .82, Communication and Professionalism = .86, Communication and Motivation = .93, Communication and Persistence = .93, Communication and Ownership = .85, Scholarship and Professionalism = .67, Scholarship and Motivation = .72, Scholarship and Persistence = .95, Scholarship and Ownership = .45, Professionalism and Motivation = .91, Professionalism and Persistence = .80, Professionalism and Ownership = .72, Motivation and Persistence = .87, Motivation and Ownership = .78, Persistence and Ownership = .61.

Figure 66 depicts mostly positive and mostly linear correlations. According to Table 13, the areas with slightly low positive correlations are scholarship and norms (0.64), ownership and norms (0.67), professionalism and scholarship (0.67), and ownership and persistence (0.61); in this sample, ownership and scholarship had the weakest positive correlation (0.45).

Motivation and professionalism had the highest positive correlation (0.91), followed by persistence and communication (0.93), persistence and scholarship (0.95), motivation and norms (0.89), communication and norms (.085), professionalism and communication (0.86), persistence and professionalism (0.80), persistence and motivation (0.87), and persistence and norms (0.79). The criteria for moderate and acceptable positive correlations were ownership and motivation (0.78), professionalism and norms (0.73), and motivation and scholarship (0.72).

Table 14. Item and Total Statistics for Year 1 Students

Variable	Total Count	Mean	St. Dev.
Norms	9	3.333	1.118
Communication	9	3.111	1.269
Scholarship	9	2.889	1.453
Professionalism	9	2.889	1.269
Motivation	9	2.889	1.167
Persistence	9	3.111	1.364
Ownership	9	3.000	1.500
Total	9	21.222	8.228

Cronbach's Alpha

Alpha
0.9589

Omitted Item Statistics for Year 1 Students

Omitted Variable	Adj. Total Mean	Adj. Total St. Dev.	Item-Adj. Total Corr	Squared Multiple Corr	Cronbach's Alpha
Norms	17.889	7.271	0.8355	0.9500	0.9547
Communication	18.111	6.972	0.9872	0.9988	0.9422
Scholarship	18.333	7.053	0.7725	0.9605	0.9601
Professionalism	18.333	7.106	0.8638	0.9224	0.9518
Motivation	18.333	7.106	0.9549	0.9738	0.9459
Persistence	18.111	6.954	0.9208	0.9976	0.9470
Ownership	18.222	7.067	0.7311	0.9937	0.9644

St. Dev. = standard deviation.

Ownership and norms have a slightly lower correlation, and ownership to persistence. Across all categories, that is, norms, communication, scholarship, professionalism, persistence, and ownership, Cronbach's alpha was 0.9589, the internal consistency value representing the degree of closeness of a scale's items. However, the results from students at the end of year 1 had strong internal consistency. Further, the results from the omitted variable do not suggest the removal of any variables among end-of-year students. The lowest alpha value was 0.94, whereas the highest was 0.96 (Table 14). However, this difference is not statistically significant.

Item Analysis for Year 2 Students

Table 15. Correlation Matrix for Year 2 Students

	Norms 2	Communication 2	Scholarship 2	Professionalism 2	Motivation 2	Persistence 2
Communication 2	0.743					
Scholarship 2	0.387	0.102				
Professionalism 2	0.475	0.633	0.265			
Motivation 2	0.245	0.291	0.032	0.469		
Persistence 2	0.686	0.762	0.286	0.866	0.627	
Ownership 2	0.829	0.909	0.243	0.729	0.351	0.897

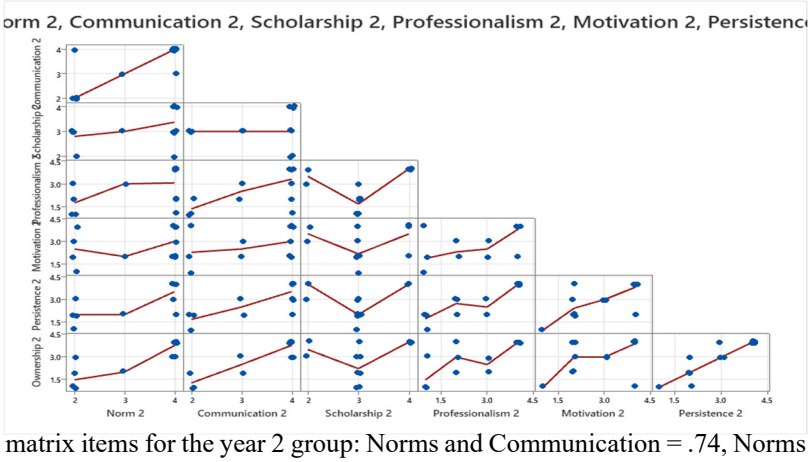


Figure 67. Correlation matrix items for the year 2 group: Norms and Communication = .74, Norms and Scholarship = .38, Norms and Professionalism = .47, Norms and Motivation = .24, Norms and Persistence = .68, Norms and Ownership = .82, Communication and Scholarship = .10, Communication and Professionalism = .63, Communication and Motivation = .29, Communication and Persistence = .76, Communication and Ownership = .90, Scholarship and Professionalism = .26, Scholarship and Motivation = .03, Scholarship and Persistence = .28, Scholarship and Ownership = .24, Professionalism and Motivation = .46, Professionalism and Persistence = .86, Professionalism and Ownership = .72, Motivation and Persistence = .62, Motivation and Ownership = .35, and Persistence and Ownership = .89.

Figure 67 depicts positive linear correlations. Further, Table 15 indicates a weak positive correlation for students at end of year 2 between scholarship and norms (0.38), professionalism and norms (0.47), and motivation and norms (0.24), scholarship and communication (0.10), motivation and communication (0.20), professionalism and scholarship (0.26), motivation and scholarship (0.03), ownership and scholarship (0.24) motivation and professionalism (0.46), and ownership and motivation (0.35).

High positive correlations are observed between ownership and norms (0.82), ownership and communication (0.90), ownership and persistence (0.89), and persistence and professionalism (0.86). Further, a moderate and acceptable positive

correlation exists between persistence and motivation (0.62), ownership and professionalism (0.72), professionalism and communication (0.63), and persistence and norms (0.68).

Table 16. Item and Total Statistics for Year 2

Variable	Total Count	Mean	St Dev.
Norms 2	12	3.250	0.965
Communication 2	12	3.333	0.888
Scholarship 2	12	3.083	0.669
Professionalism 2	12	2.583	1.240
Motivation 2	12	2.750	1.055
Persistence 2	12	2.833	1.030
Ownership 2	12	2.917	1.165
Total	12	20.750	5.512

Cronbach's Alpha

Alpha
0.8889

Omitted Item Statistics

Omitted Variable	Adj. Total Mean	Adj. Total St. Dev.	Item-Adj. Total Corr	Squared Multiple Corr	Cronbach's Alpha
Norms 2	17.500	4.777	0.7196	0.7787	0.8685
Communication 2	17.417	4.795	0.7761	0.8650	0.8635
Scholarship 2	17.667	5.297	0.2653	0.3461	0.9097
Professionalism 2	18.167	4.509	0.7614	0.8244	0.8638
Motivation 2	18.000	4.973	0.4331	0.7432	0.9029
Persistence 2	17.917	4.522	0.9533	0.9695	0.8376
Ownership 2	17.833	4.448	0.8921	0.9692	0.8435

St. Dev. = standard deviation.

For students at end of year 2, Cronbach's alpha, measuring the internal consistency across seven criteria, is 0.88 (Table 16), which is considered a strong value. For the omitted variable, results ranged from 0.83 to 0.90, all values being acceptable in social science research.

Item Analysis for Year 3 Students

Table 17. Correlation Matrix for Year 3

	Norms 3	Communication 3	Scholarship 3	Professionalism 3	Motivation 3	Persistence 3
Communication 3	0.910					
Scholarship 3	0.547	0.510				
Professionalism	0.778	0.734	0.494			
Motivation 3	0.695	0.747	0.606	0.862		
Persistence 3	0.495	0.625	0.671	0.737	0.904	
Ownership 3	0.800	0.769	0.722	0.753	0.781	0.747

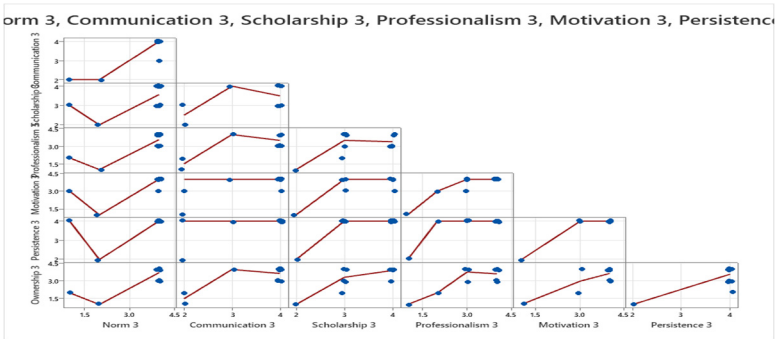


Figure 68. Correlation matrix items for the year 3 group: Norms and Communication = .91, Norms and Scholarship = .54, Norms and Professionalism = .77, Norms and Motivation = .69, Norms and Persistence = .49, Norms and Ownership

= .80, Communication and Scholarship = .51, Communication and Professionalism = .73, Communication and Motivation = .74, Communication and Persistence = .62, Communication and Ownership = .76, Scholarship and Professionalism = .49, Scholarship and Motivation = .60, Scholarship and Persistence = .67, Scholarship and Ownership = .72, Professionalism and Motivation = .86, Professionalism and Persistence = .73, Professionalism and Ownership = .75, Motivation and Persistence = .90, Motivation and Ownership = .78, and Persistence and Ownership = .74.

Figure 68 depicts a positive linear correlation. Furthermore, Table 17 indicates a weak positive correlation for students at the end of year 3 between scholarship and norms (0.54), persistence and norms (0.49), scholarship and communication (0.51), persistence and communication (0.62), motivation and scholarship (0.60), and professionalism and scholarship (0.49).

High positive correlations were observed between communication and norms (0.91), ownership and norms (0.80), and motivation and professionalism (0.86). Further, moderate positive correlations were found between motivation and norms (0.69), professionalism and norms (0.77), professionalism and communication (0.73), motivation and communication (0.74), ownership and communication (0.76), ownership and scholarship (0.72), persistence and scholarship (0.67), persistence and professionalism (0.73), ownership and professionalism (0.75), ownership and motivation (0.78), ownership and persistence (0.74).

Table 18. Item and Total Statistics for Year 3

Variable	Total Count	Mean	St. Dev.
Norms 3	11	3.545	1.036
Communication 3	11	3.545	0.820
Scholarship 3	11	3.364	0.674
Professionalism 3	11	3.182	0.982
Motivation 3	11	3.545	0.934
Persistence 3	11	3.818	0.603
Ownership 3	11	3.273	1.009
Total	11	24.273	5.293

Cronbach's Alpha

Alpha
0.9411

Omitted Item Statistics

Omitted Variable	Adj. Total Mean	Adj. Total St. Dev.	Item-Adj. Total Corr	Squared Multiple Corr	Cronbach's Alpha
Norms 3	20.727	4.407	0.8246	0.9568	0.9315
Communication 3	20.727	4.585	0.8413	0.9151	0.9291
Scholarship 3	20.909	4.826	0.6566	0.6920	0.9443
Professionalism 3	21.091	4.437	0.8452	0.8547	0.9285
Motivation 3	20.727	4.452	0.8809	0.9217	0.9248
Persistence 3	20.455	4.803	0.7909	0.9420	0.9371
Ownership 3	21.000	4.382	0.8821	0.8382	0.9250

St. Dev. = standard deviation.

The Cronbach's alpha value of 0.94 for students at the end of year 3 indicates that the instrument has strong internal consistency. In the omitted variable assessment, each category was above 0.9 and ranged between 0.92 and 0.94 (see Table 18). This data does not indicate the necessity of removing any item.

Item Analysis for Year 4 Students

Table 19. Correlation Matrix for Year 4

	Norms 4	Communication 4	Scholarship 4	Professionalism 4	Motivation 4	Persistence 4
Communication 4	-0.200					
Scholarship 4	0.878	0.293				
Professionalism 4	1.000	-0.200	0.878			
Motivation 4	0.908	0.070	0.920	0.908		
Persistence 4	1.000	-0.200	0.878	1.000	0.908	
Ownership 4	1.000	-0.200	0.878	1.000	0.908	1.000

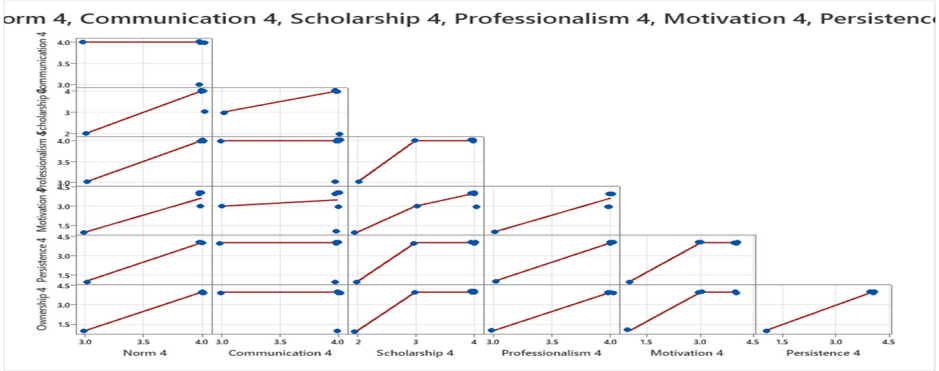


Figure 69. Correlation matrix items for the year 4 group: Norms and Communication = -.20, Norms and Scholarship = .87, Norms and Professionalism = 1.0, Norms and Motivation = .90, Norms and Persistence = 1.0, Norms and Ownership = 1.0, Communication and Scholarship = .29, Communication and Professionalism = -.20, Communication and Motivation = .07, Communication and Persistence = -.20, Communication and Ownership = -.20, Scholarship and Professionalism = .87, Scholarship and Motivation = .92, Scholarship and Persistence = .87, Scholarship and Ownership = .87, Professionalism and Motivation = .90, Professionalism and Persistence = 1.0, Professionalism and Ownership = 1.0, Motivation and Persistence = .90, Motivation and Ownership = .90, and Persistence and Ownership =1.0.

Figure 69 indicates several positive correlations that are mostly linear. Additionally, Table 19 shows negative and weak correlations among students at the end of year 4 for the following pairs: communication and norms (-0.20), professionalism and communication (-0.20), persistence and communication (-0.20), and ownership and communication (-0.20).

High positive correlations exist between scholarship and norms (0.87), professionalism and norms (1.0), motivation and norms (0.90), persistence and norms (1.0), ownership and norms (1.0), professionalism and scholarship (0.87), motivation and scholarship (0.92), persistence and scholarship (0.87), ownership and scholarship (0.87), motivation and professionalism (0.90), persistence and professionalism (1.0), ownership and professionalism (1.0), persistence and motivation (0.90), ownership and motivation (0.90), ownership and persistence (1.0). Furthermore, moderate and acceptable positive correlations were found between motivation and communication (r = 0.70).

Table 20. Item and Total Statistics for Year 4

Variable	Total Count	Mean	St. Dev.
Norms 4	6	3.833	0.408
Communication 4	6	3.833	0.408
Scholarship 4	6	3.500	0.837
Professionalism 4	6	3.833	0.408
Motivation 4	6	3.167	1.169
Persistence 4	6	3.500	1.225
Ownership 4	6	3.500	1.225
Total	6	25.167	5.115

Cronbach's Alpha

Alpha
0.9185

Omitted Item Statistics

Omitted Variable	Adj. Total Mean	Adj. Total St. Dev.	Item-Adj. Total Corr	Squared Multiple Corr	Cronbach's Alpha
Norms 4	21.333	4.719	0.9690	*	0.9090
Communication 4	21.333	5.125	-0.0637	*	0.9533
Scholarship 4	21.667	4.320	0.9406	*	0.8871
Professionalism 4	21.333	4.719	0.9690	*	0.9090
Motivation 4	22.000	4.000	0.9409	*	0.8850
Persistence 4	21.667	3.933	0.9550	*	0.8845
Ownership 4	21.667	3.933	0.9550	*	0.8845

Data were insufficient to calculate the squared multiple correlation.

Table 20 indicates a Cronbach's alpha of 0.91 for the overall scale for students at the end of year 4. The omitted variable

indicated a range of 0.88–0.95, which is within the social science industry standard (Fraenkel & Wallen, 2022). Although retesting communication as a category with a similar group should be considered. Furthermore, a larger sample size is recommended, as Minitab could not calculate multiple correlations due to limited data availability resulting from a low response rate.

Addressing the third research question

The three graduate faculty members using the faculty version rating scale used 10 data points to assess their students/advisees. Further, those 10 graduate students/advisees used the student version to conduct their assessment. Due to the low participation rate, data were collected only from students in their third year of graduate study. A two-sample t-test was used to compare the results between students and instructors. Further, each of the seven categories was tested individually using the mean difference ($\mu_1 - \mu_2$), and the analysis did not assume equal variances.

Table 21. Descriptive Statistics for Norm

Sample	N	Mean	St. Dev.	SE Mean
Norms Y3 Students	10	3.50	1.08	0.34
Norms Y3 Instructors	10	2.700	0.675	0.21

Estimation for Difference

	Difference	95% CI for Difference
	0.800	(-0.058, 1.658)

Test of Hypothesis

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
1.99	15	0.066

Using a two-sample t-test, the t-value, which measures the difference between the groups, was 1.99, the value of the difference was 0.800 at a 95% confidence interval, and the p-value of 0.066 was greater than the value of zero posited for the null hypothesis. Therefore, the difference is not statistically significant; the null hypothesis is rejected, and the alternate hypothesis is accepted. Yet the results suggest some degree of closeness in the faculty's assessment of students and the students' self-assessment in the norms category. The mean for students was 3.5, whereas the mean for instructors was 2.7 (Table 21). A mean of 3.5 is considered adequate for 3 years of study, and a value of 2.7 is close to 3.

Communication

Category ratings were very similar, and, because of the lack of variation, data could not be statistically tested for differences. However, the mean of students' ratings calculated was 3.5, with a minimum of 2 and a maximum of 4 (Table 22). These output data, particularly the mean, seem appropriate for students finishing their third year of graduate study.

Table 22. Year 3 Students' Ratings on Communication

Variable	Percentage	Mean	SE Mean	St. Dev.	Minimum	Q1	Median	Q3	Maximum
Communication Y3	100	3.5	0.268742	0.849837	2	2.75	4	4	4

Variable	Mode	N for Mode
Communication Y3	4	7

SE = standard error; St. Dev. = standard deviation

Table 23. Descriptive Statistics for Scholarship

Sample	N	Mean	St. Dev.	SE Mean
Scholarship Y3 Students	10	3.400	0.699	0.22
Scholarship Y3 instructors	10	3.000	0.816	0.26

Estimation for Difference

Difference	95% CI for Difference
0.400	(-0.317, 1.117)

Test

Null hypothesis		$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis		$H_1: \mu_1 - \mu_2 \neq 0$
T-Value	**DF**	**P-Value**
1.18	17	0.256

SE = standard error; St. Dev. = standard deviation

Based on the scholarship results, the t-value was 1.18, and the difference was 0.400. The p-value was 0.256 (Table 23), which is greater than 0.05; therefore, the ratings for year three students and instructors are not statistically significantly different. Moreover, in the context of hypothesis testing, because the p-value of 0.256 does not equal zero, the null hypothesis that the difference between the means of the two groups is equal to zero is rejected, and the alternative hypothesis is accepted. Furthermore, a comparison of the means for students (3.400) and instructors (3.000) reveals that, on average, year three students are on track in scholarship-related skills, consistent with year three graduate dispositions.

Table 24. Descriptive Statistics for Professionalism

Sample	N	Mean	St. Dev.	SE Mean
Professionalism Y3 Students	10	3.100	0.994	0.31
Professionalism Y3 Instructors	10	2.900	0.568	0.18

Estimation for Difference

Difference	95% CI for Difference
0.200	(-0.577, 0.977)

Test

Null hypothesis		$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis		$H_1: \mu_1 - \mu_2 \neq 0$
T-Value	**DF**	**P-Value**
0.55	14	0.589

Regarding professionalism, when the ratings of year three students were compared with those of their faculty members using a 95% confidence interval, the difference was 0.200, the t-value was 0.55, and the p-value was 0.589, which is greater than 0.05 (Table 24). This indicates that there was no significant difference between the assessments. Additionally, the null hypothesis, which posits that the mean difference between the two groups equals zero, is rejected, and the alternative hypothesis is accepted. Because the students' mean score in professionalism was 3.100, whereas the instructors' was 2.900, this shows that the ratings align with year three skills and disposition.

Table 25. Descriptive Statistics for Motivation

Sample	N	Mean	St. Dev.	SE Mean
Motivation Y3 Students	10	3.500	0.972	0.31
Motivation Y3 Instructors	10	3.000	0.816	0.26

Estimation for Difference

Difference	95% CI for Difference
0.500	(-0.347, 1.347)

Test

Null hypothesis		$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis		$H_1: \mu_1 - \mu_2 \neq 0$
T-Value	**DF**	**P-Value**
1.25	17	0.230

SE = standard error; St. Dev. = standard deviation

A comparison of the ratings on motivation for year three graduate students and instructors shows a t-value of 1.25. The results did not reveal a statistically significant difference based on the estimation of a difference of 0.500. The mean for students was 3.500, and the instructors' was 3.000. Moreover, the p-value being 0.230 is larger than 0.05 (Table 25). Therefore, the null hypothesis, that the mean difference between groups 1 and 2 equals zero, is rejected, and the alternative hypothesis is accepted. The result further shows that year three students, on average, align with their milestones.

Table 26. Descriptive Statistics for Persistence

Sample	N	Mean	St. Dev.	SE Mean
Professionalism Y3 Students	10	3.100	0.994	0.31
Persistence Y3 Instructors	10	2.900	0.316	0.10

Estimation for Difference

Difference	95% CI for Difference
0.200	(-0.535, 0.935)

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
0.61	10	0.558

SE = standard error; St. Dev. = standard deviation

When students' ratings on persistence were compared with instructors' ratings, results revealed the t-value was 0.61, students' mean score was 3.100, and instructors' rating of the students' mean was 2.900. Based on the p-value being 0.558, which is greater than 0.05 (Table 26). Therefore, the results were not statistically significant. As well, the result of the p-value does support rejecting the null hypothesis because the mean of the two groups did not equal zero. Therefore, the alternate hypothesis is accepted. The mean score further shows that the students' milestone aligns with year three attitudinal disposition.

Table 27. Descriptive Statistics for Ownership

Sample	N	Mean	St. Dev.	SE Mean
Ownership Y3 Students	10	3.30	1.06	0.33
Ownership Y3 Instructors	10	2.300	0.483	0.15

Estimation for Difference

Difference	95% CI for Difference
1.000	(0.198, 1.802)

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
2.72	12	0.019

SE = standard error; St. Dev. = standard deviation

The ownership results were an exception to the other six categories on the scale. The results for year 3 students were compared with the ratings of their instructors. The t-value was 2.72, the mean of the students was 3.30, while the instructors' was 2.300, therefore, a difference of 1.000. Moreover, because the p-value being 0.019 (Table 27) is less than 0.05, there is a reason, likely due to the study's small sample size, for the difference in ownership results from the other categories. Therefore, future researchers should consider increasing the sample size and retesting this category. Yet, the p-value does support accepting the alternative hypothesis and rejecting the null hypothesis, because the difference did not equal zero.

5. Summary

The results addressing research question 1 are summarized as follows: How do year 1 students compare with year 2, 3, and 4 students on the enculturation scale?

Table 28. Summary of Group Results

Category	Year 1	Year 2	Year 3	Year 4	Results based on alpha = 0.05
Norms	3.3	3.2	3.5	3.8	p-Value = .64 Difference by group: Not statistically significant
Communication	3.1	3.3	3.5	3.8	p-Value = .48 Difference by group: Not statistically significant
Scholarship	2.8	3.0	3.3	3.5	p-Value = .55 Difference by group: Not statistically significant
Professionalism	2.8	2.5	3.1	3.8	p-Value = .15 Difference by group: Not statistically significant
Motivation	2.8	2.7	3.5	3.1	p-Value = .32 Difference by group: Not statistically significant
Persistent	3.1	2.8	3.8	3.5	p-Value = .15 Difference by group: Not statistically significant
Ownership	3.0	2.9	3.2	3.5	p-Value = .76 Difference by group: Not statistically significant

The results for all seven categories for all participants by group did not show any significant difference (Table 28). Furthermore, the results revealed that students at the end of year 1 were more likely to be operating in Phase 3, thinking, on the enculturation scale. Accordingly, students' disposition should reflect that of learners who operate procedurally across the three domains of knowledge, skills, and attitudes. Similarly, year 2 results revealed that students were operating in Phase 3. The results for year 3 and 4 students were mostly in Phases 3 and 4, as expected. The disposition at this point indicates a high level of learner maturity. The difference is that they operate not only factually or conceptually but also procedurally and metacognitively. In considering this point and summarizing the results for research question 3, evidence from the test group, including ratings from faculty and year 3 students alone, appears closely aligned. This is probably because, at the time, self-assessments were highly grounded in learner maturity. Moreover, the results for instructors and students were not statistically significantly different in five of the seven categories. The exception occurred in the ownership category, the last category, for which results were statistically different. The communication category lacked sufficient data variation to test the two groups statistically. Based on the foregoing, the instrument can be administered to first-year students in order to establish a baseline for tracking growth over time. Additionally, faculty may use the instrument along with their students, starting at the end of the second year of the graduate program, to determine how best to coach and support students in their graduate learning.

In summarizing the results for research question 2, the seven categories showed a positive relationship among all variables; however, some had lower positive correlations, 0.45–0.67, than others. Nonetheless, the Cronbach's alpha value was 0.95 for year one. In year two, weak and moderate positive correlations ranged from 0.10 to 0.47 and from 0.62 to 0.72, respectively. The Cronbach's alpha for this group was 0.88, whereas the value for the year 3 group was 0.94. For weak positive correlations, values ranged from 0.49 to 0.60; for moderate positive correlations, from 0.67 to 0.78. Finally, year 4 ratings revealed Cronbach's alpha value of 0.91, a weak negative correlation of -0.20, and one category with a moderate positive correlation of 0.70**.**

6. Suggestions for Future Research

This study did not consider those who are All But Dissertation (ABD). ABD is another important subject to examine because it helps identify the impediments and factors that leave them unfinished with the program.

Purposive sampling is a non-random technique because it targets specific groups that satisfy the research criteria. In this study, the technique was based on the number of years in the study program. Future research should examine results obtained randomly, rather than purposively. Further, this study did not analyze results by institution. However, institutions may use the instrument to assess their program.

One limitation of this study is its small sample size. Further, the response rate was lower than anticipated. Accordingly, a larger sample size will provide more robust data. Moreover, working directly with faculty members will likely increase students' participation. Finally, a longitudinal design can be adopted to yield more data.

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Data sharing statement

No additional data are available.

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References

Asoodar, M., Atai, M. R., Vaezi, S., & Marandi, S. S. (2014). Examining effectiveness of communities of practice in online English for academic purposes (EAP) assessment in virtual classes. *Computers & Education*, *70*, 291–300. https://doi.org/10.1016/j.compedu.2013.08.016

Bloom, B. S., Englehart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). *The Taxonomy of educational objectives, handbook I: The Cognitive domain*. David McKay Co., Inc

Bohm, D., Senge, P. M., & Nichol, L. (2004). *On dialogue*. Routledge. https://doi.org/10.4324/9780203947555

Brookfield, S. D., & Preskill, S. (2012). *Discussion as a way of teaching: Tools and techniques for democratic classrooms*. John Wiley & Sons.

Cai, L., Choi, K., Hansen, M., & Harrell, L. (2016). Item response theory. *Annual Review of Statistics and Its Application*, *3*(1), 297–321. https://doi.org/10.1146/annurev-statistics-041715-033702

Cox, A. (2005). What are communities of practice? A comparative review of four seminal works. *Journal of Information Science*, *31*(6), 527–540. https://doi.org/10.1177/0165551505057016

Fraenkel, J. R., & Wallen, N. E. (2022). *How to: Design and evaluate research in education*. Mc Graw-Hill Higher Education.

Franz, T. M., & Spitzer, T. M. (2006). Different approaches to teaching the mechanics of American Psychological Association Style. *Journal of Scholarship of Teaching and Learning*, *6*(2), 13–20.

Gardner, S. K., Hayes, M. T., & Neider, X. N. (2007). The dispositions and skills of a PhD in education: Perspectives of faculty and graduate students in one college of education. *Innovative Higher Education*, *31*, 287–299. https://doi.org/10.1007/s10755-006-9029-1

Grant, S. (2012). The Reverence Thomas Pennock, Wesleyan Methodist missionary in nineteenth-century Jamaica: A case study of acculturation, enculturation, or something else? *Wesley and Methodist Studies*, *4*, 117–128. https://doi.org/10.2307/42909831

Hacke, W. (2010). *Meta-analysis comparing student outcomes for national board–certified teachers and non-national board–certified teachers*. University of San Francisco.

Hattie, J. (2016). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Kamler, B., & Thomson, P. (2014). *Helping doctoral students write: Pedagogies for supervision*. Routledge. https://doi.org/10.4324/9781315813639

Kelly, S. N. (2002). A sociological basis for music education. *International Journal of Music Education*, 39(1), 40–49. https://doi.org/10.1177/025576140203900105

Knowles, M. S. (1970). *The modern practice of adult education: Andragogy versus pedagogy*. Association Press.

Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory into Practice*, *41*(4), 212–218. https://doi.org/10.1207/s15430421tip4104_2

Lizardo, O., Mowry, R., Sepulvado, B., Stoltz, D. S., Taylor, M. A., Van Ness, J., & Wood, M. (2016). What are dual process models? Implications for cultural analysis in sociology. *Sociological Theory*, *34*(4), 287–310. https://doi.org/10.1177/0735275116675900

Macakova, V., & Wood, C. (2022). The relationship between academic achievement, self-efficacy, implicit

Madsen, C. K. (1982). Graduate versus undergraduate experimental scholarship: What should be our expectations? *College Music Symposium*, *22*(1), 73–77. College Music Society.

Monette, M. L. (1979). Paulo Freire and other unheard voices. *Religious Education*, *74*(5), 543–554. https://doi.org/10.1080/0034408790740511

Murrell Jr., P. C., Diez, M. E., Feiman-Nemser, S., & Schussler, D. L. (2010). *Teaching as a moral practice: Defining, developing, and assessing professional dispositions in teacher education*. Harvard Education Press.

Popham, W. J. (2000). *Modern educational measurement: Practical guidelines for educational leaders*. Allyn & Bacon.

Schafer, W. E. (1974). Sport, socialization and the school: Toward maturity or enculturation? *OSSC Bulletin*, *17*(5), 5.

Shapiro, J. P., & Stefkovich, J. A. (2016). *Ethical leadership and decision making in education: Applying theoretical perspectives to complex dilemmas*. Routledge.

Tan, L. (2014). Enculturation. In W. F. Thompson (Ed.), *Music in the social and behavioral sciences: An encyclopedia* (pp. 393–395). Sage.

theories and basic psychological needs satisfaction among university students. *Studies in Higher Education*, *47*(2), 259–269. https://doi.org/10.1080/03075079.2020.1739017

Wlodkowski, R. J., & Galbraith, M. W. (2004). Creating motivating learning environments. *Adult Learning Methods: A Guide for Effective Instruction*, *3*, 14–164.

Wlodkowski, R. J., & Ginsberg, M. B. (2017). *Enhancing adult motivation to learn: A comprehensive guide for teaching all adults*. John Wiley & Sons.

Appendix A: Matrix Construction

Enculturation	**Graduate Disposition**
Norms *Openness toward other perspectives (Brookfield & Preskill, 2012) *Respect and tolerance toward ideas that may differ from yours (Brookfield & Preskill, 2012) *Equity (Shapiro & Stefkovich, 2016) *Ethics (Shapiro & Stefkovich, 2016) *Mission (Shapiro & Stefkovich, 2016)	*Motivation* for learning Openness toward learning (Hacke, 2010) *Self-assessment of prior learning *Identify the goal of learning *Consider multiple approaches to solve a problem Willingness to invest in learning (Schafer, 1974) *Average time spent reading weekly *Subscribe to academic journals in the field of study *Ancillary materials and supplemental sources. Self-efficacy (Hattie, 2016; Knowles, 1970). Learner success (Macakova & Wood, 2022). Willingness to be vulnerable (Schafer, 1974) *Seek and use feedback from peers and the instructor *Admit ignorance
Communication *Writing using field-specific conventions (Franz & Spitzer, 2006) *Verbal exchange of ideas with clear articulation (Brookfield & Preskill, 2012).	*Persistence* Retention (Hattie, 2016). *Consistent enrolment every semester Classroom engagement *Considers class attendance to be important to learning *Read learning material prior to class session
Professionalism *Appearance* *Dress code *Interact appropriately with peers and faculty	*Ownership of success* *Seek opportunity to learn and clarify course content outside the class *Collaborate with peers *Learning as a partnership between the student and instructor
Scholarship *Understands the importance of prior research *Awareness of various sources and materials on student's subject matter *Understands the steps to produce academic material *Attitude toward knowledge sharing	