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Factors of Excellence among Science Proficient University Students

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Abstract--- *This study is a qualitative research that focused on the factors of excellence among Science proficient university students. The main objective of this study is to investigate intrinsic as well as extrinsic factors and strategies contributing towards excellent performance of the participants in Science. It is acknowledged that excellence in science learning does not rely only on the way teaching is carried out but also on the other factors such as students' ability, mathematical and language proficiency, learning strategies and the right attitude toward science learning and others. Nonetheless, little do we know about the extent to which the mentioned factors contribute towards students' proficiency in Science. Through in-depth interviews with the participants who are 20 college students of Cagayan State University at Aparri, the researcher listed several factors that influence excellence among science proficient university students. The results of this study, can be used as a paradigm in crafting a quantitative research that will validate the result. Information pertaining to the factors of excellence can be used to develop a comprehensive inventory that will help assess students' potential to excel in Science.*

Keywords--- *Factors of Excellence, Science Proficient.*

I. INTRODUCTION

As a student enters college, he is expected to face the different challenges of his academic life coupled with making projects, assignments, quizzes; to mingle with other students; to meet new friends and classmates; and to study all his lessons specially in solving problems in Science. For a student to excel he must be good at least in English, Mathematics and Science (Ramos 2015). Science is one of the dreaded subjects problem solving is involve especially in Chemistry and Physics which enable the students to think critically and to act intelligently. Complex Science subjects in college like Thermodynamics, Optics, Modern Physics and Physical Chemistry; more mathematical skills and knowledge is needed in solving problems and knowledge in English aid comprehension.

High performance in Science is acquired over times. Each year they are in school, students ought to become increasingly proficient (Madigan, 2001). For example, fourth year college students should be more proficient in solving problems in Physics and Chemistry than first year college. In another sense, acquiring proficiency takes time. Students need time to engage in activities around a specific concept if they are to become proficient with it (Panoy, 2013).Tuan et al. (2005),on the other hand, looked into both cognitive and affective components to cognition that affect students' motivation towards science learning. According to them, students' motivation towards science learning maybe influenced by factors namely self-efficacy active learning strategies, science learning value performance goal, achievement goal, and learning environment stimulation.

The researcher has already conducted a study on Predictors of Anxiety Level and Performance of Students in Physics; and Self-Directed Learning Strategy and Performance of Students in Physics. Thus, she was motivated to

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conduct a related qualitative study with a primary purpose of presenting the factors of excellence among science proficient university students.

Research Questions

Using social constructivist perspective as the lens, the researcher's theoretical orientation in the views or perspectives of individuals was focus on the question "How do individuals achieve their excellent performance in Science?" Specifically, it sought answers to two sub-questions: (1) What do you do to attain excellent performance in Science and (2) What are your stories about you and Science learning. (Your class, your teacher, your parents and friend, your aspirations, and your achievements)?

II. LITERATURE REVIEW

Factors related to Science Proficiency

Proficiency in science is being defined through performance expectations that intertwine science practices, cross-cutting concepts, and core content knowledge. These descriptions of what it means to know and do science pose challenges for assessment design and use, whether at the classroom instructional level or the system level for monitoring the progress of science education (Pellegrino, 2013).

Study Habits

Everyone has the ability to learn Science, but some students learn and make connections faster than others and even have potential far beyond expectations. However there are students whose potential in Science are often latent and remain unnoticed. This potential can be lost forever if it is not discovered and supported at the appropriate time. It may even be undermined by inappropriate experience. Different traits in Science appear at different ages. To develop abilities in Science effectively, one must tap into these abilities at appropriate times.

According to Zeidan and Jayosi (2015), positive attitude toward science makes the students more interested in focusing on science process. In other words, when the students understand the science process skills, science becomes more interesting to them, which increases the positive attitudes towards science. However, most attribute excellence to self-willingness to learn and develop such skills. According to Stovall (2003), as cited by Gunuc (2014), student engagement includes not only the time students spend on tasks but also their willingness to take part in activities. More over Krause and Coates (2008), associated student engagement with the high quality in learning outcomes. Furthermore, results from the study of Sing, Granville & Dika (2010), supported the positive effects of the 2 motivation factors, attitude and academic time on mathematics and science achievement. The strongest effects were those of academic time spent on homework. The more interested students are in a subject, the more involved they become in their assignments, putting effort into their studies and engaging in deeper levels of thinking. Experts believe that increased student engagement in math, and science at school will eventually lead to involvement in math- and science-related after-school activities and career aspirations. (U.S. Department of Education, 2010a, Sparking Curiosity Practice Summary, p. 1).

According to Azikiwe (2008), good study habits are good asset to learners because these assist students to attain mastery in areas of specialization and consequent excellent performance, while the opposite constitute constraints to

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learning and achievement leading to failure. Similarly, according to Ebele and Olofu (2017) as cited by Magulod there is a significant relationship between study habits and students' academic performance. A research conducted by Good (2006), defined the term study habits as the student's way of study whether systematic, efficient or inefficient. Good study habits are perceived to be the determinants of the academic performance. That is why efforts are made to develop and improve study habits in students.

Confidence affect performance. Compte and Postlewaite (2004) found in their study that Positive emotions can improve performance, while negative ones can diminish it. Learning strategies which refer to student's self-generated thoughts, feelings and actions which are systematically oriented toward attainment of their goals, is also referred to as attitude and behavior that is oriented towards goals. Warr and Allan (1998), as cited by Utanes (2017), suggested three general classifications of learning strategies that are positively correlated to performances of students. They are cognitive (skills in rehearsing a material to be learned or organizing it into a main theme), behavioral (preferences for seeking help from others, for trial and error or for written instructions), and self-regulation (controlling emotions, motivation and comprehension). A learner could use combinations of these learning strategies depending on his style and capability to learn Science. Moreover Lacambra (2013) suggested that students should develop and employ self-regulatory learning strategies to achieve better performance in Physics. She further suggested that students should develop higher level of intrinsic motivation. And strong determination to do better in Physics. It was found in her study that goal setting and planning; and reviewing records (reread notes) were found significantly related to students' performance in Physics.

Teachers' Practice

It has been proven that teachers have an important influence on students' academic achievement. Teachers play a crucial role in educational attainment as they are tasked with the responsibility of translating policy into action and principles based on practice during interaction with the students (Afe, 2001).According to Miles (2010), teachers with sufficient Science Process Skills can teach efficiently and their students perform effectively. According to Lacambra (2013) teachers should emphasize and explain clearly the difficult concepts and skills in Science for students better Fassimilation. A study in Ghana found that the teacher factor that significantly related to students' achievement are incidence of lateness to school, incidences of absenteeism and inability to complete the syllabi. Oredein and Oloyede (2007) conclude that teacher's management of students' homework and assignment have an impact to student's achievement, especially when it is well explained, corrected and received during class time and use as an occasion for feedback to students. Perkins (2013) indicates that teachers' attitude contributes significantly to students' attention in classroom. According to Muleji (2008), school variables that affect students' academic performance include the kind of treatment which the teachers accord the students. Research shows that students who trust their teachers are more motivated and as a result, they perform better in school (Eamon, 2005).

Parental Support

If the students are to search the maximum benefits in their schooling, they must enjoy parental support. In all spheres of learning there is substancial research evidence that involvement of parents in their children's schooling gives a positive effect on their learning (Desponges & Abouchan, 2003; Rafig, Fatima, Sohail. Saleem & Khan,

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2013).The benefits accused by students who enjoy parental involvement in their schooling include improved learner attitudes towards schooling; developing positive behaviour; improved school attendance; decrease school drop-outs; and improved academic performance. (Desporges & Abouchan, 2003; McNeal, 2001). The findings of the study of Akhtor & Azziz (2011) showed that parent involvement has strong positive influence on the child level of attainment: the more the parental involvement the higher the attainment.

Peer Influence

Betts and Zau (2004). Vigdor and Mechyba (2004) have explored into the impact of peer influence on students' academic achievement and established that peers affect students' academic achievement Peer pressure refers to the influence exerted by a peer group in encouraging a person to change his/her attitude, values in order to conform to group norm (Kirk, 2000). While most educators believe that peer pressure has an influence on children's' academic performance, Kirk (2000) observes that few studies have been done to prove this believe. According to Howard (2004), adolescents have always been exposed to peer influence, but the kinds of peer influence that they encounter have changed tremendously in the past years. Goethe (2001) found out that weak students do better when grouped with other weak students. It shows that students' performance improves if they are with the students of their own kind. Sacerdote (2001) found out that grades are higher when students have unusually academically strong peers. The results of Zimmerman (2003) were somehow contradictory to Goethe results but again it proved that students performance depends on number of different factors, it says that weak peers might reduce the grades of middling or strong students. Having friends allows the child to learn many skills: group interaction, conflict resolution and trust building.

III. METHODOLOGY

Design

The qualitative approach was used in this study for the discovery and analysis of the meaning of individuals or group of participants attributed to a certain societal or human issue. In-depth interviews were carried out to research participants.

Participants

Research participants were 20 students, who had been identified to have high performance in Science. It consists of 14 female and 6 male students who are enrolled in Science-based course from the College of Teacher Education and College of Fisheries and Marine Science. All participants were briefed regarding the research by discussing to them the consent form.

Data Gathering Procedure

A letter was delivered personally to the Dean of the college stating the purpose of the study. Upon approval, the letter was endorsed to the Science teacher for the identification of the participants. These participants were then furnished with the consent forms and were briefed about the purpose, risk, benefits and confidentiality of the study. Interviews were conducted on April 8 – May 3, 2019. Each of the participants was subjected to one-on-one interview that last in a duration that ranges from 30 to 45 minutes.

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In an unstructured open-ended interview, two general questions were asked: "What do you do to achieve excellent performance in Science?" and "What are your stories about: a) you and Science learning, b) your class, c) your teacher d) your parents e) your friend, f) your aspiration and g) your achievements. The interview was guided by an approved interview protocol and script. Responses included active listening, empathetic reflection and minimal witticisms.

Data Analysis

Analysis began with transcriptions of the conducted audio-taped interviews. Inductive approach was used to develop the themes. Open codes were generated by cutting and sorting processing technique. The language of the participants guided the development of the codes and category labels known as in vivo codes. From these partial analyses, word co-occurrences were identified which puts similar codes into a single and more complex and inclusive categories. These categories were then again sorted, compared and contrasted until saturated and classified into themes. All in all, there are at least 13 hours of taped interviews and at least 40 pages of cool analysis to develop the themes.

To establish validity of data, the researcher requested the participants to review and examine if there were inappropriate transcripts, this is to establish local coherence. Data were also combed to ensure saturation and theme coherence.

IV. RESULTS AND DISCUSSION

This study determined the academic factors of excellence among Science proficient university students in the context of phenomenology, providing a holistic understanding of the experiences and perspectives of the students. In connection with the foregoing research problems, two themes emerged from this research: intrinsic factors (a. interest b. confidence; c. determination d. discipline); and extrinsic factors (a. family support b. teacher factors; c. peer influence d. internet).

Causal Conditions of Becoming Proficient in Science

After hearing the participants' stories through unstructured interview, a general question, "Why do you strive to be proficient in Science?" was developed to facilitate development of codes that will reflect the causal conditions that makes a student proficient in Science. Three causal conditions emerged from the findings of this study: a) expectations from parents, b) love for science and c) aspirations or ambitions. At least 3 of the participants wanted their parents to be proud of them thus they strive to achieve well in their studies.

(P1) *"My main purpose why I study and strive to be good in science is my family. They are my inspiration and I want them to be proud of me. I don't want to waste their sacrifices for me. One day I'll be able to give back their sacrifices, support, love and care."*

(P12) *"I strive to excel in science in order to attain my parents' happiness."*

Furthermore, attributed from the fact that most of them belong to average-earner families, most of them have parents who hope that they could elevate their socio-economic status after they will finish their studies.

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A special case was from a respondent who is a son of a widow.

(P3) *"Kung buhay pa sana si Papa, baka yung performance ko hindi mataas, kasi nung namatay si Papa saka lang ako na motivate magsumikap dahil ako nalang ang pag- asa ng aming pamilya." ["If my father is still living, my performance might not be high because when my father died, it motivated me to strive since I am the only hope that our family have got. That is why I need good performance and finish as well."]*

Parents cannot be blamed on their high expectations on their children especially they themselves were also trained to meet expectations. This phenomenon is somewhat common to parents who are professional. The students who are proficient in Science were expected to meet those demands from their parents. Studies show that parental involvement increases students' opportunity to learn and serve as a link between school (teacher) and house (student) (G.M. Mahuro & N. Hungi, 2016). To maximize the impact of that involvement, the parent-student interaction should go beyond helping the child with her or his homework.

(P8) *"They helped me in my assignments and advanced studies during elementary."*

There were five participants who said they love science that's the reason why they strive. Participants mentioned that:

(P14) *"I want to excel in the thing that I love, that's the reason why I strive".*

(P7) *"I and Science are perfectly okay! We get along well and I really love Science."*

Some of the participants are taking Bachelor of Secondary Education-Major in Science. Asked why they strive, most of them replied:

(P5) *"As a future teacher, being proficient with my major, science is of great help for me when I will be teaching in the future. I could impart correct concepts in science to my students if I have a deeper learning or wider knowledge about it."*

Most of the participants aspire to be competent and effective Science teachers because they want to inspire students and to have a decent job. This is one of the reasons why they strive harder and put their very best in everything that they do. This condition can be projected to interest and determination. A student's motivation and degree of interest are significant factors that influence learning (Hidi & Harackiewicz, 2000). This implies that when one is motivated by his or her aspirations, he could develop the interest to learn the subject and shall be determined in attaining it. In this case, this study found out that the participants want to pursue careers that are related to Science and thus developed their interest and determination to learn the subject.

Phenomena Emerging from the Causal Conditions

It is apparent that in general, the participants need to excel to achieve better and live up with the expectations of their parents. Specifically, they also need to excel on the subjects related to their ambition and future career plans, which is Science. The participants of this study were theoretically sampled, that is, they were homogenously sampled. Participants were identified by their teachers as proficient in Science in which the students confirmed. Apparently, participants who are first Year College have finished their senior high school with honors. Some of

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them received academic excellence award in Science. All the seven fourth year college participants are Department of Science and Technology (DOST) scholars and they have received academic award for three consecutive years. Two of them participated in the 2018 University-Wide Math and Science Quiz Bee Elimination and one was qualified to represent Cagayan State University in 2018 Philippine Consortium for Science Mathematics and Technology (PCSMT) MATH & SCIENCE QUIZ held at University of Northern Philippines.

Intrinsic Factors

To achieve high performance in Science, the participants have developed their strategies. However, most of the students pinpointed first the following conditions that could contribute in achieving proficiency on the said subject in which the researcher then identified as intrinsic factors: a) interest; b) confidence; c) determination and, d) discipline. The first factor is interest. One of the participants proudly said:

(P13) *"I consider Science as the most interesting subject to learn on".*

(P8) *"I like Science because it is interesting"*

They developed already the passion of learning Science. Motivation is among the most powerful determinants of students' success or failure in school (Hardre et al., 2007, p. 247). Therefore, a student's own lack of interest can deter understanding (Koller, Baumert, Schnabel, 2001).

(P17) *"Hindi ko kailangan ng ibang tao para ipush ako na mag-aral dahil interesado at willing akong matuto at mag strive sa pag aaral." ["I don't need other people to push me to learn because I'm interested and willing to learn and strive for my studies."]*

Confidence also contributed to their proficiency in Science. Participants said they are fast learners. They easily understand what is being discussed by their teachers.

(P10) *"I always believe that I can do something better."*

(P6) *"As a student, learning Science has made me easily solve difficult problems."*

(P2) *"I find solving Science problems easy."*

Successful learners are not only confident of their abilities. They also believe that investment in learning can make a difference and help them to overcome difficulties – that is, they have a strong sense of their own efficacy (PISA, 2003).

Most of them have joined quiz bees and participated Science Fair competitions on Investigatory Project while few also engaged themselves in Dance troupes and Journalism (broadcasting, editorial and sports writing) which may have added to their confidence.

Determination is the third factor which is portrayed by two of the participants as:

(P20) *"Be determined because learning is a life long journey, it must not stop. Continue to seek information about your curiosity in Science."*

(P11) *"I already developed the attitude of not giving up or quitting when I encounter problems in Science."*

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Lastly, discipline is also a great contributor to achieving high performance in Science. It could be pointed out that having discipline will contribute to higher concentration on studying the subject. Science requires proper discipline and adequate concentration to understand its concepts.

(P19) *"If students have no discipline, they won't be listening to their teachers, thus, there will be no learning at all."*

(P14) *"In order to have a focus in learning, there is a need for me to have discipline. Hence, I review every night and during vacant time I freshen up lessons for the next meeting."*

(P5) *"I set limitations especially in using my gadgets playing mobile games."*

(P16) *"Seventy- five percent is the share of self-discipline in the development of my proficiency in Science."*

Extrinsic Factors

In addition to intrinsic factors, extrinsic factors also contribute in the development of the high performance of students in Science. These extrinsic factors are: a) family support; b) teacher factors; c) peer influence and d) internet.

Family support is a critical contributor to achieving proficiency in Science. The students confirmed that the most common supports from their parents are financial and moral support.

(P20) *"I'm so thankful with my parents because of supporting me with chosen career in the future, they are the one that support me not with just financial support but also moral support. They are always there when I feel down, they make me feel that I shouldn't surrender and quit."*

(P12) *"My parents are working hard just to provide my needs"*

They further mentioned that their parents are their inspiration and the reason why they strive hard.

(P10) *"My parents are my inspiration and my motivation, they always support me in everything, they provide me the things I need in my studies which makes me feel lucky to help them."*

(P1) *"I always see to it that not a single cent from my parents would be wasted, I always persevere to achieve my dreams so that I can make them happy and proud so that one day I'll be able to give back all their sacrifices, support, love, care and sweat they all shed for me, they are my strength in this everyday battle of life."*

(P20) *"My parents are the reasons why I strive hard in school, they are my greatest inspiration and drive in doing well in everything I do. They do not just help me financially but in all aspects, I want to repay them someday."*

(P2) *"My parents are my inspiration and my reason in achieving my dreams and aspirations. They are always there to support, love, and care for me."*

This means that their parents laid good foundational knowledge which is very useful for them at present. Encouragements is also common among the students.

(P9) *"My siblings are also good in Science and they influence and motivated me to study well."*

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(P15) *"My parents are always there to support me specially my father, back in elementary, I always seek for his help when I don't understand a certain topic but him being strict, he will not teach me, rather , he let me get my book to read it all over again and then he asked me to explain."*

Receiving rewards from their parents every time they got high grades also motivates them to strive more in their studies.

(P20) *"My parents give me additional allowance whenever I got high grades or awards."*

The students also cite the importance of support coming from their teachers. Participants believed that having a friendly teacher whom they can tell their problems with, could also help because they won't hesitate to approach him if ever they don't understand something about their lesson.

(P1) *"I won't hesitate asking questions when I want to clarify something about our lesson because my Science teacher is friendly and approachable.*

Teachers' sufficient knowledge and skills have an important role on students' high performance.

(P3) *"Our teachers in Science are very smart and flexible, they always provide us the knowledge that we need."*

(P5) *"I have learned so much in Science because my teacher is really knowledgeable."*

(P9) *"I easily understand concepts in Science because my teacher has a good strategy in teaching."*

(P15) *"My teacher in Science classes from elementary to college are the best. I always find them very capable and extremely good at their chosen fields. They know what they are talking about and they introduce new concepts in Science."*

(P18) "My teachers in Science are equally competent and effective."

(P7) "Our teacher is the one whom I considered as a very intelligent person, she is very good in teaching our lessons and make sure that everyone understands the topic very well."

They also highlighted and appreciated the efforts of their teachers who elaborately explain what they don't understand and who check if they really understand their present topic before proceeding to the next.

(P3) *"My teacher in Science is considerate, before she proceeds to the next lesson, she made sure that everybody understands the lesson."*

(P11) "*My teachers in Science are very kind, they discuss the topic to us until we get it, we don't move to the next topic unless we cannot master the current topic."*

(P9) *"I was grateful because we have a teacher that helps us really to know the fundamentals of Science. She inspires us to learn about it, and she is well- educated."*

(P17) *"Truly, my teachers in Science are really great. I look up to them because they really got to present and discuss the topics very well in a way that all of us can understand."*

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A comfortable atmosphere where students feel free to ask questions is conducive to learning (Bain, 2004; Kealoha, 2006; Middleton). Schweinle, Meyer, and Turner (2006) suggested that a positive classroom climate promoted engaged learning. This is the main implication for the context "teacher factors". It could be gleaned that the students want a teacher who could break the monotonic seriousness in a Science class. It actually eases the pressure and reduces the anxiety of the learners. In addition, they also need a teacher who is knowledgeable to teach the subject.

Motivation and support from friends is of great help to excel in Science. Some participants revealed that, their friends are their stress relievers. They influence them to always aim for something best.

(P9) *My friends are my stress – relievers. They also influence me to do well in everything I do.*

(P18) *"My friends support me in my studies. We teach each other in order to cope with the things we hardly understand."*

(P15) *"My friends motivate me to become proficient in Science. We have this friendship goal since we were in high school that we must have a high grade in our subject most especially in Science.*

(P6) *"My friends are supportive and we tend to work as one. We share ideas and do group study.*

(P2) *"My friends are my companion in doing any related school activities. We boost each other's confidence and help one another.*

(P12) *"There are friends who put their hands together when you go up at something and those who are there for you on your darkest days, and I am so blessed and happy that I got this kind of friends. They are one of my influences to always aim for something best".*

The internet, those science related videos contributed much on participants' proficiency in Science.

(P2) "As a millennial I cannot avoid watching Science videos on you tube, it really contributes to understand Science concepts through lectures and experiments."

(P5) *"I always visit the internet to unlock the unfamiliar terms that bothers me."*

(P14) *"I search in the web about things that is not clear to me."*

(P8) *"It is helpful to visit web sites which present new ideas and discoveries in Science."*

Strategies for Developing Proficiency in Science

In the presence of intrinsic and extrinsic factors described above, the high performance of the students led to the development of their strategies. Applied to the field of education, learning strategies are defined as sequence of procedures for accomplishing learning. Almost all participants were unison in their opinion towards the importance of adopting the right strategies when learning Science. Among their responses include:

(P20) *"I take clear and organize notes which I usually use as my reviewer during exams."*

(P1) *"I keep collection of learning resources."*

(P18) *"I always listen to my teacher very well during discussion."*

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They all agreed that in order to perform well in science subjects, they need to pay full attention in class and emphasized the advantage of taking notes, having an organized notes, citing its importance when studying or reviewing for a test. They further said that they only take note of important details such as definitions, formulas and examples. One of the students said,

(P2) *"It is important to take note of the formulas and solutions of sample problems, without the formula, you won't be able to solve a problem in Science."*

These strategies can be viewed as rehearsal techniques which are related to individual learning task, operating directly on incoming information, manipulating it in ways to make cognitive progress. The participants apparently treat new information, especially formulas and concepts that are newly acquired as very important therefore they take note of it.

They use this information to gather additional knowledge from different learning resources such as books. Aside from the books provided by the school in the library, some of them also have their own books in Science. They also watch Science related videos. Most of them said,

(P9) *"Doing an advance reading can always help me in attaining good performance in Science"*

(P13) *"Reading books is the best way to have advanced study… If information from books is not enough, I do researching in the internet and watching you tube to supplement my understanding."*

(P1) *"I watch educational videos and science related TV shows."*

These activities that they engage in allow not only for elaboration of information that help promote storage of information in their long term memory but also assist in recall of information when needed at a later time.

It could be recalled that teacher factor is one of the extrinsic contributors to high proficiency in Science. In addition to this, most of the participants also said that during their elementary years, their parents help them in their assignments and advanced studies. Some of them also seek help from their siblings, and other students who are ahead of them in which one of them said,

(P4) *"Actually, I approach fourth year students for my assignments."*

(P16) *"I always ask teachers and peers when I need to clarify things especially when I'm in doubt.*

One student also pinpointed that,

(P7) *"We don't only learn from self- study, we need the guidance of our teachers because they know better."*

It is apparent from the results of this study that the students mainly get help from their teachers as they perceived them to be the most knowledgeable about it.

Most interestingly, one of the participants' responses towards the way science is learned had religious connotation whereby he claimed that one should ask God's guidance always. He said,

(P12) *"I believed that after putting all my effort to excel in my Science subjects, I ought to leave things to God because God will help those who help themselves."*

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The students admit that their knowledge in Mathematics and English will help them solve problems in Science, especially in Physics. There were those who stressed the importance of having good command of the English language to do well in science. For these students, they realized that

(P10) *"English is important because science resources are in English."*

(P19) *"Being good in English helps me understand our lessons in Science well and helps me in answering questions accurately and effectively."*

(P3) *"You need to analyze first the problem in Science before trying to solve it…try finding similar problems and solve the given problem using the strategy used in that similar problem you have found."*

Most of them usually try to solve the sample problems to master the process involve in it. One student said,

(P6) *"There is a need to learn fast and effective techniques especially if engaged in a contest you must also have your own technique based on what the teacher have taught"*

This implies that using one or more strategy is needed with problems in Science that is to validate solutions.

Most of the participants' strategies were classified under self-regulation or metacognition strategies. Specifically, these strategies are space out studying over time, practice bringing information to mind, use patterns and connections to solve problems, know one's strengths and weaknesses before reviewing, and focus. When it comes to spacing out study over time, participants believed that finding time to relax helps the participants to study better.

(P4) *"I give myself time to relax, refresh and unwind. I just enjoy my classes even if it is difficult."*

They emphasized that a relaxed environment is more conducive for learning since it will be boring if they are too serious. Developing a habit of reviewing every night, according to most of the participants, could help enhance and refreshes understanding of a learned concept.

(P8) *"I am spending much of my time at night reviewing my lesson to enhance and refresh my understanding of the concept that I learned."*

The students said that their purpose of reviewing is to "go back to what transpired that day". One of the participants continued,

(P19) *"Especially on lessons that I did not understand…anyway I have notes, thus I could re-study the process involve in the concept."*

Some of them find a quiet place where they can study without interruptions. Most of them also study in advance the activities in their books, trying to solve the problems in Science long before they could tackle them in the class.

(P15) *"I find a quiet place where I can study freely without interruptions."*

(P6) *"When I study in advance, I try to solve the problems for the succeeding topics."*

One of the strategies of one participant is to solve again the given examples they have taken in their notes to deduce the process on how to arrive at correct answer.

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(P11) *"When I review I solve again examples I have in my notes."*

Establishing connections of Science concepts to real life must be done so that it would be easier for the formula to be internalized and memorized. They said that,

(P3) *"By internalizing the formula through applications, you could be able to derive it whenever you have forgotten it."*

(P2) *"If I am studying Science concepts, I like it more when it is in a form of real life situation because it makes me more engaged and understand it easier."*

Furthermore, participants mentioned that focus is needed in learning Science. Balancing time for relaxation and study is important in which one of them acknowledged that,

(P12) *"Focus is required in learning Science, You need to study when it is time to study and relax when it is time to relax."*

(P1) *"Focus on a goal which is to be more knowledgeable on the subject."*

Participants developed their focus in addition, they also believe that giving time to one's self to relax is important

Advantages of Excellent Performance in Science

The advantages or benefits of the students as a result of being proficient in Science is shown mainly by their achievements. First year college participants were awarded with "honors" (grades of 90 and above);and they were top ranking students when they were in senior high school, thus, they were able to avail academic scholarship while the fourth year college students as well are identified as having no grade lower than 90 when it comes to Science subjects. Furthermore they also avail academic scholarships and were given academic awards and are vying for Latin Honors.

V. CONCLUSION AND RECOMMENDATION

The cognitive strategies used by the science proficient students develop their conceptual understanding. The behavioral strategies boost their strategic competence. The self-regulation or metacognitive strategies enhanced their adaptive reasoning and productive disposition. It is therefore concluded that excellence in Science could be achieved by developing and employing cognitive, behavioral and metacognitive strategies. It could be noted also that both intrinsic and extrinsic factors contribute to the development of high performance in Science. Intrinsic factors such as interest, confidence, persistence and discipline comes from within the students. This could be attained by developing self-motivation to learn Science.

Extrinsic factors include family support and influence, teacher-related factors, peers and internet. Students, especially those who grasp subject content easily if not effortlessly, still need to be motivated to keep them alert in the classrooms. On how to motivate them requires some related research to be carried out by science teachers. The results of this study, factors of excellence among Science proficient university students, can be used as a paradigm in crafting a quantitative research that will validate the result.

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