PERCEPTION OF PEER-TUTORING PEDAGOGICAL APPROACH AMONG UNDERGRADUATE STUDENTS OF FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

BY

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DEPARTMENT OF SCIENCE EDUCATION SCHOOLOF SCIENCE AND TECHNOLOGY EDUCATION FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA NIGER STATE.

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ABSTRACT

This study investigated the Perception of a Peer-Tutoring Pedagogical Approach Among Undergraduate Students of the Federal University of Technology, Minna. Nine schools were used in selected from the Federal University of Technology, Minna was used as the population of the study. Descriptive survey research was employed, and Undergraduate Students of the Federal University of Technology, Minna, were used as the research samples. Four research questions guided the study, and a 20-item questionnaire was used as an instrument for data collection. The questionnaire was validated by the project supervisors and test and measurement experts. The pilot study was carried out, and reliability coefficients of 0.89 were obtained for the questionnaire. Data collected from the administration of the research instruments were analyzed using descriptive statistics of Mean and Standard Deviation. A decision rule was set, in which a mean score of 4.0 and above was considered Agreed or 4aware while a mean score below 3.0 was considered Disagreed or unperceived. Findings revealed that Undergraduates Students Perception of the Peer Tutoring Pedagogical Approach (PTPA) is unperceived by the respondents. Based on the results, it was recommended that Science students keep improving in their pedagogical approach to help them take an interest in learning abstracts topics and improve in their science subjects.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

1.0

Peer tutoring is "a system of instruction in which learners help each other and learn from themselves by teaching" (Goodlad and Hirst, 2013). Key to this definition is the word peer, meaning someone with the same or nearly equal status as the person being tutored, who, as such, is not a professional instructor. Peer tutoring has played an essential part in education and has probably existed in some incarnation since the beginning of civilization. But the first recorded use of an organized, systematic peer tutorial learning project in the Western World didn't come about until the late 1700s.

Arising from school budget woes in the late 18th and early 19th centuries, peer tutoring became an effective way of giving underprivileged (at this time, sadly the only male) children a reasonable shot at an education. The first systematic approach to peer tutoring is credited to Andrew Bell, the superintendent of the Military Male Asylum at Egmore in England. Peer tutoring in the United States has long been used in the college setting, dating back to 1640, when the first paid student tutor was hired by Harvard University "to counsel and befriend the younger lads" (Dwyer, 1989, in Mann, 2012). In the 1960s, with the resurgence of educational innovation in the United States, peer tutoring gained great popularity at all levels of schooling. More recently, educators have begun to experiment with different types of peer tutoring, looking to fit the method to their student's specific needs and abilities.

Today, with increasing college and university enrollment, graduate and undergraduate student paraprofessionals have become an integral feature of the educational structure, serving in many different capacities: teaching assistants, subject-matter tutors, lab assistants, small-group discussion leaders, counsellors, and in some cases, primary instructors for introductory-level courses. Hott (2012) defined Peer tutoring as a flexible, peer-mediated strategy that involves students serving as academic tutors and tutees. Typically, a higher-performing student is paired with a lower performing student to review critical academic or behavioural concepts. Thus, peer tutoring refers to an instructional method that uses pairings of high-performing students to tutor lower-performing students in a class-wide setting or a common venue outside of school under the supervision of a teacher.

Peer teaching, or peer tutoring, is an instrumental strategy in which advanced students, or those in later years, take on a limited instructional role. It often requires some form of credit or payment for the person acting as the teacher. Peer teaching is a well-established practice in many universities. Peer tutoring is an instructional strategy that consists of student partnerships, linking high achieving students with lower achieving students or those with comparable achievement, for structured reading and math study sessions. Thus, peer tutoring is a "systematic, peer-mediated teaching strategy".

According to Scruggs, Mastropieri, and Marshak (2012), peer tutoring is the instructional strategy where students are trained to work in pairs with their partners to improve their overall knowledge. They learn to use tutoring materials, take turns as the tutor and the tutee, ask the questions appropriately, and positively deliver feedback. In peer tutoring, students practice content information in tutoring pairs rather than whole-class learning. This significant structural difference allows for considerable flexibility in individual peer instruction (Scruggs et al., 2012). Peer tutoring will enable students to proceed with the content material at their own pace. It also provides separate time for the individual mastery of each student in the tutoring pair. For example, suppose

one student has mastered the topic faster than the other. In that case, that individual could stay in the role of tutor for a more extended period until the tutee develops a better understanding of the material.

The textbook definition of peer tutoring is "a system of instruction in which learners help each other and learn (themselves) by teaching" (Goodlad and Hirst, 2013). Key to this definition is the word peer, meaning someone with the same or nearly equal status as the person being tutored, who, as such, is not a professional instructor. Peer tutoring has played an essential part in education and has probably existed in some incarnation since the beginning of civilization. But the first recorded use of an organized, systematic peer tutorial learning project in the Western World didn't come about until the late 1700s.

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different capacities: teaching assistants, subject-matter tutors, lab assistants, small-group discussion leaders, counsellors, and in some cases, primary instructors for introductory-level courses.

Peer learning is a broad learning strategy. It covers a wide range of activities through which people learn through different approaches. These activities ranged from a traditional proctor model in schools to the more innovative learning groups in colleges and universities. In the proctor model, the senior students act as tutors and junior students as tutees. On the other hand, in creative learning groups, students of the same age group or level help each other by forming partnerships. Other models include discussions, seminars, private study groups, counselling, peer-assessment schemes, collaborative project or laboratory work, workplace mentoring, and community activities. (Topping, 2015).

Through this approach (model), the students learn significantly by elaborating their views to others. They also participate in such kinds of activities in which they can learn from their peers. (Fulk and King, 2012). Peer learning enables the students to develop their skills to organize and plan learning activities, collaborate with others, give and receive feedback about their work, and evaluate their learning. Nowadays, the importance of peer learning is increasing, and it has become part of many courses in a wide range of contexts and disciplines in many countries of the world. (opping, 2015).

1.2 Statement of the Problem

The efficacy of peer tutoring as a platform for providing personal and academic support among students is continuously being challenged by factors such as declining faculty-to-student ratios and students' under-preparedness. This study intends to examine the various adopted peer tutoring

approaches as an instructional strategy among undergraduate students in the federal university of Technology Minna. The findings from previous research highlighted the delicate imbalance between the obvious benefits and the unintended consequences of various approaches used during peer to peer tutoring. The apparent benefits of peer tutoring included opportunities for synergistic peer learning, healthy competition among students, and self-directed learning. However, the benefits of peer tutoring are negated by factors such as a low level of trust among peers, anxiety over year marks, time constraints, and discomfort due to perceived incompetency compared to their peers. Finally, the finding from the present study tends to provide opportunities for iterative model and design (approach) and continuous improvement.

1.3 Objective of the Study

This study aims to survey the influence of undergraduate students' peer-tutoring pedagogical approach in the federal university of Technology Minna. Specifically, the study sought to:

- Determine the type of perception undergraduate students have toward Peer Tutoring Pedagogical Approach (PTPA).
- Determine whether gender has an influence on Peer Tutoring Pedagogical Approach (PTPA) among undergraduate students.
- Determine whether academic level influence the perception of Peer Tutoring Pedagogical Approach (PTPA) among undergraduate students.
- Determine whether the place of residence influence the perception of the Peer Tutoring Pedagogical approach (PTPA) among undergraduate students.

1.4 Research Questions

- 1. What type of perception do undergraduate students have on Peer Tutoring Pedagogical Approach (PTPA)?
- 2. Does gender influence the perception of peer Tutoring Pedagogical Approach (PTPA) among undergraduate students?
- 3. Does Academic level influence the perception of Peer Tutoring Pedagogical Approach (PTPA) among undergraduate students?
- 4. Does place of residence influence the perception of Peer Tutoring Pedagogical Approach (PTPA)?

1.5 Significance of the Study

The study would be significant in the following ways: The peer tutoring findings will help the students interact with their fellow peer groups and clarify their doubts. They will be placed in a more comfortable zone. The students can share their ideas, and creativity can also be induced through the peer tutoring method. Thus this peer tutoring research is a boon to the teachers, and it has to the right planned and implemented by the teacher to get effective results. This project intends to deal with peer tutoring

The findings from this exploratory study highlighted the delicate balance between the obvious benefits and the unintended consequences of various peer tutoring approaches during tutorials. Due to the complexity of factors affecting student learning in any given set-up, the synergistic benefits of peer tutoring discover from this research will clear off some factors such as negative perceptions and preferences towards the peer tutoring methods, low level of trust among peers, anxiety over year marks, time constraints and discomfort due to perceived incompetency when compared to their peers. Overall, the link between disciplinary understanding and engagement on the overall pass rate in the courses.

1.6 Scope of the Study

The research was delimited to the Federal University of Technology Minna, Niger state. Therefore, due to their relevance to the research work, the peer tutors elicited needed data.

1.7 Definition of the Major Terms

The following terms are operationally defined as used in the research work:

- Learning: Learning is the modification of behaviour as a result of experience. The child brings changes in his behaviour after gaining experiences from the environment. Learning is a broad term. Learning includes all activities which affect children. Along with the growing process, the mental development of the child occurs. As a result, changes take place in his behaviour continuously. The child goes on learning through experiences.
- Peer Tutoring: This refers to the learning activities prepared and exhibited by students of the same academic level in the university.
- Peer: This refers to members of the same age group controlled by specific social needs and preferences.
- Pedagogical Approach: This is referred to any method of learning suitable or convenient for passing learning instruction across to students.
- Teaching: This refers to the expected result of learning observed in students' behaviour, ability and preference.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the literature related to the study on the topic discussed under the various study objectives, how Peer-tutoring pedagogical approach influence undergraduate students learning outcome. Then, a theoretical and conceptual framework was used to operationalize the variables, and lastly, the gaps in literature were summarized.

2.2 Concept of Peer group

Schools often seem to be judged on the kind of children they enrol in rather than on the quality of their teaching or the other facilities they offer. This observation has led many to argue that the background and abilities of a pupil's schoolmates must influence their achievements at school. Motivated by this, wealthy international literature has evolved to model and measure the consequences of social interactions between pupils – so-called 'peer-group effects' – spanning the economics, education, sociological and psychological fields.

The issue is critical regarding current educational policy favouring expansion of school choice because choice based on peer-group quality can, in theory at least, lead to a high degree of sorting across schools along the lines of prior ability Epple and Romano,(2000). This will exacerbate educational inequalities if peer-group quality has real impacts on personal achievement. An understanding of peer effects is also essential because they can mean that educational interventions that appear beneficial to the individual pupil may be even more effective when rolled out to the population (Glaeser, Sacerdote, 2003). Our paper extends the evidence base by providing estimates of the influence of innovations on a pupil's peer group when they transfer from Primary to Secondary schooling in England.

The potential for peers to affect individual achievement is central to many important policy issues in elementary and secondary education, including the impacts of school choice programs, ability tracking within schools, "mainstreaming" of special education students, and racial and economic desegregation. For example, vouchers, charter schools and other school choice programs may benefit those who remain in traditional public schools by engendering competition that leads to improvements in school quality but may also harm those left behind by diminishing the quality of their classmates (Epple and Romano 1998; Caucutt 2002). Grouping students in classrooms by ability can likewise significantly impact student achievement, depending on the magnitude of peer influences (Epple, Newlon, and Romano 2002).

The effect of desegregation policies on achievement depends not only on potential spillovers from average ability but also on whether different peers exert different degrees of influence on individual outcomes (Angrist and Lang 2004; Cooley 2007; Fryer and Fryer and Torelli 2005). Earlier analyses of peer effects were based on simple econometric models regressing students outcomes on their characteristics (measures of ability, family background and so on) and their peers' outcomes or factors. However, Manski (1993) shows that this kind of regression is plagued by two main econometric problems, raising doubts about the coefficient's causal interpretation measuring peer group effects. The first problem, known as "self-selection" bias, is that peers are often not exogenously determined, but individuals typically choose the other people they will associate with. Therefore, the characteristics of each student contribute to determining the choice of their peers and, if some of these characteristics are not observable, an endogeneity problem arises.

2.2.1 Philosophy/rationale/basic assumptions of peer tutoring.

The philosophy behind Peer Tutoring Program is that tutoring peer to peer is a beautiful way for students to develop course mastery and learn new skills. For example, Clarkson (2011) submitted that: "The concept of learning through peer tutoring is based on a social constructivist view of learning that emphasizes the role of the students to generate learning where students coach peers through social interaction within their zones of proximal development (Vygotsky, 1978). Rather than applying a stimulus/response process, users are actively engaged in making meaning through cognitive accommodation and assimilation (Piaget, 1969). Vygotsky argued that learning comes about through social negotiation within a cultural context, with language as the primary enabling tool. This social constructivist philosophy has been expanded on recently, introducing the notion of cognitive apprenticeship (Brown, Collins, & Duguid, 1989) through which students learn like traditional apprenticeships. The students access expertise through mentors, whose role is to facilitate rather than teach, and learning aims to solve realistic and practical problems in an authentic setting. For a peer tutor, this setting is a very natural human setting.

Just as in traditional apprenticeships, learners engage in activities' on-the-job' rather than through the didactic teaching of abstract concepts. The argument is that students are better equipped to approach non-familiar problems and produce appropriate solutions to a given culture. Peer tutoring is aligned with these aspects of social constructivist theory by enhancing social negotiation with the student tutor and tutee, where knowledge construction is promoted through communication and dialogue, which is helpful for the tutees".

2.2.3 Major proponents of peer tutoring.

Dr. Andrew Bell FRSE FRAS (27 March 1753 – 27 January 1832) was a Scottish Episcopalian priest and educationalist who pioneered the Madras System of Education (also known as "mutual

instruction" or the monitorial system") in schools and was the founder of Madras College, a secondary school in St. Andrews.

In Bell's adaption of the Madras or monitorial system as it later came to be known, a schoolmaster would teach a small group of brighter or older pupils basic lessons. Each of them would then relate the task to another group of children.

Joseph Lancaster (25 November 1778 – 23 October 1838) was an English Quaker and public education innovator. In 1798, he founded a free elementary school in Borough Road, Southwark, using a variant of the monitorial system. His ideas were developed simultaneously with Dr Andrew Bell in Madras, whose approach was referred to as the "Madras system of education". The method of instruction and delivery is recursive as one student learns the material, they are rewarded for successfully passing on that information to the next pupil. This method is now commonly known as peer tutoring, but the economics of Lancaster's or Bell's methodology is not widely discussed. The use of monitors was prompted partly by a need to avoid the cost of assistant teachers.

2.2.4 Peer group composition and its influence on academic performance

Peer groups are among the most influential social forces affecting adolescent behaviour – from mundane decisions concerning clothing, hairstyle, music, and entertainment, to more significant decisions concerning short and long-term education plans. During the formative adolescent years, peers are arguably even more important than parents, teachers, and counsellors, and the peer-influenced decisions of youth can have long-lasting consequences (Coleman. 1966; Sewell, Haller and Portes 1969; Sewell, Haller and Ohlendorf, 1970) as cited by (Mapesa, 2013). Parents recognize the importance of peer groups and attempt to guide and direct their children through their choice of neighbourhoods, schools, and activities (Haynie, South and Bose 2006; Lareau 2003; Mouw and Entwisle 2006) 's friendship selections, which can be increasingly challenging

during adolescence. Regardless of socioeconomic status, parents want their children to be surrounded by the best possible social networks, especially during adolescence, when youth are increasingly independent of parents.

Educational goals take form during these formative years, and youth make a series of decisions that shape their academic trajectories, even as their friendship networks influence these decisions. Unfortunately, the peer effects literature is lacking in two main areas. The first is that peer effects are assumed to be uniform across class, gender, race, and ethnicity. Race and ethnicity are especially likely to be important because adolescents are more likely to choose friends of the same racial and ethnic group (Hamm, Brown and Heck 2005; Haynie, South and Bose 2006; Quillian and Campbell 2003), introducing the possibility that peers have differing effects by race and ethnicity.

The second problem is that few studies focus on academic decisions directly influenced by friends, such as course or track selection and college choices. Instead, most studies of peer effects focus on educational outcomes that friends indirectly influence, such as early cognitive development, grades, promotion, and, most commonly, test scores (Goux and Maurin 2007; Hanushek . 2003; Henry and Rickman 2007; Kang 2007; Zimmerman 2003). Hanushek (2003) and others have pointed out that "If innovations to behaviour form an important avenue through which peers affect outcomes, the inability to capture such behaviour might lead to a serious underestimation of peer influences". Thus, behaviour decisions may lie at the intersection between peers and achievement – effectively acting as a mediator through which the influence of peers passes before shaping student achievement. Peer-group effects are a distinct class of consequences arising from 'social interactions' – abroad term which encompasses any individual behaviour that involves interdependency with the behaviour or characteristics of others. Economists have long shown an

interest [Becker (1974)], but there has been a rapid growth in the field since the 1990s with contributions in theory and empirical work.

Theoretical research seems motivated to widen the scope of economic thought to encompass behavioural modelling more commonly attributed to sociology and psychology.

Empirical work –constrained by the data –is generally concerned with finding evidence for the existence of such effects rather than the precise pathways by which they occur. The term 'peergroups usually indicates social interactions of children or young adults with people of similar age, rather than broader 'neighbourhood' effects or interactions with superiors, family or teachers. We continue to use the term in this way. The range of outcomes that have interested researchers is diverse, including smoking. Alexander(2001); Ellickson(2003), joke-telling Angelone and Hirschman (2005), sexual behaviour Selvan and Ross (2001), purchase of a retirement plan Duflo and Saez (2000) and – more commonly – education. On reflection, it looks pretty likely that many decisions are linked to similar conclusions by a friend or other associate (in the same cases fairly explicitly, like the decision to have sex, be in a gang or play tennis). Many consumption decisions rely on other consumers participating (e.g. video phones). However, the more exciting possibility is that group behaviour or attributes can modify individual actions about significant social and economic decisions that will affect their life chances – especially achievement in education.

Starting from the classical study of Coleman (1966), a host of works have analysed the effects of peer groups on children's achievement and educational outcomes Betts and Morell, (1999); Hoxby, (2000); Angrist and Lang, (2004); Hanushek. (2003) and on college students' grades and choices of fields of study Sacerdote,(2001); Zimmerman,(2003); De Giorgi, Pellizzari and Redaelli, (2006); Foster, (2006), but several problems and controversies are still unresolved. Some of these studies show that peer effects are statistically and economically significant in various educational

contexts. Students tend to perform better if the quality of their peer group is higher.Ding and Lehrer, (2006); Zimmerman, (2003); Vandenberghe,(2002); Hoxby,(2000); Sacerdote,(2001); Zimmer and Toma, (2000). Moreover, many of these studies show that peer effects are often non-linear, implying that students of middle abilities are particularly affected by weak students' negative influence (Sacerdote, (2001); Zimmerman,(2003). However, the significance and size of peer effects often change about the sample used. Other studies find no significant (or minor) peer effects Angrist and Lang, (2004); Arcidiacono and Nicholson, (2005); Foster, (2006)

2.2.5 peer group learning environment and its influence on academic performance of student

Students belonging to the same class tend to study and revise the subject together, generating essential externalities. However, this kind of relationship does not develop between all the class members since some students may not interact with each other even though attending courses together. To overcome this problem and build a peer group measure (called *Peer Exam*) based on this type of interaction, which we believe is particularly relevant, we consider members of the same group of students who sit an exam on the same date. Anecdotal evidence suggests that students who study together tend to take exams together (Coleman. 1966), as cited by (Mapesa 2013).

In theoretical and empirical studies, educational economists have highlighted the relevance of peer group quality to student performance Epple and Romano,(1998); Hoxby, (2000). A peer group affects student achievement in several ways: members of a group interact in learning, help each other in their studies, share important information, impose externalities on others by behaving well or poorly (for example, a noisy student disrupts the study environment) or by allowing teachers to go deeper in subjects, contribute to the formation of values and aspirations, and so on.

Understanding the nature and the magnitude of peer group effects in education is crucial for the "productivity" of educational processes and the organizational design of school systems. For example, to improve student outcomes, it is essential to know which inputs influence their performance most and the relative importance of peer effects compared to other information, such as teacher quality or school resources. If peer effects are at work, educational outcomes are affected by how students are arranged across classes and the desirability of comprehensive schools (which mix students of different abilities together) or stratified schools (which tend to aggregate students according to their abilities) depends on the magnitude and non-linearity of peer effects. Furthermore, the selectivity of university admission policies produces different results in the presence of peer effects. More importantly, the nature of peer effects also has fundamental implications in a family's choice regarding whether parents consider that their offspring would benefit from schools that sort students according to their abilities (Foster, 2006). Apart from peer effects related to the classroom environment, students from the same class tend to study and revise the subject together, generating essential externalities. Friendly relationships do not involve all class members: some students might attend the course together, but their interaction might still be limited. We can address this problem by considering a peer group that weights peers in relation to the number of exams taken together. Students who continually do exams in the same session often study together, sharing course material and information. We look at all the students passing an exam on the same date. We use this information to define the second measure of peer group quality, which weights the abilities of each student according to the number of exams taken together (Epple & Romano, 2013).

We know that the self-selection problem may affect these definitions since students choose other people to collaborate with while studying. Therefore, to overcome possible self-selection

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problems, we use Two-Stage Least Squares estimation and instrument peer groups through students' random (and compulsory) assignments to different teaching classes during their First Level Degree course (Foster, 2006).

Their estimations show that peer group abilities have considerable, positive effects on students' academic performance. These effects are not brought about by self-selection and are robust to various definitions of peer group and several measures of abilities (Epple and Romano, 1998). In our preferred Instrumental Variable specification, we find that an increase of one standard deviation in peer-group quality (measured as the average ability of students attending the same course) increases student performance by 0.19 (the OLS estimates show a more negligible effect equal to 0.13). This is quite a significant effect since the effect produced by an increase of one standard deviation in the student's ability generates an increase of 0.54 (Foster, 2006). Results are slightly higher when we consider our second measure of peer group quality, based on repeated interaction at exams, implying that this measure can consider relevant interaction among students. These results suggest that student quality is an essential input in tertiary education and that, to improve their students' performance, colleges and universities should attract high-quality students. Our results are consistent with selection policies adopted by many US universities to admit only the best students. They also support the idea that students applying for highly reputable institutions evaluate the high quality of instructors provided and the high quality of peers. Moreover, if student performance is determined, at least in part, by their effort, then it is rational to subsidize good students for the positive externalities they produce (Foster, 2006).

2.2.6 Peer Tutoring Models

There are many different ways you can group students to tutor each other. The teacher must ensure that any material being reviewed by tutor groups is accurately assessed in these groups. Peer tutoring is not meant for introducing new materials or concepts. You need to monitor for understanding on both ends.

2.2.6.1 Class Wide Peer Tutoring (CWPT): In this model, the whole class would be divided into pairs or small groups no more significant than five. The groups should include students with different ability levels. For example, you would use this model if the whole class were preparing for a school-wide spelling bee. Classwide peer tutoring involves dividing the class into groups of two to five students with differing ability levels. Students then act as tutors, tutees, or both tutors and tutees. Typically, CWPT involves highly structured procedures, direct rehearsal, competitive teams, and posting of scores (Maheady, Harper, and Mallette, 2001).

The entire class participates in structured peer tutoring activities two or more times per week for approximately 30 minutes (Harper and Maheady, 2007). While the procedures and routines in CWPT remain the same, student pairings or groups may change weekly or biweekly. In CWPT, student pairings are fluid and may be based on achievement levels or student compatibility.

2.2.6.2 Cross-Age Peer Tutoring: Younger students are paired with older students. The more senior student is there to model good behavioural, functional, adaptive or social skills. For example, a second-grader could be paired with a kindergarten student to show them how to walk to the cafeteria, get a lunch tray, refined foods, and find a place to sit. Older students are paired with younger students to teach or review a skill. The positions of tutor and tutee do not change. The older student serves as the tutor, and the younger student is the tutee. The more senior and younger students can have similar or differing skill levels, with the relationship being a cooperative or expert interaction. Tutors serve to model appropriate behaviour, ask questions, and encourage better study habits. This arrangement is also beneficial for students with disabilities as they may serve as tutors for younger students.

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2.2.6.3 Reciprocal Peer Tutoring (RPT): Two or more students alternate between acting as the tutor and tutee during each session, with equitable time in each role. Often, higher-performing students are paired with lower-performing students. RPT utilizes a structured format that encourages teaching material, monitoring answers, and evaluating and encouraging peers. Both group and individual rewards may be earned to motivate and maximize learning. Students in RPT may prepare the instructional materials and monitor and evaluate their peers once they have selected a goal and reward as outlined by their teacher.

2.2.6.4 Same-age Peer Tutoring: Peers within one or two years of age are paired to review key concepts. Students may have similar ability levels, or a more advanced student can be paired with a less progressive student. Students who have identical abilities should have an equal understanding of the content material and concepts. When pairing students with differing levels, the roles of tutor and tutee may be alternated, allowing the lower performing student to quiz the higher-performing student. Answers should be provided to the lower-achieving student when acting as a tutor to assist with any deficits in content knowledge. Same-age peer tutoring, like class-wide peer tutoring, can be completed within the students' classroom, or tutoring can be achieved across differing classes. Procedures are more flexible than traditional class-wide peer tutoring.

2.2.6.5 Peer Assisted Learning Strategies (PALS): Students are paired with students around the same ability level. The tutee and tutor roles can change based on which student needs help on a particular skill. For example, one student may help his partner with science vocabulary words, and then the partner may change roles and help the other student with multiplication facts. PALS is a version of the CWPT model, which involves a teacher pairing students who need additional instruction or help with a peer (Fuchs, Fuchs & Burish, 2000).

Groups are flexible and often change across a variety of subject areas or skills. Cue cards, small pieces of cardstock upon which are printed a list of tutoring steps, may be provided to help students remember PALS steps (Spencer, Scruggs, and Mastropieri, 2003). All students have the opportunity to function as a tutor or tutee at differing times. Students are typically paired with other students at the same skill level without a large discrepancy between abilities. Academic requirements are increasing, and educational funding is decreasing. Thus, schools must develop creative means to accomplish these goals. One such example could be the use of peer tutors. Peer tutoring provides a low-cost, research-supported method to improve academics (The Access Center; Coenen, 2002; Colvin, 2007; Hooper & Walker, 2002; Steinhoff & Lignugaris, 2007).

2.2.7 Benefits that exemplify the importance of peer teaching

2.2.7.1 Increased Literacy Scores: According to an Ohio University Pilot Study, Students who read and discuss story passages with their peers recall more content and score higher on assessments. The researcher divided four average-reading 6th grade students into pairs. The first pair participated in peer reading activities twice a week, whereas students in the second pair read the same passages individually at the same frequency. As a result, the first pair scored higher on each reading assessment.

2.2.7.2 Developed Reasoning and Critical Thinking Skills: Students who work in pairs and groups typically perform better on tests that involve reasoning and critical thinking, according to an oft-cited study about science education. This is large because students must become active learners, discussing and rationalizing lesson concepts in their own words.

2.2.7.3 Improved Confidence and Interpersonal Skills: Peer teaching points to students building confidence and communication abilities. Pioneering research from 1988 states tutors improves

self-esteem and interpersonal skills by giving feedback. Tutees realize these benefits by asking questions and receiving immediate clarification. A later study of at-risk students echoed these advantages.

2.2.7.4 Increased Comfort and Openness: The same 1988 study indicates that "students generally identify more easily with peer helpers than with adult authority figures." This helps create an environment where students are more comfortable asking questions and working through challenging problems in an environment free from class ridicule.

2.2.7.5 Versatility: You can run a range of peer teaching exercises based on different subjects and objectives, possibly involving other grades and classes. Lots of ideas can lead to lots of fun for your students.

2.2.7.6 Basis for choosing peer tutoring: It is a widely-researched practice across ages, grade levels, and subject areas; the intervention allows students to receive one-to-one assistance, Students have increased opportunities to respond in smaller groups, It promotes academic and social development for both the tutor and tutee, Student engagement and time on task increases, Peer tutoring increases self-confidence and self-efficacy (Spencer, 2006). A solid research base supports the strategy (e.g., Calhoon, Al Otaiba, Cihak, King, & Avalos, 2007; Kunsch, Jitendra, & Sood, 2007; Vasquez & Slocum, 2012).

2.2.8 How tutors and tutees should be selected among peers

One standard method for determining dyads, or groups, involves ranking students from the highest performing to the lowest performing student for the particular activity or subject. Pairs can be formed by cutting the list in half and then matching the top-performing student with the first most down performing student, the second-highest performing student with the second-lowest performing student, and so forth (Fuchs, Fuchs, and Kazdan, 2012). If heterogeneous groups are

desired, the number of students in each team should be determined. The list of students can then be numbered from one to the desired number of persons in a group and then repeated until the entire class is included (Harper and Maheady, 2007). When selecting tutors, teachers should be mindful of which students can be most helpful in the process. In addition, teachers should be mindful of differing student personalities, needs, and preferences. Dyads or groups should be established accordingly.

2.2.9 How should peer tutoring models be selected?

Peer tutoring models are flexible and can be altered to meet an individual student or class learning needs. The academic task should dictate the appropriate model based on content and learning goals. While there is some upfront planning and instruction, once students understand procedures, groups or dyads can be altered depending upon the setting, activity, or desired to learn outcomes (Fuchs, Fuchs, and Kazdan, 2012).

2.2.10 How much instruction is needed to use peer tutoring?

Depending on the subject area and model selected, one to four, 30- to 45-minute sessions can be devoted to teaching and modelling (see Mastropieri and Scruggs, 2007; Spencer, 2006; Polloway, Patton, and Serna, 2008). Students should master each step of the model selected before learning additional skills. A teacher will need to closely monitor student progress to ensure that established procedures are followed, students utilize interpersonal skills, and covered content. Outhred and Chester (2010) submitted that there are many benefits for both the peer tutor and tutee in this relationship. One aspect of this is that the tutor can establish a rapport with the tutee that a teacher cannot. For example, a peer tutor may have taken the same class recently or have taken similar courses. Because the tutee sees the peer tutor as being more at their level, advice given by the tutor may be accepted more readily than advice from a teacher. Another key reason for this is that a peer

tutor does not provide any grade on the paper, whereas a teacher serving in a tutor role may still be perceived as someone who grades papers.

Peer tutors can be trained through on-the-job training, as well as through formal workshops. New tutors can be paired with more experienced tutors for their first few tutorials, and after the tutors are satisfied that the new tutors can operate alone, they can give one-on-one tutoring. A key aspect of tutor training is the reflection on tutorials with other tutors. This reflection looks at what could have gone better and the tutor's progress in giving tutorials. In higher education tutorial settings, the benefits of peer tutoring programs also extend to class tutors. Using grounded theory techniques, it was found that the following five themes underlie their experiences: role exploration, sharing responsibility, regulation of the peer tutored groups, harnessing the peer tutors' role. Other benefits of peer tutoring include:

There is a "natural tendency to learn from the same age-group" (Capossela, 1998, pg. 3). In addition, many people feel more comfortable working with and asking questions of others in their same peer group because there is less of a power dynamic; the distinction between teacher and student is less pronounced. Peer tutoring allows both the tutor and the student to understand information better. As the tutor and student work through assignments and practise the concepts, both individuals gain a broader and deeper understanding of the material.

The tutor learns how to ask valuable questions and develops social listening skills, a sought-after ability in the professional world. Peer tutoring is an economically and educationally effective intervention for persons with disabilities that can benefit both the tutor and tutee, socially and educationally, by motivating them to learn (Miller & Miller, 1995). Peer tutoring gives teachers the capability to accommodate a classroom of diverse learners to improve academic achievement across ability levels and content areas At a time when university resources are stretched, and

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demands upon staff are increasing, it [peer learning] offers students the opportunity to learn from each other It gives students considerably more practice than traditional teaching and learning methods in taking responsibility for their learning and, more generally, learning how to learn. In addition, the intervention allows students to receive one-to-one assistance. Finally, peer tutoring is also valuable for the tutor, i.e. "learning is enhanced through teaching."

2.2.11 What can be done to support peer tutoring initiatives?

Provide direct, systematic instruction for the peer tutoring process selected. Consider providing cue cards summarizing procedures or post procedures until automaticity is established. Model error correction procedures. Chart, and consider posting, student or group progress. Praise use of tutoring procedures in addition to correct responses. Share with students the link between peer tutoring and increased achievement.

2.3 Theoretical Background

Weidman's (1989) model of socialization in learning institutions is perhaps the most appropriate theoretical model to investigate and interpret peer group influence. My adaption of Weidman's model follows similar studies of peer effects by Dey (1996, 1997) and Milem (1998). Weidman conceptualizes the significant influences on student change in learning institutions to be pre-learning institutions or student background characteristics, the academic and social normative context of an institution, and the impact of parental and non-college reference groups. Normative contexts are critical in Weidman's model for influencing change in personal orientations during college. However, Weidman also made three points about the interpersonal environment and interpersonal processes in socialization. First, he cites Homans (1950, 1961) and argues that the socialization process is dependent on interpersonal interaction and the sentimental intensity of the relationship associated with the exchange. Second, he notes that the frequency of interaction was

also critical. Lastly, he underscored a conclusion made by many researchers that the long-term academic impacts of learning institutions are not the result of classroom experiences but informal forms of social interaction with students and faculty. By focusing on peer group influences, this study concentrated on two parts of Weidman's model, the normative context of informal peer groups and implicitly, the socialization process of interpersonal interaction. To isolate these elements of the socialization process in learning institutions was borrowed from the conceptual and methodological models of college impact of Astin (1984, 1993), models implicit in Weidman's (1989) framework. Astin's (1993) college impact model emphasized the intercorrelated nature of student pre-college characteristics (inputs) and environmental elements of the college experience. However, this relationship becomes problematic when trying to isolate the unique contribution of the educational environment on student outcomes because student inputs are frequently related to both settings and effects. In other words, the qualities of the student may explain their eventual outcome (smart students will get high grades). They may also determine the types and nature of their educational experiences (math majors will take more math courses). In the statistical implementation of Weidman's socialization model, I made an effort to properly control the confounding relationship of inputs to friendship group measures.

2.4 Empirical framework

A recent review (Topping 1992) identified 28 previous reviews and meta¬analyses of research on peer tutoring, mostly in schools. Sharpley and Sharp- ley (1981) conducted a meta-analysis of 82 studies in schools, reporting substantial cognitive gains for both tutees and tutors. Same-age tutoring appeared as effective as cross-age tutoring, and training of tutors significantly improved eventual outcomes. Cohen, Kulik and Kulik (1982) discovered 500 titles relating to tutoring. In 65 studies with control groups, tutored students out-performed controls in 45. There was again

evidence that tutor training produced larger sizes of practical effect. Highly structured tutoring was also associated with larger effect sizes. There was evidence that peer tutoring improved tutee attitudes in class, as well as tutee self-concept. In 38 control group studies measuring tutor achievement, tutors out-performed controls in 33. Improved tutor attitudes and self-concept were also reported.

There is thus substantial evidence that peer tutoring is effective in schools. Beyond this, relative cost-effectiveness may also be considered. Levin, Glass and Meister (1987) conducted a cost-effectiveness analysis of four different interventions designed to improve reading and mathematics in primary schools (elementary schools) in the USA: computer-assisted learning, reducing class size, lengthening the school day, and cross-age peer tutoring. The most cost-effective intervention (peer tutoring) was four times more cost-effective than the least. The least cost-effective was reducing class size. While evidence concerning peer tutoring in schools can certainly not be automatically generalized into higher and further education, there is considerable food for thought in these findings.

Previous reviews and surveys of peer tutoring in higher and farther education include those of Goldschmid and Goldschmid (1976), Cornwall (1979), Whitman (1988), Lee (1988), Lawson (1989), Maxwell (1990) and Moore- West, Hennessy, Meilman, and O'Donnell (1990). These are interesting, but the earlier papers were completed when most of the literature was descriptive. The Goldschmids' empirical work (1976) was well before its time in this respect. Cornwall (1979) offered a wide-ranging overview of the field, including organisation and problem-solving advice. In a survey of 93 colleges, Lee (1988) compared seven different kinds of programmes targeted to increase retention and reduce student dropout. Programmes involving peers as resources showed up particularly well. The most expensive programmes were not more effective than cheaper ones,

and the institution's size was not a factor in retention and dropout rates. Peer tutoring and peer counselling both showed good cost-effectiveness, while traditional remedial programmes proved very cost-ineffective. Lawson (1989) surveyed 19 colleges and universities in Canada identified as having peer-assisted learning programmes. Peer tutoring was found to be more common than peer counselling. Detailed descriptions of goals, selection, training, logistics and methods for evaluation of programmes are given, but little complex data on comparative effectiveness and cost-effectiveness. Moore- West et al. (1990) surveyed peer-assisted learning programmes in United States medical schools. Of 127 colleges in an association, 62 replied, and of these, 47 had peer tutoring programmes, while 40 had 'advising programmes' and 13 had 'peer assessment programmes'.

2.5 Literature Review

The purpose of the review of the above literature was to avoid unnecessary and unintentional duplication of the framework from which research findings were interpreted and also demonstrated the researcher's familiarity with existing knowledge. The researcher reviewed literature related to the study on how Peer-tutoring pedagogical approach influences undergraduate students learning outcomes and what other researchers had said concerning the study objectives. The concept of Peer group, peer group composition and peer group teaching environment. Although the literature on peer effects in education dates back to the 1960s with the famous Coleman Report (1966), the importance of peer-group products is still disputed. Some very bold claims have been made about the potency of peers in child development (Rich Harris (1999)), yet the results of numerous studies are very mixed, finding robust, weak or non-existent effects across a wide range of outcomes. This reflects the difficulty in defining the peer group, isolating causal peer-group effects from other influences, lack of appropriate data, and different identification methodologies adopted by

researchers. Indeed, as Manski (1993) and Moffit (2001) argue, the empirical analysis of social interactions is plagued by conceptual and data problems. For example, it is a common belief that children will thrive if educated amongst better schoolmates, and this belief guides many parents in their choice of school. Many studies have tried to measure this peer-group effect. Our current study sought to determine the influence of Undergraduate Students Peer-Tutoring Pedagogical Approach on Learning Outcome in Federal University of Technology, Minna.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

The chapter describes the research design and the methods used to sample the population and the target population bringing out the sample size. The chapter further looked at data collection methods, research instruments, their validity and reliability, operational definition of variables and methods of data analysis.

3.1 Research Design

This study employed a descriptive survey design, a type of research undertaken to describe characteristics of variables in a situation. According to Best and Khan (2009), descriptive survey design is concerned with conditions or relationships that exist, opinions that are held, processes that are going on, effects that are evident, or developing trends. (Kerlinger, 1969). The descriptive survey design enabled the collection of data without manipulating the research variables. The descriptive survey design is optimized on the strengths of both quantitative and qualitative research methodology. The survey method allowed the collection of data from a large sample population and generated findings that represented the whole population at a lower cost (Saunders, 2007).

3.2 Population of the Study

The target population of the study forms the undergraduate students' federal university of Technology, Minna. The target population is 900, comprising 900 male and female undergraduate students of Minna's, the Federal University of Technology.

3.3 Sample and Sampling techniques

A sample is a smaller group of subjects obtained from the accessible population (Mugenda 2003). The study employed Mugenda (2003) recommended sample size of 10% of the target population. Using the above formula to determine the sample size for the 900 respondents, the Sample size was 18 respondents from each school, making a total of 90students plus five staff in charge of guidance and counselling, making a total of 95 respondents.

Sampling is the process of selecting a number of individuals for a study in such a way that the individuals selected represent the large group from which they were selected Mugenda, (2003). The study employed a random sampling technique to determine the sample size from individual schools. A sampling frame was developed per school that listed all the units in the population. The units were picked randomly until the desired sample size was attained. This enabled every member of the accessible population to have an equal chance of participating in the study.

3.4 Instrument of data collection

Bourke (2005) states that questionnaires are used to obtain two different types of information: First the background information on students, teachers, or others, such as age, gender, amount of schooling, and secondly attitudinal details on some specific events, way of behaving, quality of life, other persons. In the first case, even though the same information could also be gathered in different ways. From institutional records, a questionnaire is simply a convenient way of obtaining the information. In the second case, several items are asked about each attitude or opinion to tap various underlying beliefs or feelings that give rise to the attitudes.

Furthermore, the questionnaire in the study consisted of three major parts. The first part began with demographic information. All students completed the second part, and the third part was completed by teachers in charge of guidance and counselling only. Therefore, the research instruments employed in this study as tools for data collection will be questionnaires entitled to students perception of peer-tutoring pedagogical approach questionnaires (SPOPTPAQ). The instrument has two (2) sections; Section 'A' will elicit bio-data information while section 'B' will

contain a student perception of the Peer Tutoring Approach. A total of 20 items were contained in the questionnaire.

3.5 Validity of the research Instruments

Validity is the extent to which the instrument measures what it appears to measure according to the researcher's subjective assessment (Nachmias: 1958). Validity deals with the adequacy of the instruments; for example, the researcher needs to have good questions in the written task to collect the required data for analysis that can be used to conclude. Frenekel (1993) suggest that the individual who is supposed to render an intelligent judgment about the adequacy of the instruments should be given the instruments before the instruments are administered. Thus, the instruments were amended according to the expert's comments and recommendations before being distributed. In this study, the researcher sought help from the supervisors and lecturers in the school of education to judge the validity of the questionnaire and the questions in the written task.

3.6 Reliability of the research instruments

The study adopted the coefficient alpha (also known as Cronbach's alpha) to determine the internal reliability of the study instruments. The coefficient alpha ranges in values from 0 (no reliability) to (perfect reliability). Gregory (2000, cited in Manning and Munro, 2006) claims: Coefficient alpha is an index of the internal consistency of the items, that is, their tendency to correlate with one another. Therefore, as far as a test or scale with high internal consistency will also show the stability of scores in a test-retest approach, coefficient alpha is a reasonable estimate of reliability. Therefore, a pilot test will be conducted to determine the reliability coefficient with a representative sample of respondents in the university.

3.7 Method of data collection

Permission to carry out the study will be from the head of department, science education, school of science and technology education. The instrument will be distributed to the respondents by the researcher. Respondents are expected to return completed questionnaires personally.

3.8 Method of data analysis

The data collected will be done using means (\overline{X}) and standard deviations (SD). Furthermore, a descriptive chart (bar, histogram and scatter plots) will describe the result. The data analysis will be done using a statistical package for social science (SPSS) version 23.0.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Research Questions

RQ 1: What type of perception do undergraduate students have on Peer Pedagogical Approach

(PTPA)??

Table 4.1:	Mean score difference in	Undergrad	uates Stud	lents Perce	eption of F	Peer 7	futoring
	Pedagogical Approach (P	TPA).					

S/N	STATEMENTS	VU	UT	SWU	Ν	РТ	TR	VT	MEAN(X)	SD
1	Peer tutoring or tutorials is also a suitable method of teaching	79	47	18	13	17	8	17	2.67	1.967
2	I understand more when learning with my peers	71	61	21	12	13	8	13	2.55	1.811
3	I ask questions and interact more with my peers during tutorials	85	44	16	13	17	10	14	2.59	1.941
4	Peer tutoring has helped me improve a lot in the school	79	65	22	12	9	5	7	2.25	1.545
5	Peer tutoring is suitable, but I hardly participate because it exposes me to bad influence amongst the students	28	29	26	28	12	31	45	4.21	2.163
Decisi	GRAND MEAN								2.85	

Table 4.1. Shows the Mean score difference in Undergraduates Students Perception of Peer Tutoring Pedagogical Approach (PTPA). The Table reveals that the grand mean score of responses to the five items was 2.85, which was greater more minor than the decision mean score of 4.00. This implies that Undergraduates Students in Minna do not perceive Peer Tutoring Pedagogical Approach (PTPA).

RQ2: Does gender influence the perception of Peer Tutoring Pedagogical Approach (PTPA) among undergraduate students?

รเน	laents				
S/N	Gender	Ν	Mean (x̄)	SD	Mean Difference
1	Male	84	20.75	5.805	0.235
2	Female	115	21.08	6.040	

 Table 4.2: Mean response of gender on the perception of peer tutoring among undergraduate students

Table 4.2: shows the mean response of gender on the perception of peer tutoring among undergraduate students. The result indicated a difference in the mean response of mean and female with a mean score of 20.75 and standard deviation of 5.805 for males and mean score of 21.08 with a standard deviation of 6.040 for females.



Fig 4.1: Shows mean response of gender on the perception of peer tutoring among undergraduate students

RQ 3: Does academic level influence Tutoring Pedagogical Approach (PTPA) perception among undergraduate students?

S/N	Academic Level	N	Mean (x̄)	SD
1	100	24	19.75	5.855
2	200	24	16.96	4.582
3	300	46	17.30	6.186
4	400	13	18.15	6.568
5	500	92	17.84	6.595

 Table 4.3: Mean academic level influence the perception of Tutoring Pedagogical Approach (PTPA) among undergraduate students

Table 4.3: shows the academic level that influences the Tutoring Pedagogical Approach (PTPA) perception among undergraduate students. The result shows mean of 100, 200, 300, 400 and 500 levels to be 19.75, 16.96, 17.30, 18.15 and 17.84 respectively, with 100 level having the highest mean response and 200 level with the lowest mean answers.



Fig 4.2: Shows mean response of academic level influence of peer tutoring among undergraduate students

- **RQ4:** Does place of residence influence the perception of Peer Tutoring Pedagogical Approach (PTPA)
- Table 4.4: Mean response of residence influence the perception of Peer Tutoring Pedagogical

 Approach (PTPA)

S/N	Residence	Ν	Mean (x̄)	SD	Mean Difference
1	School Hostel	56	16.66	6.150	0.24
2	Off-Campus	143	16.32	7.107	0.34

Table 4.4: shows the mean response of residence influence the perception of Peer Tutoring Pedagogical Approach (PTPA). The result indicated a difference in the mean response of students leaving in the School Hostel and students staying Off-Campus with a mean score of 16.66 and standard deviation of 6.150 for School Hostel and mean score of 16.32 with a standard deviation of 7.107 for Off-Campus students.



Fig 4.3: Shows mean response of residence influence of peer tutoring among undergraduate students

4.3 Summary of Findings

Findings that originated from this study revealed that:

- 1. Undergraduates Students Perception of Peer Tutoring Pedagogical Approach (PTPA) is unperceived by the respondents.
- 2. On gender influence of perception of Peer Tutoring Pedagogical Approach (PTPA), female students use Peer Tutoring Pedagogical Approach (PTPA) than their counterparts.
- 3. On the academic level, Tutoring Pedagogical Approach (PTPA) perception among undergraduate students 100 level having the highest mean response and 200 level with lowest mean responses.
- On the place of residence influence the perception of Peer Tutoring Pedagogical Approach (PTPA). Students in the school hostel use Peer Tutoring Pedagogical Approach (PTPA) than students off-campus.

4.4 Discussion of Findings

Findings of this study revealed Mean score difference in Undergraduates Students Perception of the Peer Tutoring Pedagogical Approach (PTPA). The Table indicates that the grand mean score of responses to the five items was 2.85, which was greater more minor than the decision mean score of 4.00. This implies that Undergraduates Students in Minna do not perceive Peer Tutoring Pedagogical Approach (PTPA). This finding agrees with the following studies (Topping, 1992; & Lawson, 1989).

The findings of this study revealed the mean response of gender on the perception of peer tutoring among undergraduate students. The result indicated a difference in the mean response of mean and female with a mean score of 20.75 and standard deviation of 5.805 for males and mean score of

21.08 with a standard deviation of 6.040 for females. This finding agrees with the following studies (Topping, 1992; & Lawson, 1989).

Findings of this study revealed the academic level influence the perception of the Tutoring Pedagogical Approach (PTPA) among undergraduate students. The result shows mean of 100, 200, 300, 400 and 500 levels to be 19.75, 16.96, 17.30, 18.15 and 17.84 respectively, with 100 groups having the highest mean response and 200 level with the lowest mean answers. This finding agrees with the following studies(Topping, 1992; & Lawson, 1989).

Findings of this study revealed the mean response of residence influence the perception of the Peer Tutoring Pedagogical Approach (PTPA). The result indicated a difference in the mean response of students leaving in the School Hostel and students staying Off-Campus with a mean score of 16.66 and standard deviation of 6.150 for School Hostel and mean score of 16.32 with a standard deviation of 7.107 for Off-Campus students. This finding agrees with the following studies: (Topping, 1992; & Lawson, 1989).

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

For our students to compete in a world that is now a global village with rapid and continuous technological advancement, students need to be vast in knowledge. Given the finding, it is logical to conclude that Peer Tutoring is a critical issue to be addressed for the better performance of all students. Therefore, the following conclusion was drawn from the findings:

- 1. Avenues for Peer Tutoring Pedagogical Approach (PTPA) to be provided to the students either by the school management or the students' unions rather than engaging in politics only.
- A high level of orientation and encouragement will be given to the students on using Peer Tutoring Pedagogical Approach (PTPA) as a learning strategy.

5.2 **Recommendations**

Based on the findings of the study, the following recommendations are made:

- 1. Science students should keep improving in their pedagogical approach to help science students learn abstracts topics and improve in their science subjects.
- 2. Orientation, Workshops, seminars, symposia and conferences should be organized periodically to familiarize science students with recent research findings that would lead to effective and meaningful learning.

5.3 Contribution to Knowledge

- 1. The study helps students realise the need for students' interest and positive attitude towards Pedagogical Approach for a significant academic performance
- 2. The study has added a new dimension to the approach in Learning science subjects in the classroom.

5.4 Suggestion for further studies

Based on the findings of this study, the following studies are suggested for further research;

- 1. Experimental research could further investigate the relationship between teacher pedagogical approach and students pedagogical approach towards students' performance.
- 2. More research could explore other characteristics that can relate to student's factors concerning students' performance.

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