

Academic Self-Regulation of STEM of Senior High School Students of Divine Word Colleges in Region I, Philippines and Their Academic Performance

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Abstract

The study wanted to determine the level of academic self-regulation of the STEM students of Senior High School students of the Divine Word Colleges and its effect toward academic performance. There were four aspects of self-regulation investigated such as external regulation, introjected regulation, identified regulation and intrinsic motivation. Questionnaires were used to gather the data. The quantitative descriptive research design and explanation research was used in the study. The findings showed that the academic self-regulation of the STEM students of the senior high school of Divine Word Colleges is high which means that they have high external regulation, introjected regulation, identified regulation and moderate intrinsic motivation. However, the findings also showed that there is no correlation between academic self-regulation and their academic performance. Their academic performance can be caused by other factors that are not considered in this study.

Keywords: *Self-regulation, self-determination theory, academic performance, external regulation, introjected regulation, identified regulation, intrinsic motivation.*

Rationale

After two years of teaching at the Senior High School of Divine Word College of Vigan, the researcher has observed different behaviors of the students. Some are interested in the class and some are not interested. This can be seen through their participation in the class discussion. Some are enthusiastic to learn and express their ideas but some are not. Some are motivated but some are demotivated. They seem to be indifferent to the class discussion.

Observing those behaviors, it will be hard to jump to conclusion that the students are just lazy and stupid. The cause of those behaviors can be traced to motivation. The question to be raised, why are some motivated, while others are not motivated? When it comes to motivation, there are two kinds of motivations which are intrinsic and extrinsic motivation. Intrinsic motivation is coming from within the person himself/herself. He/she motivates himself/herself to do things because he/she finds enjoyment through accomplishing such activity. Extrinsic motivation refers to the motivation which is not coming from within the person himself/herself and in the activity itself but it is coming from outside such as from the family, group, society and culture. He/she performs such activity because of rewards or fear of punishment. Though the person does not find enjoyment with the activity, he/she has no choice but to do it or else he/she will not be rewarded or punished. In this case, the person has no control over his/her behavior but it is other people or external environment that controls the behavior. It is the environment that regulates his/her behavior. In this case, a human being who has free-will cannot regulate his/her behavior on his/her own free-will.

Self-regulation has become an important topic of interest related to children's learning and development with an emerging understanding of its contribution to children becoming positive learners as well as their long term mental health. It is important to children's development. It has been recognized as

a key indicator of better health and education, significantly decreasing the possibility of both developmental and learning difficulties in the future (Casenhiser, Shanker, & Stieben, 2012). Inspired by self-regulation theory, the researcher is interested to find out if the students of Divine Word Colleges really regulate their own behavior and make their own choice when it comes to the reason why they study, do their homework, participate in classroom discussion or are they just following the wish of their teachers, afraid of their parents, doing it because they are supposed to do it? Those concerns motivates the researcher to conduct this study to find out the extent of the self-regulation of the students and if those self-regulation affect their academic performance.

The importance of the study

Using the concept of self-determination theory (SDT) developed by Ryan and Deci (2000), the purpose of this study is to investigate the impact of four motivational profiles (external, introjected, identified regulation, and intrinsic motivation) on the academic performance of Senior High School students of Divine Word Colleges in Region I, Philippines. The findings of the study will help discover ways on how to motivate students in order to perform well in their academic endeavor. Hopefully the findings of the study will also give an idea to the administrators, guidance and counselors to design a counseling program to help students to direct their own behaviors and be independent in deciding what they want to be in their lives. Self-independence may not happen later in life, if it is not done as early as possible. This can be done through gradual autonomy support, giving them chances to solve their own problems and inviting them to participate in making decisions.

Theoretical framework

Self-Regulated learning

This is one of one of the domains of the self-regulation. It refers to learning that is guided by metacognition or thinking about one's thinking, planning, monitoring, and evaluating personal progress against a standard and personal motivation to learn. Self-regulated learning describes a process of taking control of and evaluating one's own learning and behavior (Omrod, 2009). Students in this case are studying not because of external forces such as parents, teachers and society's demand. They decide to learn on their own because they find it important for themselves and find studying enjoyable. It is regulated by the students themselves and is intentional, deliberate, conscious, voluntary, and strategic without any fear of punishment or shame. It is the students themselves who take the control. They plan, set the goals, lay out the strategies, monitor and evaluate the progress of their own learning (Zimmerman, 2002).

Schraw, Crippen, & Hartley, (2006) defines self-regulated learning as one's ability to understand and control one's learning environment. Self-regulation abilities include goal setting, self-monitoring, self-instruction, and self-reinforcement. Self - regulated learning is not about academic performance but It is a self-directive process and set of behaviors whereby learners transform their mental abilities into skills (Zimmerman, Bonnor, & Kovach, 2002). Self-regulated learners are characterized by self-regulating, self-monitoring, self-evaluating, self-managing. Some signs of self-regulated learners are active – participation in the class because of their interest to know and provide the necessary resources and time for the success of their own learning.

Understanding self-regulation

Despite considerable research in the field, definition of self-regulation remains a difficult one. It is a multidimensional construct which is composed of motivational, cognitive, behavioral, and affective functions (Grolnick & Farkas, 2002). It also becomes complex because the conceptualizations of self-regulation differs according to the theoretical viewpoint of the researcher, leading to the assessment of different aspects of this important construct. Behavioral theories of self-regulation, for example, focus on learned self-control, where motivation by rewards, and children's development of strategies to manage

their reactions to gain such rewards, lead to self-regulated behavior (Bronson, 2000). In this case, self-regulation is the ability of the person to regulate his/her behavior based on his/her intrinsic motivation and external motivation. Happiness and unhappiness are often caused by one's ability to regulate his/her own life.

In line with the above concept, research consistently shows that self-regulation is considered a skill which is necessary for reliable emotional well-being. Emotional well-being is determined by how the person manages his/her life. It makes a difference from one's well-being to another person's well-being. The emotional well-being of the person who controls his/her own life is different from the one whose life is controlled by others or external forces/regulators. A true happy person is the one who is free to act based on his own values and free will. Behaviorally, he/she acts based on his/her long-term best interest, consistent with his/her deepest values. (Violation of one's deepest values causes guilt, shame, and anxiety, which undermine well-being.) Emotionally, self-regulation is the ability to calm yourself down when you're upset and cheer yourself up when you're down (Stosny, 2011). Then there is a need to improve our self-regulation skill and a good place to start is an understanding of the biology and function of emotions in general and specifically feelings. Emotions *move* us. The ancients believed that emotions move behavior; in modern times we say they motivate behavior. They energize us to do things by sending chemical signals to the muscles and organs of the body; they prepare us for *action*.

By having self-regulation skill, one has the ability to monitor and control his/her own behavior, emotions, or thoughts, altering them in accordance with the demands of the situation. It can boost the capability of the person to inhibit responses, to resist interference from irrelevant stimulation, and to persist on relevant tasks even when one doesn't enjoy them (Cook & Cook, 2009). By continuing to improve self-regulation skill, one can reach the level of maturity in terms of self-regulation. According to Cook and Cook (2009), mature self-regulation requires several sophisticated cognitive skills. These include awareness of the demands of any given situation; consistent monitoring of one's own behavior, thoughts, and strategies; consideration of how successfully one is meeting the demands of the situation; and the ability to change aspects of his/her current functioning as needed to fit the situation or to accomplish a goal. This is further pointed out by Baumeister (2007) that there are four components of self-regulation theory and they are standards of desired behavior, motivation to meet the standards, monitoring of situations and thoughts that precede breaking said standards and will power. In order to achieve certain goal or objective, one has to apply the desired behavior to achieve such goal. Example is a student who wants to be in the dean's list has to study smartly or read a lot of books. Or a person who wants to have an excellent health condition has to take the right food, regular exercise and take vitamins. Those are the desired behavior to achieve a good health condition. In order to carry out those desired behaviors, one should have the motivation. Correct motivation is needed to sustain the behavior to achieve the goal. Beyond motivation, in order to achieve the goal, one should monitor the situation by which standards of desired behavior can be broken. Often times, even how much one wants to keep going and maintain the regular activity or behavior but there are situations in which those regular behaviors cannot be maintained because of unpredicted situations that occur along the way. One cannot continue doing exercise due to some situations that prevent the regular behaviors to continue. Lastly is the will power. One way wish to be always working hard but if there is no will power or inner strength to stick it out, then things can go in different directions. It is expected that by applying the four components of self-regulation one can stop doing things that she/he knows that she/he should not do.

Bandura (1991) in support of Baumeister's theory of self-regulation, argued that the major self-regulative mechanism operates through three principal sub-functions and these include monitoring one's own behavior, its determinants, and its effects, judgment of one's behavior in relation to personal standards and environmental circumstances, and affective self-reaction. In terms of self-monitoring, according to Bandura (1991), people cannot influence their own motivation and action very well if they do not pay adequate attention to their own performances, the conditions under which they occur, and the immediate and distal effects they produce. In this case, one needs to monitor the performance if it is still

on the right tract as expected or not, then also monitor the situation that affects the performances and the final outcome. One can be motivated to apply the same behavior when the performance outcome is as expected and the conditions are still favorable to support the same kind of behavior. Thus, constant monitoring is necessary to regulate the behavior in order to consistently apply the correct behavior to achieve the final outcome. Success in self-regulation partly depends on the fidelity, consistency and temporal proximity of self-monitoring. Included in the self-monitoring are thought pattern, emotional reactions, behavior and condition under which these reactions occur and motivation. Self-observation/monitoring provides information needed for setting realistic goals and for evaluating one's progress toward them. Besides monitoring the behavior itself, one has to judge the behavior if the behavior is still within the prescribed standard behavior imposed by himself/herself and as prescribed by society. Consequently, such judgment results to self-reactive influences, in the sense that people will pursue course of action that produce positive self-reaction and refrain from behaving in ways that result in self-censure. One would be satisfied to maintain the behavior that meets the desired standard as accepted not only by the person but also by the society or influential persons in the society. Though Bandura does not include will power as part of the components of self-regulation behavior but both Bandura and Baumeister agree that self-regulation can be achieved by establishing desired standards of behaviors, monitoring of situation or environmental circumstances and self-motivation in order to attain the self-regulated behavior.

As Baumeister and Bandura focus on the individual effort of self-regulation, while Lundy (n.d) argued that self-regulation is also a collective effort. Self – regulation is a collective effort of systems and structure. She argues that self-regulation is influenced by the system and the structure, the culture and communities where we are living, or learning. Even if one has a self-regulation behavior but such self-regulation behavior cannot be sustained and enhanced when the system, structure, culture of the organization and practices or values of the community do not support. Example, there are many schools that are exploring ways on how classroom design enhances self-regulation. There's also a growing awareness that self-regulation gets a real boost when the whole school is involved. In this case, even though the students have self-regulation behavior but if the school does not support such behavior, consequently it will not continue. In this case self-regulation is not just class management problem and the student himself/herself but community or school as a whole. On the top of it, self-regulation capacities are also strengthened when the family is on board. In a sense that self-regulation is enhanced or strengthened when students experience consistent expectations and support at home and at school. And, as the self-regulation movement grows, we see how policies and programs in other sectors can foster self-regulation capacities in students.

The question that remains in our mind is the purpose of self-regulation. Why do we regulate our behavior? It is the way how the individuals choose to do and how they go about trying to accomplish their goals. Markus and Wurf (1997) distinguish three components of self-regulation process: goal selection, preparation for action and cybernetic cycle of behavior. According to them, the first stage in the self-regulation process is the goal selection stage. Before one can regulate his/her behavior, one must select the goal and decide what one intends to do. After one has set the goal, now one has to prepare a plan for action. In this stage, one has to design and prepare to implement the plan to achieve the goal. Lastly is cybernetic cycle of behavior. It is a way on how one uses information that he/she gathers in the process of executing the plan to regulate his/her behavior. Usually after one sets the goal, then he/she examines his/her behavior and compare if his/her behavior is leading toward the attainment of the goal. After obtaining the information, one has to adjust his/her behavior to reduce the discrepancy between the goal and the behavior; some adjustments have to be made.

According to Eisenberg, Smith, Sadovsky, & Spinrad, (2005), Shonkoff & Phillips (2000) beside achieving the goal, aspects of self-regulation correlate with various positive outcomes for children and adolescents—including better academic performance, problem-solving skills, and reading comprehension; more satisfying interactions with peers; higher levels of intrinsic motivation, self- worth, perceived

competence, self-efficacy, moral cognition, and moral conduct; fewer behavior problems; and lower levels of psychopathology, such as depression. However, though self-regulation is important in achieving the goal, the attainment of goal can also be affected by other factors such as self-efficacy, possible selves, and self-awareness (Bandura, 1986, 1989). It is about one's own belief toward his/her capability to succeed. People with high self-efficacy believe they have the ability to succeed at a task, to overcome obstacles, and to reach their goals. While, people with low self-efficacy doubt their ability to succeed and do not believe that they have what it takes to reach their goals. Self-efficacy may be important aspect in self-regulation; however, self-regulation is also affected by one's dream of what he wants to be in the future or a possible self that one wants to be in the future (Markus & Nurius, 1986; Markus & Ruvolo, 1989). Last factor that can also influence self-regulation is self-awareness. Knowing one's self is another factor that can influence self-regulation as Duval and Wicklund (1972) argued that when people focus their attention inward (i.e., when they become self-aware), they tend to compare their present state with a relevant standard. Encouragement arises when people believe they are meeting or exceeding a relevant standard; discouragement arises when people believe they are falling short of a relevant standard.

Latest theory on self-regulation is authored by Deci and Ryan (2000, 1999, and 1985). They pointed out the components of self-regulation and these are external regulation, introjected regulation, identified regulation, integrated regulation and intrinsic regulation. The four components are parts of extrinsic motivation. These theories indicate that human behavior is either self-regulated or controlled. Intrinsic motivation indicates self-regulation, while extrinsic motivation is a form of controlled behavior. It has been argued that the ability to self-regulate has been viewed as a desirable quality throughout history because of its positive effects on behavior and the acquisition of skills (Reid, 1993). Self-regulated learners direct their own behaviors to study and achieve what they want to achieve in their studies. They monitor their progress; redirect their behavior toward the established goals. According to Zimmerman, (2001), In order for students to be self-regulated they need to be aware of their own thought process, and be motivated to actively participate in their own learning process.

External regulation

The main question here is why people do certain things and not the other things. The reasons why a certain person does one thing but not the other thing are related to different kind of motivation of different people (Deci, & Ryan, 2000). Deci and Ryan have investigated the reason behind why a person is so passionate in certain activity but not in other activity. Their investigation leads to different motivation as the reason why a person acts. Motivation refers to the drive or reason for doing something. Without it, one would have no inspiration, and one would not accomplish what he/she wants to accomplish (Deci, & Ryan, 1985). It makes the difference between the motivated and the demotivated person. The motivated person can accomplish his/her goal, while the demotivated person cannot accomplish. It is a key when it comes to getting people to take action.

Source of motivation is intrinsic and extrinsic. Intrinsic motivation is taking some action or accomplishing one thing because he/she finds that by doing such things he/she finds enjoyment or pleasure or make him happy. The motivation for acting is found in the action itself and the person himself/herself, and not in some external forces. The self-autonomy can be achieved when individuals feel they are engaging in activity because they choose to do so, not because they feel pressured by other people (parents, teachers) or other external factors. Extrinsic motivation is contrary to intrinsic motivation. The source of motivation is something external to the person. Though the decision to act is made by the person, but such decision is not originated from within the person but from something external to the person such as reward or punishment. When one acts based on intrinsic motivation, he/she is doing something because he/she likes it, it is fun, he/she enjoys it, or he/she finds it pleasurable. While extrinsic motivation, one does certain thing because of reward or fear for punishment, even though the act does not give him/her happiness or pleasure. One is not acting on his/her own free will. The one that regulates the behavior is not the person himself/herself but it is external forces or demands such as praise

and punishment that come from parents, society or social group. The person is not in control of and cannot alter his/her actions, thoughts and feelings except to comply. In this case, there is no autonomy. Autonomous behavior comes from one's sense of self, unlike controlled behavior that comes from outside pressure. Self-determination may well be the most powerful factor in becoming a well-adjusted person (McLean, 2006).

In line with the theory of motivation, self-regulation is a deliberate effort done by a person to alter his own states and responses, including behavior, thoughts, impulses or appetites, emotions, and task performance. However, such self-regulation can be motivated either by the person himself/herself or pressure from society or culture. Behaviorally, the person acts on certain thing, either because he/she likes it or because other people, external environment, society or culture requires it. The behavior is learned by the person through the society where he/she is living. The problem arises when comparing human to animal because animal learn certain pattern of behavior, not because it likes the act but because of fear of punishment.

Previous research on the animal concluded that animals learn behaviors based on past rewards and punishments. In that way, behavior patterns are molded by the external environment (Psychology, n.d). However, Bandura, a behaviorist, argued that shaping human behavior is more complex than animal. If animal is more on external regulation, human is external and internal at the same time. On the one hand, Bandura argued that the environment plays a greater role in shaping our behavior than genetics and at the other hand Bandura (1986, 1996) argued that there are several factors shaping our behavior and the *first is self-observation*. By observing the behavior of others and learn the consequence of those behaviors, one can learn certain pattern of behaviors. "Most human behavior is learned observationally through modeling: from observing others, one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action." We regulate our behavior by monitoring the behavior of others and consequence of those behaviors and adjusting our behavior accordingly. *Second is judgmental process*. It is a subjective evaluation of the consequences of our behavior. A person will always evaluate the consequence of his/her behavior without referring it to others or external rules (personal standards), and make some adjustment to his/her behavior. It is almost impossible to regulate a behavior effectively without monitoring its consequences. Poor monitoring is the main cause of self - regulation failure. He/she can also evaluate his/her behavior based on prescribed standards of behavior (standard of reference). In other words, the behavior of the person is directed by his/her own will.

Beyond self-observation and judgmental process, other psychologists confirm that self-regulation can be considered from both behavioral and neural systems levels, and from developmental traditions that have historically devoted greater attention to either (a) emotion-related processes of reactivity and regulation or (b) cognitive processes, including children's working memory and attention deployment (Blair & Razza, 2007). There is consensus across these diverse disciplinary perspectives that children's self-regulation includes their ability to manage or modulate positive and negative emotions, to inhibit or control their behavior, and to shift and focus their attention (Blair, 2002; Cole, Martin, & Dennis, 2004; Eisenberg et al., 1996; Kochanska, Murray, & Coy, 1997; Kopp, 1989; Mischel, Ebbesen, & Zeiss, 1976). Their ability to modulate their behavior can be externally and internally influenced.

Now we know where the behavior comes from. In short, in external regulation, the behavior of the person is not motivated by the person himself/herself but it is externally motivated. The person behaves to gain some rewards or to avoid some negative contingency. Example, someone does regular exercise to lose weight but the real purpose is to get a prize or to be recognized. A student who is doing well in academic may have excelled because his/her parents promised him/her a new car. Therefore, the behavior is controlled by external incentives such as praise, rewards, and punishment avoidance.

Introjected regulation

The reasons for acting are always different from one person to person because of different sources of motivation. Motivation for acting varies from one individual person to another; one has intrinsic

motivation, while others have extrinsic motivation. Contrary to the external regulation wherein a person acts out of fear of punishment or reward, and obedience, introjected regulation is behaving out of a sense of guilt or obligation or a need to prove something. One is behaving in a certain way because he/she has to do it, not because he/she wants to do it or one wants to be recognized. It involves the internalization of external controls, which are then applied through self-imposed pressures in order to avoid guilt or to maintain self-esteem (Deci & Ryan, 1999). It is a controlling motivational regulation in which people act due to internal pressures that are regulated by contingent self-esteem (Ryan & Deci, 2000). One is taking on external regulations to behavior but not fully accepting said regulations as his/her own. The motivation is still extrinsic motivation; however, such extrinsic motivation has been adopted but not yet incorporated by the person into the sense of self. The behavior rather than being externally controlled becomes internally controlled. However, at this stage the behavior is extrinsically motivated as it is used in order to achieve another goal rather than for the joy of participation (Cox, 2007).

Introjected regulation indicates that people go along with a task because they think they should and feel guilty if they don't. Such regulation might include studying for exams, doing homework, physical exercise or visiting a sick relative or elderly parent because he/she thinks that he/she should or ought to do it, not because he/she wants to do it (Positive Psychology Resources, 2006). Though the control is still with the person who committed the act, however, the act is not really the act of free-will and because he/she wants to do it but he/she does it because it is an obligation or a duty to do or else they would be ashamed. He acts because of pride, shame or guilt. Taking another example is losing weight because one feels that obesity is a character flaw. Obesity in the mind of many people is bad. Introjected regulation occurs when the external contingencies have been internalized and the individual acts to facilitate self-esteem (e.g. exhibit ability) or lessen guilt and avoid demonstration of failure.

Identified regulation

Identified regulation is behaving because of the importance one ascribes to the behavior. One is doing regular exercise because it is important for his/her health. At this level, the action begins to be integrated within the person's sense of self. Identification involves a conscious acceptance of the behavior as being important in order to achieve personally valued outcomes. It is a more autonomously driven form of extrinsic motivation. It involves consciously valuing a goal or regulation so that said action is accepted as personally important. It is no longer external pressure on the person to perform such act but he/she does it because he/she is aware of its importance and at the same time finds pleasure and enjoyment pursuing such behavior or activity. Another example is losing weight because a healthy weight is an important goal to accomplish. Or students who finish their assignments because they know that it is important for them to finish their assignments and they want to learn. In the identified regulation, it is no longer outside forces that motivate them to do certain thing but the person himself/herself and the value of the act itself. The act is good in itself.

The person acts on certain thing when he/she sees it as important for him/her. This happens when the behavior or act is explicitly recognized and valued by the individual (high perceived value and personal importance). At the identified regulation level, the person himself/herself motivates himself/herself to do certain things because of its value for the person himself/herself (Vlachopoulos & Karageorghis, 2005). The person must be able to make his/her decisions which values and rules to embrace, not depending on their parents or society where he/she lives.

Intrinsic motivation

Intrinsic motivation is the inner passion of an individual person to pursue certain activity that what he/she believes giving him/her pleasure. In other words, intrinsic motivation is an energizing of behavior that comes from within an individual, out of will and interest for the activity at hand. No external rewards are required to incite the intrinsically motivated person into action. The reward is the behavior itself. In the Self-determination theory, intrinsic motivation represents the most self-determined or autonomous

behavior regulation by inherent interest, enjoyment and satisfaction. There are three types of intrinsic motivation according to Deci and Ryan, (2000):

1. Intrinsic motivation toward knowledge is observed if an activity is performed for the pleasure or satisfaction of learning or understanding something.

2. Intrinsic motivation toward accomplishment is defined as engaging in an activity for the pleasure of accomplishing or creating something.

3. Intrinsic motivation toward stimulation occurs when an activity is performed to obtain stimulating experiences.

In relation to academic performance, other authors argued that intrinsic motivation is associated with interest, excitement, confidence; enhance performance, persistence, creativity, self-esteem, and general well-being of students (Ryan & Deci, 2000). They explained that intrinsic motivation offers not only higher performance of students but it bring happiness and enjoyment for the student for pursuing their studies.

Related studies

This section looks into several studies conducted by other researchers related to similar topic on academic self-regulation and academic performance. Concern on the academic self-regulation and academic performance has started years back by many researchers. The theory of self-regulation is a broader theory of motivation. Motivation, extrinsic and intrinsic, affects how people regulate their behavior in order to achieve their goals. Students who want to be included in the dean's list will affect their studying behavior. Academic performance depends on the level of motivation of students. Koh, Tan, Tan, and Fang (2010) conducted a study to find out the effect of motivation of students and academic performance. The aim of this study was to investigate the effect of SBL on learners' motivation and their academic performance. In assessing students' motivation, the researchers adopted a framework based on the Self-determination Theory (SDT), chosen on account of its comprehensive treatment of the relationship between students' perceived needs satisfaction and their motivation. The study hypothesized that SBL, which provides learners with interactive learning experiences, will enhance students' motivation and performance. The findings suggest that the students perceived their psychological needs to be satisfied and had high levels of self-determined motivation. Students who undertook SBL had higher mean performance test scores, although SBL may have differential effects on learners depending on factors such as gender, educational backgrounds, and IT knowledge.

Pursuing the same interest on the relationship between motivation and academic performance, Ayub (2017) conducted a study on the effect of intrinsic and extrinsic motivation on academic performance. Samples of 200 students of selected university in Karachi were taken. The aim of the study was to explore the relationship between intrinsic and extrinsic motivation on academic performance. Results of the study suggest that intrinsic and extrinsic motivation and academic performance were positively correlated. Furthermore, the study concluded that motivation improves academic performance of the students and there is a gender difference in motivation type and academic performance. Kitsantas, Winsler and Huie (2008) in their study on self-regulation and academic success, supported the idea that self-regulation affects the academic performance of students. They argued that differences in low- and high-achieving students are closely linked to an individual's level of self-regulation. Self-regulation refers to the degree to which students are "metacognitively, motivationally, and behaviorally active participants of their own learning process" (Zimmerman, 1989).

Dent (2013) conducted a study on self-regulation and academic achievement across childhood and adolescence. The study found that self-regulatory capacities had direct effect on academic achievement as a whole. In similar effort, Agustiani, Chayad, and Musa (2018) undertook a study on self-efficacy and self-regulated learning as Predictors of Students' Academic Performance. The study revealed that there is a correlation between self-efficacy, self-regulation of learning and academic achievements of students. This is also found in the study of McClelland and Cameron (2011) who investigated self-regulation and

academic achievement in elementary education. Based on their investigation, they confirm the correlation between self-regulation and academic achievement of elementary children. Such correlation also found across discipline of studies such as medical schools that self-regulation affects academic performance in medical education (Lucier, Jonker, Rikers & Themmen, 2016).

Similar study was also carried out by Cobb (2003) on the relationship between self-regulated learning behaviors and academic performance in web-based courses in Virginia. His study is similar to the findings of Kitsantas, Winsler and Huie (2008) that self – regulated learning affect the academic performance of students who took the web-based course. Intrinsic goal orientation was used as predictors in the development of a mathematical formula used to predict academic success in a web-based course. In the same interest, Pintrich and De Groot (1990), prior to Cobb and others, had conducted the similar study on the effect of motivational and self-regulated learning components to classroom academic performance. His study found that self-efficacy and intrinsic value were positively related to cognitive engagement and performance. Self-regulation, self-efficacy, and test anxiety emerged as the best predictors of performance. Intrinsic value did not have a direct influence on performance but was strongly related to self-regulation and cognitive strategy use, regardless of prior achievement level.

The reviews of those related studies support or strengthen the theories and the assumption of the current study that academic self – regulation can affect the academic performance of students. Building on those previous studies, the current study would like to investigate different aspect of self-regulation and find out what particular components of self-regulation affects the academic performance.

Statement of the problems

The statement of the problem of the study is drawn from the conceptual framework. This study is to determine the level of self-regulation of students and its influence on their academic performance, specifically to answer the following:

1. What is self-regulation of Senior High School students in terms of?
 - a. External regulation
 - b. Introjected regulation
 - c. Identified regulation
 - d. Intrinsic motivation
2. What is the academic performance of students in terms of their grade?
3. Is there any relationship between self-regulation and academic performance of STEM students?

Assumption of the study

The assumption of the study is that academic self-regulation of the students affect their academic performance and can be measured.

Hypothesis

Ayub (2017) on his study on the intrinsic and extrinsic motivation and academic performance found a correlation and the study of Kitsantas, Winsler, and Huie (2008) also found the existence of correlation, therefore the study hypothesizes that there is a relationship between self-regulation and the academic performance of STEM students.

Research methodology

In order to carry out the study, an appropriate research methodology is utilized. Therefore, this part will discuss research design, data gathering instruments, population, locale of the study, data gathering procedures and statistical treatment of data.

Research design

The study is a quantitative descriptive research design and explanation research to determine and explain the level of academic self-regulation of students. It describes and explains what is found in the

data. It involves the description, recording, analysis and interpretation based on the data gathered through questionnaires which are statistically computed. It is a fact finding with adequate interpretation. It assesses, determines and reports the way things are. In other words, it describes the data that have been collected on research sample, describes “what is” about the data gathered.

In line with the current study, descriptive correlational method was deployed. The study assessed the academic self-regulation level of students and how it affects their academic performance. This was to identify what the dominant self-regulations among students were and what particular self-regulation does affect the academic performance.

Locale of the study

The locale of the study was Divine Word Colleges of Region I. The Divine Word Colleges are run by the Congregation of the Divine Word Missionaries or known as Society of the Divine Word or in Latin, Societas Verbi Divini (SVD).

Population

The population of the study was composed of 302 STEM (science, technology, engineering and mathematic) of Senior High School students of the three colleges. STEM students were chosen on the basis of their capability to understand and answer the questionnaires. Total enumeration sampling was used to meet the required data for the study.

Data gathering instruments

The study utilized questionnaires. The questionnaires were adopted from SRQ_A made by Kennon (n.d) from University of Columbia. The questionnaires were distributed to STEM students of the three private Catholic colleges in Region I. Questionnaires were composed of five parts and they external regulation, introjected regulation, identified regulation, intrinsic motivation, and academic performance.

Data gathering procedures

In the process of data gathering, the researcher sent letters to the Presidents of the three colleges in Region I, requesting the Presidents to allow the researcher to flow his questionnaires in his college. The researcher personally met the Presidents and students and requested them to answer the questionnaires.

The retrieval of questionnaires was arranged between the President’s representative and the researcher with the help of employees and faculty of the three colleges.

Statistical treatment of data

In consistent with the study as descriptive research, therefore descriptive statistics is used to measure the weighted mean and the Pearson r will be used to measure their correlations.

The following ranges of values with their descriptive interpretation will be used:

Statistical range descriptive interpretation overall descriptive rating

- 4.21-5.00 Very true Very High*
- 3.41-4.20 True High*
- 2.61-3.40 Somewhat true Moderate*
- 1.81-2.60 Not true Low*
- 1.00-1.80 Not at all true Very Low*

Findings

The finding of the study is presented according to the statements of the problem.

Problem 1a. What is the academic self-regulation of STEM of Senior High School students in terms of external regulation?

Table 1a. External regulation

	\bar{X}	DR
1. I do my homework because I will get in trouble if I don't	3.54	True/high
2 I do my homework because that is what I'm supposed to do	4.09	True/High
3. I do my classwork so that teacher won't yell at me	3.32	Somewhat true/moderate
4. I do my classwork because that's the rule	3.70	True/High
5. I try to answer hard questions in class because that's what I am supposed to do.	3.48	True/ High
6. I try to answer hard questions in class because I want the teacher to say nice things about me	2.95	Somewhat true/moderate
7. I try to do well in school because that's what I am supposed to do	3.94	True/High
8. I try to do well in school because I will get in trouble if I don't do well.	3.48	True/High
9. I try to do well in school because I might get reward if I do well	3.58	True/High
Overall	3.56	True/High

Legend

- 4.21-5.00 Very true Very High*
- 3.41-4.20 True High*
- 2.61-3.40 somewhat true Moderate*
- 1.81-2.60 not true Low*
- 1.00-1.80 Not at all true Very Low*

Based on the computed mean presented on the table, it shows that most students have a high external self- regulation but there are some who have moderate self-regulation. However, overall, the students have a high or 3.56 mean rating which means that they have high external regulation. This means that they do their homework, classwork, try to answer hard questions in class and try to do well in the school because of external factor such as fear, pressure, punishment, rule, and reward.

Problem 1b. What is the academic self-regulation of STEM of Senior High School students in terms of introjected Regulation?

Table 1b. Introjected regulation

Items	\bar{X}	DR
1. I do my homework because I want the teacher to think I'm good student.	3.28	Somewhat true/Moderate
2. I do my homework because I feel bad about myself if I don't do it	3.97	True/High
3. I do my classwork because I want the teacher to think I'm good students.	3.28	Somewhat True/High
4. I do my classwork because I'll be ashamed of myself if I didn't get done.	3.74	True/High
5. I try to answer hard questions in class because I want other students to think I'm smart.	2.61	Somewhat true/Moderate
6. I try to answer hard questions in class because I	3.36	Somewhat

feel ashamed of myself when I don't try		true/Moderate
7. I try to do well in school so that my teacher will think I'm good student.	3.11	Somewhat true/Moderate
8. I try to do well in school because I feel really bad about myself if I don't do well	3.79	True/High
9. I try to do well in school because I feel really proud of myself if I do well	3.99	True/High
Overall	3.46	True/High

Legend

4.21-5.00 *Very true Very High*

3.41-4.20 *True High*

2.61-3.40 *somewhat true Moderate*

1.81-2.60 *not true Low*

1.00-1.80 *Not at all true Very Low*

As indicated by the computed mean presented on the table, it reveals that most students have moderate introjected self-regulation but some have a high introjected self-regulation. However, as a whole, the STEM of the senior high school students of Divine Word Colleges have a high (3.46) introjected academic self-regulation which means that they are behaving out of a sense of guilt or obligation or a need to prove something. The students do their homework and classwork, answer hard questions and try to do well in school because they have to do it, because they feel guilty if they don't, because it is their obligation. Somehow they have internalized the external controls, which are then applied through self-imposed pressures in order to avoid guilt or to maintain self-esteem (Deci & Ryan, 1999).

Problem 1c. What is the academic self-regulation of STEM of Senior High School students in terms of identified regulation?

Table 1c. Identified regulation

Items	\bar{X}	DR
1. I do my homework because I want to understand the subject	4.02	True/High
2. I do my homework because it is important to me to do my homework.	4.2	True/High
3. I do my classwork because I want to learn new things.	4.16	True/High
4. I do my class work because it's important to me to work on my classwork.	3.98	True/High
5. I try to answer hard questions in class to find out if I'm right or wrong.	3.78	True/High
6. . I try to answer hard questions in class because it is important to me to try to answer hard questions in class	3.33	Somewhat True/Moderate
7. I try to do well in school because it's important to me to try to do well in the school.	3.93	True/High
Overall	3.91	True/High

Legend

4.21-5.00 *Very true Very High*

3.41-4.20 *True High*

2.61-3.40 somewhat true Moderate

1.81-2.60 not true Low

1.00-1.80 Not at all true Very Low

As it is gleaned from the table and as seen in the computed mean, it shows that most students have high identified self-regulation, though some have moderate identified self-regulation. However, overall the students have high identified self-regulation which is indicated by its computed mean rating of 3.91 which is interpreted as high. It means that students pursue certain activity such as doing homework, classwork, answering hard questions in class and try to do well in school because of their importance. They have somehow accepted consciously that doing homework, classwork, answering questions in class and trying to do well in school is important for them in order to achieve personally valued outcomes. They have consciously valued the goal of certain activity as personally important. They made their judgment based on the value of the activity for them.

Problem 1d. What is the academic self-regulation of Senior High School students in terms of intrinsic motivation?

Table 1d. Intrinsic motivation

Items	\bar{X}	DR
1. I do my homework because it's fun	3.03	Somewhat true/Moderate
2. I do my homework because I enjoy doing my homework.	3.36	Somewhat true/Moderate
3. I do my classwork because it is fun	3.32	Somewhat true/Moderate
4. I do my classwork because I enjoy doing my classwork	3.37	Somewhat true/Moderate
5. I try to answer hard questions in class because I enjoy answering hard questions	3.02	Somewhat true/Moderate
6. I try to answer hard questions in class because it is fun to answer hard questions.	3.09	Somewhat true/moderate
7. I try to do well in school because I enjoy doing school work well.	3.47	True/High
Overall	3.24	

Legend

4.21-5.00 Very true Very High

3.41-4.20 True High

2.61-3.40 somewhat true Moderate

1.81-2.60 not true Low

1.00-1.80 Not at all true Very Low

Based on the computed mean as presented on the table, it shows that most students have moderate intrinsic motivation. Only few students have rated themselves high. Overall mean rating points out that the STEM of the Senior High School Students of Divine Word Colleges have somewhat true or moderate level of intrinsic motivation as indicated by its overall mean ration of 3.24 which is moderate or somewhat true. It means that the students lack of autonomy and self-motivated interest in their behavior or in their studies. Their academic participation is still predominantly influenced by external motivation such as external self-regulation, introjected self-regulation and identified self-regulation. Their academic

participations are not regulated by the inherent interest and enjoyment and satisfaction found in the activity they undertook. According to Deci and Ryan, (2000), intrinsic motivation does not require external rewards to do certain activity or behavior, because the reward is the behavior itself. They engage in activity just for the pleasure of accomplishing or creating something.

Table 2 e. Summary on the level of academic self- regulation

	\bar{X}	DR
External Regulation	3.56	True/High
Introjected Regulation	3.46	True/High
Identified Regulation	3.91	True/High
Intrinsic Regulation	3.24	Somewhat true/Moderate
Overall	3.54	True/High

Legend

4.21-5.00 Very true Very High

3.41-4.20 True High

2.61-3.40 Somewhat true Moderate

1.81-2.60 Not true Low

1.00-1.80 Not at all true Very Low

As gleaned from the summary table, it reveals that Academic self-regulation of students are high but these academic self-regulation are mostly influenced by extrinsic motivation such as external regulation, introjected regulation and identified regulation. Their intrinsic motivation is found to be somewhat true or moderate.

Problem 2: Is there a relationship between academic self-regulation and academic performance?

Table 2. Relationship between academic self-regulation and academic performance

External Regulation	0.0817
Introjected Regulation	0.0983
Identified Regulation	0.1526
Intrinsic Motivation	-0.0064
As a Whole	0.0816

*Significant at .05 level

Based on the correlation coefficient computation, it is found that academic self-regulation such as external regulation, introjected regulation; identified regulation and intrinsic motivation have no correlation with the academic performance of the students. Therefore the hypothesis of the study that there is no relationship between academic self-regulation and academic performance is accepted. The finding of the study is contradictory to the result of the study of Ayub (2017), Kitsantas, Winsler and Huie (2008), Cobb (2003) on the effect of intrinsic and extrinsic motivation on academic performance. The results of those studies suggest that intrinsic and extrinsic motivation and academic performance are positively correlated. The result of the current study may point out different factors that cause academic performance.

Conclusion

Based on the findings of the study, the study concludes that academic self-regulation of the STEM students of the Divine Word Colleges is high; however, there is no relationship between academic self-regulation and academic performance and therefore the hypothesis is rejected. This further concludes that

the academic performance of students of Divine Word College of Vigan is not controlled by their academic self-regulation such as extrinsic and intrinsic motivation. Their academic performance can be affected other factor such as their self-efficacy, self-awareness, possible self (Bandura, 1986, 1989). Bandura argued that people with high self-efficacy believe they have the ability to succeed at a task, to overcome obstacles, and to reach their goals. While, people with low self-efficacy doubt their ability to succeed and do not believe that they have what it takes to reach their goals. Dreaming of possible self in the future can affect the outcome certain behavior (Markus & Nurius, 1986; Markus & Ruvolo, 1989). Last factor that can also influence the outcome is self-awareness. Knowing one's self is another factor that can influence the outcome as Duval and Wicklund (1972) argued that when people focus their attention inward (i.e., when they become self-aware), they tend to compare their present state with a relevant standard. Encouragement arises when people believe they are meeting or exceeding a relevant standard; discouragement arises when people believe they are falling short of a relevant standard.

The output of the study may point to the contradictory idea that that the ability to self-regulate has been viewed as a desirable quality throughout history because of its positive effects on behavior and the acquisition of skills (Reid, 1993), the attainment of goals and academic performance.

Recommendation

Ryan and Deci, (2000) explained that intrinsic motivation offers not only higher performance of students but it bring happiness and enjoyment for the student for pursuing their studies. Therefore based on that study and based on the findings of the current study which extrinsic motivation is higher than intrinsic motivation, recommends that there is a need to improve the intrinsic motivation of the students and reorient their extrinsic motivation.

Further study should be pursued related to the factors that affect the academic performance of the students beside intrinsic and extrinsic motivation such as self-efficacy, self-awareness and possible self (Bandura, 1986, 1989).

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