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RESEARCH ARTICLE

DYNAMICS OF TEACHING ENGLISH, SCIENCE AND MATHEMATICS IN THE TERTIARY LEVEL.

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Abstract

This study was conducted to determine the dynamics of teaching English, Science, and Mathematics in the tertiary level.

The Descriptive-Experimental type of research was utilized with the three professors handling English, Science, and Mathematics subjects of the first year Bachelor of Arts students in the College of Social Science and Humanities (CSSH) as the respondents. The variables considered were sex, age, number of years in teaching in the university, highest educational attainment, and number of trainings and/or seminars attended within the last two years, and subject taught. The aspects were the general interaction pattern, teaching style, classroom interaction strategies, and mode of questioning.

In the data-gathering process, pre-test and post-test in the three subject areas were administered, the actual classroom interactions were video recorded, and with the aid of a questionnaire-checklist, the gathered data were analyzed.

To statistically treat the data, these tools were used: to determine the extent of application of strategies in the classroom commonly employed by the respondents with respect to general interaction pattern, Frequency, Percentage, and Rank were used; with respect to teaching styles, classroom interaction strategies, and mode of questioning, Mean was used. To determine the level of the performance of the students in English, Science, and Mathematics after utilizing the classroom interaction patterns, Mean and Standard Deviation were utilized. To determine the significant difference on the level of performance of the students in English, Science, and Mathematics after utilizing the interaction patterns, t-test was applied; and for the significant difference in the general pattern of interaction in the observed English, Science, and Mathematics classes, F-test (one-way Analysis of Variance) was applied.

The findings of the study revealed with respect to general interaction pattern, in the top ranks were lecture (explanation), plain English, recall/recognition questions, response from female students, positive acknowledgment of female students, and social interaction among female students. As to the extent of the application of strategies in the classroom interaction commonly employed by the respondents with respect to teaching style, classroom interaction strategies and mode of questioning, the assertive and facilitative teaching styles attained the verbal interpretation of "always". Suggestive and collaborative

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teaching styles were both verbally interpreted as "often". The methodologies obtained the verbal interpretation of "sometimes" and the maximum participation strategies with "always". The mode of questioning also obtained a verbal interpretation of "always".

After utilizing the classroom interaction patterns, the level of performance of the students in English, Science, and Mathematics was found average. Moreover, there was no significant difference on the level of performance of the students in English subject while there were in Science and Mathematics.

Based on the analyses and interpretation, it was concluded that lecture in the form of writing and talking as well as giving directives can help the students thoroughly understand the lessons; classes in English, Science and Mathematics were always conducted using English Language; female students actively take part in the teaching-learning processes across the three subjects; the assertive teaching style was mostly subscribed by the professors; lecture and discussion are always utilized in teaching than the other classroom interaction strategies; interaction strategies helped escalate scores of the English, Science, and Mathematics students; and strategies such as writing and talking, giving directives, code switching, and redirect questioning pattern positively influenced the process of learning of the students.

In view of the findings, it is recommended that the professors should integrate hybrid instruction into the usual classroom contacts and integrate peer mentoring in order to reinforce the usual teaching-learning situation. They should also ensure that in the teaching-learning processes, there is a framework of questions that thoroughly includes Higher Order Thinking Skills (HOTS) and/ or strike balance in including those that deal with Lower Order Thinking Skills (LOTS) and HOTS. Male students are strongly encouraged to become active in class discussions and other activities. The professors need to provide them motivation, class work and tasks that really catch their attention and suit their abilities. The professors must integrate in their pedagogy the giving of diagnostic test before beginning a lesson/chapter and achievement test after that lesson/chapter in order to gauge how much the students have learned thereby conducting strict monitoring and promoting metacognitive learning. Multidisciplinary events such as math bazaars, science booths/exhibits, English recitals, interactive exhibits, mini-entrepreneurial and marketing activities and the like should be held at least once every semester to promote group camaraderie among students as they apply their knowledge, skills and values acquired in different subject areas. The campus through its director, dean, department head/s, program coordinator/s, and sub-organization advisers must launch periodic and carefully structured and other follow up programs; and establish linkages in the fields of English, Science, and Mathematics in order to bolster classroom learning. The university should implement a policy that would require faculty members to maximize student participation and interaction, hence, revolutionize stereotypes in every classroom. A parallel study using other variables and sets of respondents may also be conducted.

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Introduction:-

Education is everyone's aspiration. Throughout the ages, the humankind finds it to be the primordial instrument towards success. It is even considered as the driving force behind parents' and guardians' hardwork—to send the children in school.

Regardless whether a school is public or private, quality teaching is what every learner needs. In the tertiary level, multifarious methodologies, strategies and techniques are being applied by the professors to ensure that learners are fully equipped with the competencies needed to make them globally competitive.

To ensure efficiency and effectiveness in classroom interaction, today's teachers need to be ready to play a variety of roles such as educator, motivator, guide, counselor, coach, and disciplinarian. They must also be prepared for the demands on their time outside the classroom: grading papers, planning lessons, dealing with myriad academic and for some, administrative tasks. Teachers must be prepared to work as part of a team, combining their efforts with their colleagues, supervisors, and parents to create the best possible learning environment for their students. In addition, they must continually educate themselves—learning about new advances in education, new technologies, and new ways to encourage their students to reach their full potential.

It is along this framework that the Constitution of the Philippines provides for as stated in Sections 1 and 2 of Article XIV that it ensures the right of all citizens to quality education at all levels. The state shall take appropriate steps to make such education accessible to all. The constitution mandates that the State shall establish, maintain, and support and complete, adequate and integrated system of education relevant to the needs of the people and society (De Leon, 1999).

The government, through its constitutional mandate, indeed sees to it that its citizens receive education. It has its basic implementing arms such as Department of Education (DepEd) and Commission of Higher Education (CHED) that are mandated to ensure quality and smooth delivery of education to Filipinos. Within each institution, there are standards adhered to so as the policies implemented by DepEd and CHED are properly delivered.

To ensure effective delivery, there are existing practices of teachers that are indispensable in their effectiveness in the classroom. These also have relation to their conversation fluency in English that is the medium of instruction in most of the subject offerings especially in English, Science and Mathematics. While practices deal with the embodiment and execution of the pedagogies, a vehicle for learning transfer is also inherent. Hence, English Language comes in as a powerful tool for facilitative teaching-learning process in non-Filipino subjects specifically English, Science and Mathematics (ENSCIMA) which are considered as the core subjects in the curriculum.

Classroom interaction is an integral part of the teaching process. Moore (1989) asserted that without it there cannot be education, since it is the process of intellectually interacting with content that results in changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind.

Knowing the students and their interests is an important aspect to be concerned about if people think on the nature of human learning. The teacher’s competence in the foreign language, the methodology, techniques, and activities educators use along the classes are of dramatic importance, too (Abarca, 2004).

In a classroom, teachers, regardless of the level they handle are often confronted with not-so-active students and tend to avoid interaction. In order to facilitate interaction, teachers usually ask questions, give follow-ups and even translate the question to the native language expecting them to respond. Occasionally, no student answered their questions, but often some students do not respond even if they understand the question, know the answer, and are able to give the answer. Some students are often reluctant to initiate conversations or ask the teacher a question in front of the class. This eventually impedes feedback mechanism in the teaching-learning process.

It is a truly miserable feeling when most of the learners do not participate and eventually yield less learning and development. Teachers always wanted to figure out the reasons for their passive and “don’t-care” behaviors. This basically is the premise why this study is conducted-- to ensure that every facet of teaching parallels the mission, vision and goals of the institution.

Objectives:-

The general objective of this study is to determine the dynamics of teaching of English, Science and Mathematics in the tertiary level.

It specifically aimed to:

1. Determine the general interaction pattern in terms of:
    a) instruction;

   b) language use;
   c) questioning;
   d) response;
   e) feedback; and
   f) effective teaching management (non-academic).
2. Determine the extent of the application of strategies in the classroom interaction commonly employed by the respondents with respect to:
   a) teaching style;
   b) classroom interaction strategies; and
   c) mode of questioning.
3. Determine the level of the performance of the students in English, Science, and Mathematics after utilizing the classroom interaction patterns.
4. Determine the significant difference on the level of performance of the students in English, Science, and Mathematics after utilizing the interaction patterns.
5. Determine the significant difference in the general pattern of interaction in the observed English, Science, and Mathematics classrooms.

Literature Review:-

In the 2010 Census of Population and Housing (2010 CPH), the highest educational attainment was asked for persons aged 5 years old and over. The household population in this age bracket was recorded at 81.9 million, comprising 88.9 percent of the total household population in the country. Of the total household population aged five years and over, 19.1 percent had finished at most high school, 11.7 percent completed at most elementary education, 10.1 percent were academic degree holders, and 2.7 percent were post secondary graduates. Among those with college/academic degrees, females (56.1 percent) outnumbered males (43.9 percent). Similarly, there were more females (58.0 percent) than males (42.0 percent) among those with post baccalaureate courses. The educational attainment of the population in the country had improved since year 2000. The proportions of graduates of both secondary and tertiary (college) levels had increased from 2000 to 2010. In 2010, high school graduates accounted for 19.1 percent compared to only 12.9 percent in 2000. College graduates increased from 4.3 percent in 2000 to 10.1 percent in 2010. On the other hand, the proportion of those with no grade completed had decreased from 8.3 percent to 4.0 percent.

In the study of Julie Wilson on High and Low Achievers' Classroom Interaction Patterns in an Upper Primary Classroom at University of South Australia, it was found out that significant factors influencing the interaction patterns of the study's high and low achievers were being uncertain of the answer, just not wanting to be involved, getting teased by other students, feeling embarrassed, concerned about being wrong and lack of enjoyment for a particular subject. These findings showed that no one factor alone influenced high or low achievers' interaction patterns. Past and present successes and relationships in classrooms were seen as being responsible for students' willingness to initiate interactions in this classroom.

According to Ifamuyiwa (2007), in the cooperative interaction condition, students learn together and have the opportunity to engage in interactions relevant to the accomplishment of the learning tasks. Cooperative interaction pattern offered the necessary aids for diagnosing students' difficulties more easily than the competitive interaction pattern in which students study independently and a student tries to learn the material better than others in the group without discussing with other students but only seek assistance from the teacher. In the individualist condition, a student work on his or her own, avoiding interaction with other students, seeking assistance from the teacher alone.

Ifamuyiwa (2007) further reported that the ability levels of the students involved in the various interaction patterns have been considered to be an important mediating variable by some researchers although no clear-cut pattern has emerged.

Teachers should avoid monotonous patterns of presenting the same kind of lesson day after day. When topics are presented using a variety of learning activities, learners tend to understand concepts and principles better and retain more. The following tips will help and give ideas in planning which method to use in a particular lesson: Consider first the suggestions given in the lesson manuals and when necessary, adapt them to the needs of those you teach; have a definite purpose for using the method; select methods that are appropriate and effective; when appropriate,

choose methods that actively engage the learners; practice using the methods before you teach the lesson; and make a chart of methods you used and may use for every lesson every day (Santiago, 2010).

One of the sure-fire secrets to success in Math is maintaining a positive attitude towards it and the ability to do it. By using positive Math affirmations and eliminating all negative Math self-talk and disempowering Math beliefs, pupils can develop a positive attitude and increased enthusiasm for Math (Ureta, 2010).

It is absolutely critical when teaching Algebra to ensure that students recall and truly understand the more basic material before you push on to the more complex material. One method of teaching Algebra is to begin every lesson with a quick recap of what has been learned recently along with a few words explaining that the Algebra topic of the day is a small extension of what was learned yesterday (Gibson, 2010).

In the article written by Carson (2010) which conveyed that after Mandarin, English is spoken by more people than any other language, and is the native language of more than 350 million people. More people speak English than those who speak the Arabic and French languages combined. Moreover, English is the international language of diplomacy, business, science, technology, banking, computing, medicine, aviation, UN and NATO armed forces, engineering, tourism, Hollywood films and arguably the best pop and rock music in the world. English has plenty of words to choose from. In fact, an English speaker is offered the biggest vocabulary of any language with a choice of 500,000 to 1,000,000 words (including technical and scientific terms) (http://thestar.com.my/English/story.asp?file=/2007/10/18/lifefocus/ 18963932& sec =lifefocus).

In the 1950s, Eric Berne developed the theory of Transactional Analysis, a theory that sees any conversation or non-verbal communication as a transaction taking place between two people. As a result, any communication includes a transactional stimulus and a transactional response. As a conversation proceeds, this is repeated a number of times between the two individuals. However, Berne also recognized that any individual, whatever their age, does not react in a single definable way at all times; instead he believed that any individual has three ego states, between which they can switch instantaneously and often. By consciously realigning the transaction through focusing on an adult to adult stimulus, there is a greater chance of developing a positive response with the student involved. It is only if this is obviously not working and a crossed transaction appears to surface time after time (through an adult stimulus leading to a child to parent response, or vice versa) that the teacher can switch back to a more rigid transaction of parent to child (http://www.teachingexpertise.com/articles).

A teacher is the captain of educational journey; exact about everything (Murray, 2009). The teacher's competencies needed are organizing a well-managed classroom in terms of time management, record-keeping, orderliness and discipline, fostering linkages for mutual concerns, and undertaking networking activities with organizations for educational, social and civic purposes (Salandanan, 2006).

Henry Adams once said: "A teacher affects eternity; no one knows where his influence stops." The teacher serves as the prime mover of the educational wheel while the learners are the key participants in the learning process (Corpuz, 2007).

In the Teaching Philosophy written by Palmer (2000), the "good" teacher is one who establishes an environment that encourages student interaction with the text and with each other. This requires that the student feels safe and is willing to take risks within the classroom. The "good" teacher also clearly communicates his or her high expectations for his or her students, inspiring them to excellence when in comes to academics. A "good" teacher also is passionate about ensuring that the students understand the material given to them. He or she strives to actively engage students and help them make connections with the material. This requires that he or she makes the effort to know his or her students well enough to help them in forming these connections. He or she also recognizes the whole person in the student. Therefore, the "good" teacher understands that the student is able to learn more than just academic material, but is learning how to be a person. Thus, the "good" teacher is a good role model, showing in both of his or her words and actions how an adult member of society is supposed to act (http://www.tcnj.edu/~jones26/teaching%20philosophy.htm).

Borich (2000) explains: A teacher who is excited about the subject being taught and shows it by facial expression, voice inflection, gesture, and general movement is more likely to hold the attention of students than one who does

not exhibit these behaviors. This is true whether or not teachers consciously perceived these behaviors in themselves.

In such an institutional setting, a teacher is the person institutionally invested with not only the most talking rights but also the power to control both the content and procedure, discussion topic, and who may participate (Gil, 2002).

Harjunen and Tainio (2003) said the organization of classroom interaction and especially discipline management is interplay between the verbal and non-verbal activities as well as the visual and special resources used by teachers and pupils.

In teacher-centered instruction, the teacher is the main source of information and knowledge. These days, a fully teacher-centered class is construed as a less effective type of instruction, but some forms of teacher-centered instruction are good and often necessary in the classroom (http://web.utah.edu/taresources/Teaching%20Styles.htm).

Domingo (2006), as cited by Miranda (2007), stated that successful teachers consider some factors in order to effectively facilitate their profession; these are personal grooming, voice, smile, accent on the positive (having faith and confidence with students), competence without dogmatism (creating a democratic atmosphere) and respect for individual differences.

Ordway, as cited by Valencia (2003), revealed that the quality of teaching techniques have something to do with the scholastic performance of the child. Every teacher should discover the strong points of the students and adapt their skills on the interest of the child.

Teaching serves as their way of reaching out to the minds and hearts of the young, thus help raise upright and passionate citizens. Their innate ability in mirroring outstanding emotions of compassions and caring easily generates the students' resolve in continuing their search for more knowledge despite obstacles on the way. With their enthusiasm and perseverance, students become challenged and inspired to do their best.

Teachers assume diversified roles. Prominently, they serve as facilitators of learning by arousing interest and sustaining attractiveness of their subject matter. As classroom managers, they maintain order and discipline so as to bring forth favorable and enjoyable learning environment. They are custodians of instructional materials, equipment, audiovisual tools and reading materials which they arrange neatly and appropriately for ease in use and safekeeping. As co-administrators they are well-informed regarding the policies, rules and regulations that must be implemented and strictly followed. As supervisors, they see to it that all the learning tasks are carried out in their proper sequence and in effective transactions (Salandanan, 2007).

Teachers should not only focus on teaching the subjects but also inculcate values, attitudes, and the over-all performance of the students. They should not only limit themselves to teaching but they should also innovate and recommend strategies that will help the students develop positive values and attitudes while at school (Bona, 2010).

Studies show that children easily learn Science when they are given the opportunities to "do" Science. Investigating and experimenting are excellent ways to teach children some Science concepts (De Guzman, 2010).

Giving specific praise adds meaning to their effort or behavior. When used correctly, specific praise increases motivation and helps students build a positive self-image (Martin, 2009).

In Thuraisingam's (2003) study on the Nature of Talk in the History Classrooms in Singapore, the findings show that the talk in the history classrooms investigated in Singapore consists of three types. They are teacher-talk, student-talk and other types of talk. Of the three types of talk, teacher-talk comprised 63% of the talk, student-talk 28% and other types of talk 8%. Teacher-talk involved the giving of content information; the provision of direction; stating procedure sometimes in order to manage information; the asking of closed inductive questions; the asking of open discursive questions; the acceptance of the student answers; and, the rejection and criticism of student answers. Related to these are the various types of student talk that occurred, specifically: making predictable and unpredictable responses to the teacher; initiating talk to the teacher; responding to their peers; and, initiating talk to the peers. Both teacher and students also engaged in other types of talk such as talking off-task, verbalizing, or when the students made formal presentations in class, when they engaged in electronic talk, or, code switched.

Serving as a unifying framework of project TEACH included this integrated key idea: Every teacher must be a reading teacher. S/he must be a values education teacher as well and one that is a critical / analytical and creative thinker herself or himself. S/he must be aware of how to use IT as an effective tool for the teaching and learning process (http://members. tripod.com/pcer_ph/id19.htm).

One challenge faced by instructors is recognizing and interacting with all students each class session. Often it is difficult to foster participation by all students in a class. The following are tips to encourage individual student-teacher interaction and participation during each class session. (1) Daily Greeting Fosters Inclusion - Stand by the classroom door and speak pleasantly to each student as he/she enters. (2) Participation Strategies for Inclusion - Use name cards to assure that each student is provided an opportunity to respond or comment during class. (3) Entrance Passes Reinforce Concepts - At the beginning of class, ask each student to write down one thing they learned from the previous lesson on an index card. (4) Exit Passes Assess and Promote Learning - Informally assess student learning and promote immediate individual responsibility for learning by requesting an exit pass. (5) Speak Outs Foster Inclusion - Provide an opportunity for every student to verbally participate in class through a "speak out" (Glencoe/McGraw-Hill, 2005).

Hoodbhoy (1998) asserted that Science teaching is heavily dependent on textbooks and memorization and rely heavily on transmission mode of delivery. Such students appear to lack ability to solve some simple conceptual based questions (SPDC, 2002-03).

Arend (2001) identified three approaches to conduct discussion which depend upon teacher's purpose and the nature of the students involved. First is recitation discussion, characterized by brief question and answer. It helps in motivating and checking student understands. Second, inquiry or problem-based discussion which centers around a discrepant event, that encourages discussion and help students become aware of their reasoning processes. Third, sharing-based discussion which helps students form and express independent thoughts and opinions.

In the implications of Anwar's study on Promoting Interaction in Lower Secondary Science Classroom (2005), it was expressed that Science teachers should change their role from transmitter of knowledge to constructor of knowledge. To achieve this they have to apply interactive ways of teaching. The purpose of Science teaching should be to nurture students learning by providing an environment, where they can interact with each other and with teacher. There is also a need to shift theoretical paradigm of teaching to more practicum mode at the teacher training institutes. Teacher educators should be taught how to handle discussion in the classroom.

Wise use of time can make a difference in how much a teacher accomplishes and how well the students' interest is aroused and sustained. Providing sufficient time for every learning task will go a long way in promoting efficiency and precision in the students' performance (Bilbao, 2006).

Atkin and Black (2003) noted that what really counts in education is what happens when teachers and students meet. The wisdom of any decision about education is best judged on the basis of whether or not it raises the quality of these interactions.

TIMSS 2007 is the fourth in a cycle of internationally comparative assessments dedicated to improving teaching and learning in mathematics and science for students around the world. Carried out every four years at the fourth and eighth grades, TIMSS provides data about trends in Mathematics and Science achievement over time.

To inform educational policy in the participating countries, this worldwide assessment and research project also routinely collects extensive background information that addresses concerns about the quantity, quality, and content of instruction. For example, TIMSS 2007 collected detailed information about Mathematics and Science curriculum coverage and implementation, as well as teacher preparation, resource availability, and the use of technology (http://timss.bc.edu/TIMSS2007/about.html).

In the List of Seven Principles for Good Practice in Undergraduate Education by Arthur W. Chickering and Zelda F. Gamson of the American Association for Higher Education, the following were included: encourages contact between students and faculty, develops reciprocity and cooperation among students, encourages active learning, gives prompt feedback, emphasizes time on task, communicates high expectations, and respects diverse talents and ways of learning.

The teachers in order to take effect learning in the classroom, he or she must be able to fully present and discuss the topic. It therefore requires fluency or a strong command and fluidity of the language. In order to converse, the speakers (and receivers) adopt certain strategies such as turn-taking, interrupting, backchannelling, returning to topic, topic shift, hesitation devices/fillers, repair and upshot. So, it would seem logical to make students aware of and practice these strategies in class (Metcalf, 2009).

For Lee and Ng (2009), teacher interaction strategy is defined as an interaction device a teacher adopts to interact with his/her students in classrooms. This includes the use of referential/display questions, wait time, turn allocation, as well as ways of engaging learners in communication. It is believed that the interaction strategy/ies adopted by a teacher can promote/reduce reticence in classrooms because they are believed to be able to determine the communicativeness of the classroom, which is characterized by: (1) Participation rights: how much a teacher and students talk in classrooms; (2) Role of teacher and students: whether a teacher plays an instructional or facilitator role, and whether students can take charge of their own learning; and (3) Organization of classroom interaction: whether the interaction pattern is teacher fronted or learner initiated (Walsh, 2006).

This view is further supported by Clifton's (2006) classroom interaction study. He audiotaped his classes and analyzed how his own classroom talk shaped student interaction and participation in classrooms. It was found that his lesson was teacher fronted; however, because of the adoption of facilitator talk, he was successful in establishing more symmetrical social relationships with his students, resulting in more participation opportunities, which then helped reduce reticence in the classroom.

How teachers conduct their lessons and how they interact with their students can influence learners' communicative behavior in classrooms. Teacher variables, like learner variables, are complex and multiple, and each of these variables deserves a place in student reticence research. This study aims to examine whether teacher interaction strategy, one of the teacher variables, triggers student reticence in classrooms (Lee and Ng, 2009).

In this study, teacher interaction strategy was found to be not the only factor determining student reticence in classrooms. The pedagogical goals of the lesson, the task/activities used, and the proficiency level of the students came into play. These factors were found to influence a teacher's decision on the use of interaction strategy/ies, suggesting that teachers' interactional choices are pedagogically related. Walsh (2006) argues teachers' 'interactive decision-making' plays a role in student reticence and suggests teachers develop this skill through the use of reflective practice and professional dialogue. His suggestion is insightful and deserves further investigation.

Gimbert (2002) listed the six teaching strategies such as: Morning Meeting: A daily routine that builds community, creates a positive climate for learning, and reinforces academic and social skills; Rules and Logical Consequences: A clear and consistent approach to discipline that fosters responsibility and self-control; Guided Discovery: A format for introducing materials that encourages inquiry, heightens interest, and teaches care of the school environment; Academic Choice: An approach to giving children choices in their learning that helps them become invested, self-motivated learners; Classroom Organization: Strategies for arranging materials, furniture, and displays to encourage independence, promote caring, and maximize learning and positive social interaction; and Family Communication Strategies: Ideas for involving families as true partners in their children's education.

Thinking about the types of questions that could be asked or even preparing specific questions prior to teaching a lesson will often lead to more effective classroom discussions. It is important to think of thoughtful questions that encourage students to think critically about the concept being learned. In order to be successful at effectively questioning students, teachers must be aware of the type of questions they are directing to the students and use effective questioning practices (http://www.ndted.org/TeachingResources/Classroom Tips/Effective_Questioning.htm).

In order to have good discussions, teachers need to provide problems which have multiple solutions or methods of solution. These types of problems are best in simulating discussion, creativity and risk-taking. When teachers are trying to encourage a meaningful discussion, it is crucial that they give their students plenty of time to respond and think about what they want to say. Teachers should avoid yes/no questions and short answered question if they want to have a quality discussion. Open-ended higher level thinking questions are the best choice to get students thinking and communicating their ideas. The teacher should stay involved in the discussion to correct wrong information but should be careful when pointing out mistakes. It is very important to create and maintain an environment that

students feel comfortable participating (http://www.ndt-ed.org/TeachingResources/ClassroomTips/Communication.htm).

Through the art of thoughtful questioning, teachers can extract not only factual information, but aid learners in: connecting concepts, making inferences, increasing awareness, encouraging creative and imaginative thought, aiding critical thinking processes, and generally helping learners explore deeper levels of knowing, thinking, and understanding (Erickson, 2007).

There are many classroom activities - apart from lecturing – that can be employed for effective teaching and learning. Some of these are: simple demonstrations conducted by the teacher; minor experiments (that do not require special equipment) conducted by the students (Needless to say, safety is always the primary concern for the above two activities); questions and answers as guided by the teacher; class discussions around certain questions or topics (e.g. what are your views on abortion, or euthanasia, or human cloning); discussions based on individual input (e.g. "list 3 objectives you want to achieve in attending this course"); discussions after watching videos, listening to recordings, or reading articles together; group discussions followed by presentations (and then further discussions); presentations of results of either group or individual projects; case studies (preferably on real-life examples) using all or some of the above techniques; quizzes; debates; table-top group exercises in problem-solving; role-playing exercises; videotaping any of the above classroom activities and watching the replays for discussion and/or evaluation. A detailed exposition on the skills for conducting each of the above activities would be inappropriate in this handbook. Instead, we will concentrate on the skills for conducting discussions, which form an essential part of many of the above activities. Asking questions is often the start of a discussion, so let us start with the skill of asking questions (http://www.hku.hk/space/publications/et/ech4.pdf).

In cooperative learning, a relatively small group of learners study a topic to learn. The group members work cooperatively, helping each other. Cooperative learning takes many forms: peer tutoring, student teams, group investigation, and jigsaw (Ambito, 2010).

The appeal of interactive exercises in English relies on the teacher's motivation, resourcefulness, readings, patience and tryouts (Go, 2010).

Decker (2004) warned against initial problems facing interactive teaching such as inadequacies in implementing student interaction; students' lack of prerequisite skills for group interaction; absence of appropriate texts and teaching materials; low student response to keep the activity going; meager stock exercises to ward off boredom on interactive activities, classroom size and arrangement unsuitable for group work; and absence of alternative forms of assessment to complement pencil and paper exams. Some English teachers may find interactive teaching time-consuming and frustrating when students do not get the swing of it. If the teacher's zest for facilitative drive dwindles, classroom activities may cause listlessness among students.

Audiovisual media never fail to arouse students' curiosity and sustain student's interest especially when a new topic is being introduced. They serve as stimuli which can cause positive interaction (Salandanan, 2006).

Research into student retention suggests that students drop out of college most frequently citing lack of connection as the key factor. With this in mind, it is good practice to pepper the first few classes of the term with connection building activities. Having established a connection amongst peers, students will be more likely to contact each other outside of class for support, ask each other for missed notes, feel safer to offer answers aloud during discussions, and ask for advice regarding other academic and personal concerns (Rodriguez, 2010).

Kelly (2010) in her article "Effective Praise" explained that a key part of teaching is providing students with effective praise. When used correctly, praise provides students with positive reinforcement. It motivates them to learn and participate in class. However, in order for praise to truly be effective, it must be specific (http://712educators.about.com/od/praise/a/praise.htm).

Class interaction is dependent upon the teacher's questioning skills. In such, teachers should acquire the following skills in order to generate interaction among students. They are: varying type of question, asking non-directed questions, calling on non-volunteers, rephrasing, sequencing logically, requiring abstract thinking, asking open-ended questions, and allowing for sufficient wait-time (Corpuz et. al., 2007).

Teachers' questioning techniques can either facilitate or obstruct learning. The effectiveness of questioning in teacher-student interactions can be significantly enhanced by a few basic techniques such as: (1) pose the question first, before asking a student to respond, (2) allow plenty of "think time" by waiting at least 7-10 seconds before expecting students to respond, (3) make sure you give all students the opportunity to respond rather than relying on volunteers,(4) hold students accountable by expecting, requiring, and facilitating their participation and contributions, and (5) establish a safe atmosphere for risk-taking by guiding students in the process of learning from their mistakes (Lucas et. al., 2007).

Rommiett Stevens (2010) observed classroom life and the use of questions. She unearthed the fact that teachers were involved in a high frequency of question asking, asking approximately 395 questions each day. The majority of these questions, about two out of three, were asked at a low intellectual level, usually requiring little more than rote memory and recall. And they were asked not by the student, the person at the center of learning, but by the teacher. Reviews of research in the United States, the United Kingdom, Germany, and Australia, as well as in many developing nations, have shown similar results. To a great extent, teaching means talking and asking questions, and learning means following directions and answering questions. Much of the current research and teacher education has focused on altering these findings, and creating more challenging and meaningful classroom questions (http://education.stateuniversity.com/pages/ 1836/Classroom-Questions.html).

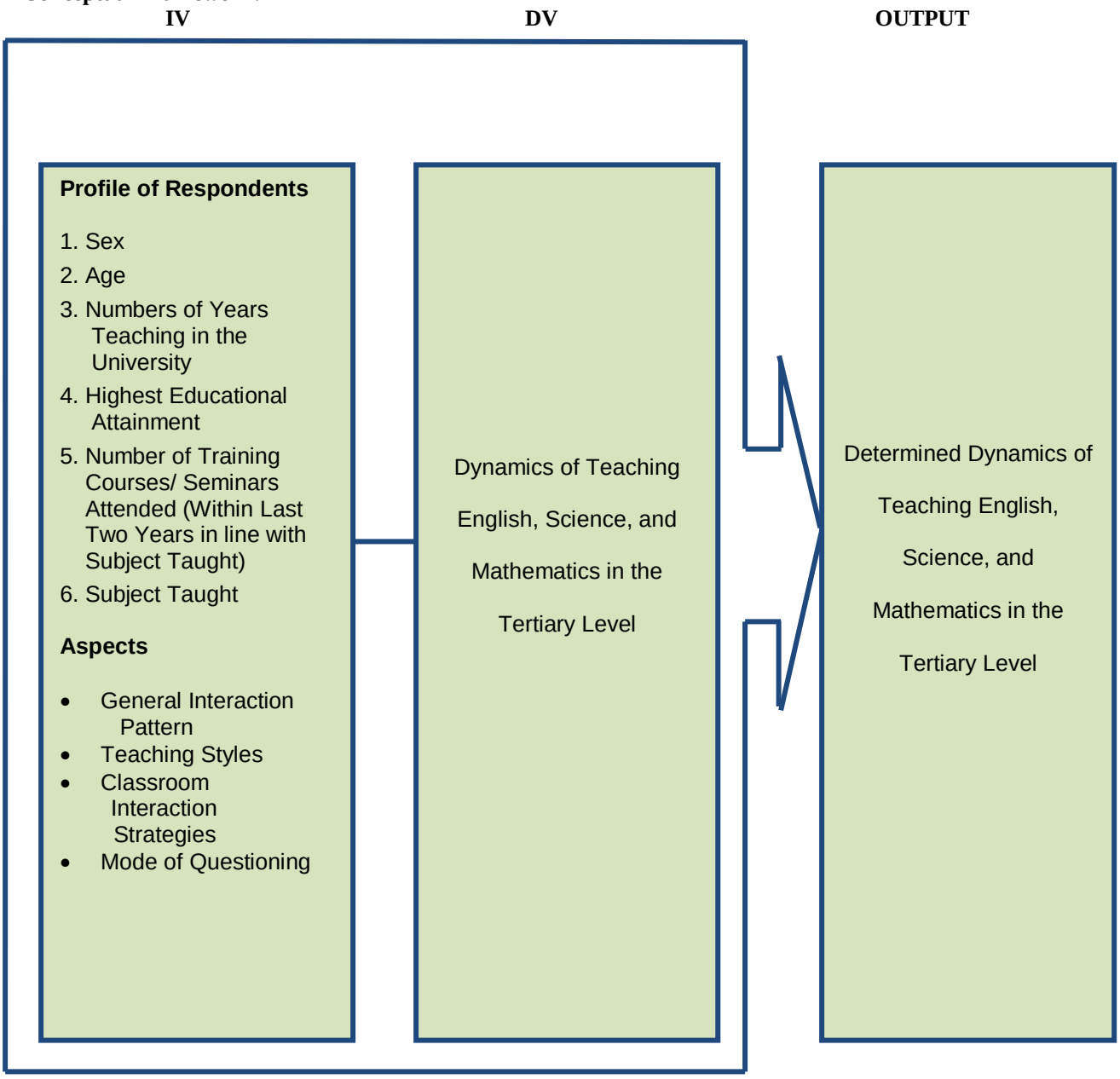
According to the Maryland State Department of Education publication Better Thinking and Learning, teachers who ask "higher-order" questions promote learning because these types of questions require students to apply, analyze, synthesize, and evaluate information instead of simply recalling facts. A meta-analysis of l8 experiments by Redfield and Rousseau concluded that the predominant use of higher-level questions during instruction yielded positive gains on tests of both factual recall and application of thinking skills. Similarly, Andre reviewed a research investigating the effects of having students respond to "higher-level" questions inserted every few paragraphs in a text. He concluded that such a procedure facilitates better textbook learning than do fact question inserts.

In spite of the obvious educational advantages of emphasizing higher-order questions, research studies of classrooms conducted by Gall and Hare and Pulliam confirm that only 20 percent of classroom questions posed by teachers require more than simple factual recall. John Goodlad reports that only about one percent of classroom discussion invited students to give their own opinions and reasoning (http://www.pgcps.org/~elc/isquestiontopromote.html).

Questioning is a vital tool of human thought and social interaction with which to open doors to data, information, knowledge, and wisdom. Questions serve a range of functions, depending on the context of the interaction. Therefore, the art and science of questioning lies in knowing what question to ask when. A question is only as good as the answer it evokes, and questions thus contribute to success or failure across different contexts (Serrat, 2009).

Questions are prerequisite to learning. They are a window into creativity and insight. They motivate fresh thinking. They challenge outdated assumptions. They lead us into the future. A powerful question generates curiosity in participants; stimulates reflective thinking and conversation; surfaces and challenges assumptions; is thought-provoking; channels attention, focuses inquiry, and promises insight; invites creativity and new possibilities; generates energy, a vector to explore, and forward movement; is broad, enduring, and stays with participants; touches a deep meaning; and evokes more questions (Vogt et. al., 2003).

Conceptual Framework:-



Conceptual Model of the Study:-

Based on the theories presented, a conceptual model was developed utilizing IV-DV Model. As presented in Figure 1, the conceptual framework shows the interplay between and among variables involved in the dynamics of teaching English, Science and Mathematics in the tertiary level.

The first frame which is the independent variables includes the profile of the respondents in terms of sex, age, number of years teaching in the university, highest educational attainment, number of training courses/ seminars attended (within last two years in line with subject taught), and subject taught. The aspects include general interaction pattern, teaching styles, classroom interaction strategies, and mode of questioning.

The second frame is the dependent variable which is the dynamics of teaching English, Science and Mathematics in the tertiary level.

The line from the independent variables running through the dependent variables depicts the relationship between predictors and the performance.

The third frame reflects the output of this study which is the determined dynamics of teaching English, Science, and Mathematics in the tertiary level.

Methodology:-

This research study utilized the Descriptive-Experimental type of research with the three professors handling English, Science, and Mathematics respectively as the respondents. These three subjects were being taken by the first year Bachelor of Arts students in the College of Social Science and Humanities (CSSH).

The data-gathering was made possible through observing, recording and assessing the actual classroom interactions in the teaching of English, Science, and Mathematics. Three class meetings in each subject area were observed and recorded in a camcorder. The observed/recorded data were processed using a questionnaire-checklist adopted/modified by the researcher with reference to "Interaction Patterns in Mathematics Classrooms in Ogun State Secondary Schools" a 2008-conducted research, highly relevant documents, literature, and studies.

This adopted/modified instrument was subjected to content and face validation by experts in Educational Management. The pre-test and parallel tests constructed to determine the level of performance of the students in English, Science and Mathematics were also subjected to content and face validation by the experts in the corresponding fields of discipline.

Tallying was done and to statistically treat the gathered data, these statistical tools were used: to determine the extent of application of strategies in the classroom commonly employed by the respondents with respect to general interaction pattern, Frequency, Percentage, and Rank were used; with respect to teaching styles, classroom interaction strategies, and mode of questioning, Mean was used. To determine the level of the performance of the students in English, Science, and Mathematics after utilizing the classroom interaction patterns, Mean and Standard Deviation were utilized. To determine the significant difference on the level of performance of the students in English, Science and Mathematics after utilizing the interaction patterns, t-test was applied; and for the significant difference in the general pattern of interaction in the observed English, Science, and Mathematics classrooms, F-test (one-way Analysis of Variance) was applied.

The Likert Scale and its interpretation were utilized for the second part. (http://changingminds.org/explanations/research/measurement/likert_scale.htm)

Scale	***Verbal Interpretation***	***Range***
5	Always	4.20 – 5.00
4	Often	3.40 – 4.19
3	Sometimes	2.60 – 3.39
2	Rarely	1.80 – 2.59
1	Never	1.00 – 1.79

For the scores obtained in the tests, the following rating scheme was utilized.

English and Science (30 items)

Range of Score	***Verbal Interpretation***
21 – 30	High
11 – 20	Average
0 – 10	Low

Mathematics (20 items)

Range of Score	***Verbal Interpretation***
14 – 20	High
7 – 13	Average
0 – 6	Low

Results and Discussions:-

The following is the presentation of the results and discussions.

Profile of the Respondents:-

Table 1:- Profile of Respondents

Faculty/ Subject Handled	Sex	Age	No. of Years Teaching in the University	Highest Educational Attainment	No. of Training Courses/Seminars Attended (within the last 2 years)
English	Female	57	9	Ph D - Educ. Mgt.	9-above
Science	Female	42	6	MAT - Science	6-8
Mathematics	Male	47	17	MAT - Mathematics	3-5

The table shows that the faculty handling English is female, 57 years old, nine years of teaching in the university, with a degree of Doctor of Philosophy major in Educational Management and has 9-above training courses/seminars attended within the last two years. The faculty handling Science is also female, 42 years old, six years of teaching in the university, with a degree of Master of Arts in Teaching major in Science and has 6-8 training courses/seminars attended within the last two years. The faculty handling Mathematics is male, 47 years old, 17 years of teaching in the university, with a degree of Master of Arts in Teaching major in Mathematics and has 3-5 training courses/seminars attended within the last two years.

General Interaction Pattern in Terms of Instruction, Language Use, Questioning, Response, Feedback, and Effective Teaching Management (Non-Academic)

Table 2:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Instruction of the English Class

Instruction	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Lecture (Explanation)	20	34.5	1	38	45.8	1	24	37.5	1
Lecture (writing and talking)	2	3.4	5.5	0	0.0	5.5	2	3.1	5
Lecture (Explanation of materials)	2	3.4	5.5	0	0.0	5.5	1	1.6	6
Giving of examples	4	6.9	4	13	15.7	2	12	18.8	3
Cueing /Probing	12	20.7	3	7	8.4	4	4	6.3	4
Directives	18	31.0	2	25	30.1	3	21	32.8	2
Total	**58**	**100**		**83**	**100**		**64**	**100**	

The table shows that in the three interactions in the teaching of English, lecture (explanation) was the most commonly applied with frequencies of 20, 38, and 24 respectively. It can be noted as well that in those three interactions, it was in the second that listed the highest occurrence. On the contrary, it was the lecture with explanation of materials that occupied the lowest rank with its 2, 0, and 1 frequencies.

It can be deduced that lecture prevails in the teaching-learning process. It is actually the most common instructional method being employed by the faculty since it does not demand plenty of visual aid preparation for as long as there is a source material such as book, the lesson discussion can be started.

At present, it is heavily criticized due to its nature of being very traditional. This reality is supported by the article posted in the Integrated Advancement website which asserted that lecture is still the most frequently used method of instruction. The learning effectiveness of the lecture method has been questioned because of the lack of interaction; but it continues as a means of reaching a large group at one time with a condensed, organized body of information (http://www.tpub.com/content/advancement/12045/css/12045_68.htm).

Another relevant insight is from the Faculty Information and Resource Journal of George Mason University which shared that for many years, the lecture method was the most widely used instructional strategy in college classrooms. Nearly 80% of all U.S. college classrooms in the late 1970s reported using some form of the lecture

method to teach students. Although the usefulness of other teaching strategies is being widely examined today, the lecture still remains an important way to communicate information. Used in conjunction with active learning teaching strategies, the traditional lecture can be an effective way to achieve instructional goals. The advantages of the lecture approach are that it provides a way to communicate a large amount of information to many listeners, maximizes instructor control, and is non-threatening to students. The disadvantages are that lecturing minimizes feedback from students, assumes an unrealistic level of student understanding and comprehension, and often disengages students from the learning process causing information to be quickly forgotten (http://www.gmu.edu/ resources/facstaff/part-time/contents.html).

Table 3:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Language Use of the English Class.

Language Use	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Plain English	116	100	1	82	97.6	1	71	100	1
English-Filipino/ "Taglish"/ "Englog"/ Code Switching	0	0	2.5	2	2.4	2	0	0	2.5
Plain Filipino	0	0	2.5	0	0	3	0	0	2.5
Total	**116**	**100**		**84**	**100**		**71**	**100**	

The data reveal that plain English is the language used in the class with its frequency of 116, 82, and 71 in the three interactions, hence, ranked first. Code switching occurred twice in the second interaction and ranked second. Plain Filipino was not used in any instance by the professor.

This result reflects that the English class was indeed conducted using the English language as a medium. Understandably, it has to be that way so that what is taught is already what is being applied and that the students would be provided with the much needed conditioning.

This scenario finds support in the article written by Carson (2010) which conveyed that after Mandarin, English is spoken by more people than any other language, and is the native language of more than 350 million people. More people speak English than those who speak the Arabic and French languages combined. Moreover, English is the international language of diplomacy, business, science, technology, banking, computing, medicine, aviation, UN and NATO armed forces, engineering, tourism, Hollywood films and arguably the best pop and rock music in the world. English has plenty of words to choose from. In fact, an English speaker is offered the biggest vocabulary of any language with a choice of 500,000 to 1,000,000 words (including technical and scientific terms) (http://thestar.com.my/English/story.asp?file=/2007/10/18/lifefocus/18963932 &sec=lifefocus).

Exposing students to the target language is truly beneficial because it provides a facet of conditioning. According to Wilson (2010), if you want to do business with big companies, all quotations, enquiries and submissions are done in English. Verbal transaction could be in mix Tagalog/English but all written communication is in English (http://www.philippinestagalog.com/how-important-is-the-study-of-english-language-to-filipino-people.php).

Table 4:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Questioning of the English Class

Questioning	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Recall / Recognition	47	75.8	1	37	62.7	1	23	52.3	1
Higher Level	3	4.8	3	6	10.2	3	1	2.3	3
Re-direct	12	19.4	2	16	27.1	2	20	45.4	2
Total	**62**	**100**		**59**	**100**		**44**	**100**	

It is reflected in the above table that recall/recognition questions obtained the frequencies of 47, 37, and 23 in the three interactions respectively, and ranked first. Redirect followed with 12, 16, and 20 in the three interactions. Higher level questioning was the last in rank with 3, 6, and 1 frequencies.

This only shows that recall/ recognition questions dominate the entire set of questions asked by the faculty. This practice can be considered as prevalent regardless of subject being taught for the reason that recall/recognition questions do not require much thinking on the part of a teacher. On the part of the students, this level of questions can be easily answered and that there would be no need for analysis and critical thinking.

Rommiett Stevens (2010) observed classroom life and the use of questions. She unearthed the fact that teachers were involved in a high frequency of question asking, asking approximately 395 questions each day. The majority of these questions, about two out of three, were asked at a low intellectual level, usually requiring little more than rote memory and recall. And they were asked not by the student, the person at the center of learning, but by the teacher. Reviews of research in the United States, the United Kingdom, Germany, and Australia, as well as in many developing nations, have shown similar results. To a great extent, teaching means talking and asking questions, and learning means following directions and answering questions. Much of the current research and teacher education has focused on altering these findings, and creating more challenging and meaningful classroom questions (http://education.stateuniversity.com/pages/1836/Classroom-Questions.html).

According to the Maryland State Department of Education publication Better Thinking and Learning, teachers who ask "higher-order" questions promote learning because these types of questions require students to apply, analyze, synthesize, and evaluate information instead of simply recalling facts. A meta-analysis of l8 experiments by Redfield and Rousseau concluded that the predominant use of higher-level questions during instruction yielded positive gains on tests of both factual recall and application of thinking skills. Similarly, Andre reviewed a research investigating the effects of having students respond to "higher-level" questions inserted every few paragraphs in a text. He concluded that such a procedure facilitates better textbook learning than do fact question inserts.

In spite of the obvious educational advantages of emphasizing higher-order questions, research studies of classrooms conducted by Gall and Hare and Pulliam confirm that only 20 percent of classroom questions posed by teachers require more than simple factual recall. John Goodlad reports that only about one percent of classroom discussion invited students to give their own opinions and reasoning (http://www.pgcps.org/~elc/isquestiontopromote.html).

Table 5:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Response of the English Class

Response	1st Interaction			2nd Interaction			3rd Interaction		
	F	**%**	**R**	**F**	**%**	**R**	**F**	**%**	**R**
Response (female students)	67	32.5	1	23	15.5	3	26	21.7	2
Response (male students)	51	24.8	2	24	16.2	2	9	7.5	5
Recite (female students)	24	11.7	3	20	13.5	4	26	21.7	2
Recite (male students)	20	9.7	4	30	20.3	1	9	7.5	5
Silence / 'I don't know' (female students)	6	2.9	8	6	4.1	8	8	6.6	7
Silence / 'I don't know' (male students)	18	8.7	5	16	10.8	5	9	7.5	5
Statement (female students)	11	5.3	6	14	9.5	7	26	21.7	2
Statement (male students)	9	4.4	7	15	10.1	6	7	5.8	8
Total	**206**	**100**		**148**	**100**		**120**	**100**	

The data reveal that female students responded well by having rank 1 in the first interaction, males in the second, and female in the third with the frequencies of 67, 30, and 26. On the contrary, females ranked last in silence/I don't know in the first and second interactions, and the males in giving a statement as a response.

These results clearly manifest that female students have the strong tendencies to take part in the teaching-learning process in a language classroom. Considering their dominance in number, they have the confidence of reciting frequently.

Dr Luan Brizendine of the University of California, who's published her findings in *The Female Brain*, says the average woman works her way through 20,000 words per day, compared with just 7,000 for the average bloke. She says "women devote more brain cells to talking than men", and cites fundamental differences between male and female brains as the cause (Haines, 2006) (http://www.theregister.co.uk/2006/11/28/female_chat_addiction/).

Men love to talk but they limit their words because people generally do not like men who talk a lot. Men want to say a few words but with a lot of meaning. They express themselves more through actions rather than words (Gayagay, 2010).

According to a study released today, men talk just as much as women — on average 16,000 words in a day. Using digital voice recorders over an eight-year period, researchers at the University of Arizona studied how many words hundreds of American and Mexican college students spoke over several days. The students carried the voice-activated recorders for almost all of their waking hours, on average about 17 hours a day.

The study found that women spoke 16,215 words a day, while men spoke 15,669. Although women speak slightly more words than men, statistically, the difference is insignificant, according to Matthias R. Mehl, a Psychology professor at the University of Arizona and the study's lead author (Phillips, 2007) (http://abcnews.go.com/Technology/story?id=3348076&page=1).

Table 6:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Feedback of the English Class

Feedback	1st Interaction			2nd Interaction			3rd Interaction		
	F	**%**	**R**	**F**	**%**	**R**	**F**	**%**	**R**
Acknowledgment Positive (female students)	2	66.7	1	4	28.6	2	10	83.3	1
Acknowledgment Positive (male students)	0	0.0	3.5	10	71.4	1	2	16.7	2
Wrong answers (female students)	0	0.0	3.5	0	0.0	3.5	0	0.0	3.5
Wrong answers (male students)	1	33.3	2	0	0.0	3.5	0	0.0	3.5
Total	**3**	**100**		**14**	**100**		**12**	**100**	

The table shows that in rank 1 are positive acknowledgment of female students in the first and third interactions; and of male in the second interaction with frequencies of 2, 10, and 10 respectively. Last in rank is wrong answers for female students across three interactions.

This denotes that acknowledgment and praises are given more frequently than comments for the wrong answers. It seems to be quite common among college professors to be more inclined into giving positive comments such as “very good” rather than uttering negative comments that would surely embarrass a student. In teaching in the tertiary level, this is one of the considerations being practiced by many of the professors since it is reinforcing the motivation to study harder among the students.

Kelly (2010) in her article “Effective Praise” explained that a key part of teaching is providing students with effective praise. When used correctly, praise provides students with positive reinforcement. It motivates them to learn and participate in class. However, in order for praise to truly be effective, it must be specific (http://712educators.about.com/od/praise/a/praise.htm).

Table 7:- Frequency, Percentage and Rank on General Interaction Pattern in Terms of Effective Teaching Management of the English Class

Effective Teaching Management (Non-academic)	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Discipline (female students)	4	10.2	4	4	9.8	4	2	5.1	4
Discipline (male students)	6	15.4	3	10	24.4	3	3	7.7	3
Social Interaction (female students)	15	38.5	1	11	26.8	2	17	43.6	1.5
Social Interaction (male students)	14	35.9	2	16	39.0	1	17	43.6	1.5
Total	**39**	**100**		**41**	**100**		**39**	**100**	

The table indicates that social interaction by female students ranked first in the initial interaction with its frequency of 15, social interaction by males in the second interaction with 16 and by both male and female in the third interaction with 17. Last in rank was discipline to female students with frequencies of 4, 4, and 2 respectively.

These data confirm that in college classrooms social interaction occurs more than discipline concerns which signify that the students are given freedom to discuss among themselves the topics which are related to the lesson at hand. In this scenario, a student to student interaction takes place which can also be considered as a small talk. Small talk, inasmuch as it does not impede the flow of discussion, is part of the "digestion" process of what has been previously discussed.

Small talk is conversation for its own sake, or "…comments on what is perfectly obvious." It is an informal type of discourse that does not cover any functional topics of conversation or any transactions that need to be addressed. The phenomenon of small talk was initially studied in 1923 by Bronisław Malinowski, who coined the term phatic communiication to describe it. The ability to conduct small talk is a social skill (http://en.wikipedia.org/wiki/ Small_talk_(phatic_communication).

Table 8:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Instruction of the Science Class

Instruction	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Lecture (Explanation)	62	47.3	1	43	40.6	1	30	68.2	1
Lecture (writing and talking)	28	21.4	2	22	20.7	2	1	2.3	4.5
Lecture (Explanation of materials)	0	0.0	6	15	14.2	3	0		6
Giving of examples	18	13.7	3	4	3.8	6	1	2.3	4.5
Cueing /Probing	15	11.5	4	14	13.2	4	2	4.5	3
Directives	8	6.1	5	8	7.5	5	10	22.7	2
Total	**131**	**100**		**106**	**100**		**44**	**100**	

The table shows that in the three interactions in the teaching of Science (Chemistry 1), lecture (explanation) was the most commonly applied with frequencies of 62, 43, and 30 respectively and ranked first. The last was lecture (explanation of materials) with the event that took place only in the second interaction.

This implies that similar with the English class, the lecture (explanation) is also considered as the common instructional method in the Science class. This may be due to the bulk of information that must be precisely presented and discussed to the students.

A previously published study compared the performance of General Chemistry students taught using a traditional approach during the period 1990-1994 (n = 420) to students taught during the subsequent four years by the same instructors, but using the POGIL approach (n= 485).(Farrell et al., 1999) The attrition rate (D, W, F) decreased from

21.9% (traditional) to 9.6% (POGIL). The percentage of students earning an A or B rose from 52% to 64%. These data are consistent with a study of general chemistry at a different small liberal arts college in which the 1993 ACS General Chemistry Exam was used as a basis for comparison. Over the ten year period 1993-2003, in traditionally taught classes of about 40, the exam average was 56%, the highest average in a single year was 65%. In the first year of POGIL instruction (2004), the average was 68% (McKnight, 2004) (http://www.pogil.org/about/effectiveness).

In a multi-institutional study of the effectiveness of POGIL in organic chemistry, complementary methods were used to compare POGIL and lecture courses with class sizes ranging from 20 to 75 across a range of institutions including a large public university and a small, 1st-tier liberal arts college. The similarities of the findings, despite differences in the studies, provide additional evidence for the general effectiveness of POGIL (Straumanis A., and Simons E., 2006).

Table 9:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Language Use of the Science Class

Language Use	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Plain English	98	86.7	1	85	62.0	1	37	78.7	1
English- Filipino/ "Taglish"/"Englog"/ Code Switching	15	13.3	2	52	38.0	2	9	19.1	2
Plain Filipino	0	0.0	3	0	0.0	3	1	2.1	3
Total	**113**	**100**		**137**	**100**		**47**	**100**	

The data reveal that plain English is the language used in the class with its frequency of 98, 85, and 37 in the three interactions, hence ranked first. Second is Code switching with frequencies of 15, 52, and 9. Plain Filipino was used one time in the third interaction and is ranked third.

This shows that in the teaching of Science, English language is used with some instances of code switching to the native language. This is done in order to facilitate understanding because teachers are left with no other choice but to code switch since there are topics that are highly technical and complex that can only be made comprehensible by explaining it in the native language.

This affirms the fact the there is constant debate over which language should be used in educating Filipinos: English, Tagalog, or local dialects. The use of English for teaching Math and Science as well as English language and literature subjects has endured for many years, however (http://en.wikipilipinas.org/index.php?title=Education_in_the_Philippines).

Table 10:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Questioning of the Science Class

Questioning	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Recall / Recognition	55	93.2	1	38	79.2	1	12	75.0	1
Higher Level	1	1.7	3	0	0.0	3	2	12.5	2.5
Re-direct	3	5.1	2	10	20.8	2	2	12.5	2.5
Total	**59**	**100**		**48**	**100**		**16**	**100**	

It is reflected in the above table that recall/recognition ranked first in the three interactions with frequencies of 55, 38, and 12. Higher level questioning and re-direct tied in the last rank with 1, 0, 2, and 3, 10, 2 frequencies.

This clearly conveys that many of the questions deal with knowledge and comprehension levels of the lesson at hand. Since Socrates, the use of questions to promote learning has been a primary form of discourse in instructional situations.

In today's classrooms, we see patterns from the ubiquitous Teacher Initiation-Student Response-Teacher Evaluation (I-R-E) and its variations to questioning among students as they engage in inquiry activities and literature discussions during book clubs *(*www.lssc.k12.in.us/highschool/.../QAR% 20Article% 20Raphael.doc*).*

Questioning is a vital tool of human thought and social interaction with which to open doors to data, information, knowledge, and wisdom. Questions serve a range of functions, depending on the context of the interaction. Therefore, the art and science of questioning lies in knowing what question to ask when. A question is only as good as the answer it evokes, and questions thus contribute to success or failure across different contexts (Serrat, 2009).

Questions are prerequisite to learning. They are a window into creativity and insight. They motivate fresh thinking. They challenge outdated assumptions. They lead us into the future. A powerful question generates curiosity in participants; stimulates reflective thinking and conversation; surfaces and challenges assumptions; is thought-provoking; channels attention, focuses inquiry, and promises insight; invites creativity and new possibilities; generates energy, a vector to explore, and forward movement; is broad, enduring, and stays with participants; touches a deep meaning; and evokes more questions (Vogt et. al., 2003).

Table 11:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Response of the Science Class

Response	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Response (female students)	53	29.9	1	51	32.5	1	6	22.2	2
Response (male students)	34	19.2	2	44	28.0	2	7	25.9	1
Recite (female students)	21	11.9	3	20	12.7	3	3	11.1	3.5
Recite (male students)	18	10.2	5	17	10.8	4	3	11.1	3.5
Silence / 'I don't know' (female students)	8	4.5	8	9	5.7	6	2	7.4	6.5
Silence / ('I don't know' (male students)	19	10.7	4	10	6.4	5	2	7.4	6.5
Statement (female students)	14	7.9	6	2	1.3	8	2	7.4	6.5
Statement (male students)	10	5.6	7	4	2.5	7	2	7.4	6.5
Total	**177**	**100**		**157**	**100**		**27**	**100**	

The data reveal that in the observed Science class, response from female students ranked first in interactions 1 and 2 with frequencies of 53, 51, and response from male with a frequency of 7 in the third interaction. Silence/ "I don't know" by female students with a frequency of 8 ranked last in the first interaction, statement by female students with a frequency of 2 in the second interaction, and silence of both male and female as well as statement by both male and female students which tied in the last interaction posting a frequency of 2.

This implies that female students are more active than males in answering questions. They also have strong tendencies of easily sharing what they have in mind making them frequent talkers in the class.

Girls talk earlier than boys and the formulated language area in their brains assist them in sharing their experiences and feelings easily and thus enable them to mature earlier (http://authspot.com/journals/are-girls-more-talkative-than-boys/).

Table 12:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Feedback of the Science Class

Feedback	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Acknowledgment Positive (female students)	6	50.0	1.5	9	60.0	1	2	66.7	1
Acknowledgment Positive (male students)	6	50.0	1.5	5	33.3	2	1	33.3	2
Wrong answers (female students)	0	0.0	3.5	0	0.0	4	0	0.0	3.5
Wrong answers (male students)	0	0.0	3.5	1	6.7	3	0	0.0	3.5

Total	**12**	**100**		**15**	**100**		**3**	**100**	

It is evident in the above table that in rank 1 is positive acknowledgment of female with frequencies of 9 and 2 in the second and third interactions, and rank 1.5 of positive acknowledgment for both male and female students with a similar frequency of 6. Last in rank is wrong answers for females with similar frequency of 0.

This result shows that more often feedbacks are given for correct answers and less or none at all in the wrong ones in which case, considering the value of giving feedback as an instrument for effective teaching, they have to be provided at all times.

As expressed by Professor Ip (2005), it is important for students to know how well they are doing as they learn. This is because the knowledge that they are doing well gives students a sense of achievement which motivates them to learn more. Similarly, it is also important to let students know when they have made a mistake so that they will learn from it and take corrective measures. Hence, it is absolutely essential for teachers to monitor students' learning and give them feedback. Feedback can be given to individual students, to a group of them, or to the whole class. It would be more efficient if the whole class can share in the monitoring process and the feedback.

An important dimension of feedback is its immediacy. The longer the time gap between the completion of the work and its feedback, the less effective the feedback becomes. Ideally, feedback should be provided within minutes after the completion of a task (e.g. immediately after a student asks or answers a question). Teachers can use non-verbal gestures to indicate their intention; they can nod their heads, use facial expressions or hand gestures to prompt the student to continue, or adopt a physical stance that signals their readiness to move on. Teachers should vary their reactions to students' answers; they can restate what the student has said to reinforce the point, ask for clarification, invite the student to elaborate, acknowledge the student's contribution but ask for another view, or nod their heads but remain silent.

Teachers should give credit to students for correct answers, but be aware that most students will stop thinking about a question once the instructor has indicated that someone's response is correct. However, teachers should correct wrong answers tactfully, and encourage the student to rephrase or revise the answer. If a student needs assistance in answering a question, teachers should look to other students to provide help rather than providing it themselves.

Table 13:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Effective Teaching Management of the Science Class

Effective Teaching Management (Non-academic)	**1st Interaction**			**2nd Interaction**			**3rd Interaction**		
	F	**%**	**R**	**F**	**%**	**R**	**F**	**%**	**R**
Discipline (female students)	1	3.3	3.5	5	11.6	3.5	2	6.7	4
Discipline (male students)	1	3.3	3.5	5	11.6	3.5	3	10.0	3
Social Interaction (female students)	16	53.3	1	19	44.2	1	10	33.3	2
Social Interaction (male students)	12	40.0	2	14	32.6	2	15	50.0	1
Total	**30**	**100**		**43**	**100**		**30**	**100**	

The table shows that social interaction of female students ranked first with frequencies of 16 and 19 in the first and second interactions, and social interaction of male students in the third interaction. Last in rank is discipline for female and male students with frequencies of 1 and 5 in the first and second interactions and in the third is discipline for female with a frequency of 2.

The figure shows few discipline problems among the students though there were many instances of social interactions. The student talk in this case is considered relevant and part of the topic being discussed. Being mentors, it is important that we allow students to interact among themselves.

One reason as expressed by Rodriguez (2010) is that research into student retention suggests that students drop out of college most frequently citing lack of connection as the key factor. With this in mind, it is good practice to pepper the first few classes of the term with connection building activities. Having established a connection amongst peers, students will be more likely to contact each other outside of class for support, ask each other for missed notes, feel safer to offer answers aloud during discussions, and ask for advice regarding other academic and personal concerns.

Table 14:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Instruction of the Mathematics Class

Instruction	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Lecture (Explanation)	69	53.1	1	61	48.4	1	44	42.3	1
Lecture (writing and talking)	25	19.2	2	24	19.0	3	30	28.8	2
Lecture (Explanation of materials)	0	0.0	6	0	0.0	6	0	0.0	6
Giving of examples	17	13.1	3	4	3.2	5	10	9.6	4
Cueing /Probing	7	5.4	5	26	20.6	2	13	12.5	3
Directives	12	9.2	4	11	8.7	4	7	6.7	5
Total	**130**	**100**		**126**	**100**		**104**	**100**	

The table shows that lecture (explanation) ranked first in with frequencies 69, 61, and 44 in the three interactions respectively. Lecture (writing and talking) occupied the second rank, while the last is lecture (explanation of materials).

This reflects that lecturing or explaining concepts is highly utilized in teaching Mathematics because before there could be computations, there have to be an understanding evoked on the minds of students.

It is absolutely critical when teaching Algebra to ensure that your students recall and truly understand the more basic material before you push on to the more complex material. One method of teaching algebra is to begin every lesson with a quick recap of what has been learned recently along with a few words explaining that the Algebra topic of the day is a small extension of what was learned yesterday (Gibson, 2010).

To gain an understanding of algebra, students must be introduced to the concepts of patterns, relationships, variables, expressions, unknowns, equations and graphs in a wide variety of contexts (http://www.curriculumsupport. education.nsw.gov.au/secondary/mathematics/years7_10/teaching/algebra.htm).

Table 15:- Frequency, Percentage, and Rank on the General Interaction Pattern in Terms of Language Use of the Mathematics Class

Language Use	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Plain English	92	63.4	1	94	57.7	1	101	71.6	1
English-Filipino/ "Taglish"/"Englog"/ Code Switching	53	36.6	2	56	34.4	2	38	27.0	2
Plain Filipino	0	0.0	3	13	8.0	3	2	1.4	3
Total	**145**	**100**		**163**	**100**		**141**	**100**	

As shown in the table, plain English ranked first with a frequency of 92, 94, and 101 respectively in the three interactions. Second in rank is code switching with frequencies of 53, 56, and 38 and last is plain Filipino with 0, 13, and 2.

These data signify that the teaching of Mathematics is usually conducted using English being the medium of instruction but at times or as need arises, explaining in English-Filipino or "Taglish" or code switching occurs. For the many, Math seems to be a difficult subject. With this line of thought, a psychological barrier already exists and in order to neutralize it, Math teachers have to consider and stimulate the affective domain of the learners, and one

element that may also help is to code switch since speaking the native language signifies the effort to reach out the level of the students.

Use math vocabulary "all the time" with some duplication with simpler terms, but not just the simple words: so students will know that you think the vocabulary is important (http://www.wikihow.com/Teach-Algebra).

Table 16:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Questioning of the Mathematics Class

Questioning	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Recall / Recognition	95	76.0	1	54	70.1	1	54	71.1	1
Higher Level	4	3.2	3	1	1.3	3	1	1.3	3
Re-direct	26	20.8	2	22	28.6	2	21	27.6	2
Total	**125**	**100**		**77**	**100**		**76**	**100**	

It can be noted that recall/recognition questions ranked first with frequencies of 95, 54, and 54 in the three interactions. This was followed by re-direct with 26, 22, and 21; and higher level with 4, 1, and 1 frequencies.

These data imply that recall questions are given basically as a need to diagnose memorization capability since it is a requisite for math students to be able to recall basic math facts, procedures, rules, or formulas.

According to the article of WGBH Educational Foundation (2002), number facts are the basic computations (9 + 3 = 12 or 2 x 4 = 8) students are required to memorize in the earliest grades of elementary school. Recalling these facts efficiently is critical because it allows a student to approach more advanced mathematical thinking without being bogged down by simple calculations. (http://www.pbs.org/wgbh/misunderstoodminds/mathdiffs.html)

Table 17:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Response of the Mathematics Class

Response	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Response (female students)	99	39.8	1	59	48.4	1	62	43.1	1
Response (male students)	72	28.9	2	22	18.0	2	38	26.4	2
Recite (female students)	12	4.8	5.5	3	2.4	6.5	3	2.1	5.5
Recite (male students)	12	4.8	5.5	5	4.1	5	2	1.4	7
Silence / 'I don't know' (female students)	18	7.2	4	14	11.5	4	15	10.4	4
Silence / 'I don't know' (male students)	22	8.8	3	16	13.1	3	20	13.9	3
Statement (female students)	6	2.4	8	0	0.0	8	3	2.1	5.5
Statement (male students)	8	3.2	7	3	2.4	6.5	1	0.7	8
Total	**249**	**100**		**122**	**100**		**144**	**100**	

As shown in the table, response from female students obtained frequencies of 99, 59, and 62 and ranked first. This was followed by the response from male students with frequencies of 77, 22, and 38. Last was statement of female students in the first 2 interactions with 6 and 0 frequencies and statement of male students in the third interaction with a frequency of 1.

These results reflect that females are active participants in the classroom. They can give quick answers to questions than their male counterparts. They also have the strong tendencies of sharing what is in their mind. This may be due to the bias that females are the more "talkers" in class.

In previous researchers, it was revealed that math is a male domain attributed largely to their courage in handling computations and the cultural belief that boys are biologically good at math. Deb Russell (2011) enlightens on the term 'Numeracy Gender Gap' which refers to the discrepancies in attitude, skills, and mathematical behaviors

between males and females. In today's information, problem solving world, mathematical skills and ability are critical to success. Unfortunately, research and statistics provide evidence supporting the existence of a gender gap in mathematics. It is well documented that girls are underrepresented in college majors, advanced degree programs and careers related to mathematics. Although females tend to be better than their counterpart males in mathematics classes, they continue to score lower on tests including the SATs. However, the gap is beginning to narrow. In the beginning of the 1980s, standardized test scores showed that girls were significantly behind in math. Results from national assessment tests show 17-year-old boys lead girls by only five points in math (http://math.about.com/library/weekly/aa011002a.htm).

Table 18:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Feedback of the Mathematics Class

Feedback	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Acknowledgment Positive (female students)	1	33.3	2	2	100	1	2	100	1
Acknowledgment Positive (male students)	1	33.3	2	0	0.0	3	0	0	3
Wrong answers (female students)	0	0.0	4	0	0.0	3	0	0	3
Wrong answers (male students)	1	33.3	2	0	0.0	3	0	0	3
Total	**3**	**100**		**2**	**100**		**2**	**100**	

It is evident in the above table that in rank 1 is positive acknowledgment of female with frequencies of 2 in both second and third interactions and frequency of 1 in the first interaction. Last in rank is wrong answers for females with frequency of 0.

This exhibits the fact that mentors are inclined to giving words of encouragement to their students by dwelling on the positive and not on the errors, hence, giving praises or acknowledgment.

This practice is parallel to the principle that "students respond to praise" (http://www.addchoices.com/praise.htm).

Giving specific praise adds meaning to their effort or behavior. When used correctly, specific praise increases motivation and helps students build a positive self-image (Martin, 2009).

Table 19:- Frequency, Percentage and Rank on the General Interaction Pattern in Terms of Effective Teaching Management of the Mathematics Class

Effective Teaching Management (Non-academic)	1st Interaction			2nd Interaction			3rd Interaction		
	F	%	R	F	%	R	F	%	R
Discipline (female students)	3	11.1	3	12	17.9	2.5	1	4.3	3.5
Discipline (male students)	2	7.4	4	10	14.9	4	1	4.3	3.5
Social Interaction (female students)	14	51.9	1	33	49.3	1	15	65.2	1
Social Interaction (male students)	8	29.6	2	12	17.9	2.5	6	26.1	2
Total	**27**	**100**		**67**	**100**		**23**	**100**	

The table shows that social interaction of female students ranked first with frequencies of 14, 33, and 15 in the tree interactions. Last in rank is discipline for male students with frequencies of 2, 10, and 1.

This implies that females are good talkers. Undoubtedly the teaching profession is dominated by females. Females, in whatever situations are highly expressive, be it cognitively or affectively. They always have the reservoir of words to anything that they think of or feel about.
Howson (2006) asserted that teaching is fast becoming an all-female profession with women outnumbering men in the classroom as much as 13 to one, dramatic new figures revealed today. The number of male teachers has

plummeted to an all-time low, threatening a classroom discipline crisis as a generation of boys misses out on authority role models.

Extent of the Application of Strategies in the Classroom Interaction Commonly Employed by the Respondents with Respect to Teaching Style, Classroom Interaction Strategies, and Mode of Questioning:-

Table 20:- Computed Mean on the Extent of the Application of Assertive Teaching Style Commonly Employed by the Respondents in the Teaching of English, Science, and Mathematics

A. Assertive	**English**		**Science**		**Math**		**Overall**	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. Gives directions	5.00	Always	5.00	Always	5.00	Always	5.00	Always
2. Asks direct questions	5.00	Always	5.00	Always	5.00	Always	5.00	Always
3. Gives information	5.00	Always	5.00	Always	5.00	Always	5.00	Always
	5.00	Always	5.00	Always	5.00	Always	5.00	Always

The table reveals that the respondents always apply the assertive teaching style in English, Science and Mathematics classrooms based on the computed mean of 5.00 verbally interpreted as "always". They commonly share on the practice of giving directions, asking direct questions and giving information to their students regardless of the subject being taught.

It implies that this style is obviously the most practiced due to its teacher-controlled nature. This is the very reason why up to this modern times lecture method, though ineffective and boring at times, still remains popularly reliable.

This result parallels the principle of Assertive Discipline which communicates that assertive teachers react confidently and quickly in situations that require the management of student behavior. They are supported by a few clearly stated classroom rules that have been explained and enforced. They give firm, clear, concise directions to students who are in need of outside guidance to help them behave appropriately. Students who comply are reinforced, whereas those who disobey rules and directions receive negative consequences. Assertive teachers do not see students as adversaries, nor do they use an abrasive, sarcastic, hostile style (as with "hostile" teachers). Neither do they react in a passive, inconsistent, timid, non-directive manner (as with "non-assertive" teachers) (http://www.behavioradvisor.com/AssertiveDiscipline.html).

Table 21:- Computed Mean on the Extent of the Application of Suggestive Teaching Style Commonly Employed by the Respondents in the Teaching of English, Science, and Mathematics

B. Suggestive	**English**		**Science**		**Math**		**Overall**	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. Suggests alternatives	4.33	Always	5.00	Always	5.00	Always	4.78	Always
2. Offers opinions	4.67	Always	5.00	Always	5.00	Always	4.89	Always
3. Relates personal experience (model)	1.67	Never	2.33	Rarely	2.33	Rarely	2.22	Rarely
	3.56	Often	4.11	Often	4.11	Often	4.04	Often

It is revealed in the above table that the teachers of English, Science, and Mathematics always suggest alternatives, based on the overall computed mean of 4.78 verbally interpreted as "always"; as well as "offers opinion to their students based on the overall computed mean of 4.89 verbally interpreted as "always". With regard to relating personal experience as a model, the teacher of English has the computed mean of 1.67 verbally interpreted as "never", and the teachers of Science and Mathematics have the computed mean of both 2.33 verbally interpreted as "rarely". In adapting the suggestive teaching style, they all have the verbal interpretation of "often" as signified by the computed mean of 3.56, and 4.11 for both Science and Mathematics respectively.

This signifies that to facilitate learning, indeed a teacher will exhaust all possible ways so that students can learn the lessons. They will also ask all relevant questions in order for the student to think and arrive at the right answers. It is innate for them to easily dispense suggestions, tips, and even techniques so that learners can maximize their attendance of the class.

These findings found relevance in the article in Categories of Teaching Styles which cited that teachers who have a demonstrator or personal model teaching style tend to run teacher-centered classes with an emphasis on demonstration and modeling. This type of a teacher acts as a role model by demonstrating skills and processes, and then as a coach/ guide in helping students develop and apply these skills and knowledge. A teacher with this type of teaching style might comment: "I show my students how to properly do a task or work through a problem and then I'll help them master the task or problem solution. It's important that my students can independently solve similar problems by using and adapting demonstrated methods" (http://members.shaw. ca/mdde615/tchstycats.htm#demonstrator).

Table 22:- Computed Mean on the Extent of the Application of Collaborative Teaching Style Commonly Employed by the Respondents in the Teaching of English, Science, and Mathematics

C. Collaborative	**English**		**Science**		**Math**		**Overall**	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. Elicits/accepts learner ideas	5.00	Always	5.00	Always	5.00	Always	5.00	Always
2. Explores learner ideas	4.67	Always	5.00	Always	5.00	Always	4.89	Always
3. Relates personal experience (empathize)	1.67	Never	2.67	Some-times	2.33	Rarely	2.22	Rarely
	3.78	Often	4.22	Always	4.11	Often	4.04	Often

The data above denote that the teachers of English, Science, and Mathematics always elicit/accept learner ideas, and explore learner ideas based on the overall computed mean of 5.00 and 4.89 both verbally interpreted as “always”. In relating personal experience to empathize, they differ as revealed by the computed mean of 1.67 verbally interpreted as “never” for English; 2.67 verbally interpreted as “sometimes” for Science; and 2.33 verbally interpreted as “rarely” for Mathematics.

This implies that there is a need to empathize with the students. This can be done by relating the teacher’s personal experience that is deemed to be a reinforcing tool towards learning the subject. In doing so, the students would be enlightened that there are no shortcuts in learning. There are rough roads and sacrifices that need to be overcome.
These data confirm what some recent research shows. According to Harris (2010), many students do poorly on assignments or in participation because they do not understand what to do or why they should do it. Hence, teachers should spend more time explaining why we teach what we do, and why the topic or approach or activity is important and interesting and worthwhile. In the process, some of the teacher's enthusiasm will be transmitted to the students, who will be more likely to become interested. Similarly, teachers should spend more time explaining exactly what is expected on assignments or activities. Students who are uncertain about what to do will seldom perform well.

Table 23:- Computed Mean on the Extent of the Application of Facilitative Teaching Style Commonly Employed by the Respondents in the Teaching of English, Science, and Mathematics

D. Facilitative	**English**		**Science**		**Math**		**Overall**	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. Elicits/accepts learner feelings	5.00	Always	5.00	Always	5.00	Always	5.00	Always
2. Offers feelings	4.00	Often	3.00	Some-times	2.67	Some-times	3.22	Some-times
3. Encourages	5.00	Always	5.00	Always	5.00	Always	5.00	Always
4. Uses silence	3.67	Often	4.67	Always	5.00	Always	4.44	Always
	4.42	Always	4.42	Always	4.42	Always	4.42	Always

The table shows that all the respondents always elicit/accept learner feelings, and encourage, based on its computed mean of 5.00. In offering feelings, the computed mean is 4.00 verbally interpreted as “often” for English, 3.00 and 2.67 both verbally interpreted as “sometimes” for Science and Math respectively. In using silence, the computed mean is 3.67 verbally interpreted as “always” for English, and 4.67 and 5.00 both verbally interpreted as “always” for Science and Mathematics respectively. Generally, English, Science, and Math classes obtained an overall mean of 4.42 verbally interpreted as “always”.

This signifies that efforts are exerted by the faculty in order to simplify and accelerate understanding among their students. They even go down to the bottom level of explaining the topic in order to make everyone in the class not only understand but be able to learn, synthesize, and share.

According to Douglas (2003), teaching is no longer a simple process of telling, giving out instructions or information, lecturing or making and checking assignment. To be an effective and successful teacher, one must have to become more motivating, managing, guiding, and assisting agent for the student as he learns. Further, Mazon (2001) pointed out that the very nature of the study and thinking needs some techniques that will enable teachers to do their tasks better, which all aimed at better learning achievement of learners.

Table 24:- Computed Mean on the Extent of the Application of Classroom Interaction Strategies (A. Methodologies) Commonly Employed by the Respondents in the Teaching of English, Science and Mathematics

	English		**Science**		**Math**		**Overall**	
A. Methodologies	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. Lecture	4.67	Always	5.00	Always	5.00	Always	4.89	Always
2. Discussion	4.67	Always	5.00	Always	5.00	Always	4.89	Always
3. Small Group Discussion (SGW); Pair Work	2.33	Never	2.67	Some-times	1.00	Never	2.00	Rarely
4. Reporting/ Oral Presentation	1.00	Never	1.67	Never	1.33	Never	1.33	Never
5. Role Playing	1.67	Never	1.00	Never	1.00	Never	1.22	Never
6. Question and Answer	4.67	Always	4.33	Always	5.00	Always	4.67	Always
7. Problem Solving	1.00	Never	4.67	Always	5.00	Always	3.56	Often
8. Experimenting (Minor/Major)	1.00	Never	3.00	Some-times	1.00	Never	1.67	Never
	2.63	Some-times	3.42	Often	3.04	Some-times	3.03	Some-times

The table indicates that English, Science, and Mathematics professors always employ lecture, discussion, and question and answer in handling their classes based on the obtained computed mean of 4.67, and 5.00 for both Science and Mathematics in the first two methodologies; and 4.67, 4.33, and 5.00 respectively. In the small group work (SGW) or pair work, they vary with the computed mean of 2.33 and 1.00 both verbally interpreted as “never” for English and Mathematics, and 2.67 for Science verbally interpreted as “sometimes”. In reporting/ oral presentation and role playing, the computed mean are 1.00, 1.67 and 1.33, and 1.67, 1.00 and 1.00 respectively all verbally interpreted as “never” in all of the three subject areas. In problem solving, the computed mean is 1.00 verbally interpreted as “never” for English, 4.67 and 5.00 both verbally interpreted as “always” in Science and Mathematics respectively. In experimenting either minor or major, Science has a computed mean of 3.00 verbally interpreted as “sometimes” and both 1.00 verbally interpreted as “never” for English and Mathematics. With all these, it is deemed noticeable that lecture, discussion, and question and answer are the prevalent teaching methodologies utilized in the teaching of English, Science and Mathematics. Hierarchically, problem solving and small group work or pair work are used.

Correspondingly, this implies that up to this time, lecture, discussion and question and answer methodologies remain to be widely used and deemed reliable, though traditional in nature, in delivering good results in the teaching-learning situation.

For many years, the lecture method was the most widely used instructional strategy in college classrooms. Nearly 80% of all U.S. college classrooms in the late 1970s reported using some form of the lecture method to teach students (Cashin, 1990). Although the usefulness of other teaching strategies is being widely examined today, the lecture still remains an important way to communicate information. Used in conjunction with active learning teaching strategies, the traditional lecture can be an effective way to achieve instructional goals. The advantages of the lecture approach are that it provides a way to communicate a large amount of information to many listeners, maximizes instructor control and is non-threatening to students. The disadvantages are that lecturing minimizes feedback from students, assumes an unrealistic level of student understanding and comprehension, and often

disengages students from the learning process causing information to be quickly forgotten (http://www.gmu.edu/resources/facstaff/part-time/strategy.html).

Table 25:- Computed Mean on the Extent of the Application of Classroom Interaction Strategies (B. Maximum Participation Strategies) Commonly Employed by the Respondents in the Teaching of English, Science, and Mathematics

B. Maximum Participation Strategies	**English**		**Science**		**Math**		**Overall**	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. Begins each class with a controversy or problem.	4.00	Often	4.33	Always	4.33	Always	4.22	Always
2. Uses silence to encourage reflection.	3.67	Often	5.00	Always	5.00	Always	4.56	Always
3. Arranges and uses classroom space to encourage interaction.	4.67	Always	4.00	Often	4.67	Always	4.44	Always
4. Creates a friendly environment.	5.00	Always	5.00	Always	5.00	Always	5.00	Always
5. Abstains from imposing opinion or conclusion on the class.	5.00	Always	4.00	Often	3.67	Often	4.22	Always
6. Respects the contributions of all participants by "*active listening*" …	5.00	Always	5.00	Always	5.00	Always	5.00	Always
7. Poses questions which invite participation…	5.00	Always	5.00	Always	4.67	Always	4.89	Always
8. Gives thanks to the respondent/s.	3.00	Always	4.00	Often	2.67	Some-times	3.22	Some-times
9. Uses *body language* to encourage expression…	5.00	Always	5.00	Always	5.00	Always	5.00	Always
10. Uses verbal cues such as "Aha!", "I see.", "Really"…	5.00	Always	5.00	Always	5.00	Always	5.00	Always
11. Encourages the more silent participants to speak up…	4.67	Always	4.67	Always	4.00	Often	4.44	Always
12. If the class is large, breaks students into discussion groups…	3.33	Sometimes	3.67	Often	2.33	Rarely	3.11	Some-times
13. Prevents one or two participants from dominating the whole discussion …	4.67	Always	4.67	Always	5.00	Always	4.78	Always
14. Provides further information for reference…	4.67	Always	5.00	Always	5.00	Always	4.89	Always
15. Plays "*devil's advocate*" from time to time…	3.00	Some-times	4.33	Always	4.67	Always	4.00	Often
16. Points out factual errors and faults of reasoning along the way.	5.00	Always	5.00	Always	5.00	Always	5.00	Always
17. Follows the flow of thinking of the participants, …	4.67	Always	5.00	Always	5.00	Always	4.89	Always
18. Maintains a *balance of views* by highlighting opposite viewpoints…	5.00	Always	5.00	Always	5.00	Always	5.00	Always
19. Summarizes progress from time to time.	4.33	Always	5.00	Always	5.00	Always	4.78	Always
20. Gives a wrap-up at the end of the discussion session.	4.67	Always	5.00	Always	5.00	Always	4.89	Always
	4.47	Always	4.68	Always	4.55	Always	4.57	Always

The table reveals that the classroom interaction strategies usually utilized above among others in the teaching of English, Science, and Mathematics are items 4, 6, 9, 10, 16, and 18 with similar mean of 5.00 verbally interpreted as always. The items that obtained that lowest mean are 8 and 12 with the mean of 3.22 and 3.11 verbally interpreted as sometimes.

This shows that only sometimes there is giving of thanks to the students as they recite, and that of breaking them into discussion groups. Giving thanks to those who recite and actively participate in the class is one good gesture of giving importance and appreciation to the efforts exerted. In view thereof, every teacher has to integrate this in the daily repertoire of teaching in such a creative and effective manner. Forming discussion groups is also a must since this elicits interaction especially in large classes. In such case, the timid ones are provided with the ample opportunity of showcasing their hidden potentialities.

This idea can be reinforced by the article of Margie (2009) titled "Group Work in the Classroom" which expressed that group work in classrooms has become more and more common over the last several years. Many teachers use it to help students learn from each other, build community, and teach cooperation.

The above results further show that teachers employ in their teaching varied strategies in order to elicit interaction among students and that above all else they provide a friendly environment among students which is highly considered as an essential ingredient to make students participate freely in class discussions and other related activities. It is important that students feel they are welcome and are important elements in the teaching-learning encounter.
This scheme is highlighted in the "Friendly Classroom" that if a student does not feel pressure to write every sound coming out of the lecturer's mouth, they will be able to better attend to what she is actually saying (http://www.cs.huji.ac.il/~kirk/Friendly.pdf).

Table 26:- Computed Mean on the Extent of the Application of Mode of Questioning Commonly Employed by the Respondents in the Teaching of English, Science, and Mathematics

Mode of Questioning	**English**		**Science**		**Math**		**Overall**	
	Mean	VI	Mean	VI	Mean	VI	Mean	VI
1. Phrases questions clearly.	5.00	Always	5.00	Always	5.00	Always	5.00	Always
2. Starts with easy questions.	5.00	Always	5.00	Always	5.00	Always	5.00	Always
3. Asks questions primarily on academic nature.	5.00	Always	5.00	Always	5.00	Always	5.00	Always
4. Asks personal questions for motivation.	3.33	Some-times	4.00	Often	3.33	Some-times	3.56	Often
5. Asks questions answerable by a "yes" or a "no".	5.00	Always	5.00	Always	5.00	Always	5.00	Always
6. Asks multiple questions in one go.	1.67	Never	2.33	Rarely	3.33	Some-times	2.44	Rarely
7. Asks questions with multiple solutions or methods of solutions.	4.00	Often	4.33	Always	4.00	Often	4.11	Often
8. Arranges questions into knowledge, comprehension…	3.67	Often	4.33	Always	4.33	Always	4.11	Often
9. Encourages students to respond in some way to each question asked.	5.00	Always	4.67	Always	5.00	Always	4.89	Always
10. Balances responses from volunteering and non-volunteering…	5.00	Always	5.00	Always	4.00	Often	4.67	Always
11. Elicits a high percentage of correct responses from students …	5.00	Always	5.00	Always	5.00	Always	5.00	Always
12. Probes students' responses to have them clarify ideas…	5.00	Always	5.00	Always	5.00	Always	5.00	Always
13. Acknowledges correct responses from students …	4.00	Often	4.67	Always	4.33	Always	4.33	Always
14. Addresses the question to a specific participant.	3.00	Some-times	3.33	Some-times	2.33	Rarely	2.89	Some-times
15. Addresses the question to the whole class.	4.33	Always	4.33	Always	5.00	Always	4.56	Always
16. Selects the more passive and timid participants…	4.33	Always	4.00	Often	3.67	Often	4.00	Often
17. If the respondent speaks too softly,	5.00	Always	4.67	Always	4.67	Always	4.78	Always

asks him/her to speak up …								
18. Asks the respondent to clarify and elaborate.	5.00	Always	5.00	Always	5.00	Always	5.00	Always
19. Allows three to five seconds of wait time… questions are asked.	5.00	Always	5.00	Always	5.00	Always	5.00	Always
20. Allots too much time waiting for answers.	1.67	Never	2.33	Rarely	2.67	Some-times	2.22	Rarely
	4.25	Always	4.40	Always	4.33	Always	4.33	Always

The data reflect that in teaching English, Science, and Mathematics, the respondents commonly employ the modes of questioning cited in items 1, 2, 3, 5, 9, 10, 11, 12, 13, 15, 17, 18, and 19 which all obtained the verbal interpretation of always. Items 4, 7, 8, and 16 obtained the verbal interpretation of often, item 14 obtained the verbal interpretation of sometimes, and items 6 and 20 obtained the verbal interpretation of rarely.

This shows that they fully know how to give questions as they teach their lessons though they rarely ask multiple questions in one go, and that they don't allot much time in waiting for answers which are actually good strategies. Wait time is advocated but need not be prolonged because this can drag the flow of discussion.

According to Larkin (2005) rather than facilitating thinking, however, asking multiple questions is more likely to confuse students.

Level of Performance of the Students in English, Science, and Mathematics After Utilizing the Classroom Interaction Patterns

Table 27:- Computed t-test on the Level of Performance of the Students in English, Science, and Mathematics After Utilizing the Classroom Interaction Patterns

	Mean	N	Std. Deviation	Std. Error Mean	VI
Pair 1 English Pre	13. 53	34	4.31	.739	Average
English Post	14.56	34	4.26	.730	Average
Pair 2 Science Pre	10.35	34	3.10	.532	Low
Science Post	13.47	34	3.39	.581	Average
Pair 3 Mathematics Pre	8.85	34	2.46	.422	Average
Mathematics Post	11.41	34	3.81	.654	Average

It is evident in the table that Pair 1- pre-test in English obtained a computed mean of 13.43 verbally interpreted as "average" and the post-test obtained a computed mean of 14.56 verbally interpreted as "average. In Pair 2-pre-test in Science obtained a computed mean of 10. 35 verbally interpreted as "low" and the post-test obtained a computed mean of 13.47 verbally interpreted as "average". In Pair 3- pre-test in Mathematics obtained a computed mean of 8.85 verbally interpreted as "average" and the post-test obtained a computed mean of 11. 41 verbally interpreted as "average". These results signify the increase in scores of the students after the classroom interactions took place. Science got the highest escalation by drawing a margin of 3.12 followed by Mathematics with 2.56, and English with 1.03.

This only manifests that classroom interactions pose an impact in the understanding of a lesson among students. Interactions bridge the gap in the teaching-learning process. Hence, though independent learning is being pushed through, the faculty must not forget that there really is a felt need among students to receive and share their ideas.

This corroborates with Tinto who stated that student-faculty interactions, which include both formal classroom experiences and informal interactions outside of class, are crucial to the academic continuation and intellectual development of students. A lack of such interactions is a very significant determinant of attrition. Likewise, Pascarella and Terenzini reported that the frequency and quality of student-faculty interactions significantly predict freshman academic outcomes such as college satisfaction and attrition. Related work has found that students who frequently interacted with faculty expressed greater satisfaction with their total college experience in comparison to students who interact at a lesser level. Wilson et al. also indicated that the faculty who enjoy and seek interaction

with students outside of class demonstrate their accessibility for such interaction through their in-class attitudes and teaching styles (http://www.questia.com/googleScholar. qst;jsessionid=8A9E671ECCE65A67812995F07E13F1B7. inst2_2a?docId=5001285108).

Significant Difference on the Level of Performance of the Students in English, Science, and Mathematics After Utilizing the Classroom Interaction Patterns

Table 28:- Computed t-test on the Level of Performance of Students in English, Science, and Mathematics After Utilizing the Classroom Interaction Patterns

	Mean	Sd	t	df	P-value	Ho	VI
English Pre-test	13.53	4.31					Not
Post-test	14.56	4.26	1.212	33	.234	Accept	Significant
Science Pre-test	10.35	3.10					
Post-test	13.47	3.39	4.925	33	.000	Reject	Significant
Mathematics Pre-test	8.85	2.46	3.977	33	.000	Reject	Significant
Post-test	11.14	3.81					

As shown in the table, there is enough evidence to claim that there is significant difference on the level of performance of the students in Science and Mathematics before and after the intervention on interaction since they both have the computed p-value of .000 that is less than the alpha level of .05. Therefore, the null hypothesis is rejected. In English, there is no enough evidence to claim that there is a significant difference since the computed p-value of .234 is greater than the alpha level of .05. Therefore, the null hypothesis is accepted.

These results show that interactions play a significant role in imparting learning to the students. It seems that teachers make something out of nothing. Students come to class with their little knowledge but after few class meetings they seem to have learned a lot. This makes teaching the noblest profession for teachers produce the other professionals in this world.

Studies conducted on classroom interaction have shown that student talk accounts for an average of less than 30 percent of talk in 'teacher-fronted' classrooms. Yet studies on language and learning have shown that children not only learn to talk but they also talk to learn. This can be seen from the fact that children are persistent questioners; it is by asking questions that they explore and learn about the world around them. However, studies have shown that the number of questions asked by children drops significantly as soon as they enter school (Tsui, 1995).

Teachers must be mindful of their instructional goals and prepare questions with those in mind. Adequate preparation ahead of time ensures that the purposes for asking questions are likely to be well-matched to the instructional task. Preparing ahead will also reduce the amount of in-class 'trial and error' time. That is to say, the less time teachers take in class, trying to figure out what they are doing as they are doing it, the more time there will be for teachers and students to be engaged in actual learning (Hall, 2001) (http://www.slideshare.net/tina_wilkinson/classroom-interaction).

Students will not get enough practice just by talking to the instructor, and very little by just listening to the instructor. Students develop competency and become critical thinkers in classroom that provides opportunities for intensive, structured interaction among students. (Bishop, 2000) The most direct way to create classroom interaction is to adopt the principles of collaborative learning. In collaborative learning, the teacher designs a learning problem or task, and then assigns small groups of students to address the problem collaboratively. Students are typically instructed to reach a consensus on an issue, or to create a group product. The purpose of the collaborative learning is to enhance learning and achievement by encouraging peer-to-peer interaction and cooperation (Bishop, 2000) (http://faculty.valenciacc.edu/pbishop/lcrb/clssrm-interact.pdf).

Significant Difference on the General Pattern of Interaction in the Observed English, Science, and Mathematics Classrooms

Table 29:- Computed F-value on the General Interaction Pattern in Terms of Instruction

Lecture (Explanation)	**Source**	**DF**	**SS**	**MS**	**F**	**P**	**Ho**	**VI**
	Factor	2	1422	711	4.17	0.073	A	NS
	Error	6	1023	170				
	Total	8	2444					
Lecture (Writing & Talking)	Factor	2	957.6	478.8	6.75	0.029	R	S
	Error	6	425.3	70.9				
	Total	8	1382.9					
Lecture (Explanation of Materials)	Factor	2	42.0	21.0	0.83	0.481	A	NS
	Error	6	152.0	25.3				
	Total	8	194.0					
Giving of Examples	Factor	2	11.6	5.8	0.12	0.892	A	NS
	Error	6	298.0	49.7				
	Total	8	309.6					
Cueing/ Probing	Factor	2	90.9	45.4	0.84	0.478	A	NS
	Error	6	326.0	54.3				
	Total	8	416.9					
Directives	Factor	2	290.67	145.33	21.10	0.002	R	S
	Error	6	41.33	6.89				
	Total	8	332.00					

The data reveal that with respect to instructional pattern, the test statistics for lecture (writing and talking) and directives are 6.75 and 21.10, with p-values of 0.029, and 0.002 respectively. Since the p-values are less than the commonly chosen α-level of 0.05, there are pieces of evidences for a difference in classroom interaction strategies being employed by English, Science, and Mathematics professors, therefore, the null hypothesis is rejected.

This implies that explanation alone is not enough. There is a need for visual stimulation among students. They have to see on the board what they have heard since in many instances they fail to synchronize the sound and the letter of the word/s uttered by the professor/s.

This difference manifests in what is in the Sensory Stimulation Theory which has as its basic premise that effective learning occurs when the senses are stimulated (Laird, 1985). Laird quotes research that found that the vast majority of knowledge held by adults (75%) is learned through seeing. Hearing is the next most effective (about 13%) and the other senses - touch, smell and taste account for 12% of what we know. By stimulating the senses, especially the visual sense, learning can be enhanced. However, this theory says that if multi-senses are stimulated, greater learning takes place. Stimulation through the senses is achieved through a greater variety of colors, volume levels, strong statements, facts presented visually, use of a variety of techniques and media (http://www.brookes.ac.uk/services/ocsd/2_learntch/theories.html#sensory).

Table 30:- Computed F-value on the General Interaction Pattern in Terms of Language Use

Plain English	**Source**	**DF**	**SS**	**MS**	**F**	**P**	**Ho**	**VI**
	Factor	2	802	401	0.75	0.512	A	NS
	Error	6	3210	535				
	Total	8	4012					
Code Switching	Factor	2	3505	1752	8.26	0.019	R	S
	Error	6	1273	212				
	Total	8	4778					
Plain Filipino	Factor	2	50.0	25.0	1.53	0.290	A	NS
	Error	6	98.0	16.3				
	Total	8	148.0					

With respect to language use pattern of the professors, the test statistic for code switching (English-Filipino/Taglish) is 8.26 with p-value of 0.019. Since the p-value is less than the commonly chosen α-level of 0.05, there is evidence for a difference in classroom interaction strategies being employed by English, Science, and Mathematics professors. Therefore, the null hypothesis is rejected.

It implies that switching to Filipino when teaching facilitates further understanding of a lesson. It may be perceived to be in contradictory to the principle that English, Science, and Math subjects have to be taught with English language as a medium, but sometimes defying the odds may be justifiably done in order to meet the desired outcome.

Cook, as cited by Skiba (1997) puts the extent of code switching in normal conversations amongst bilinguals into perspective by outlining that code switching consists of 84% single word switches, 10% phrase switches and 6% clause switching. There are a number of possible reasons for the switching from one language to another. The first of these is the notion that a speaker may not be able to express him/herself in one language so switches to the other to compensate for the deficiency. As a result, the speaker may be triggered into speaking in the other language for a while. This type of code switching tends to occur when the speaker is upset, tired or distracted in some manner. Secondly, switching commonly occurs when an individual wishes to express solidarity with a particular social group. Rapport is established between the speaker and the listener when the listener responds with a similar switch. (http://iteslj.org/Articles/Skiba-CodeSwitching.html)

Code switching, that is, changing between languages at some point in a sentence or utterance, is a commonly used communication strategy among language learners and bilinguals. While traditional methods of formal instruction often discourage code switching, students, especially those placed in a language immersion situation, often use it. If viewed as a learning strategy, wherein the student uses the target language as much as possible but reverts to their native language for any element of an utterance that they are unable to produce in the target language (as, e.g., in Wolfgang Butzkamm's concept of enlightened monolingualism), then it has the advantages that it encourages fluency development and motivation and a sense of accomplishment by enabling the student to discuss topics of interest to him or her early in the learning process—before requisite vocabulary has been memorized. It is particularly effective for students whose native language is English, due to the high probability of a simple English word or short phrase being understood by the conversational partner (http://en.wikipedia.org/wiki/Language_education).

Table 31:- Computed F-value on the General Interaction Pattern in Terms of Questioning

Recall/ Recognition	Source	DF	SS	MS	F	P	Ho	VI
	Factor	2	2092	1046	2.67	0.148	A	NS
	Error	6	2349	392				
	Total	8	4441					
Higher Level	Factor	2	8.22	4.11	1.19	0.366	A	NS
	Error	6	20.67	3.44				
	Total	8	28.89					
Redirect	Factor	2	494.0	247.0	17.64	0.003	R	S
	Error	6	84.0	14.0				
	Total	8	578.0					

In the questioning pattern, the test statistics for redirect is 17.64 with p-value of 0.003. Since the p-value is less than the commonly chosen α-level of 0.05, there is evidence for a difference in classroom interaction strategies being employed by English, Science, and Mathematics professors. Therefore, the null hypothesis is rejected.

This implies that redirecting questions impacts teaching-learning situation. When a student being called to answer a question is incapable of providing answer or shy to give an answer, it would help to call for another student to answer such question. In such scenario, the former would be inspired by the latter in sharing his/her ideas.

Cashin (2010) in his article, asserted that this procedure not only encourages more student participation, but it also implies that peers are resources for learning (http://honolulu.hawaii.edu/intranet/committees/FacDev Com/guidebk/ teachtip/askquest.htm).

According to Berkeley Compendium, if a professor wants to encourage class discussion, invite students to share their knowledge, have students apply concepts to demonstrate understanding, respond to student questions, he or she should consider redirecting student questions. A professor in the social sciences, for example, says that in the

discussion section he tries hard not to answer students' questions directly unless he doubts that anyone in the class would be in a position to give the correct response. (http://teaching.berkeley.edu/ compendium/suggestions/file57.html)

Table 32:- Computed F-value on the General Interaction Pattern in Terms of Response

Response (from female students)	Source	DF	SS	MS	F	P	Ho	VI
	Factor	2	2550	1275	2.12	0.202	A	NS
	Error	6	3614	602				
	Total	8	6164					
Response (from male students)	Factor	2	502	251	0.51	0.624	A	NS
	Error	6	2943	490				
	Total	8	3444					
Recite (female students)	Factor	2	450.7	225.3	4.88	0.055	A	NS
	Error	6	277.3	46.2				
	Total	8	728.0					
Recite (male students)	Factor	2	266.9	133.4	1.93	0.225	A	NS
	Error	6	414.0	69.0				
	Total	8	680.9					
Silence/I don't know (female students)	Factor	2	168.22	84.11	12.62	0.007	A	NS
	Error	6	40.00	6.67				
	Total	8	208.22					
Silence/I don't know (male students)	Factor	2	122.0	61.0	1.76	0.250	A	NS
	Error	6	208.0	34.7				
	Total	8	330.0					
Statement (female students)	Factor	2	326.0	163.0	4.08	0.076	A	NS
	Error	6	240.0	40.0				
	Total	8	566.0					
Statement (male students)	Factor	2	66.9	33.4	2.10	0.203	A	NS
	Error	6	95.3	15.9				
	Total	8	162.2					

In the response pattern, there is no evidence for a difference in classroom interaction strategies being employed by English, Science and Mathematics professors since the statistics are 2.12, 0.51, 4.88, 1.93, 12.62, 1.76, 4.08, and 2.10 respectively with p-values of 0.202, 0.624, 0.055, 0.225, 0.007, 0.250, 0.076 and 0.203 which are greater than commonly chosen α-level of 0.05. Therefore, the null hypothesis is accepted.

In the course of discussion, professors practically ask questions in order to facilitate interaction and elicit responses among students. This is in order to promote student involvement in the teaching-learning process.

An issue relevant to talking patterns is that of Macrae (2006) which in her article revealed that women talk almost three times as much as men, with the average woman chalking up 20,000 words in a day - 13,000 more than the average man. Women also speak more quickly, devote more brainpower to chit-chat - and actually get a buzz out of hearing their own voices, a new book suggests.

Table 33:- Computed F-value on the General Interaction Pattern in Terms of Feedback

Acknowledgment Positive (female)	Source	DF	SS	MS	F	P	Ho	VI
	Factor	2	29.6	14.8	1.48	0.301	A	NS
	Error	6	60.0	10.0				
	Total	8	89.6					
Acknowledgment Positive (male)	Factor	2	26.9	13.4	1.14	0.380	A	NS
	Error	6	70.7	11.8				
	Total	8	97.6					
Wrong Answers (male)	Factor	2	0.000	0.000	0.00	1.000	A	NS
	Error	6	2.000	0.333				

	Total	8	2.000					

In the feedback pattern, there is no evidence for a difference in classroom interaction strategies being employed by English, Science, and Mathematics professors since the test statistics are 1.48, 1.14, and 0.00 respectively with p-values of 0.301, 0.380 and 1.000 which are greater than commonly chosen α-level of 0.05, therefore, the null hypothesis is accepted.

Feedback can be both positive and negative, and is most useful within a culture of learning and development, rather than within a punitive culture. Feedback helps people to become more aware of to do and how to do it. Receiving it gives an opportunity to change and modify in order to become more effective. To be helpful, feedback needs to be given in a concerned and supportive way and to include both positive and negative observations.

Kumar and Stracke (2006) suggested that while students might view feedback as 'error correction' supervisors generally see it as a teaching/learning process, hence supervisors can encourage students to view feedback in this more active and positive way (http://www.learning.ox.ac.uk/rsv.php?page=319).

As Walker (2009) notes "a necessary precondition for a student to act on a gap is that she/he is given a comment that enables her/him to do so: the comments must be usable by the student." Consequently "it is the quality, not just the quantity, of feedback that merits our closest attention" (http://www.flinders.edu.au/teaching/teaching-strategies/assessment/feedback/).

Table 34:- Computed F-value on the General Interaction Pattern in Terms of Effective Teaching Management

Discipline (female students)	Source	DF	SS	MS	F	P	Ho	VI
	Factor	2	11.6	5.8	0.43	0.667	A	NS
	Error	6	80.0	13.3				
	Total	8	91.6					
Discipline (male students)	Factor	2	16.9	8.4	0.62	0.568	A	NS
	Error	6	81.3	13.6				
	Total	8	98.2					
Social Interaction (female students)	Factor	2	72.7	36.3	0.75	0.511	A	NS
	Error	6	289.3	48.2				
	Total	8	362.0					
Social Interaction (male students)	Factor	2	78.00	39.00	8.36	0.018	A	NS
	Error	6	28.00	4.67				
	Total	8	106.00					

In the effective teaching management, there is no evidence for a difference in classroom interaction strategies being employed by English, Science, and Mathematics professors since the test statistics are 0.43, 0.62, 0.75 and 8.36 respectively with p-values of 0.667, 0.568, 0.511 and 0.018 which are greater than commonly chosen α-level of 0.05, therefore, the null hypothesis is accepted.

This indicates that the students behave similarly in their English, Science, and Math classes and that their professors respond similarly in the way they behave or vice versa. Generally, classroom discipline is one of the most significant classroom practices. It not only provides the opportunity for teachers to instruct students in their traditional school subjects but it is also integrally related to the issue of inculcating a sense of responsibility in students. In selecting an approach to classroom discipline, some teachers experience, and have to deal with, tensions arising from their desire to utilize educationally justifiable models while still quickly and effectively gaining and maintaining the order in the classroom essential to ensure subject learning takes place, and teachers and students feel protected from threat.

In the study conducted by Lewis (1997), the results indicate that teachers who report more stress are those most interested in empowering more their students in the decision making process. Associated with increased concern is a greater use of worry, selfblame, tension reduction, wishful thinking and keep to self. The most concerned teachers also express a greater tendency to get sick as a result of the stress. These data suggest the need for professional

development curriculum for teachers to assist them in effectively sharing power with students and in reflecting upon a range of more productive coping strategies.

Lack of classroom discipline results in academic chaos, low student performance and teacher exhaustion and frustration. With classroom discipline, there is a safe learning environment for both students and teachers. Teachers can deliver effective lesson presentation without classroom disruption, and students can receive a quality education without constant distractions. Classroom discipline is designed to produce well-mannered students with proper personal, social and ethical abilities (Glenn, 2010).

Table 35:- Computed F-value on the General Interaction Pattern in Terms of Teaching Styles

Assertive	Source	DF	SS	MS	F	P	Ho	VI
	Factor	2	0.000					
	Error	6	0.000					
	Total	8	0.000					
Suggestive	Factor	2	0.61	0.31	0.12	0.886	A	NS
	Error	6	14.90	2.48				
	Total	8	15.51					
Collaborative	Factor	2	0.22	0.11	0.04	0.961	A	NS
	Error	6	16.24	2.71				
	Total	8	16.46					
Facilitative	Factor	2	0.000	0.000	0.00	1.000	A	NS
	Error	9	8.235	0.915				
	Total	11	8.235					

With respect to the teaching styles, there is no evidence for a difference in classroom interaction strategies being employed by English, Science, and Mathematics professors since the test statistics are 0.12, 0.04, and 0.00 respectively with p-values of 0.886, 0.961, and 1.000 which are greater than commonly chosen α-level of 0.05, therefore, the null hypothesis is accepted.

This denotes that the professors handle their classes quite similarly and that based on their approaches, students perform in likewise manner. This may be attributed to the stimulus-response theory that in order to produce the desired result a corresponding input has to be done.

Traditionally, the teaching of EFL in most East Asian countries is dominated by a teacher-centered, book-centered, grammar-translation method and an emphasis on rote memory (Liu and Littlewood, 1997). These traditional language teaching approaches have resulted in a number of typical learning styles in East Asian countries, with introverted learning being one of them. In East Asia, most students see knowledge as something to be transmitted by the teacher rather than discovered by the learners. They, therefore, find it normal to engage in modes of learning which are teacher-centered and in which they receive knowledge rather than interpret it. According to Harshbarger et. al. (1986), Japanese and Korean students are often quiet, shy and reticent in language classrooms. They dislike public touch and overt displays of opinions or emotions, indicating a reserve that is the hallmark of introverts. Chinese students likewise name "listening to teacher "as their most frequent activity in senior school English classes (Liu and Littlewood, 1997). All these claims are confirmed by a study conducted by Sato, in which she compared the participation of Asian students in the classroom interaction with that of non-Asian students. Sato found that the Asians took significant fewer speaking turns than did their non-Asian classmates (36.5% as opposed to 63.5%) (Zhenhui, 2001).

Table 36:- Computed F-value on the General Interaction Pattern in Terms of Classroom Interaction Strategies

A. Methodologies	Source	DF	SS	MS	F	P	Ho	VI
	Factor	2	1.79	0.89	0.27	0.762	A	NS
	Error	21	68.25	3.25				
	Total	23	70.03					
B. Maximum Participation Strategies	Factor	2	0.511	0.256	0.57	0.570	A	NS
	Error	57	25.636	0.450				
	Total	59	26.148					

In the classroom interaction strategies, the test statistic for methodologies and maximum participation strategies are 0.27 and 0.57 with p-values of 0.762 and 0.570 respectively. Since the p-values are greater than the commonly chosen α-level of 0.05, there is no evidence for a difference in classroom interaction strategies being employed by English, Science, and Mathematics professors. Therefore, the null hypothesis accepted.

This implies that methodologies in the teaching of English, Science, and Mathematics appear common. Though they are exactly different in content, the way they are taught seems to be alike.

To achieve the goal of teaching, the teacher must adopt effective teaching methods in education. The teacher has many options to choose from different teaching methods designed specifically for teaching and learning. Students respond differently to different methods of teaching. Also, the students have their unique way of demonstrating the knowledge acquired and absorbing the information that is imparted. So, to aid this process of demonstrating the knowledge, the teacher has to adopt a technique that assists the students in retaining the information and increasing their understanding. There are many teaching methods for children like questioning, modeling, demonstrating, collaborating and explaining (http://www.buzzle.com/articles/teaching-methods-in-education.html).

One theory to consider along the context of effective teaching is the Holistic learning theory. The basic premise of this theory is that the 'individual personality consists of many elements specifically the intellect, emotions, the body impulse (or desire), intuition and imagination (Laird, 1985) that all require activation if learning is to be more effective (http://www.brookes.ac.uk/ services/ocsd/2_learntch/theories.html#sensory).

Table 37:- Computed F-value on the General Interaction Pattern in Terms of Mode of Questioning

Mode of Questioning	Source	DF	SS	MS	F	P	Ho	VI
	Factor	2	0.246	0.123	0.14	0.868	A	NS
	Error	57	49.444	0.867				
	Total	59	49.690					

In the mode of questioning, the test statistic is 0.14 with p-value of 0.868. Since the p-value is greater than the commonly chosen α-level of 0.05, there is no evidence for a difference in classroom interaction strategies being employed by English, Science, and Mathematics professors. Therefore, the null hypothesis is accepted.

This reflects that the professors employ similar patterns of questioning if not ask questions of similar category. The conflict with this is that if the pattern of questioning always deals only with knowledge questions. It would be more holistic if the question would follow the Bloom's Taxonomy of asking questions in which it comprises knowledge, comprehension, application, analysis, synthesis, and evaluation.

Today, verbal questioning is so prevalent in education that it's difficult to picture a classroom in which a teacher isn't asking questions. In fact, researchers note that verbal questioning is second only to lecturing as the most common instructional practice (Black, 2001). Teachers ask about 300–400 questions per day and as many as 120 questions per hour.

However, teachers often use verbal questioning merely as an organizational tool—to check students' class work and homework, review and summarize lessons, and evaluate students' learning. (Black, 2001; Goodman and Berntson, 2000) But verbal questioning has the potential to do much more. It can motivate students to pay attention and learn, develop students' thinking skills, stimulate students to inquire and investigate on their own, synthesize information and experiences, create a context for exploring ideas, and enhance students' cumulative knowledge base (Black, 2001; Goodman and Berntson, 2000).

Most teachers ask questions that require students to merely recall knowledge or information rather than use higher-order thinking skills (Redfield and Rousseau, 1981; Wilen, 2001). Teachers can improve their ability to ask questions of different cognitive levels by familiarizing themselves with question taxonomies, which classify questions on the basis of the mental activity or intellectual behavior required to formulate an answer (Morgan and Schreiber, 2000). As they answer questions at different cognitive levels—especially higher levels—students develop critical-thinking and communication skills.

Researchers studying teachers' questioning patterns found that 53 percent of the questions that teachers asked stood alone, and 47 percent were part of a sequence of two or more questions. Of this 47 percent, only 10 percent were a part of a sequence having four or more questions (Wragg and Brown, 2001).

Summary and Conclusions:-

Based on the findings of the study, the following summary and conclusions were drawn:

1. Lecture in the form of writing and talking as well as giving directives can help the students thoroughly understand the lessons.
2. Classes in English, Science and Mathematics were always conducted using English Language.
3. Female students actively take part in the teaching-learning processes across the three subjects.
4. The assertive teaching style was mostly subscribed to by the professors.
5. Lecture and discussion are always utilized in teaching than the other classroom interaction strategies.
6. Interaction strategies helped escalate scores of the English, Science, and Mathematics students.
7. Strategies such as writing and talking, giving directives, code switching, and redirect questioning pattern positively influenced the process of learning of the students.

Implications and Recommendations:-

In line with the findings and conclusions, the following implications and recommendations are presented:

Implications:-

It is implied in the study that through the use of appropriate and reliable instructional pattern, language use, questioning, classroom management, teaching style, classroom instruction strategies and mode of questioning, there is no doubt that students can learn and get higher grades in their different subjects be it on the dimension of literacy or numeracy or both. Likewise, one cannot discount the good effects brought about by code switching as need arises as this can truly help scaffold understanding among the learners.

Recommendations:-

1. The professors should integrate hybrid instruction into the usual classroom contacts and integrate peer mentoring in order to reinforce the usual teaching-learning situation.
2. The professors should ensure that in the teaching-learning processes, there is a framework of questions that thoroughly includes Higher Order Thinking Skills (HOTS) and/ or strike balance in including those that deal with Lower Order Thinking Skills (LOTS) and HOTS.
3. Male students are strongly encouraged to become active in class discussions and other activities. The professors need to provide them motivation, class work and tasks that really catch their attention and suit their abilities.
4. The professors must integrate in their pedagogy the giving of diagnostic test before beginning a lesson/chapter and achievement test after that lesson/chapter in order to gauge how much the students have learned thereby conducting strict monitoring and promoting metacognitive learning.
5. Multidisciplinary events such as math bazaars, science booths/exhibits, English recitals, interactive exhibits, mini-entrepreneurial and marketing activities and the like should be held at least once every semester to promote group camaraderie among students as they apply their knowledge, skills and values acquired in different subject areas.
6. The campus through its director, dean, department head/s, program coordinator/s, and sub-organization advisers must launch periodic and carefully structured and other follow up programs; and establish linkages in the fields of English, Science, and Mathematics in order to bolster classroom learning.
7. The university should implement a policy that would require faculty members to maximize student participation and interaction, hence, revolutionize stereotypes in every classroom.
8. A parallel study using other variables and sets of respondents may be conducted.

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