Exploring College Academic Performance of K to12 IT and Non-IT-related Strands to Reduce Academic Deficiencies

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***Abstract*—Improving students' academic performance is a significant concern among academics. Despite various strategies to improve academic performance, there are still a significant number of students who fail academically. This study sought to investigate the possible reasons for the academic deficiencies among Infotech Development Systems Colleges, Inc. Information Technology (IT) students in the IT and Non-IT-related strands, if their strand is significant to their academic performance in college, as well as formulate a solution based on the identified reasons and recommendations to reduce the negative academic remarks. The researchers employed survey questionnaires and interviews to conduct exploratory data analysis. Similarly, the Senior High School academic performance and actual grades of the respondents from AY 2018-2019 to First Semester of AY 2021-2022. On the tested hypothesis showed statistical significance ($p < 0.05$) on IT-related strand. The study further reveals that the Non-IT-related strand has more students with academic deficiencies compared to IT-related strand and highlights a variety of reasons cited. Respondents cited misalignment of strand to current program, instructor not speaking clearly, unreliable internet connection, and failure to complete and submit an academic task as reasons for academic deficiencies. The researchers designed a model that can potentially eliminate academic inadequacies. The model takes into account both internal and external factors; for internal variable it includes effective time management, a positive attitude and mindset, prompt and punctual completion of requirements, and good study habits. While for the external factors, competent and student-friendly instructors, a stable, strong, and accessible internet connection, a conducive learning environment, relevant available resources and facilities, adaptation of limited face-to-face or hybrid classes, and alignment of SHS strand to college program of choice are recommended.**

***Keywords*—Academic performance; exploratory research; reduce academic deficiencies; thematic analysis**

I. INTRODUCTION

Expanding our worldview through education broadens our perspective. Many nations, like the Philippines, are shaping education to be the most valuable resource a nation may possess. Philippine Basic Education introduced the K-12 Curriculum, which requires students to complete two years of senior high school before being eligible for college. Students who enroll in this program may select their own track or strand based on their preferences or areas of interest, or they may choose to pursue work for the remaining two years of senior high school. Senior high school students follow a basic core curriculum and can specialize in one of four areas. These tracks are distinct fields of study, akin to college courses. The tracks are Academic, Technical-Vocational and Livelihood (TVL), Sports, and Arts and Design. Some of the most popular strand under Academic and TVL tracks are Science, Technology, Engineering, and Mathematics (STEM); Accountancy, Business, and Management (ABM); Humanities and Social Sciences (HUMSS); General Academic, Information and Communication Technology (ICT) and Home Economics (HE). Magdadaro [1] mentioned that having an ideal strand offer learners a sense of self-assurance and can help students to be passionate about their chosen career.

Academic performance is among the several components of academic success and key feature in education. [2], [3] Academic success and obtaining good grades are among the main goals in all levels of education while having positive outcomes both for the learners and educational systems. [4] The students' performance (academic achievement) plays an important role in producing the best quality graduates who will become great leaders and manpower for the country thus responsible for the country's economic and social development also one of the major factors considered by employers in hiring workers especially for the fresh graduates. Thus, students have to put the greatest effort in their study to obtain good grades and to prepare themselves for future opportunities in their career at the same time to fulfil the employer's demand. [5], [6] Many factors, including socioeconomic status, student temperament and motivation, peer, and parental support influence academic performance. [7] Factors affecting the academic performance of students are numerous and they can vary from nation to nation as well as even from person to person. As such, it would be really inadequate to investigate students' academic performance through a single-factor perspective [8] Students' performance also determines quality of education that will be passing to the students by the potential teachers at primary and secondary school levels. The good academic performance of students at the Senior High School is of paramount importance in every educational system. Meanwhile, numerous factors influence the academic performance of students and have been researched, but many problems persist. [9], [10].

There is a noticeable situation in which students enroll in college courses that are not associated with their track or

strand of senior high school. The mismatch rate is high between the strand of the learners during their senior high school and the course they enrolled in college. [11] Three mismatch characteristics affect students' academic outcomes: (1) a mismatch between expected and real grades, (2) a mismatch between expected and real levels of interest in studying, and (3) a mismatch between expected and real time for extracurricular activities at university. [12] The student's past performance in SHS has a significant effect on the student's self-efficacy in using information and communications technology (ICT)-related technologies in college. Computer self-efficacy also influences the students to achieve their academic goals in college; also, both past performance and computer self-efficacy have a strong influence on technology outcome expectations, however, the technology outcome expectations have a less significant effect on the students' achievement of their academic goals. [13] Low academic performance and adjustment to college are phenomena not new in the global education institutions. In fact, reported 60% of students who cannot adjust to college drop out early in school. The students who cannot establish good relationships with their friends, teachers and school administration, who do not like the school and the subjects have a higher tendency to be absent from school and to drop out of school. Also, that the specific causes of school dropouts include the difficulty of adjusting with the school curriculum. [14], [15], [16], [17] Moreover, mentioned that the problem of low academic achievement of students in the examinations is one of the most challenging problems that faces students as well as teachers. Low or weakness of the student's mark under the normal average in a study subject level as a result of a variety of reasons, including those related to the student himself, or those related to family, social and academic environment. Consequently, this may lead to frequent repetition of failure, despite their abilities that qualify them to get the best marks. [18].

In Infotech Development Systems Colleges, Inc. (IDSCI), it was discovered that a significant number of students in Information Technology programs have incomplete and failed remarks on their final grades, particularly in professional courses, as well as a significant number of dropouts, resulting in a decrease in program enrollment. In addition, students who took the non-IT-related strand in SHS are thought to have more incomplete and failed grades than those who took the IT-related strand.

The purpose of this study is to investigate the factors that contribute to the academic shortcomings of the respondents and to establish whether or not their strands have an impact on their academic performance. In addition to this, the researchers are interested in determining if the curriculum that they have chosen for their college is compatible with and advantageous to them. The researchers intend to carry out this study to serve as a guide to the institution, as well as for the students, particularly those who are enrolled and wishes to enroll in the Information Technology Department. The guidance will be presented in the form of a model with the goal of reducing the detrimental effect that it has on academic achievement. This model was designed using the causes that have been discovered for the academic deficiencies, as well as the recommendations made by the students, which included the alignment of their SHS strand.

II. METHODOLOLY

The exploratory research method was used in this study to determine ways to reduce academic deficiencies by examining respondents' college academic performance. This study was conducted among sixty-two (62) Information Technology (IT) students from Infotech Development System Colleges, Inc. and was divided into IT and Non-IT-related Strands based on their chosen strand. In order to gather enough information, the researcher used a survey questionnaire. The questionnaire was issued to eighty (80) target respondents, however only sixty (62) were retrieved. The proponent foregoes the available size with a confidence level of 90% and a margin of error of 5%.

After initiating the strand, the researchers identified the college academic achievement of the target respondents in order to determine the number of students that received INC and failed remarks. The researchers employed a questionnaire in which respondents were asked to assess their level of agreement with the criteria that had been devised to match the SHS Strand to the chosen college program. The questionnaire was distributed to respondents using Google Form, and the categories on the item on SHS strand matching on the college program, as well as if their strand was beneficial to their academic achievement in college, were listed to aid respondents in choosing the right decisions. In addition, weighted mean and standard deviation were utilized in order to identify and analyze the data.

The researcher also utilized the SHS and college academic performance to further determine if the respondent's strand has a significant relation to their academic performance in college. The research used the Pearson R statistical tool for the correlation. See (1). The SHS generated weighted average (GWA) was converted into a numerical value stipulated in the institution's Student Handbook. The numerical value was converted using a 6-point performance equivalent scale (6-Outstanding to 1-Failed).

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum y_i - \bar{y})^2}} \quad (1)$$

A separate survey questionnaire was also distributed only to respondents who had Incomplete or Failed remarks in order to determine the reason for their negative remarks. A 5-point Likert scale was used in both instruments. See Table I.

TABLE I. FIVE-POINT LIKERT SCALE FOR THE MATCHING AND BENEFITS OF SHS STRAND

Point Score	Range *Interval*	Descriptive Rating
		Level of Agreement
1	1:00-1.79	Strongly Disagree
2	1.80-2.59	Disagree
3	2.60-3.39	Neutral
4	3.40-4.19	Agree
5	4.20-5.00	Strongly Agree

Moreover, the researcher used thematic analysis to identify the recommendations by the respondents to reduce the academic deficiencies. Thematic analysis is the process of identifying patterns or themes within qualitative data. The goal of a thematic analysis is to identify themes, i.e. patterns in the data that are important or interesting, and use these themes to address the research or say something about an issue. This is much more than simply summarizing the data; a good thematic analysis interprets and makes sense of it [19].

A structured interview was conducted to collect the possible recommendations to reduce academic deficiencies. There were twenty-four (24) IT students who participated in the interview. These were the students who has failed or incomplete grades. Based on the respondents' recommendation, the analysis produced six (6) themes which included time management, positive attitude and mindset, instructor, requirement completion, study habits, and resumption of classes. The flowchart of the research process is presented on Fig. 1.

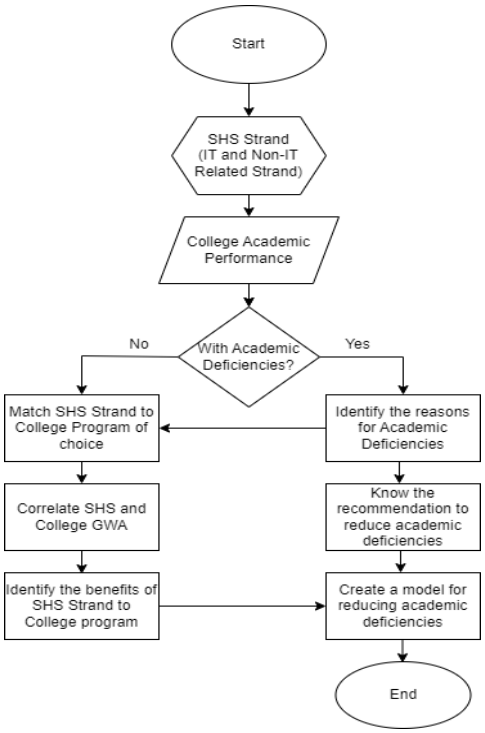

Fig. 1. Flowchart of the research process.

The researcher retrieved the instruments automatically through Google form. The academic performance of the respondents was measured using their actual grades from AY 2018-2019 to First Semester of the AY 2021-2022 taken from the Office of the Registrar with the permission of the IT students. The Student Profile Form was also used to identify the academic strand of the respondents. In this study, the respondents' Senior High School (SHS) strand were identified and categorized into IT Related Strand (ITRS) and Non-IT-Related Strand (NITRS). ITRS includes STEM and ICT while the NITRS includes ABM, HUMSS, GAS, Home Economics, Automotive, Agriculture, Arts and Design, Electrical, Dressmaking and Industry-al Arts. The meaning and significance of the responses were interpreted through processes that included gathering, synthesizing, tabulating, and interpreting the meaning and significance of the responses. Tables and graphs were created to display the collected data. Data analysis was carried out using Microsoft Excel and Social Science Statistics Calculator. Mean, standard deviation, frequency, percentage, and correlation for descriptive analysis.

III. Results and Discussion

In Fig. 2 shows the academic remarks status of the respondents. The results show that 58% got passing remarks but despite the high rate of passing grade there were still 42% respondents who got incomplete or failed academic remarks. Fig. 2 also reveals that 19% belong to IT-related-strand while 23% belong to non-IT-related strand students.

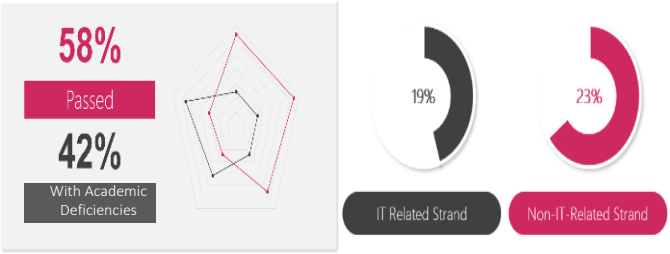

Fig. 2. Academic remarks status of the respondents.

Academic excellence is not universal among students; there are some students that despite of various strategies to improve academic performance, there are still number of students who fail academically. Failure in small doses is actually crucial in learning. However, when students completely fail academically, this means that they are unable to overcome the small failures over time to learn and grow and eventually succeed [20]. There are many causes of student failure, and these causes could be looked at in various ways. In this study, the researcher also would like to identify the reason of IT and non-IT-related strand for academic deficiencies in the area of subject matter, teacher factor, learning environment, motivation and attitude, and personal issues in order to provide sufficient solution based on the determined reasons for academic deficiencies. And also, to determine if their strand has an effect and beneficial to their college academic performance.

A. Reasons for Academic Deficiencies

1) Subject matter: Fig. 3 shows the reasons for academic deficiencies in terms of Subject Matter. In the course content was too difficult to understand, ITRS got a mean score of 3.33 with SD of 1.12 interpreted as neutral while NITRS got a mean score of 3.13 with SD of 1.13 interpreted as neutral. Too much course content/information was presented at a time making it difficult to be absorbed, ITRS yielded a mean score of 3.67 with SD of 0.71 interpreted as agree while NITRS gained a mean score of 3.47 with SD of 1.13 interpreted as agree. On the prerequisite competencies were not well developed in the preceding year level, ITRS obtained a mean score of 3.67 with SD of 1.00 interpreted as agree. On the other hand, NITRS obtained a mean score of 3.13 with SD of 1.25 and was

interpreted as neutral. In terms of the SHS strand undergone was not aligned with the present program being taken up, ITRS received a mean score of 2.78 with SD of 1.09 contrary to NITRS which received a mean score of 3.60 with SD of 1.40 interpreted as agree.

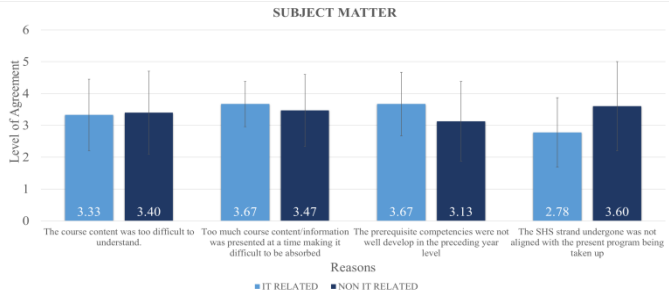

Fig. 3. Reasons for academic deficiencies in terms of subject matter.

According to the data, misalignment of the SHS strand to the enrolled program is one of the reasons why non-IT-related strand respondents received incomplete or failed remarks, as opposed to IT-related strand respondents. NITRS respondents mentioned that the topic presented in their current program is too different from the topics and discussion in their SHS strand, and they are finding it difficult to acclimatize. They also said that enrolling in an IT-related strand will make it easier for them to understand the lecture and other class activities. Moreover, the ITRS and NITRS both agreed that a fast-paced discussion was also one of the reasons for academic deficiencies. They have a hard time absorbing information that is delivered at the same time since it does not give them enough time to comprehend and learn the lesson. ITRS further stated that in the previous year's level, the required competences for the next course were not fully developed. Lack of competence causes a lack of confidence and willingness to complete tasks and activities. Students with strand mismatch lag behind others as it is more difficult for them to follow the unfamiliar subjects of their course. Students suffering from strand mismatch are also deprived of interpersonal relationships as forming them is directly related to academic engagement. It also has various indirect effects from these relationships to cognitive and behavioral participation [21].

2) Teacher factor: Fig. 4 shows the reasons for academic deficiencies in terms of the teacher factor. On the instructor did not speak clearly, ITRS got a mean score of 2.67 with SD of 1.12 interpreted as neutral while NITRS got a mean score of 3.91 with SD of 1.33 interpreted as agree. The instructor did not provide clear explanations, ITRS yielded a mean score of 2.78 with SD of 1.20 interpreted as neutral; on the other hand, NITRS yielded a mean score of 2.40 with SD of 1.35 interpreted as disagree. On the instructor did not consider extended deadlines, ITRS gained a mean score of 2.78 with SD of 1.09 interpreted as neutral while NITRS got a mean score of 2.67 with SD of 1.40 interpreted as neutral.

According to the research, NITRS respondents have difficulty understanding the lesson since their instructor did not talk in a manner that was appropriate for the situation. Respondents even claimed that some professors speak so quickly and utilize unfamiliar terminologies that they are unable to understand what they are trying to communicate. They also have difficulty understanding some computer words because they come from different strands. The ITRS, on the other hand, does not agree or disagree with the provided rationale; similarly, the instructor failed to present a clear discussion with which the NITRS disagrees. Teachers with poor communication skills may cause poor academic performance of students and lead to unstable professional life after school. Good communication minimizes the potential of unkind feeling during the process of teaching and learning. For a teacher, it is very pertinent to have good communication skills to create good classroom environment for effective teacher-student interaction to promote effective learning by students and acquisition of desired professional goals. Good communication is not only needed for effective teaching and learning, but it is also very important in the effectiveness of every human concern in life [22].

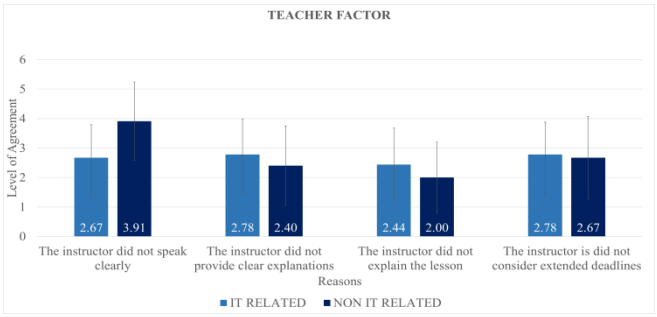

Fig. 4. Reasons for academic deficiencies in terms of teacher factor.

3) Learning environment: Fig. 5 shows the reasons for the academic deficiencies in terms of the learning environment. In terms of the internet connection being poor, ITRS obtained a mean score of 3.33 interpreted as neutral on the other hand NITRS received a mean score of 3.67 with SD of 1.54 interpreted as agree. On the learning area was un-comfortable, ITRS got a mean score of 3.33 with SD of 1.22 while NITRS yielded a mean score of 3.40 with SD of 1.24 both interpreted as agree.

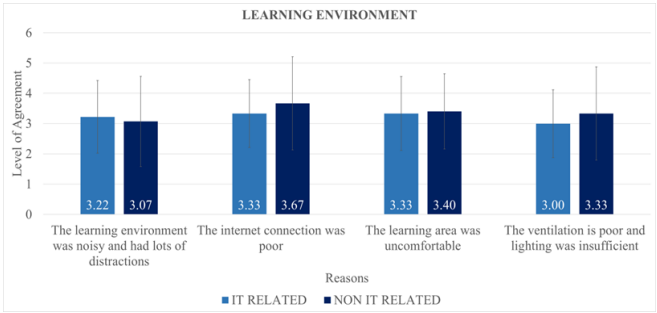

Fig. 5. Reasons for academic deficiencies in terms of learning environment.

Because of the unreliable internet connection, NITRS respondents find it difficult to complete a course satisfactorily, according to the data. Students rely heavily on internet connections in the new normal; from online classroom discussion to assignment submission, a poor internet connection prevents them from joining the class and completing duties. They also underline that being in an uncomfortable learning environment does not help them perform well, and that some people feel uncomfortable when they are being observed doing an activity or participating in a class discussion. Though ITRS does not agree or disagree with either of the above reasons, it is one of their group's highest mean scores, indicating that they are thinking about the reasons for their weaknesses. According to Torres-Diaz, students who do not have access to the internet are more likely to perform poorly on their examinations in comparison to students who frequently utilize the online educational resources. People who participate in interactive activities with their classmates and professors, as well as those who use online resources appropriately for their schoolwork, have a tendency to have better academic achievement overall [23].

4) Motivation and attitude: Fig. 6 shows the reasons for the academic deficiencies in terms of the learning environment. On lack of motivation, ITRS gained a mean score of 3.11 with SD of 1.17 while NITRS received a mean score of 3.13 with SD of 1.13 both interpreted as neutral. In terms of failure to do tasks and homework, ITRS obtained a mean score of 2.78 with SD of 1.09 interpreted as neutral on the other hand NITRS yielded a mean score of 3.87 with SD of 1.06 interpreted as agree.

The data shows that NITRS respondents, despite the fact that they did not dislike the courses, accept the fact that they failed to complete the academic task as the reason for their negative academic performance. However, ITRS respondents did not agree or disagree. Furthermore, although being neutral, the highest mean of the latter group lacks enthusiasm to perform as expected and continue with their academic responsibilities.

They lose interest in what they are doing because they see no reason to finish what they have started. Sometimes students lack motivation, so they become apathetic [24]. When students are unmotivated, they might feel that academic success doesn't matter or that they will never achieve it. Students who lack motivation might have experienced a good deal of failure early on in their education and feel there is no point in trying any longer. These students need to find a "why" when it comes to academic success, a reason that will motivate them to achieve their goals. A motivation can come from a career goal, a desire for a future accomplishment, the hope to be financially stable, or even the desire to give back to the community or family members.

5) Personal issues: Fig. 7 presents the reasons for academic deficiencies in terms of personal issues. On procrastinating or delayed doing tasks, ITRS got a mean score of 3.11 with SD of 0.93 interpreted as neutral on the other hand NITRS received a mean score of 3.93 with SD of 1.10 interpreted as agree. Lacking confidence in participating in class, ITRS got a mean score of 3.11 with SD of 1.45 interpreted as neutral while NITRS gained a mean score of 2.80 with SD of 1.37 interpreted as neutral.

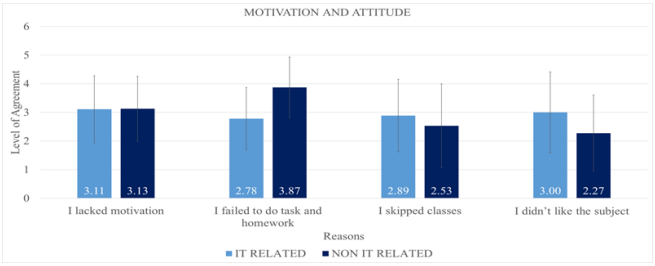

Fig. 6. Reasons for academic deficiencies in terms of motivation and attitude.

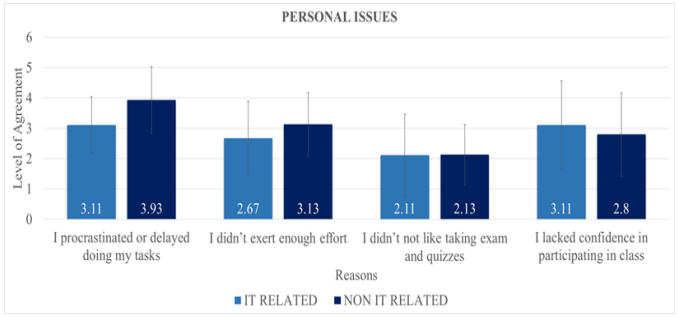

Fig. 7. Reasons for academic deficiencies in terms of personal issues.

According to the research, NITRS respondents have a habit of not completing projects on time. Respondents also admitted to making excuses for not doing their work and deferring chores like schoolwork or preparation for a test by doing anything else instead. ITRS responses do not agree or disagree with the stated personal concerns, but the highest mean in their category agrees with NITRS, and their lack of confidence in engaging in class may be a cause in their academic deficits. Late assignment submission indicates poor quality pupils in terms of performance. Their drop-out percentage (33.33%) is greater than the rate of on-time submissions (5.23%). Their request for an extension on the due date of their tasks is most likely due to poor time management rather than a desire to enhance performance. Students who submit their assignments on time perform better than those who submit their assignments late [25].

B. Agreement on the Matching of Strand to College Program of Choice as Perceived by the Students

With the above-mentioned reasons, the researcher further investigates if their SHS strand has equipped them with information and skills in preparation for their higher education, and how linked the respondent's strand was to their current program.

TABLE II. THE MATCH OF STRAND TO COLLEGE PROGRAM OF CHOICE AS PERCEIVED BY THE RESPONDENTS

INDICATOR	IT RELATED			NON IT RELATED		
	Mean	*SD*	*INT*	*Mean*	*SD*	*INT*
The SHS strand chosen specialization is aligned to the college program of choice.	4.28	0.92	SA	4.00	1.12	A
The specialization subject taken in SHS were related to the courses taken in college	4.21	1.01	SA	4.09	1.01	A
Some knowledge contents needed in college courses are introduced in SHS subjects	4.13	1.06	A	4.09	0.84	A
Some pertinent skills needed in college are taught and developed in SHS	4.24	0.87	SA	4.09	0.98	A
The SHS curriculum meets the college program requirements	4.10	0.94	A	4.09	0.98	A
General Mean and SD	4.19	0.96	A	4.07	0.99	A
Interpretation Legend: SA-Strongly Agree A-Agree N-Neutral D-Disagree SDA-Strongly Disagree						

Table II presents the matching of SHS strands based on the perspective of the IT respondents. The result show that in Table I, in terms of the SHS strand chosen specialization is aligned to the college program of choice, ITRS got a mean score of 4.38 with Standard Deviation (SD) of 0.92 and interpreted as strongly agree while the NITRS got a mean score of 4.00 with SD of 1.12 and interpreted as agree. On specialization subjects taken in SHS were related to the course taken in college ITRS got a mean score of 4.21 with SD of 1.01 while the NITRS only agreed with 4.09 mean score with 1.01 SD. Some knowledge content needed in college is taught and developed in SHS and their curriculum meets the college program requirements, ITRS got a mean score of 4.13 and 4.10 with SD of 1.06 and 0.94 while NITRS got a mean score of 4.09 and 0.84 and 0.98 SD, both interpreted as agree. On some pertinent skills needed in college are taught and developed in SHS, ITRS got a mean score of 4.24 with SD of 0.87 and interpreted strongly agree while the NITRS got a mean score of 4.09 with SD of 0.98 interpreted as agree. ITRS on general mean and SD got a mean score of 4.19 and 0.96 while NITRS got a mean score of 4.07 with SD of 0.99 both interpreted as agree.

The data demonstrates that the SHS strand courses, particularly those related to IT; match the courses offered by the IT program. The IT related strand, in contrast to the non-IT-related strand, strongly suggests it is needed in college courses, and the SHS curriculum fits some but not all of the college program standards. College program curriculum is an important factor in a student's learning development. The structures, standards, and performance indicators of the secondary and tertiary curriculum influence success in college. The usage of a vertically-aligned curriculum is beneficial to the students, although it needs systematic effort. Specialized pre-college courses gear students with advanced knowledge and make them excellent in their chosen fields [26]. During Senior High School, the students will gain the mandatory skills needed for their future professions that will help them do their work in a better way.

C. Correlation between SHS GWA and College GWA

After matching, to further tests the connection between SHS strand to their chosen college program the researcher correlates the SHS GWA to the College GWA to discover if the SHS Strand influences their college academic achievement.

1) Correlation between IT-Related strand and college GWA: Fig. 8 shows the correlation between the SHS GWA of the IT-related strand and their college academic performance.

The data reveals that although technically a positive correlation with r = 0.4115, the relationship between variables is weak. The p-value is 0.026567. The result is significant at $p < 0.05$. By normal standards, the association between the two variables would be considered statistically significant.

2) Correlation between Non-IT related-strand and college GWA: Fig. 9 shows the correlation between the SHS GWA of the Non-IT-related strand and their college academic performance. The data reveals that although technically a negative correlation, the relationship between variables is only weak with r = -0.114. The P-Value is 0.527587. The result is not significant at $p < 0.05$. The association between the two variables would not be considered statistically significant.

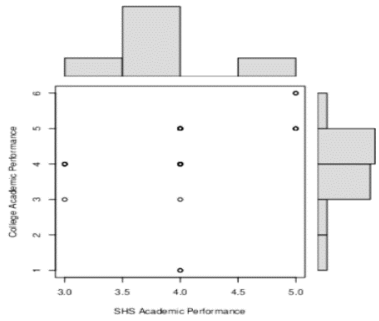

Fig. 8. Correlation between IT-Related strand and college GWA.

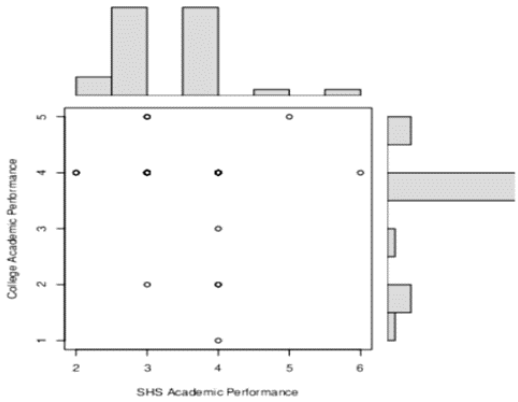

Fig. 9. Correlation between Non-IT related-strand and college GWA.

According to the research, regardless of the strand that IT students choose, it has no effect on their academic performance; nevertheless, enrolling in a related strand has a significant benefit over enrolling in a non-related strand. ITRS respondents also stated that it is simpler for them to grasp the lesson since they have prior knowledge on specific courses. Because of the information they gained in their SHS strand, they are also confident in their ability to contribute and interact in class. In the study of Alipio [27], academic achievement was affected by SHS strand and academic adjustment. Moderation effects between academic adjustment and SHS strand suggest that STEM strand students performed better than those in other SHS strands.

D. Agreement on How Beneficial the SHS Strand to Academic Success in College

The study also determines how beneficial the SHS strand is to the academic performance of the respondents' program of choice. This would determine whether or not the learning from their strand was beneficial to their learning acquisition in college. The study also determines how beneficial the SHS strand is to the academic performance of the respondents' program of choice. This would determine whether or not the learning from their strand was beneficial to their learning acquisition in college.

Table III presents how their SHS strand helps their academic performance in college. ITRS perception on SHS strand helps them accomplish their class activities and projects in college obtained a mean score of 4.38 with SD of 0.68 considered as strongly agree while NITRS perception obtained a mean score of 4.15 with SD of 0.87 understood as agree. On SHS strand helps them get high scores in quizzes in college obtained a mean score of 4.07 with SD of 0.70 defined as agree while NITRS obtained a mean score of 4.15 with SD of 0.94 interpreted as agree. ITRS got a general mean of 4.22 and general SD of 0.70 interpreted as strongly agree while NITRS got a general mean of 4.07 with SD of 1.00 and interpreted as agree.

In comparison to the NITRS, the data shows that respondents in the IT-related strand strongly believe that their chosen stand aided their academic achievement in college, particularly in completing class tasks and projects. Some ITRS respondents stated that some of the college class activities were already presented in their SHS strand, and that the knowledge and abilities required to complete the work had already been gained. Despite the confidence in easy understanding of the course or lesson and task performances, contrary to NITRS experiences due to the mismatch of strand taken in SHS, ITRS cannot confidently believe that their strand was highly effective in getting good grades and test scores because the technique and modality of delivery in higher education are different. However, when compared to non-related strands, aligned strands provide a significant advantage in academic achievement, particularly in the acquisition of knowledge in IT professional courses. According to Lumboy [28] the level of difficulty experienced by the respondents on their college subjects are highly related to the strand they have taken in senior high school. Those who are graduates of STEM excelled over the other as evident in their college academics.

E. Recommendation to Reduce Academic Deficiencies

Fig. 10 presents the recommendation to reduce academic deficiencies as perceived by the respondents. The researcher uses thematic analysis to analyze the result. Based on the respondents' recommendation, the analysis produced six (6) themes which included time management, positive attitude and mindset, instructor, requirement completion, study habits, and resumption of classes. Among the themes, requirement completion got the highest percentage of 38%, followed by positive attitude with 25%, study habits and instructor both received 13% while time management is 8% and resumption of classes with the lowest percentage of 4%.

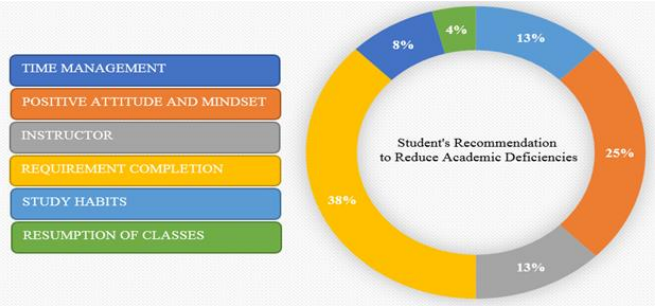

Fig. 10. Recommendation to reduce academic deficiencies.

TABLE III. AGREEMENT ON HOW BENEFICIAL THE SHS STRAND IS TO ACADEMIC SUCCESS IN COLLEGE

INDICATOR	IT RELATED			NON-IT RELATED		
	Mean	*SD*	*INT*	*Mean*	*SD*	*INT*
My SHS strand helps me understand the course/lesson in college easily.	4.31	0.66	SA	3.91	1.13	A
My SHS strand helps me accomplish the class activities and projects in college.	4.38	0.68	SA	4.15	0.87	A
My SHS strand gives me confidence in participating in class discussions in college.	4.31	0.66	SA	4.18	0.85	A
My SHS strand helps me perform the class laboratories.	4.20	0.77	SA	3.91	1.2	A
My SHS strand helps me achieve high grades in college	4.03	0.73	A	4.12	1.02	A
My SHS strand help me get high score in quizzes in college	4.07	0.70	A	4.15	0.94	A
General Mean and SD	4.22	0.70	SA	4.07	1.00	A
Interpretation Legend: SA-Strongly Agree A-Agree N-Neutral D-Disagree SDA-Strongly Disagree						

1) Time management: The necessity of time management in obtaining academic success was underlined by the NITRS respondents in particular. Respondents admitted to not prioritizing their academics as also shown in Fig. 7 and suggested time management as a solution. Knowing what to prioritize, giving time to difficult topic courses, and efficiently organizing their schedule will all help them over-come their academic deficiencies. Some of the responses under this theme include: "In my situation, I had a lot of obligations. Most of the time I can't manage my time. I need to work to pay my enrollment fee so most of the time I skip classes. My recommendation is time management to avoid failed/INC", "Give time to the subjects where I am having difficulty", and "Plan your time well. Do your assignments early enough".

2) Positive attitude and mindset: The majority of NITRS respondents clearly indicate that having a positive attitude and mindset would be extremely beneficial in overcoming academic difficulties. They go on to say that taking a real interest in the course, learning from mistakes, being open to new learning and setting appropriate goals are all things that will help them succeed in school. Negative thinking, according to the respondents, just causes stress and discourages students from pursuing academic success. Some of the responses under this theme include: "Keep a positive attitude. Find genuine interest in the topic. Think about the class and the workload positively", "Just don't think of anything that is not related to the very goal of education or the purpose of having a school, especially if those thoughts are just making us stress", "We must stop pointing and complaining about our conditions as a student. Instead, make solutions to those problems and not excuses, so that we can move on", and "Learn from mistakes. First of all, you must practice self-criticism and try to analyze the reasons that have caused the failure."

3) Instructor: Instructors play a significant part in every student's academic career, and the instructor's impact can sometimes determine a student's success or failure. Fig. 4 shows that the NITRS respondents have difficulties understanding the lesson because the instructor does not talk properly, and they propose that they convey the discussion in a clear manner. The respondents also recommend that instructors should demonstrate sympathy, be more considerate of students' situations, especially when it comes to submitting activities, and encourage them to pursue their academic goals. In the same way, double-check every submission. Students are motivated to succeed academically when their instructor has a positive view-point and understands their circumstances. Some of the responses under this theme include: "Help the student whenever possible. Ask how you can help. Encourage them and don't give up on them", and "I recommend to all teachers to make sure to double check the records of their students."

4) Requirement completion: To avoid academic deficiencies, the majority of respondents recommend meeting all academic prerequisites. Fig. 6 shows NITRS indicating that the reason for their poor academic performance is that they did not complete the task and homework. The respondents then recommend that students complete all class activities and deliver all required output. The likelihood of passing the course and program increases with a complete submission. Some of the responses under this theme include: "Do all task/project/take quizzes/exam and always participate in online class", "Try to meet each subjects needed output", "For me my recommendation to avoid inc is to comply all the requirements, don't miss out the activity and study more".

5) Study habit: Respondents advise practicing reviewing prior to attending class and taking exams. Additionally, students should concentrate on their studies in order to reduce academic deficiencies. Proper study habits help to improve academic standing, boost confidence in class participation, and achieve high grades on exams. Some of the responses under this theme include: "Focus on the study", "Review", and "Don't be lazy all the time".

6) Resumption of classes: The pandemic has changed the mode of delivery of classes, and some students have been affected and have not fully recovered from the abrupt change in delivery. There were students who excelled in face-to-face delivery but struggled to deliver successfully in online mode, encountering difficulties in meeting the required output and failing to join the class due to a variety of factors. In lieu of the difficulties encountered, a respondent from ITRS has suggested that the face-to-face mode of delivery be resumed to ensure quality learning and that they could truly understand the discussion and avoid academic deficiencies. A response under this theme: "I recommend f2f classes because I think implementing f2f classes will help students to be motivated and has an energy to do things on time and the communication between the teacher and students will really help a lot in the performance of the students."

F. Model for Reducing Academic Deficiencies

Based on the identified causes of academic deficiencies and the respondents' recommendations to avoid them, the researcher developed a model that could potentially reduce academic deficiencies. The model (see Fig. 11) is made up of two (2) components: internal and external, as well as students at the center who will execute and carry out the given components. Internal factors include effective time management, positive attitude and mindset, prompt/punctual requirement completion, and good study habits. Furthermore, in order for the student to remain motivated to achieve academic success, these external factors should be considered; competent and student-friendly instructors, stable, and strong, and accessible internet connections, conducive learning environment, relevant available resources and facilities, adaptation of limited face-to-face or hybrid classes and lastly alignment of SHS strand to college program of choice.

1) Internal factor

a) Effective time management: By carefully managing time through meticulous preparation of every second of every day, the student may regulate their schedule so that their time is spent efficiently and they can finally attain their objective. According to Vences Cyril [29], having these skills gives

students the ability to plan ahead and prioritize upcoming assignments and events. This is an important factor in keeping students organized and avoiding procrastination, and ultimately leads to academic success. Being efficient with time may also lead to the discovery of limitless possibilities to focus on oneself and one's mental health, resulting in a right mentality. Ahmad, Batool, & Hussain Ch [30] also mentioned that time management is important in enhancing learners' performance and accomplishments. It is a talent to manage time, and every student must be familiar with and command of this skill in order to get better outcomes. A student can only survive if he or she has good time management skills.

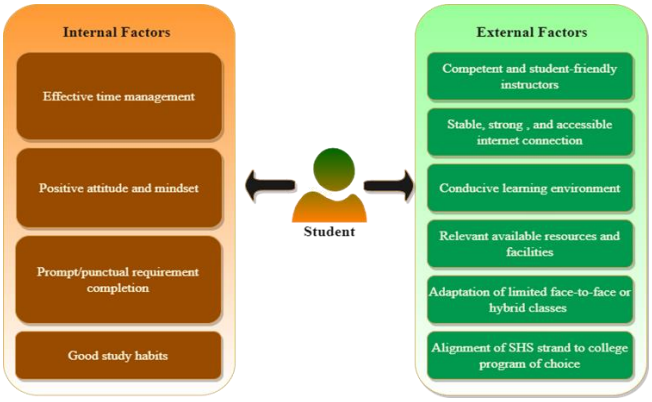

Fig. 11. Model for reducing academic deficiencies.

b) Positive attitude and mindset: Having a positive mentality reduces negative thinking, and they will be more focused on studying and executing academic tasks, as well as driven to complete them on time. An article from Overcoming Fear of Academic Failure: Reasons Why Student Fail vs Thrive stated that the ability to learn from failure and keep working toward your goals anyway comes from adopting a resilience mindset. This takes practice, but you can train yourself to understand that failure is part of life and then be willing to keep trying anyway. An important aspect of resilience is the desire to learn from mistakes. Even if you fail, knowing that you can find a solution and work toward your goals in new ways should help you overcome failure [31].

c) Prompt/punctual requirement completion: In order to be a successful student, it is essential to complete assignments on time. Meeting time schedule demonstrates that the student can efficiently manage their time and priorities. Numerous activities are evaluated, and timely completion of assignments is essential for receiving excellent scores. By completing assignments on time, students are able to avoid late submission penalties and keep excellent scores in their courses. There are a numerous of benefits associated with doing your assignment in a timely manner. These would include learning how to be more disciplined and independent, improving your ability to manage your time more effectively, which would give you more flexibility to pursue other interests, and increasing the amount of information that you have obtained. By having a great understanding are more likely to achieve a better grade [32].

d) Good study habits: There is a substantial association between students' study habits and academic achievement. The study habits of students were used to predict their achievement. The use of study strategies and habits can help students improve their academic performance. Study habits are the reason for the development of academic achievement. [33] [34] [35] Students who have a wide range of self-management skills can deal with long and uncertain deadlines by breaking far-off goals into smaller, closer goals on their own. Students who don't have these skills, on the other hand, would benefit from structures that set sub-goals with deadlines. For example, having students turn in an outline for a paper after the first third of the semester, the first draft after the second third, and the final draft at the end of the semester helps break down a big goal into smaller, more manageable goals. In an ideal world, this scaffolding of self-regulated learning and writing could be used as a model for long-term projects in the future. In general, making goals closer (e.g., with sub-goals) may help the student do better in school and stop putting things off. [36].

2) External factor

a) Competent and student-friendly instructor: Students' performance is also affected by outside forces that are beyond their control. Because of the diverse worries of the student, having competent and sympathetic instructors will assist the student perform well in class. When the learner thinks that they are being understood, they feel comfortable and motivated to fulfill the work provided. Naz [37] mentioned that for quality education the competent teachers are necessary. Teacher's professional competence includes knowledge and understanding of children and their learning, subject knowledge, curriculum, the education system and the teacher's role. Academic performance has a highly substantial and positively correlated relationship with teachers' levels of expertise, grasp, and clarity on the topics they teach. In addition, aspects of a teacher's demeanor such as engagement, pace, the overall attitude of the instructor, openness, and rapport have a substantial bearing on students' cumulative grade point averages [38] [39].

b) Stable, strong, and accessible internet connection: Because of the new normal delivery it is also required to have a solid internet connection in order for the students to join classes, submit requirements and acquire relevant information. Dogniez [40] stated that improved connectivity and the vast learning resources that are available over the Internet can be harnessed to advance access and quality of education. A reliable internet connection offers a lot of convenience and allows us to complete tasks with much less hassle, whether that's downloading a document or making a video call to a work colleague or a loved one. With a good internet connection, we can work, educate ourselves, entertain ourselves and save money.

c) Conducive learning environment: A suitable setting is a necessary for learning. Comfortable learning place with minimal destruction helps the student comprehend and grasp the information being taught. In addition, having restricted, substandard and run-down resources and facilities also

hampers student progress, thus it proposes that students should have suitable available learning materials and facilities. This will bring about an enjoyable, exciting and meaningful process, whereby students anticipate attending courses. Students will also feel more at ease learning in a classroom atmosphere and would be able to concentrate more intensively on understanding the subjects at hand. It is supported by Chongui [41] stating conducive environment for learning, such as one with comfortable class-room set-ups, relevant use of teaching materials and interesting classroom activities, will further motivate the students to learn.

d) Relevant available resources and facilities: Students' academic success is greatly influenced by the quality of school facilities, and inadequate facilities result in low performance. [42] The availability and proper usage of school physical amenities have a key role in improving students' academic achievement, whereas the lack of such facilities may lead to students' poor academic performance. If physical facilities are accessible and utilized sensibly to fulfill the demands of the students, this would definitely increase students' enthusiasm in studying and lead to superior performance. [43].

e) Adaptation of limited face-to-face or hybrid classes: Due to the COVID-19 pandemic, the academic delivery method switched from in-person to online. Some students adapted the new method with ease, but others did not, which affected their academic achievement. There are students that succeed and do better when there is face-to-face interaction, particularly in skills-based courses that need laboratory activities. The researchers chose to incorporate limited face-to-face or hybrid classes in the model in order to meet the demands of students for laboratory activities in light of the ongoing pandemic threat and the contemporary method of instruction.

Adopting hybrid course delivery, which could provide a solution to ensure that Bioscience students receive practical laboratory experience and face-to-face contact to stay motivated and benefit from the on-campus facilities and support, while also giving students some of the flexibility provided by remote study. Student demographics and digital equality must be taken into account in the present competitive higher education market, where student retention is crucial, to ensure that the right strategy is used to serve all students.[44] Kemp [45] also mentioned that with a blended learning strategy, teachers can assign a variety of in-person and online activities to their students. Allowing students to choose how to finish particular task types may be an effective strategy to help more students feel in charge of their own learning and to help them fit learning more readily into their other responsibilities at home and at work.

f) Alignment of SHS strand to college program of choice: Students' senior high school track or strand has an impact on their academic success and self-regulated learning. The students' senior high school experience has better prepared them for college, especially in the nursing program. Graduates of senior high school's academic STEM program seem better equipped to enroll in the nursing program, better able to handle the rigors of the program, and more likely to succeed in nursing school. [46] The model also implies that it would be more advantageous and students would have easier time learning if the strands are connected to the curriculum or perform a bridge program.

Al-Muslimawi and Hamid [47] found external and internal factors that influence students' academic performance in their study. The study found that learning facilities and technology had the greatest impact on students' academic performance, while extracurricular activities can improve academic performance and college life. Competence and aptitude are also excellent indicators of academic success. Family issues might negatively impact students' performance. In addition to socioeconomic position and other factors, work and finances affect students' academic achievement. Social and other issues can slightly affect quality performance, but they are easier to overcome. Moreover, class schedule, size, and atmosphere can negatively impact learning. And, most students' academic performance is affected by text books and test procedures.

In the related studies, significant similarities were discovered, which validates some factors in the researchers' designed model. The researchers, on the other hand, included additional variables that might potentially improve academic performance and fill the gap of the previous studies. Existing studies have identified a number of factors and potential solutions, but the researchers opted to build an approach that concentrated on reducing academic deficiencies. The developed model is a blend of conventional and contemporary solutions that also takes into account the changes in academic mode of delivery caused by the COVID-19 pandemic. And these modifications affected the academic achievement of the students in some way. In addition, because students in this study had an additional year of high school, the researchers investigated whether or not this factored into their academic success in college.

IV. Conclusion

The researcher discovers that the Non-IT-Related strand, in comparison to the IT-Related strand, has a number of issues in terms of academic performance for a variety of reasons. They emphasize that because of the strand misalignment, they find it difficult to understand the courses in the program chosen. It is also believed that instructors who do not communicate clearly have an impact on students' ability to absorb knowledge, and that students who have an unreliable internet connection have a harder time performing effectively in class. Respondents acknowledged not finishing academic tasks and not submitting them on time, resulting in failed and incomplete remarks. In addition, both the IT-related and non-IT related strands are in agreement that their SHS strands are related to the program that they intend to study in college; however, the IT-Related strand is the one that believes their strand is more beneficial to their academic success in college than the non-IT related strand. The IT-related strand was determined to be statistically significant at a level of $p < 0.05$, which indicates that enrolling in the IT-Related strand offers a considerable advantage over the non-IT related strand. As a result, the researchers constructed a model that, with the help of the given reasons and recommendations from the respondents, can potentially eliminate academic inadequacies.

In order to effectively address and give a solution to the problem that has been recognized, the model takes into account both internal and external factors. It is recommended that, with regard to the internal variables, effective time management, a positive attitude and mindset, prompt and punctual completion of requirements, and good study habits be utilized. While for the external factors, the model includes competent and student-friendly instructors, a stable, strong, and accessible internet connection, a conducive learning environment, relevant available resources and facilities, adaptation of limited face-to-face or hybrid classes, and alignment of SHS strand to college program of choice.

The approach that was formulated might be used as a guide by the institution, particularly in the formulation and process of the admission policy to avoid or address misalignment of strand to the college program of choice, evaluation of teaching professionals, and acquisition of education infrastructure. In addition to that, this may also be of use to the Information Technology Department in terms of assessing their curriculum, the approach utilized by teachers, and the monitoring of their students in conjunction with the Guidance Office. Furthermore, this model may be of assistance to the government education sector, particularly CHED and DepEd, in the process of reevaluating the policies and guidelines, particularly as they pertain to the implementation of the K to 12 or Senior High School program and how this program affects academic performance in college.

The investigation was conducted on the IT Department, but the researchers recommend looking into other programs. Additionally, to perform in-depth study on the alignment of the curriculum between senior high schools and higher education institutions, as well as how it contributes to other possible causes of academic inadequacies.

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