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ORIGINAL ARTICLE

Engineering Students' Expectations about Calculus-based Physics

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ABSTRACT

The study measured the first-year engineering expectation in calculus-based Physics subject and compared expectations when respondents were grouped according to sex and grouped according to senior high school strand completed. A quantitative research design using a descriptive-comparative approach was utilized. The study respondents were first-year engineering students under the course Physics for Engineers during the first semester of SY 2024-2025. The students' expectations are categorized as independence related, coherence related, concept related, reality link related, mathematics link related, and effort related. Results showed strongly positive expectations in independence related, coherence related, concept related, reality-link related, mathematics-ink related, and effort related expectations. Overall expectations in Physics for Engineers course were likewise strongly positive regardless of sex and high school strand completed. In conclusion, the independence expectation, coherence expectation, concept expectation, mathematics link expectation, reality link expectation, effort expectation and overall expectations in calculus-based Physics of college students are all positive regardless of sex and completed high school strand.

Keywords: *Physics expectations, calculus- based Physics, sex, senior high school strand completed*

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INTRODUCTION

The world is full of number of things that we could never understand all at once. Instead, if we are to make sense out of the world, we must learn to pick and choose, to group things together. There are many things in this world that are very different but may fall into related groups when we look for related physical properties. Physics is the name given to the scientific study of the world - the real world. Physics tells us the rules that make everything in the world sensible. It helps us understand what and why things can happen or not in the real world. We don't have to be physicists to buy an electric device and plug it in, but physics tells us what we mean by a machine, why we have to plug it in, and what we are paying for from the power company. A little knowledge of physics goes a long way in helping people manage their lives. Through the years, physics has been a relevant science in an age of increasing reliance on tools and fruits of science. Physics has long been considered a basic science because of its relevance to humanity.

However, large number of students do not take any course in physics or physics-related courses. Maybe, students believed that physics consists of unrelated concepts that in reality is irrelevant to physics class, or maybe there are some students who believe that physics requires well-developed manipulative skills in mathematics. So many barriers can prevent students from learning physics. However, these barriers can be minimized if cannot be avoided when the characteristics and beliefs of students are identified.

The alignment of student expectations with higher education realities is relevant in fostering a positive learning scenario. Lobo & Gurney, (2014); Jones, (2010) and Byrne et al. (2012) cited that while meeting these expectations can contribute to student engagement, achievement and satisfaction, it is important to consider the consequence of extreme adjustment. A conflict between expectations of student and institutional realities can lead to negative consequences which include lessened engagement, retention and achievement Pather & Dorasamy (2018); Money et al., (2017); Pather & Booi, (2019); (Byrne et al., (2012).

In Philippine context, understanding these expectations and their implications is particularly relevant, given the diverse student population and the varying quality of higher education institutions.
This understanding is especially important in physics education. The hindrance that prevents students from learning physics, like student's perception or belief in the need for advanced mathematical skills, can be aggravated by a mismatch between students' expectations and the realities of physics courses. By identifying and addressing these expectations, educators can create more inclusive and effective physics learning scenario.

A study by Lenton (2015) measured student expectations on various university life aspects like learning opportunities, assessment and feedback, academic support, voice of students, and asked students for a rating of the course's overall quality. This is an important tool for students and university since higher rating implies the quality of instruction, and associated with higher numbers of retention and applications.

As a project part, Maryland Physics Education Research Group created the Maryland Physics Expectation (MPEX) instrument to assess the effect of attitudes, beliefs, and student expectations on what is learned in calculus-based physics subject. Physics expectation was categorized as independence related, coherence related, concept related, reality-link related, mathematics-link related, and effort related. Independence related expectation is defined as beliefs about physics learning which is either a way of acquiring knowledge or rebuilding way of one's comprehension. Coherence related expectation is the expectation about the knowledge framework of physics, on how it could be a body of lone pieces or one organized system. Concept related expectation is the expectation on the content of physics, whether it includes equations or underlying concepts of equations. Reality-Link related expectation is the expectation about the link between physics and real-world scenario. Whether experiences in the classroom are unrelated to physics or it is relevant to consider them to be related. Mathematics-link related expectation is the expectation about the mathematics role in physics learning. To think mathematic as just utilized to solve unknown variables or used as a way of representing physical events of information. Lastly, Effort related expectations are about undertakings and necessary activities that make sense out of physics. Whether or not to expect that thinking carefully and evaluating the task at hand should be based on available materials and feedback Redish, etal., (1998).

Knowing and assessing the beliefs and expectations about physics would improve student's learning. It is on these grounds that the study has been conceptualized to identify the student's expectation in the course Physics for Engineers.

Research Questions

This study examined how innovative technologies change school management. Research questions include:

1. What is the utilization level of innovative technologies in school management practices as perceived by school heads?
2. What is the level of effectiveness of school management practices as perceived by school heads?
3. Is there a significant relationship between utilizing innovative technologies and school management practices?
4. Do the qualitative data support the quantitative results of the study?

METHODS

Study Design

The research is a quantitative research design using a descriptive-comparative approach. A questionnaire was used as the primary tool for collecting data. The study used the descriptive-comparative approach since survey was used to gather data. Data were used to describe the expectation on the calculus-based Physics for Engineers course using frequency and percent. Comparisons were likewise done for expectations responses compared by sex and by completed high school strand.

Population and Sample

The respondents of the study were first-year engineering students enrolled in the course Physics for Engineers during the first semester of school year 2024-2025. The respondents were selected as such since only first-year engineering students are taking a calculus-based Physics for Engineers course in the first semesters of every school year. There were 79 students who gave consent to make use of the responses for the study of whom are forty (40) males and thirty-nine (39) females. Among the respondents, twenty-five (25) of them completed the Humanities and Social Science HUMMS); thirty-nine (39) completed Science, Technology, Engineering and Mathematics (STEM); three (3) completed Accountancy, Business and Management (ABM), four (4) completed Technical, Vocational Livelihood (TVL), and five (5) students completed the General Academic Strand (GAS).

Instrumentation

The questionnaire used was adopted from a Maryland Physics Expectation (MPEX) questionnaire created by the Maryland Physics Education Research Group. A pre-survey was given to university faculty members and engineering students of different majors for validation and reliability testing. The students' expectations in calculus-based Physics for Engineers course were categorized as independence, coherence, concepts, reality links, mathematics link and effort. As adopted from MPEX survey questionnaire, variables considered under each category are independence related expectation, coherence related expectation, concept related expectation, reality-link related expectation, mathematics-link related expectation and effort related expectation. Variables considered under each category are as follows:

A. Independence related expectation

1. Fundamental concepts are understood by mere reading the text, working on a lot of the problems, and/or paying close attention in the class;
2. Not expecting to comprehend questions in an intrinsic sense but to be just accepted as givens;
3. Few equipped people are able to really comprehending physics;
4. When answering exams or homework activities, concepts that underlie problems are thought of;
5. Understanding physics means capable of remembering read or seen;
6. To utilize a formula in a problem, know more than what each variable in the formula represents.

B. Coherence related expectations

1. Physics knowledge contains a lot of bits of information that are basically relevant to a certain condition;
2. A grade in the course is mostly resolved by familiarity of the subject matter. Insights or ingenuity has less to do with the grade;
3. In solving physics problems, if results from computations differ significantly from expected result, calculations are to be trusted;
4. In class or in text, derived proofs of formula have less to do with problem solving, or with the skills needed to succeed in the subject;
5. Errors committed in homework and examination are used as guides needed to be able to perform and comprehend Physics concept better.

C. Concept related expectations

1. Rather than carefully analyzing in detail a few problems, the most effective way to understand physics is by solving a lot worded problem;
2. Physics learning is acquiring knowledge that are particularly seen in laws, theories and formula provided in texts and/or in class;
3. If coming up with two or more distinct ways to solve a problem with varied answers, select the most sensible answer;

4. Main skill acquired from the course is problems solving skill;
5. High possibility of passing the course without understanding physics very well.

D. Reality link related expectations

1. Physics problem solving primarily means pairing problems with theories or laws then substituting derived or given values to acquire an answer;
2. Learning physics alter some notions about how the physical reality functions;
3. Relation of physical laws with experiences in the reality is minimal;
4. To attain career targets, good physics grade is not sufficient, good physics understanding is necessary;
5. To comprehend physics, at times figure personal experiences and relate them to the concepts being learned;
6. Physics course is related to reality and at times could help to know the connection, but it is least important with what is to be done in the course;
7. Learning physics help comprehend everyday life situations;
8. A lot of problems in the course enables one to memorize most needed information;
9. The primary skill acquired from the course is learning logical reasoning of the physical reality.

E. Mathematics link related expectations

1. All learned from derived proof of a formula is that validity of the obtained formula and accepted to be used in problem-solving;
2. The most relevant aspect in physics problem-solving is choosing the appropriate equation or formula to use;
3. There is nothing much that could be done to come up with a specific equation forgotten and necessary in solving a problem;
4. Learning physics requires a lot of rethinking, restructuring, and reorganizing information given in classroom and/or in the textbooks.

F. Effort related expectations

1. Going over class notes thoroughly in preparation for tests in the course;
2. Spending great amount of time to figure out and comprehend some of the derived proofs in the classroom or in textbook;
3. Detailly reading the text and thoroughly working on the many given examples;
4. Result of an examination do not provide any relevant guidance to elevate course comprehension. All the learning related with the examination is the reviewing done before the examination;
5. Spending great amount of time working on a problem is a useless. If progress is not made quickly, ask someone more knowledgeable.

Data Analysis

The descriptive and inferential statistics were used in the data analysis and interpretation. The descriptive measure used was the weighted mean and percent which measured the expectation classification in Physics for Engineers course. The Likert scale as shown below, was used to classify students' expectations on calculus-based Physics for Engineers course according to high school strand completed and according to sex. Disagreement or strong disagreement responses imply a moderately negative and highly negative expectation respectively, while agreement or strong agreement imply moderately positive and highly positive expectation, respectively. The neutral classification implies an undecided expectation.

Kruskal- Wallis test was utilized to assess difference among the perceptions on physics expectations of students according to high school strand completed. The t-test was the statistical tool used to determine if there is a significant difference in the perception of physics expectation level of students grouped according to sex. Chi-square test was used to compare equality of proportion. All hypotheses were tested using 0.05 significance level.

RESULTS

Students' physics expectations are group as independence related, coherence related, concept related, reality-link relate, mathematics-link related and effort related expectations.

Table 1 presents the student's level of Independence expectation in Physics for Engineers Course and comparison of proportion for positive expectation, neutral and negative expectation. It could be seen from the presented data that students have higher positive independence expectation in Physics for Engineers Course specifically on the following: Fundamental concepts are understood by mere reading the text, working on a lot of the problems, and/or paying close attention in class (44.3% moderately positive and 26.6% highly positive); When answering exams or homework activities, concepts that underlie problems are thought of (43.0% moderately positive and 13.9% highly positive); Understanding physics means capable of remembering read or seen (35.4% moderately positive and 15.2% highly positive); and To utilize a formula in a problem, know more than what each variable in the formula represents (54.4% moderately positive and 19.0% highly positive). Students were undecided on the independence expectation variables: Not expecting to comprehend questions in an intrinsic sense but to be just accepted as given values (43.0% neutral); and few equipped people are able of really comprehending physics (44.3% neutral). The Chi-square test values which were significant at 0.05 significance level implies that there are significant differences in the proportions of students with a positive expectations, negative expectations and neutral expectations on the items under independence expectations on Physics for Engineers Course are highly rated by students.

This implies that students believe that physics learning is either a means of acquiring information or reconstruction of one's comprehension.

Table 1. Student's Independence Expectation on Calculus-Based Physics for Engineers Course

INDEPENDENCE EXPECTATION	Percent					Chi-Square	P
	HNE	MNE	N	MPE	HPE		
1. Fundamental concepts are understood by mere reading the text, working on a lot of the problems, and/or paying close attention in the class	1.3	6.3	21.5	44.3	26.6	46.380^a	.000

2. Not expecting to comprehend questions in intrinsic sense but to be just accepted as given values	3.8	24.1	43.0	21.5	7.6	38.152[a]	.000
3. Few equipped people are able of really comprehending physics	6.3	13.9	44.3	22.8	12.7	34.608[a]	.000
4. When answering exams or homework activities, concepts that underlie problems are thought of	0	5.1	38.0	43.0	13.9	32.038[b]	.000
5. Understanding physics means capable of remembering read or seen	2.5	11.4	35.4	35.4	15.2	34.734[a]	.000
6. To utilize a formula in a problem, know more than what each variable in the formula represents	3.8	2.5	20.3	54.4	19.0	69.291[a]	.000

Table 2 shows the student's coherence expectation in calculus-based Physics for Engineers Course. Data shown in the table indicates that about half or more of the total student respondents have moderate to high positive coherence expectation in calculus-based Physics for Engineers course. The items included are Physics knowledge contains a lot of bits of information that are basically relevant to a certain condition (45.6% moderate positive and 30.4% high positive); Grade in the course is mostly resolved by the familiarity of the subject matter. Insights or ingenuity has less to do with the grade (39.2% moderately positive and 12.7 highly positive); In solving physics problems, if results from computation differ significantly from expected, calculations are to be trusted (38.0% moderately positive and 11.4% highly positive); Mistakes committed in homework and examination are used as guides needed to be able to perform and comprehend Physics concept better (54.4% moderately positive and 25.3% highly positive); and In class or in text, derived proofs of formula have less to do with problem solving, or with the skills needed to succeed in the subject (40.5% moderately positive and 10.1% highly positive). All computed chi-square values for each coherence item were significant at 0.05 significant level. This indicates that the proportion of student responses on coherence expectations differ significantly. Again, just like the result shown in table 1, students expect that the framework of physics understanding is how it could be a cluster of single pieces or could be one logical system.

Table 2. Student's Coherence Expectation on Calculus-Based Physics for Engineers Course

COHERENCE EXPECTATION	**PERCENT**					**Chi-Square**	**Sig.**
	HNE	MNE	N	MPE	HPE		
1. Physics knowledge contains a lot of bits of information that are basically relevant to a certain condition	2.5	1.3	20.3	45.6	30.4	56.000[a]	.000
2. Grades in the course are mostly resolved by the familiarity of the subject matter. Insights or ingenuity have less to do with the grade	1.3	10.1	36.7	39.2	12.7	45.494[a]	.000
3. In solving physics problems, if results from computation differ significantly from expected value, calculations are to be trusted	2.5	8.9	39.2	38.0	11.4	47.266[a]	.000
4. In class or in text, derived proofs of formula have less to do with problem solving, or with the skills needed to succeed in the subject	6.3	10.1	32.9	40.5	10.1	38.278[a]	.000

5. Mistakes committed in homework and examination are used as guides needed to be able to perform and comprehend Physics concept better	0	2.5	17.7	54.4	25.3	45.000[b]	.000

Table 3 shows concept expectation in calculus-based Physics for Engineers course. The computed percentages described positive agreement on concept expectation on items: Rather than carefully analyzing in detail a few problems, the most effective way to understand physics is by solving a lot worded problem (30.4% moderately positive and 26.6% highly positive); Physics learning is acquiring knowledge that are particularly seen in laws, theories and formula provided in textbooks and/or in classroom (49.4% moderately positive and 21.5% highly positive) and Main skill acquired from the course is problems-solving skill (50.6% moderately positive and 20.3% highly positive).

Table 3. Student's Concept Expectation on Calculus-Based Physics for Engineers Course

CONCEPT EXPECTATION	**PERCENT**					**Chi-Square**	**p**
	HNE	MNE	N	MPE	HPE		
1. Rather than carefully analyzing in detail a few problems, the most effective way to understand physics is by solving a lot worded problem	1.3	10.1	31.6	30.4	26.6	29.038[a]	.000
2. Physics learning is acquiring knowledge that are particularly seen in laws, theories and formula provided in textbooks and/or in classroom	2.5	3.8	22.8	49.4	21.5	56.886[a]	.000
3. If coming up with two or more distinct ways to solve a problem with varied answers, select the most sensible answer	1.3	12.7	41.8	35.4	8.9	49.038[a]	.000
4. The main skill acquired from the course is problems-solving skill	1.3	6.3	21.5	50.6	20.3	58.405[a]	.000
5. There is a great possibility of passing the course without understanding physics very well	24.1	24.1	30.4	17.7	3.8	16.127[a]	.003

The concept on having a great possibility of passing the course without understanding physics very well (24.1% highly negative and 24.1% moderately negative) and If coming up with two or more distinct ways to solve a problem with varied answers, select the most sensible answer (1.3% highly negative, 12.7% moderately negative and 41.8% neutral) were geared toward uncertainty or negative expectation. Again, same as the results of table 1.A and table 1.B, the computed chi-square values were significant at 0.05 significant level which imply significant differences in proportions of responses. The expectation of students on content of physics could include either equations or as underlying concept of equations.

Table 4 presents the student's mathematics-link expectation in calculus-based Physics for Engineers course. It could be gleamed from the data that all items categorized under mathematic-link expectation were positively expected by the students. Students highly expect that The only thing learned from derived proof of a formula is that the obtained formula is valid and accepted to be used in problem solving (45.6% moderately positive and 15.2% highly positive); The most relevant aspect in physics problem solving is choosing the appropriate equation or formula to use (35.4% moderately positive and 44.3% highly positive); There is nothing much to be done to come up with a specific forgotten equation necessary in solving a problem (34.2% moderately positive and 13.9% highly positive); and Learning physics requires a lot of rethinking, restructure, and reorganizing information given in classroom and/or in the textbooks (51.9% moderately positive and 27.8% highly positive). All of the computed chi-square values were significant at considered 0.05 significant level implying that the proportions of respondents differ significantly on all mathematics-link expectation items. This means that student's expectation of mathematics role in learning physics could either just used to solve numerical values or is used to represent of physical phenomena.

Table 4. Students' Mathematics Link Expectation on Calculus-Based Physics for Engineers Course

MATHEMATICS – LINK EXPECTATION	**PERCENT**					**Chi-Square**	**P**
	HNE	MNE	N	MPE	HPE		
1. The only thing learned from derived proof of a formula is that the obtained formula is valid and accepted to be used in problem solving	2.5	5.1	31.6	45.6	15.2	52.962[a]	.000
2. The most relevant aspect in physics problem solving is choosing the appropriate equation or formula to be used	3.8	2.5	13.9	35.4	44.3	56.633[a]	.000
3. There is nothing much to be done to come up with a specific forgotten equation necessary in solving a problem	2.5	7.6	41.8	34.2	13.9	46.253[a]	.000
4. Learning physics requires great amount of rethinking, restructuring, and reorganizing given information in classroom and/or in the textbooks	3.8	2.5	13.9	51.9	27.8	66.506[a]	.000

Table 5 presents the students' Reality Link Expectation in Calculus-Based Physics for Engineers course. The added percentages under moderately to highly positive expectations for each Reality Link Expectation item is more than 50% which indicates students have a positive expectation per item under Reality link. These include the following: Physics problem solving primarily means pairing problems with theories or laws then substituting derived or given values to acquire an answer; Learning physics alter some notions about how the physical reality functions; Relation of physical laws with experience in the reality is minimal; To attain career targets, good physics grade is not sufficient, good physics understanding is necessary; To comprehend physics, at times figure personal experiences and relate them to the concepts being learned; Physics is related to reality and at times could help to know the connection, but it is least important with what is being done in the course; Learning physics help comprehend everyday life situations; A lot of problems in the course enables one to memorize most needed information; and The primary skill acquired from the course is learning logical reasoning of the physical reality.

Proportions of respondents per expectation classification in all Reality link expectation items are significantly incomparable as implied by all the computed Chi-square values which are significant at prescribed significant level. Again, similar to the results presented in tables 1, 2, 3 and 4, student's expectation on the association between physics and reality is that experiences outside the classroom is unrelated to physics or it is relevant to think about them to be together.

Table 5. Students' Reality Link Expectations on Calculus-Based Physics for Engineers Course

REALITY-LINK EXPECTATION	PERCENT					Chi-Square	P
	HNE	MNE	N	MPE	HPE		
1. Physics problem solving primarily means pairing problems with theories or laws then substituting derived or given values to acquire an answer	2.5	10.1	26.6	43.0	17.7	38.785[a]	.000
2. Learning physics alter some notions about how the physical reality functions	2.5	2.5	25.3	45.6	24.1	51.696[a]	.000
3. Relation of physical laws with experience in the reality is minimal	8.9	16.5	21.5	36.7	16.5	17.013[a]	.002
4. To attain career targets, good physics grade is not sufficient, good physics understanding is necessary	3.8	7.6	30.4	36.7	21.5	31.823[a]	.000
5. To comprehend physics, at times figure personal experiences and relate them to the concepts being learned	1.3	12.7	44.3	30.4	11.4	46.506[a]	.000
6. Physics is related to reality and at times could help to know the connection, but it is least important with what is being done in the course	3.8	13.9	27.8	35.4	19.0	23.722[a]	.000
7. Learning physics help comprehend everyday life situations		7.6	32.9	40.5	19.0	20.291[b]	.000
8. A lot of problems in the course enables one to memorize most needed information	1.3	11.4	27.8	51.9	7.6	65.494[a]	.000
9. The primary skill acquired from the course is learning logical reasoning of the physical reality	1.3	3.8	34.2	46.8	13.9	62.076[a]	.000

Table 6 shows the students' Effort expectations in calculus-based Physics for Engineers course. The data show that students have positive effort expectation. Students have positive expectations on the following items under Effort expectations: Going over class notes thoroughly in preparation for tests in the course (38.0% moderately positive and 27.8% highly positive); Spending great amount of time to figure out and comprehend some of the derived proofs in the classroom or in the textbook (39.2 % moderately positive and 26.6% highly positive); Detailly reading the text and thoroughly working on the many given examples (26.6% moderately positive and 24.1% highly positive); 4. Result of an examination do not provide any relevant guidance to elevate course comprehension. All the learning related with the examination is the reviewing done before the examination (26.6% moderately positive and 7.6% highly positive); and spending great amount of time working on a problem is useless. If progress is not made quickly, ask someone more knowledgeable (21.5 moderately positive and 15.2% highly positive).

Table 6. Students' Effort Expectations on Calculus-based Physics for Engineers Course

EFFORT EXPECTATION	PERCENT					Chi-Square	p
	HNE	MNE	N	MPE	HPE		
1. Going over class notes thoroughly in preparation for tests in the course	1.3	8.9	24.1	38.0	27.8	34.608[a]	.000
2. Spending great amount of time to figure out and comprehend some of the derived proofs in the classroom or in the textbook	1.3	6.3	26.6	39.2	26.6	39.291[a]	.000
3. Detailly reading the text and thoroughly working on the many given examples	1.3	8.9	39.2	26.6	24.1	35.747[a]	.000
4. Results of an examination do not provide any relevant guidance to elevate course comprehension. All the learning related with the examination is the reviewing done before the examination	10.1	17.7	38.0	26.6	7.6	24.608[a]	.000
5. Spending great amount of time working on a problem is a useless. If progress is not made quickly, ask someone more knowledgeable	16.5	19.0	27.8	21.5	15.2	3.975[a]	.409

The computed Chi-square values per item are significant at baseline significant level except for the last item listed in the table. This implies that the proportion of respondents differs significantly per expectation classification and effort expectation item except for the spending great amount of time working on a problem is a useless. If progress is not made quickly, ask someone more knowledgeable. If progress not made quickly, ask someone more knowledgeable where no significant difference is shown in the number of respondents per expectation classification. This indicates likewise that the number of respondents who have positive, negative expectations or neutral differ significantly for the rest of the effort items. Students expect activities and necessary work that are physics sensible. Students expect that thinking thoroughly and evaluating the task at hand could be based on availability of materials and feedback or not.

Table 7 shows the categorized expectation on the course: Physics for Engineers as perceived by first-year engineering students when grouped according to sex. The computed mean for each category and the overall mean implies moderate positive expectation for both female and male students except for concept expectation where female students are neutral in the concept expectation. This is similar to the output presented in table 1 where moderate to high positive expectations in all categories were observed. All the computed t values were likewise significant at baseline significant level which implies that the expectations of both female and male students are not significantly different.

Table 7. Student's Level of Expectation in Physics for Engineers Course When Students Are Grouped by Sex

EXPECTATION CATEGORY/SEX	Male		Female		T	p
	Mean	Des	Mean	Des		
Independence Related	3.48	A	3.56	A	-.706	.482
Coherence Related	3.67	A	3.69	A	-.126	.900

Concept Related	3.53	A	3.38	N	1.068	.289
Mathematics – Link Related	3.78	A	4.18	A	-1.962	.053
Reality-Link Related	3.57	A	3.61	A	-.230	.819
Effort Related	3.41	A	3.53	A	-.862	.391
Overall Expectation	3.56	A	3.60	A	-.378	.707

Table 8 presents the expectation on Physics for Engineers course when respondents were grouped according to high school strand completed. Based on the descriptive equivalence of means computed, the expectation per category for all students in different high school strands completed were all moderately positive.

Table 8. Student's Level of Expectation on Physics Expectation for Engineers Course When Grouped According to High School Strand Completed

EXPECTATION CATEGORY	**HIGH SCHOOL STRAND COMPLETED**										
	HUMMS		STEM		ABM		TVL		GAS		p
	Mean	Des	Mean	Des	Mean	Des	Mean	Des	Mean	Des	
Independence	3.56	A	3.44	A	3.67	A	3.78	A	3.50	A	0.638
Coherence	3.70	A	3.62	A	3.52	A	4.13	A	3.65	A	0.362
Concept	3.49	A	3.37	A	3.48	A	3.83	A	3.45	A	0.635
Mathematics – Link	3.81	A	3.80	A	3.45	A	4.33	SA	3.69	A	0.772
Reality-Link	3.56	A	3.56	A	3.73	A	3.83	A	3.56	A	0.279
Effort	3.50	A	3.42	A	3.48	A	3.60	A	3.50	A	0.967
Overall Expectation	3.59	A	3.53	A	3.58	A	3.89	A	3.55	A	0.556

This is likewise true with the overall expectation where the overall means of 3.59, 3.53, 3.58, 3.89, and 3.55 for HUMMS, STEM, ABM, TVL and GAS students, respectively imply moderate positive expectations. The computed p values for each category and overall expectation are not significant at baseline level of significance. The expectations of students were similar regardless of high school strands completed.

CONCLUSION

From the findings of the research, the following are concluded that the overall expectation and categorized expectation in terms of independence related, coherence related, concept related, mathematics link related, reality link related, and effort related expectations are all positively expected by students. The overall expectation, as well as categorized expectations in calculus-based Physics for

Engineers course were agreed upon and favorable for both male and female engineering students. The overall expectation, as well as independence related expectation, coherence related expectation, concept related expectation, mathematics-link related, reality-link related and effort related expectations in Physics for Engineers course are agreed upon by students regardless of completed high school strand of students.

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