

Perceived Difficulties in College Algebra Among Education, Arts, and Sciences Students

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Abstract

Mathematics has long been considered a challenging subject at all educational levels, with many students failing to reach the expected level of mastery. These difficulties are often linked to both student- and teacher-related factors, such as limited conceptual understanding, low motivation, and the continued use of traditional teaching approaches. In higher education, College Algebra remains one of the most difficult foundational mathematics courses. This study aimed to determine the difficulties encountered by first-year college students in College Algebra as perceived by themselves and by their mathematics instructors.

A descriptive-survey method was employed, involving 59 Education students, 29 Arts and Sciences students, and their mathematics instructors from a private higher education institution in Negros Occidental, Philippines. A validated and reliable questionnaire based on the College Algebra syllabus was used to assess

perceived levels of difficulty across key algebraic topics. Data were analyzed using means, standard errors, and z-tests at a 0.05 level of significance.

Findings revealed that both students and instructors generally perceived College Algebra topics as moderately difficult (overall mean = 3.16). Algebraic Fractions was identified as the most difficult. No significant difference was found in perceived difficulties when students were grouped according to gender. However, significant differences were observed between Education and Arts and Sciences students in specific subtopics, particularly Algebraic Fractions and Systems of Real Numbers.

The study concludes that while most College Algebra topics pose moderate challenges, targeted instructional interventions and differentiated learning approaches are needed to strengthen students' understanding and mastery of complex algebraic concepts.

Keywords: *College Algebra, Mathematics Difficulties, Mathematics Education, Perceived Difficulty, Student Perceptions*

INTRODUCTION

The subject of mathematics has consistently been a focal point of discussion and concern among students at the elementary, secondary, and tertiary levels. Many students express that mathematics is difficult and hard to understand, a sentiment supported by performance results from national and

international assessments, which show that elementary and secondary students often perform below the target mastery level of seventy-five percent. The challenges in learning mathematics are multifaceted, stemming from both student- and teacher-related factors across educational levels.

At the elementary level, students face difficulties in understanding mathematical concepts and material due to limited mathematical abilities, immature conceptual understanding, and a lack of motivation (Maryanto et al., 2023). These challenges are compounded by teaching practices that often focus on brief explanations without engaging students deeply, alongside teachers' limited innovation and creativity in delivering math content (Maryanto et al., 2023). Similar issues persist in secondary education, where students struggle with word problems, mathematical operations, and connecting concepts, while teachers face challenges such as limited discipline, difficulties in timely lesson delivery, and insufficient use of technology (Maryanto et al., 2023).

Moreover, mathematics learning difficulties extend into higher education, where students often suffer from weak critical thinking skills, low interest, and poor numeracy literacy, all of which affect their overall problem-solving abilities (Maryanto et al., 2023). In addition, lecturers sometimes rely heavily on traditional teaching methods that fail to engage or adjust to varied student abilities (Maryanto et al., 2023). These challenges are further intensified by overcrowded classrooms, lack of specialized mathematics laboratories, inadequate reward and discipline systems, and minimal parental involvement, as evidenced in studies focusing on sixth-grade students (Abuhasanein, 2025). Other notable barriers include math anxiety, ineffective teaching methods, and socio-cultural factors that hinder students' mathematical performance and self-confidence (Frontiers in Psychology, 2022). Addressing these issues requires a holistic approach involving innovative teaching strategies, improved teacher training, the use of technology, and supportive learning environments to enhance students' understanding and mastery of mathematics.

This undesirable situation is not only a concern for school administrators but, more significantly, for the teachers. Teachers are crucial factors in the teaching-learning process and are often referred to as the backbone of the education system because they are entrusted with the responsibility of training the youth. The task of producing quality graduates depends greatly on their hands, as they hold unique opportunities for influencing students both academically and personally. Teachers simplify complex and abstract concepts, provide motivation and guidance, and serve as role models who inspire and nurture students to reach their full potential. Their dedication goes beyond classroom instruction to include mentoring, emotional support, and continuous efforts to create a supportive and effective learning environment. Ultimately, the quality of any education system is closely tied to the quality of its teachers, whose influence extends far beyond academic outcomes to shape the future of society (Digital Class World, 2024).

It has been observed that difficulties in the learning of mathematics, particularly in College Algebra, are common experiences among Education students and those from the College of Arts and Sciences. Given this context, the present study aims to investigate the difficulties in College Algebra as perceived by both first-year college students and mathematics instructors.

Specifically, this study sought to answer the following questions:

1. What are the difficulties of first-year college students in College Algebra as perceived by them and the mathematics college instructors when all the contents were taken altogether?
2. What are the difficulties of first-year college students in College Algebra as perceived by them when grouped according to gender?
3. What are the difficulties of first-year college students in College Algebra as perceived by them when grouped according to their field of specialization?

4. Is there a significant difference in the perception of college students towards difficulties in College Algebra when they are grouped according to gender?
5. Is there a significant difference in the perception of college students towards difficulties in College Algebra when they are grouped according to their field of specialization?

METHODOLOGY

This chapter presents a comprehensive description of the research methodology employed in this study. It outlines the research design, the target population and research setting, the sampling strategy, the data collection instruments, the data gathering procedures, and the statistical techniques utilized for data analysis. Each subsection provides a detailed account of the steps undertaken to conduct the study rigorously.

Research Design

The descriptive-survey method was utilized in this study to gather the necessary data and information regarding the difficulties experienced by education and arts and sciences students, as well as mathematics college instructors in a Private Higher Educational Institution. This methodological approach is widely regarded as appropriate for studies that involve systematically surveying and describing the current status or characteristics of a particular phenomenon without manipulating variables. Descriptive survey research focuses on capturing an accurate and detailed snapshot of a population's opinions, behaviors, or experiences at a specific point in time (DistanceLearning Institute, 2024; Teachers Institute, 2024).

In education research, the descriptive-survey method enables investigators to collect comprehensive data through structured instruments such as questionnaires or interviews that explore perceptions, challenges, and factual conditions from participants. The method's strength lies in its ability to provide rich quantitative and qualitative information, which can be used for effective decision-making, policy formulation, and further research (Scribd, 2025). Researchers employing this approach often follow systematic procedures including defining research questions, designing surveys with clear and unbiased items, carefully selecting samples to ensure representativeness, and analyzing data using statistical tools (Teachers Institute, 2024).

By focusing on the "what is" aspect rather than causal relationships, descriptive survey research is effective in educational settings to examine students' experiences, teachers' attitudes, or institutional challenges. It is particularly suited for studies like the present one, where understanding the difficulties faced in College Algebra and their perceptions by both students and instructors is essential. Through descriptive surveys, the study seeks to present an objective and factual description of the problems and to serve as a basis for developing interventions and support mechanisms (Aggarwal, 2008; Best & Kahn, 2007).

Research Locale

The research was undertaken at a Private Higher Educational Institution, located at Western Visayas, Negros Occidental Province. The study population comprised the entire 59 Education, 29 Arts and Sciences students, and their corresponding mathematics instructors.

Respondents of the Study

The subject-respondents of the study were the fifty-nine (59) education students and the twenty-nine (29) arts and sciences students. mathematics instructors of these students were also considered as respondents of the study because the difficulties experiences by the college students were perceived by the students themselves and the mathematics college instructors.

Sampling Design

The sampling design for this study utilized a purposive sampling method, where the respondents were selected based on their direct involvement with the difficulties in learning College Algebra. The subject-respondents of the study were composed of two distinct groups: Education students and Arts and Sciences students. Specifically, the study included fifty-nine (59) Education students and twenty-nine (29) Arts and Sciences students, all of whom were enrolled in the College Algebra course. These students were chosen as they have first-hand experience with the challenges they face while learning the subject.

Additionally, the study considered mathematics instructors as key respondents, as they have valuable insights into the perceived difficulties of the students they teach. The difficulties experienced by the students were perceived not only by the students themselves but also by the mathematics instructors, making their input crucial for the study. The number of mathematics instructors selected for the study depends on the number of instructors teaching College Algebra to the identified student groups.

The purposive sampling approach was chosen because it allows for the selection of individuals who have relevant and specific knowledge about the research topic. In this case, the researcher aimed to gather information directly from those who are most familiar with the learning and teaching of College Algebra. The students and instructors who were selected are those most likely to provide meaningful insights into the difficulties experienced in the course.

By using this method, the researcher ensured that the sample was tailored to capture the perspectives of those directly involved in the College Algebra learning process, providing a more accurate and focused understanding of the perceived challenges.

Data Gathering Procedure

After finalizing the research instrument, the researcher was able to get the approval of the department heads of Education and Arts and Sciences to conduct the study. Sufficient copies were then reproduced for the conduct of the survey.

To ensure that appropriate perceptions and responses could be gathered, the researcher personally administered the questionnaire to the college students of the two departments as well as to the mathematics instructors handling the classes. In this way, the researcher obtained a one hundred percent retrieval of the research instrument. After the accomplished questionnaire was retrieved, the data were tallied, tabulated and analyzed, and interpreted according to the specific problems, and hypotheses that were set forth. Participants received comprehensive information regarding the study's aims and were assured of the strict confidentiality of their responses.

Research Instrument

The data-gathering instrument utilized in this study consisted of two parts. Part I was used to gather data on personal information such as name, gender, and area of specialization for the college students while name, gender, educational attainment and teaching experience for mathematics college instructors. Part II of the data-gathering instrument was a survey-questionnaire which identified education, arts and sciences students' difficulties in College Algebra. The survey-questionnaire consisted of the topics and sub-topics included in the course College Algebra presented in the course syllabus. In identifying difficulties among the topics and sub-topics presented, students were asked to encircle the extent to which college students and mathematics college instructors perceived as difficult. The developed survey questionnaire to identify education and arts and sciences students' difficulties on the contents of College Algebra were considered valid and reliable since it was based from the course syllabus constructed by the field of mathematics and duly approved by the concerned school for utilization based on CHED Policies Standards and Guidelines.

Statistical Treatment of Data

The pertinent data gathered in this study were treated in the following manner: Problems 1, 2 and 3 which identified the content of the College Algebra where education, arts and sciences students and mathematics college instructors perceived it as difficult, the mean was used. The numerical scales of the mean used in identifying the content of College Algebra where respondents find it difficult are as follows:

Numerical Scale	Verbal Description
4.21 - 5.00	Very Difficult
3.41-4.20	Difficult
2.61-3.40	Moderately Difficult
1.81-2.60	Easy
1.00 -1.80	Very Easy

Problem 4 and 5 which determined the differences on the perception of college students towards the difficulties in the content of College Algebra when they are grouped according to gender and field of specialization, z- test (z-critical value) was used.

The decision to reject or not to reject the null hypothesis in this study, a 0.05 level of significance was used. To be significant at 0.05 level, the critical value had to reach 1.96 or above.

RESULTS AND DISCUSSIONS

Table 1. Distribution of Subject-Respondents of the Study

Grouping Variables	Frequency	Percentage
Gender		
<i>Male</i>	24	27
<i>Female</i>	64	73

Total	88	100
Area of Specialization		
Education	59	67
Arts and Sciences	29	33
Total	88	100

Table 1 presents the distribution of the respondents according to gender and area of specialization. As shown, out of the 88 respondents, 64 or 73 percent are female, while only 24 or 27 percent are male. This indicates that the majority of the respondents in the study are female. In terms of area of specialization, 59 respondents or 67 percent are from the field of Education, whereas 29 respondents or 33 percent belong to Arts and Sciences. This suggests that a greater proportion of the respondents are specializing in Education compared to Arts and Sciences.

Table 2. Extent of the Difficulties Perceived by the First Year College Students and Mathematics College Instructors in College Algebra

System of Numbers	Real	College Students		Mathematics Instructors		Overall Mean	Interpretation
		Mean	Interpretation	Mean	Interpretation		
1. Systems of Real Numbers		3.05	Moderately Difficult	2.84	Moderately Difficult	2.95	Moderately Difficult
2. Special Products and Factoring		3.08	Moderately Difficult	3.00	Moderately Difficult	3.04	Moderately Difficult
3. Algebraic Fractions		3.04	Moderately Difficult	3.92	Difficult	3.48	Difficult
4. Linear Equation in One Unknown		3.12	Moderately Difficult	3.19	Moderately Difficult	3.16	Moderately Difficult
Overall Mean		3.07	Moderately Difficult	3.24	Moderately Difficult	3.16	Moderately Difficult

Table 2 presents the perceived extent of difficulties in College Algebra among first-year college students and mathematics instructors. Both groups rated the subject as moderately difficult, with overall means of 3.07 for students and 3.24 for instructors, and a combined mean of 3.16. Among specific topics, Systems of Real Numbers, Special Products and Factoring, and Linear Equations in One Unknown were all rated moderately difficult. However, Algebraic Fractions emerged as the most challenging, with students rating it moderately difficult ($M = 3.04$) and instructors rating it difficult ($M = 3.92$), yielding a combined mean of 3.48. These findings indicate that while most topics are moderately difficult, Algebraic Fractions requires greater instructional attention.

Table 3. Extent of Difficulties of First Year College Students in the Systems of Real Numbers as Perceived by Themselves

System of Numbers	Arts and Sciences		Education		Overall Mean	Interpretation
	Mean	Interpretation	Mean	Interpretation		
1. The Real Number System	3.17	Moderately Difficult	2.78	Moderately Difficult	2.98	Moderately Difficult
2. Laws of Addition and Multiplication	3.30	Moderately Difficult	2.51	Easy	2.91	Moderately Difficult
3. Laws of Signs	3.17	Moderately Difficult	2.78	Moderately Difficult	2.98	Moderately Difficult
4. Signs of Grouping	3.27	Moderately Difficult	2.88	Moderately Difficult	3.08	Moderately Difficult
5. Similar Terms	3.20	Moderately Difficult	2.63	Moderately Difficult	2.92	Moderately Difficult
6. Numerical Inequality	3.10	Moderately Difficult	3.15	Moderately Difficult	3.13	Moderately Difficult
7. Rational and Irrational Numbers	3.40	Moderately Difficult	3.05	Moderately Difficult	3.23	Moderately Difficult
8. Elementary Operations on Fractions	3.57	Difficult	2.42	Easy	3.00	Moderately Difficult
9. Index Laws	3.23	Moderately Difficult	3.27	Moderately Difficult	3.25	Moderately Difficult
Overall Mean	3.27	Moderately Difficult	2.83	Moderately Difficult	3.05	Moderately Difficult

Table 3 shows the perceived difficulties of first-year students in the Systems of Real Numbers grouped by specialization. Arts and Sciences students obtained a higher mean ($M = 3.27$) compared to Education students ($M = 2.83$), both interpreted as moderately difficult. Across subtopics, both groups reported moderate difficulty, though differences appeared in Laws of Addition and Multiplication—rated moderately difficult by Arts and Sciences (3.30) but easy by Education (2.51)—and in Elementary Operations on Fractions, rated difficult (3.57) and easy (2.42), respectively. Overall, Arts and Sciences students showed higher perceived difficulty, suggesting a need for targeted interventions to strengthen foundational algebra skills.

Table 4. Extent of the Difficulties of First Year College Students in Special Products and Factoring as Perceived by Themselves

Special Products and Factoring	Arts and Sciences		Education		Overall Mean	Interpretation
	Mean	Interpretation	Mean	Interpretation		
1. Square Root	3.27	Moderately Difficult	2.86	Moderately Difficult	3.07	Moderately Difficult
2. Perfect Squares	3.07	Moderately Difficult	2.81	Moderately Difficult	2.94	Moderately Difficult

3. Products of Binomials	3.10	Moderately Difficult	2.90	Moderately Difficult	3.0	Moderately Difficult
4. Grouping Multiplication	3.13	Moderately Difficult	2.90	Moderately Difficult	3.02	Moderately Difficult
5. Difference of Two Squares	2.97	Moderately Difficult	3.03	Moderately Difficult	3.00	Moderately Difficult
6. Sum and Difference of Two Cubes	3.27	Moderately Difficult	3.05	Moderately Difficult	3.16	Moderately Difficult
7. Perfect Square Trinomials	3.13	Moderately Difficult	3.24	Moderately Difficult	3.19	Moderately Difficult
8. Factoring by Grouping	3.17	Moderately Difficult	3.19	Moderately Difficult	3.18	Moderately Difficult
9. Special Powers	3.20	Moderately Difficult	3.08	Moderately Difficult	3.14	Moderately Difficult
Overall Mean	3.14	Moderately Difficult	3.01	Moderately Difficult	3.08	Moderately Difficult

Table 4 presents the perceived difficulties of students in Special Products and Factoring. Both Arts and Sciences ($M = 3.14$) and Education ($M = 3.01$) students rated the topic as moderately difficult, with an overall mean of 3.08. Across subtopics, Arts and Sciences students found Square Root (3.27), Sum and Difference of Two Cubes (3.27), and Special Powers (3.20) most challenging, while Education students rated Perfect Square Trinomials (3.24) and Factoring by Grouping (3.19) highest. No subtopic was rated easy or very difficult, indicating consistent but manageable challenges. These results suggest a moderate level of difficulty overall, with slightly greater difficulty among Arts and Sciences students, highlighting the need for reinforced instruction and practice.

Table 5. Extent of Difficulties of First Year College Students in Algebraic Fractions as Perceived by Themselves

Algebraic Fractions	Arts and Sciences		Education		Overall Mean	Interpretation
	Mean	Interpretation	Mean	Interpretation		
1.Reduction to Lowest Term	3.60	Difficult	2.58	Easy	3.09	Moderately Difficult
2. Fractions with Common Denominators	3.37	Moderately Difficult	2.42	Easy	2.90	Moderately Difficult
3. Four Fundamental Operations on Fractions	3.27	Moderately Difficult	2.59	Easy	2.93	Moderately Difficult
4. Simple and Complex Fractions	3.27	Moderately Difficult	2.86	Moderately Difficult	3.07	Moderately Difficult
5. Mixed Expressions	3.17	Moderately Difficult	3.03	Moderately Difficult	3.10	Moderately Difficult
6. Radicals	3.03	Moderately Difficult	3.29	Moderately Difficult	3.16	Moderately Difficult
Overall Mean	3.28	Moderately Difficult	2.80	Moderately Difficult	3.04	Moderately Difficult

Table 5 presents the perceived difficulties of first-year students in Algebraic Fractions grouped by specialization. Arts and Sciences students obtained a higher overall mean ($M = 3.28$) than Education students ($M = 2.80$), both interpreted as moderately difficult, with a combined mean of 3.04. Across subtopics, Arts and Sciences students reported greater difficulty, particularly in Reduction to Lowest Term (3.60 vs. 2.58), Fractions with Common Denominators (3.37 vs. 2.42), and Four Fundamental Operations on Fractions (3.27 vs. 2.59). Both groups, however, rated Simple and Complex Fractions, Mixed Expressions, and Radicals as moderately difficult. Overall, Arts and Sciences students exhibited higher difficulty levels, indicating the need for targeted instruction in basic fraction operations, while both groups would benefit from reinforcement in advanced fraction concepts.

Table 6. Extent of the Difficulties of First Year College Students in Linear Equations in One Unknown as Perceived by Themselves

Linear Equation in One Unknown	Arts and Sciences		Education		Overall Mean	Interpretation
	Mean	Interpretation	Mean	Interpretation		
1. Equivalent Equations	2.93	Moderately Difficult	3.15	Moderately Difficult	3.04	Moderately Difficult
2. Linear Equations	3.10	Moderately Difficult	3.22	Moderately Difficult	3.16	Moderately Difficult
3. Algebraic Translation	3.03	Moderately Difficult	3.41	Moderately Difficult	3.22	Moderately Difficult
4. Word Problem Solving	2.70	Moderately Difficult	3.36	Moderately Difficult	3.03	Moderately Difficult
4.a Lever Problems	2.67	Moderately Difficult	3.31	Moderately Difficult	2.99	Moderately Difficult
4.b Percentage Problems	2.90	Moderately Difficult	3.22	Moderately Difficult	3.06	Moderately Difficult
4.c Uniform Motion Problems	2.97	Moderately Difficult	3.53	Difficult	3.25	Moderately Difficult
4.d Problems on Simple Interest	2.87	Moderately Difficult	3.27	Moderately Difficult	3.07	Moderately Difficult
Overall Mean	2.92	Moderately Difficult	3.31	Moderately Difficult	3.12	Moderately Difficult

Table 6 presents the perceived difficulties of first-year students in Linear Equations in One Unknown. Arts and Sciences students obtained an overall mean of 2.92, while Education students had a slightly higher mean of 3.31, both interpreted as moderately difficult, with a combined mean of 3.12. Across subtopics, both groups rated Equivalent Equations, Linear Equations, and Algebraic Translation as moderately difficult. However, Education students reported greater difficulty in Word Problem Solving ($M = 3.36$) compared to Arts and Sciences students ($M = 2.70$), with Uniform Motion Problems emerging as the most challenging (3.53 vs. 2.97).

When grouped by gender, both male and female students rated all major topics—Systems of Real Numbers, Special Products and Factoring, Algebraic Fractions, and Linear Equations in One Unknown—as moderately difficult. The only exception was Uniform Motion Problems, rated difficult by female students ($M = 3.41$). Statistical analysis showed no significant difference in perceived difficulty based on

gender. Overall, results suggest that students across groups find College Algebra moderately difficult, with word problems, particularly Uniform Motion Problems, requiring additional instructional support.

Table 7. Differences Between the Difficulties of First Year College Students in the Systems of Real Numbers When Grouped According to Area of Specialization

Systems of Real Numbers	Mean Difference	Sedm	z	Interpretation
1. The Real Number System	0.39	0.22	1.77	Not Significant
2. Laws of Addition and Multiplication	0.79	0.24	3.26	Significant
3. Laws of Signs	0.39	0.24	1.61	Not Significant
4. Signs of Grouping	0.39	0.22	1.77	Not Significant
5. Similar Terms	0.57	0.24	2.38	Significant
6. Numerical Inequality	0.05	0.24	0.23	Not Significant
7. Rational and Irrational Numbers	0.35	0.21	1.67	Not Significant
8. Elementary Operations on Fractions	1.15	0.24	4.75	Significant
9. Index Laws	0.04	0.22	0.18	Not Significant

Table 7 shows that most subtopics under the Systems of Real Numbers revealed no significant differences between Arts and Sciences and Education students. However, significant differences were noted in Laws of Addition and Multiplication, Similar Terms, and Elementary Operations on Fractions, where Arts and Sciences students experienced greater difficulty. This indicates that while both groups share similar challenges, Arts and Sciences students require additional support in these specific areas.

Table 8. Differences Between the Difficulties of First Year College Students in Special Products and Factoring When Grouped According to Area of Specialization

Special Products and Factoring	Mean Difference	Sedm	z	Interpretation
1. Square Root	0.41	0.22	1.86	Not Significant
2. Perfect Squares	0.26	0.21	1.24	Not Significant
3. Products of Binomials	0.2	0.21	0.95	Not Significant
4. Grouping Multiplication	0.23	0.23	1.00	Not Significant
5. Difference of Two Squares	0.06	0.21	0.29	Not Significant
6. Sum and Difference of Two Cubes	0.22	0.21	1.05	Not Significant
7. Perfect Square Trinomials	0.11	0.21	0.52	Not Significant
8. Factoring by Grouping	0.02	0.21	0.10	Not Significant
9. Special Powers	0.12	0.22	0.57	Not Significant

Table 8 shows that all subtopics under Special Products and Factoring—including Square Root, Perfect Squares, Products of Binomials, Grouping Multiplication, Difference of Two Squares, Sum and Difference of Two Cubes, Perfect Square Trinomials, Factoring by Grouping, and Special Powers—had z-values that did not reach significance. This indicates no significant difference between Arts and Sciences and Education students, suggesting that both groups encountered a similar level of difficulty. Instructional interventions may therefore be applied uniformly across specializations.

Table 9. Differences Between the Difficulties of First Year College Students in Algebraic Fractions When Grouped According to Area of Specialization

Algebraic Fractions	Mean Difference	Sedm	z	Interpretation
1.Reduction to Lowest Term	1.02	0.22	4.64	Significant
2.Fractions with Common Denominators	0.95	0.21	4.52	Signifiant
3.Four Fundamental Operations on Fractions	0.68	0.21	3.24	Significant
4.Simple and Complex Fractions	0.41	0.20	2.05	Significant
5.Mixed Expressions	0.14	0.21	0.67	Not Significant
6.Radicals	0.26	0.19	1.37	Not Significant

Table 9 shows significant differences in Reduction to Lowest Term, Fractions with Common Denominators, Four Fundamental Operations on Fractions, and Simple and Complex Fractions, where Arts and Sciences students experienced greater difficulty. No significant differences were found in Mixed Expressions and Radicals. Overall, the findings suggest that Arts and Sciences students struggle more with basic fraction operations, indicating a need for targeted instructional support in these areas.

Table 10. Differences Between the Difficulties of First Year College Students in Linear Equation in One Unknown When Grouped According to Area of Specialization

Linear Equation in One Unknown	Mean Difference	Sedm	z	Interpretation
1.Equivalent Equations	0.22	0.20	1.10	Not Significant
2.Linear Equations	0.12	0.19	0.63	Not Signifiant
3.Algebraic Translation	0.38	0.20	1.90	Not Significant
4.Word Problem Solving	0.66	0.20	3.30	Significant
4.a Lever Problems	0.44	0.21	2.10	Significant
4.b Percentage Problems	0.32	0.23	1.39	Not Significant
4.c Uniform Motion Problems	0.56	0.21	2.67	Significant
4.d Problems on Simple Interest	0.40	0.21	1.40	Not Significant

Table 10 shows no significant differences in Equivalent Equations, Linear Equations, and Algebraic Translation, indicating similar difficulty levels for both groups. However, significant differences were found in Word Problem Solving, particularly in Lever Problems and Uniform Motion Problems, where Arts and Sciences students struggled more. Overall, both groups share similar challenges in basic concepts, but Arts and Sciences students need additional support in solving applied word problems

Conclusion

Based on the findings of this study, the following conclusions were drawn it was noted that Education and Arts and Sciences college students have been exposed to College Algebra, but they have not yet achieved mastery of the subject. While they have learned foundational topics such as the systems of real numbers, special products and factoring, and linear equations, they have not mastered these concepts well

enough to advance to more complex topics within College Algebra. Additionally, they have no mastery over algebraic fractions.

The study also found that these students have not mastered various subtopics within College Algebra, including systems of real numbers, special products and factoring, algebraic fractions, and linear equations in one unknown. Both the students and their mathematics instructors perceive that the students have not fully mastered these areas of the subject.

Interestingly, there are discrepancies in the perceptions of students and instructors regarding the difficulties students face in College Algebra. While both groups agree that students struggle with certain topics, their perceptions of the severity of these difficulties differ slightly.

In terms of gender, male and female Education and Arts and Sciences college students show similar patterns in their understanding of College Algebra. Both groups have no mastery over key topics such as the systems of real numbers, special products and factoring, algebraic fractions, and linear equations in one unknown. Additionally, their perceptions of the difficulties they face in these topics are almost identical.

While students share similar perceptions of their difficulties in most subtopics, there are some areas where their views differ. For example, their understanding of the laws of addition and multiplication, similar terms, and elementary operations on fractions varies. Similarly, when it comes to mixed fractions, radicals, and operations on fractions, students' views are largely similar, but they differ in certain areas like reduction to lowest terms, fractions with common denominators, and simplified complex fractions.

Finally, when considering topics such as equivalent equations, linear equations, algebraic translation, and percentage problems, students have similar perceptions of their difficulties. However, they diverge in their views on more complex problems, like the lever problem and uniform motion problems.

Recommendations

Based on the findings of the study, the researcher offers the following recommendations that Mathematics college instructors should make an additional effort to teach College Algebra in a way that is both simple and meaningful to their students. It is crucial that they find methods to simplify complex concepts, allowing students to grasp them more easily and engage with the material in a deeper way. Instructors should also motivate their students to dedicate more time and attention to learning algebra, emphasizing the importance of consistent effort in mastering the subject.

Students, in turn, are encouraged to put in more effort when learning College Algebra. By doing so, they will not only improve their mathematical skills but also recognize the value and relevance of mathematics in their everyday lives. It is important for students to understand that algebra is not just an academic requirement, but a tool that can help them in various aspects of life.

To further support student learning, a tutorial program should be developed specifically to help improve their performance in mathematics, particularly in algebra. This program would provide additional guidance for students who may struggle with the subject, offering them personalized support to enhance their understanding and skills.

Instructors are also encouraged to explore new teaching strategies that can make learning algebra more engaging and accessible. By incorporating creative approaches, instructors can spark students' interest in the subject and make learning more enjoyable.

Additionally, male and female students should be given equal opportunities to succeed in mathematics, with a particular focus on algebra. It is vital to ensure that all students, regardless of gender, feel equally capable and supported in their studies.

This study should be shared with the College of Education, Arts, and Sciences to provide valuable insights into the difficulties students experience in College Algebra. By understanding these challenges, faculty and administrators can take steps to address them and improve the learning experience.

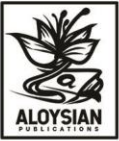
A similar study should be conducted in other departments offering College Algebra, as this could reveal whether the perceived difficulties in learning the subject are consistent across different academic fields or whether they vary.

Mathematics instructors should also be mindful of gender equity in their classrooms. By creating an inclusive environment, they can help eliminate the stereotype that mathematics is a male-dominated field, ensuring that both male and female students feel equally confident in their ability to succeed.

Lastly, school administrators should openly support programs that aim to improve and enhance students' mathematical skills. By investing in programs that provide extra support and resources, administrators can play a key role in helping students overcome difficulties in mathematics and improve their overall academic performance.

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