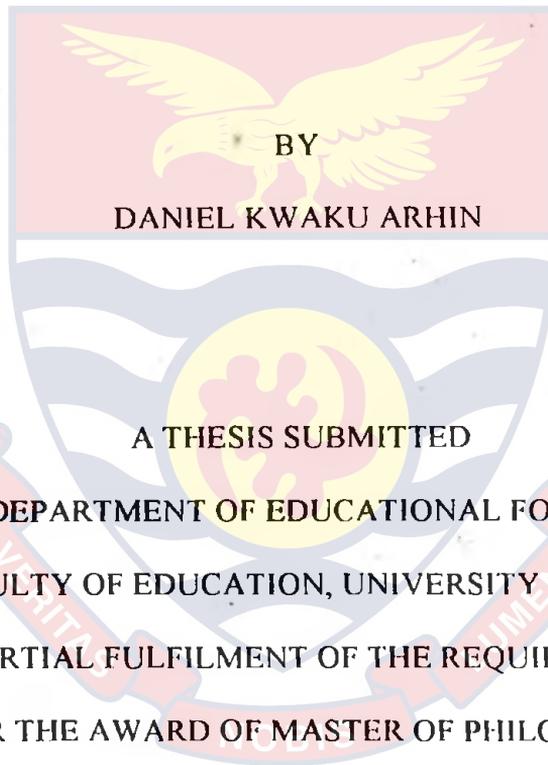


UNIVERSITY OF CAPE COAST

THE EFFECT OF TANGIBLE AND INTANGIBLE
REWARDS ON PUPILS' PERFORMANCE: A CASE STUDY OF PUPILS
IN ASSIN SOUTH ZONE, CENTRAL REGION, GHANA



BY
DANIEL KWAKU ARHIN

A THESIS SUBMITTED
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DEGREE IN PSYCHOLOGY

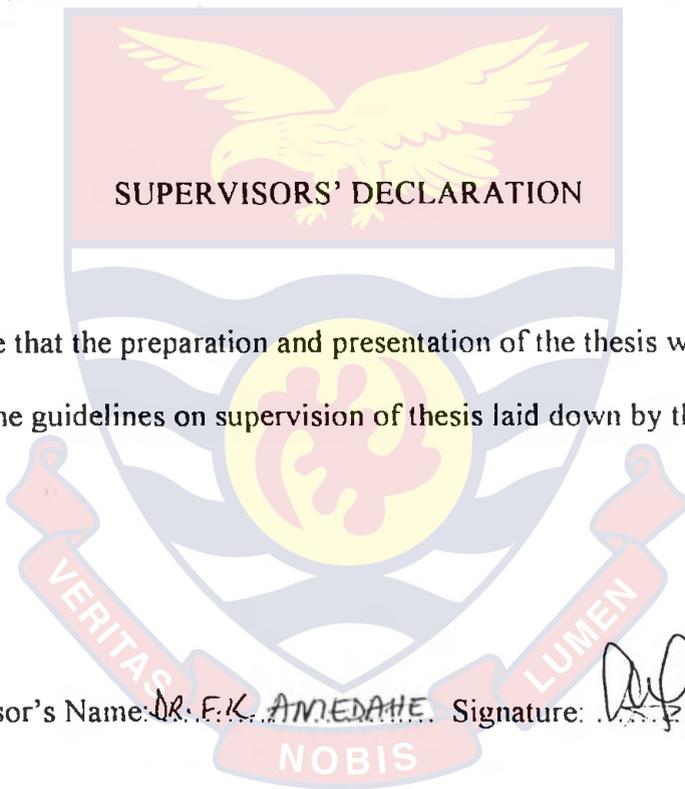
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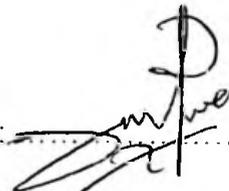
I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Name: DANIEL KWAME ARMIN Signature:  Date: 30-1-2004



We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Name: DR. F.K. AMEDAH Signature:  Date: JAN 30, 2004

Supervisor's Name: DR. J. A. OPARE Signature:  Date: 30-01-04

ABSTRACT

The purpose of the study was to find out the effect of the use of tangible and intangible rewards on pupils' performance.

Six schools were selected from 41 primary six classes by simple random sampling in the Assin South Zone of the Central Region of Ghana for the study. There were 158 pupils involved in the study. They were made up of 102 boys and 56 girls.

Quasi-experimental design was used for the study. The pretest-posttest comparison group was also adopted. The data collecting instruments were pretest and posttest developed by the investigator. The test items were twenty multiple choice questions each for English language and mathematics.

There were three experimental schools and three control schools. The three experimental schools received intervention for one month. The intervention took the form of teaching. The three control schools were taught by their class teachers without the use of any kind of reward. The researcher paid visits to the control schools to ascertain whether the teachers did use any form of rewards. There was a pretest before the intervention and a posttest after the one month period.

The data was analysed by means of independent t-test and one way analysis of covariance (ANCOVA). The major findings of this study are that pupils who received tangible rewards showed a slight improvement in English language and mathematics.

There was a significant improvement in the performance of pupils who received intangible rewards in English language and mathematics. Besides, both tangible and intangible rewards had significant effects on the pupils' performance in mathematics. The use of intangible rewards in schools should outweigh that of tangible rewards.



ACKNOWLEDGEMENT

I wish to express my appreciation and thankfulness to the Almighty God. Without His grace, care and help, this work would never have been accomplished.

It is my pleasure to express my profound gratitude to Dr. J. A. Opare, Dean of the Faculty of Education and my supervisor Dr. F. K. Amedahe of the Department of Educational Foundations for their encouragement, guidance, constructive criticism and suggestions which made this piece of work possible. I am equally grateful to all colleagues who in diverse ways gave suggestions towards this work, especially Messrs Ben Sokpe, a lecturer in the Department of Science Education and John Appiah, an Assistant Director of Enyan Essiam District Education Office, Ajumako.

I am very much indebted to the District Director of Education, Assin, Mr. Nurudeen Inkoom, the headteachers and class teachers of the six schools chosen for the study for their warm reception, assistance and co-operation during my field work. To the pupils who served as subjects used for the investigation, I wish that the Lord Almighty open the way for them to attain greater heights in their academic pursuits. I also wish to record my appreciation and gratitude to the staff of Audio Visual Consult, Cape Coast, for their efficient secretarial services.

Finally, I deem it appropriate to reiterate that every success that goes with this final piece of work be shared with all those who in diverse ways extended their help to me.

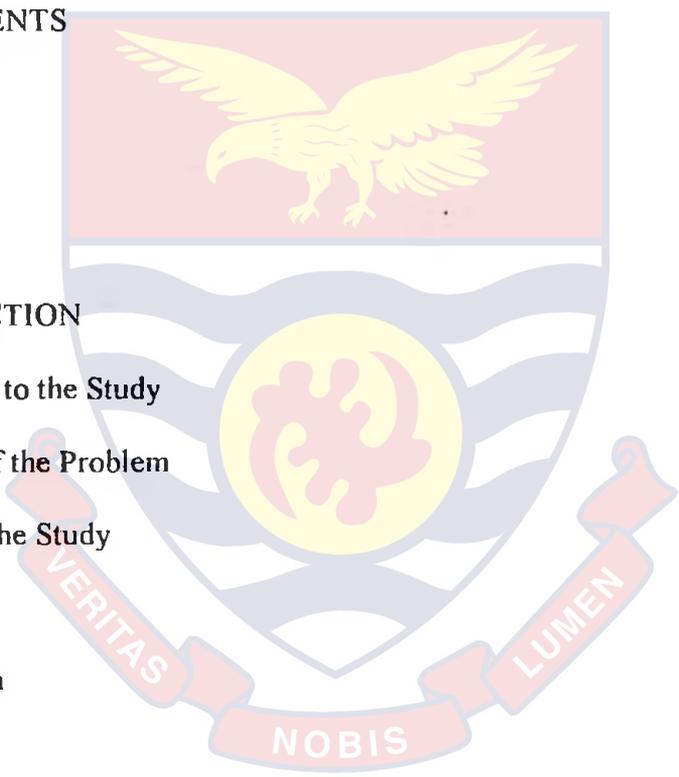
DEDICATION

This piece of work is dedicated to my late loving wife, Beatrice Arabella Arhin,
and to my children Kweku, Ato, Ama and Ekua.



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CHAPTER I

INTRODUCTION

Background to the Study

The basic aim of education is to produce people who will become useful members of society. The success of teachers to satisfy and encourage their pupils to the realisation of the general objectives of education and that of individual goals and aspirations depend to a large extent upon teachers' ability to reward pupils effectively.

Rewards seek to influence conduct favourably by associating pleasant feelings with the desired act. Rewards create pleasurable associations that are strong inducements to repeat the desired act. They also create happiness, generate interest and enthusiasm. Besides, rewards appeal to ego-maximization and development of high morale.

In many learning situations, the correct answer to a problem followed by a reward serves as a motivation to pupils. The reward may be in the form of approval, praise, hand clap or a favourable remark. As behaviourists have shown, the more frequent and immediate the reward, the greater is its motivating effect. According to Petty and Thomes (1994) if a class must complete ten questions from a worksheet, teachers should not allow them to complete the ten questions and then hand them in. Rather teachers should instruct pupils to complete the first three and present these to them for immediate marking; then they should set the next three, and so on. At the end, teachers will be surprised what a difference this makes, even with sixteen year-olds.

School teachers have a greater deal of control over many of the learning experiences they provide for their pupils. The extent to which these learning experiences are registered relatively permanent in the minds of the students depends on how judiciously the teacher uses the reward mechanism.

However, very few teachers use them consistently and well. In terms of the behavioural theory, consequences for behaviour may be described as rewarding according to their effects. Rewarding consequences, also known as positive reinforcers, are those which follow a behaviour and serve to increase its frequency. The important issue, however, is not what the teacher thinks is rewarding but the effect that it has on subsequent behaviour.

What teachers use as rewards will depend upon what they believe to be effective in bringing about change based upon their own experience as teachers. It is believed by psychologists that motivation is a product of the value an individual attaches to success and estimates of the likelihood of success on a given task. Here, the incentives used with student must be valued by them. Some students are not particularly interested in teacher praise or grades, but may value notes to be taken to their parents, a little extra recess time or a special privilege in the classroom.

Rewards have indeed become a useful instrument for classroom learning. Resourceful teachers use their knowledge of the effect of reward on behaviour to enhance the learning process of their students. Skilful teachers make use of feedback to produce rewards for the learner. However, skill is required in supplying feedback so as to continue to produce the desired effect on the learner. The nature of the lesson and the age of the learner will determine the rate of supplying feedback.

Statement of the Problem

It is in the nature of schooling and the way in which schools have to be structured that pupils are taught in groups of varying sizes. Teachers have to learn to be experts in the management of such groups in order to bring about good learning outcomes. In that process, pupils have to learn some basic social skills of co-operation and sharing. It would seem to make sense for teachers to try to identify what children find rewarding and then to structure the teaching environment so as to make access to such rewards dependent upon the behaviour which they want to encourage.

Bruce (1995) in a study into the use of motivational techniques by teachers in the classroom came out with the following findings:-

- i. teachers used the motivational techniques less and least frequently;
- ii. motivational technique like praise was not frequently used by teachers;
- iii. primary school teachers used motivational techniques more than the J.S.S teacher;
- iv. male teachers used motivational techniques more than their female counterparts.

These findings implied that teaching and learning in the classroom did not appeal to pupils. This in a way could contribute to low academic performance. The major task of the researcher was to apply reward techniques to pupils in some primary schools and determine their effect on learning. It is, therefore, typified, in the words of Mace (1968), that men are led to behave sensibly and to do the right thing by a great variety of stimulations and inducements and organisations of circumstances.

Granted that rewards influence performance, what is the relative effect of tangible and intangible rewards on pupils' performance? This is the key issue of investigation in this study.

Purpose of Study

Attempts by classroom teachers and teacher trainees have not been encouraging with regard to the use of rewards as a motivational technique to achieve effective teaching and learning outcomes.

The purpose of this study, therefore, was to find out the effect of tangible and intangible rewards on pupils' performance when used in teaching and learning encounter in schools.

Hypotheses

The study attempted to test the following research hypotheses.

1. Pupils who receive tangible rewards like toffees, exercise books and pens would perform better than pupils who did not receive any form of reward.
2. Pupils who receive intangible rewards like hand claps for and verbal rewards such as 'good' and 'well done' would perform better than pupils who did not receive any form of reward.
3. Pupils who receive both tangible rewards (toffees, pencils) and intangible rewards (well done, good) would perform better than pupils who did not receive any reward.

4. Pupils who receive tangible rewards (pens, pencils) would perform better than pupils who received intangible rewards (good, well done).

Delimitation

The study was restricted to primary six classes in Assin South Zone in the Central Region of Ghana. Six mixed schools were involved. The content of the study was limited to English language and mathematics based on the approved syllabus. The study was delimited to tangible rewards like toffees, pens, pencils, exercise books and money and the intangible rewards include praising the child, telling him that he has done well, clapping for him and making good and positive comments in exercise books.

Limitation

Due to limited time, financial and logistic constraints on the part of the researcher, this study covered Assin South Zone in the Central Region of Ghana.

These constraints, notwithstanding, it is hoped that the resultant findings from this study would constitute a strong basis for generalisation.

Significance of the Study

The importance of rewards in the educational system cannot be overemphasised. The study would be of great immense value to teachers.

The primary focus of the research is the classroom teacher. The findings will provide a better understanding of the value and use of reward techniques in the

classroom. It will therefore aid practising teachers and teacher-trainees to have adequate knowledge in the use of reward techniques so as to improve their teaching skills.

It will serve as a literature in the field of educational psychology. This will expose teachers, teacher trainees, psychologists and all those who are connected with the upbringing of the pupil to the reward techniques.

Definition of Key Terms

For the purpose of this study the following operational definitions were adopted.

1. Rewards are either concrete or non-concrete consequences given for right responses and actions.
2. Tangible rewards refer to concrete materials given for right responses and actions like pencils, toffees and erasers.
3. Intangible rewards refer to non-concrete materials that are given for right responses or actions to specific questions. For instance, they are good, excellent, well done and teacher approval.

Organisation of the Study

The chapter under discussion of which this sub-unit formed part is the introduction. This dealt with the background of the study, statement of the problem, hypotheses, delimitation, definitions and significance of the study. Chapter two discusses related literature concerning the study. This began with theoretical overview and continued with some studies relating to the study and ended with summary. Chapter three gives account of the method used in the study. It examined the population, sample

and sampling procedures for the study. It also discussed the design of the study, administration of instruments and data collection.

Results and discussion of the findings are presented in chapter four, while chapter five dealt with summary of findings, conclusion and recommendations of the study.



CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

The role of rewards in teaching and learning encounter cannot be overemphasised as they are used by teachers and school authorities for the purpose of teaching and learning.

Studies that have been carried out on this concept reveal differences of views expressed on it. This is due to the fact that there are differences in the cultural setting and standpoint of individual writers.

It is against this background that any view that has been expressed on this concept has to be reviewed before a write-up of this nature on the topic can be undertaken in line with the situation in Ghana.

In this chapter literature has been reviewed with the following sub-topics:

Theoretical Review

1. Definition of reward
2. Importance of reward
3. Types of reward
4. Intangible reward
5. Use of praise
6. Teacher attention

7. Tangible reward

Empirical Review

1. Intangible rewards
2. Tangible rewards
3. Summary of literature review

Theoretical Review

Definition of Reward

According to Chaplin (1968) reward is any stimulus, situation or verbal statement which produces satisfaction or increases the probability of a learned act. Lefrancois (1988) defines reward as an object, event, stimulus or outcome, which is perceived as being pleasant. Martin and Pear (1988) also state that reward causes behaviour to increase in frequency. They further elaborate that if in a given situation somebody does something that is followed immediately by a positive reinforcer, then that person is more likely to do the same thing again when he or she next encounters a similar situation.

A common denominator drawn from the three definitions is that to reward is to create a satisfactory situation which will enable the pupil to repeat the act. The psychologists make it clear that as a result of the reward a behaviour occurs but Martin and Pear (1988) put stress on the immediacy with which the reward occurs.

Munn, Fernald and Fernald (1972) reported that Thorndike (1933) in his law of effects reaffirms that a reward is a pleasant state of affairs resulting when a person is ready to do something and is allowed to do it. Thorndike's addition to the definitions discussed so far stresses on a feeling towards what is rewarding to the person.

It can be noted that a rewarding event has to be desirable and pleasant to serve as a stimulus to the recipient, such that its immediate application should induce in one a stronger desire to repeat a behaviour because of the importance one attaches to a particular reward or event.

Munn et al (1972) reported that Skinner's experiment (1948) sent the message he wished to impress upon teachers as the real practical application was that learning occurs when the individual behaves in a certain way and is immediately given a reward for that behaviour. For instance, young children constantly request attention and praise.

Reward is therefore a consequence of the behaviour that caused it through presenting a positive reinforcer after that behaviour.

Finally, rewards are satisfactory situations which increase the probability for pupils to repeat a learned act.

Importance of Reward

Houston and McCarthy (1980) support Skinner's view that the subject is rewarded for making a particular response, or for displaying a particular behaviour. They cite the example of a child learning to sit quietly when rewarded with the opportunity to listen to a story. In addition, he may learn to clean up when praised by a teacher. The child may learn to paint for the satisfaction of creating. Physical activities such as riding a tricycle or bicycle, jumping and hopping may reward themselves. They may also be reinforced by the teacher or by peer approval forms of conditioning in all human life.

According to learning theorists for instance, Skinner (1990) and Guthrie (1952), rewards are extremely prevalent in human civilisation and claim that the search for ‘reward’ is the basis of most motivation.

Skinner (1953) has observed that reward is to affect future conduct favourably. To him, reward seeks to influence conduct favourably by associating a pleasant feeling with the desired act. Skinner (1990) states that in terms of motivating learning, rewards have the following advantages:

- i. they create pleasurable associations that are strong inducements to repeat the desired act;
- ii. they have the advantage of being ideo-motive through the force of suggestions;
- iii. being pleasant, they generate interest and enthusiasm; and
- iv. they appeal to ego-maximisation and develop high morale.

It can be inferred here that reward helps students to gain interest in learning. It also sustains students’ involvement in the learning process. In addition, it enables students to develop their own potential and directs students their full energy towards learning. Furthermore, it appeals to curiosity and attempts to develop self-learning. Events that are followed by a reinforcer tend to be repeated and this fact has obvious application for educators. Jones and Jones (1990) state that students who are struggling in school and obtain few of the more natural reinforcers associated with academic achievements such as grades, teacher – praise, enhanced self-esteem, status and its associated privileges, often require an external reinforcer to stimulate their initial involvement in important academic activities.

Furthermore, Bandura (1969) and Deci (1975) in three different studies are of the view that rewards appear to be most useful when they simultaneously reinforce performance and provide feedback about mastery of subject matter. Gage and Berliner (1991) state that when rewards are provided based on a student reaching designated performance criterion, for example, teachers should agree on a specific goal to help generate pupils' interest.

The idea being conveyed in the above review is that when a student has been rewarded or deserves to be rewarded, he or she must be made aware of why he or she is being rewarded. This could be done when there is a written or verbal comment on the idea behind the type of reinforcement given to the student. Gage and Berliner (1984) are of the view that reward systems for motivating behaviour when used judiciously and monitored carefully do show consistent evidence of effectiveness.

Types of Rewards

From the behavioural point of view, Crider, Goethals, Kavanaugh, and Solomon (1983) write that rewards are thought of primarily in terms of objective reinforcers supplied by the external environment and the subjective internal rewards that come from the individual's own sense of self-satisfaction. External rewards are in some way directly under the influence of the teacher. These can roughly be known as intangible rewards and material rewards also known as tangible rewards.

Intangible Rewards

Crider et al. (1983) commenting on the use of intangible rewards sum up their use of these rewards as most effective when they are as immediate as possible, realistically

applied consistently and awarded by a person who carries prestige and status in the eyes of the recipient. Examples include praise, teacher attention, positive notes to parents, special privileges and home rewards.

Use of Praise

Everyone likes to be praised. Gage and Beliner (1984) stated that praise is the easiest and most natural of the motivational devices available to a teacher.

Flanders and Simon (1969), Rosenshine (1971) in their research indicate that various aspects of praise and corrective feedback are positively correlated with pupils' achievement and positive attitudes.

Brophy (1981) is also of the opinion that praise serves many purposes in classroom instruction. However, it is primarily used to reinforce students on what they are doing right. Overall, it is a good idea to use praise frequently, especially with young pupils and in classrooms with many low-achieving students. When praise is credible, it is given sincerely for good work. Brophy also notes that when teachers praise low-achieving or disruptive students for good work, they often contradict their words with tone posture or other non-verbal cues.

Perrot (1990) writes that several research studies indicate that non-verbal reward refers to the physical messages sent by teachers through cues such as eye contact, facial expressions and body position. For instance, does the teacher smile, frown or remain impassive when a pupil responds in class discussion? Where is the teacher standing? Does the teacher appear relaxed or tense?

All these non-verbal messages indicate to the pupil whether the teacher is interested or bored, involved or passive. A smile, or nod of the head and friendly eye contact can be used to encourage participation. Perrot also is of the view that praise is often a mixture of verbal and non-verbal rewards. For example, the nod and friendly eye contact being accompanied by the phrase “well done” will help pupils to repeat exciting stimuli. In addition, he noted that it is important to reward pupil participation; for instance, ‘that was a good attempt’ and draw the pupil’s attention that the response was not entirely appropriate. Rewarding a good effect is possible even when the answer is incorrect. During problem – solving activities, reward may actually terminate problem-solving altogether.

According to Durojaiye (1976) and Perrot (1990), among the incentives that teachers often use, praise is the easiest and most frequently used. Perrot is of the view that praise not only changes behaviour; it develops confidence and a positive self-image. A pupil who is weak academically and lacks confidence may need considerable help and praise, while a clever and confident pupil may not need so much positive rewards.

Durojaiye (1976) also asserts that praise should be given for good behaviour and the efforts of students so that they will continue to behave in the approved manner to gain adults’ praise. Early psychological studies in other countries have also shown that commendation, particularly in public is on the whole an effective means of motivating learning. Words and praises such as ‘Good’ ‘That’s right’, ‘Excellent’, ‘Terrific’ ‘Beautiful’, ‘Very interesting’ and the like can inspire students into working harder or behaving well.

Unfortunately this kind of reinforcement does not provide specific information on which aspect of behaviour is being reinforced. Therefore, it is important to describe the behaviour being praised. Rather than saying, 'That's nice, Yaw', when Yaw listens attentively, we might say, 'Yaw, I appreciate the way you are listening to the discussion'. Teachers can develop their repertoire of social reinforcers and learn when to reinforce students, which is even more important. Petty and Thornes (1994) support the view that praise is greatly strengthened by eye contact, especially if this is sustained and accompanied with a smile. From the discussions so far, praise, contingent on a certain behaviour, increases the frequency of approved behaviour. This social approval in its many forms is a relatively consistent reinforcer or incentive.

To support the effectiveness of praise, Madsen, Becker, Thomas, Koser and Plager as cited in Slavin 1991 confirm that praise and attention facilitate learning. The pupil must be told why he is being praised. Teachers should also try to reinforce behaviours they want students to stop for example, getting out of their seats without permission.

Alberto and Troutman (1990) support the view that praise should be specific. They also cite the following examples: "I like the way you are sitting"; "That is excellent work"; "You should be proud of what you have done"; "That is just what I wanted you to do".

Harold (1965) notes that the ability to praise is largely a matter of a personal orientation that causes one to see others clearly and to understand them. So if a teacher is able to use praise at an appreciable level, it will lead to the development of self-esteem belongingness and self-actualisation.

Harold (1965) observed that intermittent use of praise is as effective as those given for every pupil's action. Teachers should try as much as possible to relate the use of praise to the teaching-learning process.

Brophy (1981) lists characteristics of effective praise. He notes that effective praise which is delivered contingently has these characteristics:

1. Specifies the particulars of the accomplishment;
2. Shows spontaneity, variety and other signs of credibility;
3. Rewards attainment of specified performance criteria (which can include effort criteria, however)
4. Provides information to students about their competence or the value of their accomplishments;
5. Orients students towards better appreciation of their own task-related behaviour and thinking about problems solving.
6. Uses students own prior accomplishments as the context for describing present accomplishments.
7. Gives recognition of noteworthy effort or success at difficult tasks.
8. Attributes success to effort and ability, implying that similar success can be expected in the future.
9. Focuses students' attention on their work task, that is relevant behaviour.
10. Fosters appreciation of and desirable attributions about task-relevant behaviour after the process is completed.

In inferring from the characteristics of praise above, Brophy (1981) is of the opinion that the first five characteristics motivate pupils to improve upon their performance. The numbers six and seven must be used to motivate pupils whose previous performance was not noteworthy but have now improved. The last three numbers eight to ten cater for pupils whose mastery level is excellent.

Petty and Thornes (1994) support the characteristics listed by Brophy (1981). They are of the view that teachers should praise in every piece of work. In addition, teachers should praise every effort made by pupils. This means that progress and achievement should be praised rather than aptitude or flair.

Also, Petty and Thornes (1994) say, it is often helpful to point out exactly what the teacher is praising and why. For instance, 'Good accent; you are making the sound right in the back of your throat', is better than just 'Good accent' and much better than just 'Good' which could mean simply 'Good Grammar'. If a teacher points out what he is praising and why, it will give them the encouragement to learn.

Alberto and Troutman (1990) also support the use of praise as an effective reward in teaching and learning encounters. They emphasise the use of words and phrases as praise by teachers. They cite the following example, "I like the way you are sitting." "That is excellent work", "You should be proud of what you have done. That is just what I wanted you to do, You should show this to your parents".

Bull and Solity (1993) are of the view that there is more to praise than just saying "Well done". What is said and how it is said contribute to the effectiveness of praise in strengthening 'Good behaviour'. They have outlined five effective ways of using praise. The steps are:

- i. Gain attention and show approval
- ii. Say why you are pleased.
- iii. Say what progress or improvement there has been
- iv. Mention other consequences which may follow
- v. Give a motivational challenge.

What is deduced from the five steps of Bull and Solity is that pupils concerned must be made aware of the exact behaviour emitted which deserved to be praised. This would serve as a challenge and motivate or urge pupils to achieve success.

MacCarthy and Houston (1980) support reward training by noting that the pupil is rewarded for making a particular response, or for displaying a particular behaviour. For example, a pupil may learn to sit quietly when rewarded with the opportunity to listen to a story. He may learn to clean up when praised by a teacher.

Teacher Attention

Bull and Solity (1993) say teacher attention should involve pleasant interactions with pupils. Special positive attention from the teacher is one of the most effective rewarding experiences that pupils can have. Most students respond enthusiastically to that attention. It can be given in the form of greetings, short talks, compliments, acknowledgements, smiles and frequent eye contact. It involves saying positive things to pupils. Also, the use of expressions such as smiling, winking, nodding and nearness to the student for example, walking together, sitting together, playing games with students

by the teacher after school make pupils feel motivated. Also touching, hugging, shaking hands or holding hands are types of social rewards that pupils are so pleased to receive.

Alberto and Troutman (1990) support teacher attention, as a form of social reward and break it into categories of expressions, contacts, proximity and privileges.

Expressions are some of the non-verbal rewards used as teacher attention on pupils, for example smiling, winking, laughing, nodding and clapping. Contacts include hugging, touching, shaking hands, holding hands and patting head or back.

Proximity involves non-verbal expressions such as sitting next to pupils at lunch, sitting next to the pupil on bus trips, placing the pupils' desk next to the teacher's, sitting on teacher's lap during story time and being teacher's partner in a game. Privileges can take the form of having good work displayed being leader of an activity, being classroom monitors and being a captain of a team.

Tangible Reward

Alberto and Troutman (1990) and Bull and Solity (1993) have classified tangible rewards to include merit or credit marks, good termly reports, certificates, house points, privileges, special responsibilities, badges of office, adhesive stickers, posters, pencils, special rubber stamps, toys, magazines, money, handkerchiefs, other token prizes, edibles such as toffee, nuts and food.

These forms of rewards are good in themselves but, because they tend to be material in nature, they should not be frequently used. The danger is that either a few children often get these awards and other children are left out and are discouraged; or other children do everything they can by fair or foul means to receive some of the

awards, thus creating disciplinary problems. When tangible rewards are used, the teacher must make sure that a good proportion of students benefit from them.

Crider et al. (1983) agree that material or tangible rewards usually carry some desirable intrinsic value too, as with certain privileges. They can, in addition, particularly in the case of good termly reports, attract further rewards outside the school, notably parental approval and perhaps, in consequence, yet more privileges and treats. Thus, the awarding or withholding of tangible rewards in school can be an effective aid to the teacher in the maintenance of classroom control and certainly should never be treated in the somewhat dismissive fashion that obtains on occasions when it comes, for example, to the writing of termly or yearly reports.

Crider et al. (1983) state that the giving and withholding of tangible rewards can be built into a complete system for the maintenance of control and the modification of behaviour. They further state that, under such a system, sometimes known as token economy, students are awarded points or tokens each time they produce a previously agreed item of behaviour. For instance, if a pupil remained seated for five minutes in his or her class or refrained from aggressive behaviour towards others during a lesson.

Crider et al. (1983) express the view that such systems work best in closed institutions, such as residential schools, where the reward system is under the extensive control of those in authority and where the pupils' behaviour can be monitored throughout the day. They are less likely to be effective in an open community like the ordinary school, where the staff have contact with the pupils for only a limited time and where staff-pupil ratios are not favourable enough to allow the close and continuous monitoring of individual pupils' behaviour which the token economy ideally demands.

Nevertheless, in a modified form the token economy does have a place in the ordinary school in certain circumstances, provided that the staff are all agreed as to its value, know what is involved and operate it consistently.

Bull and Solity (1993) classify token economy as a reward. They say token rewards are useful as they can be given immediately and can even be exchanged for other rewards later on. They also act as a link from the desired behaviour to a delayed reward such as a period of free activity choice at the end of the session or day. Here, pupils are to be awarded materials like badges to be worn for the day. Stars may be stuck in pupils' books or on a wall chart, or points maybe given for remembering to follow classroom routines.

Bull and Solity (1993) are of the view that tangible rewards would be perhaps the least natural of all rewards occurring in school when used on an everyday basis or with older pupils. They seem more likely to be reserved for the commendation of excellence including, as they do, prizes of all kinds.

Whenever so-called 'back-up' rewards, such as specially arranged activities or material rewards are used it is essential that they are always paired with a more naturally occurring event, such as praise, and with feedback of exactly why the pupil is praised.

Empirical Review

The empirical review focuses on the practical research experiences of psychologists regarding rewards. The broad discussion is based on intangible and tangible rewards.

Intangible Rewards

Lindgren (1956) conducted an experiment on students who were completely unaware that they were subjects of an experiment. The experimenter carried on what appeared to be an informal conversation with subjects but actually behaved according to plan. In the end, there was marked increase in frequency of responses. It was also observed that when the reward was withdrawn the responses decreased.

In the above experimental study, it was noted that the behaviour of the subjects was shaped through reinforcement. The subjects in each case were manipulated by the experimenter into giving that behaviour.

Petty and Thornes (1994) examined twenty-eight variables they thought might be related to a teacher's effectiveness. One of the few they found to be important was that successful teachers are more likely to praise students who answer questions.

Engle and Snellgrove (1974) in their studies came across a psychologist who conducted an experiment on rewards and punishment. The psychologist had four groups of pupils with equal ability to work on a series of tests in arithmetic addition for five consecutive days. The first group was praised publicly for their work. The members of the second group were publicly reprimanded for poor work. The third group was ignored, although they were in the same room and could observe the proceedings. The fourth group served as a control and did not know what happened in the other room.

The result of the experiment was that, reward and punishment were equally effective in producing desired school activity. After the first session, however, punishment lost its effect, whereas reward continued to be effective till the end of the experiment. As for the ignored group, they profited slightly by their observation. The

control group did not perform in all the five days. The impression created here is that it is usually better to use rewards rather than punishment.

✓ In another study, Engle and Snellgrove (1974) asked the subjects to make up sentences using words printed on cards. Each card contained a verb and six pronouns. The pronouns were he, I, she, they, we and you. Each sentence had to contain one of the pronouns and the verb. Engle and Snellgrove specifically used intangible reward 'good' whenever a sentence containing the pronoun I or we was given. The construction of sentences containing the other pronoun was not rewarded in the control group. In the course of eighty trials there was a steady increase in the number of sentences containing I and we, whereas with the control group of subjects, to whom no reward was given, there was no increase.

Engle and Snellgrove (1969) in a study of one hundred and twenty-four, fifth – grade pupils were given a simple work test. The teacher praised them by writing a (good) or blamed them by writing a (poor) on the test papers, regardless of the work accomplished. The pupils in this study had all been given a personality inventory. The children were unaware that they had been divided into two groups: Introverts and extroverts. It was found that praise increased the work output of introverted children, while blame increased the work output of extroverted children. Here, individual differences in personality must be considered when applying rewards.

Deci (1975) found some intriguing differences in the reactions of men and women to reward. Deci's study investigated the effects of praise on subjects' interest in working on puzzles. Women who were praised showed the typical decrease in intrinsic motivation while men responded to praise with increased intrinsic motivation.

The most probable explanation is that the men regarded the praise as a means of conveying information about competence. Hence, they became more interested in working on the puzzles. Women, on the other hand, saw praise as controlling their behaviour.

✓ Alberto and Troutman (1990) in a study observed a teacher who provided very high rates of verbal praise for reading, studying and completing mathematics problems for seventh grade pupil who scored 2 Cs, 2 Ds and F at the end of the first semester examination. The student's mother informed the private teacher later that three of his teachers had written notes indicating that the student's work in their various classes had improved dramatically. Test papers from all classes were As and Bs. Here, the private teacher has accomplished his task by using praise to reward the student to obtain As and Bs at the end of the day.

✓ Munn et al. (1972) in a study to assess pupils on an introversion-extraversion scale on a perceptual – motor task used praise for their efforts regardless of their actual performance in the experimental group. The results indicated that receiving praise was more effective than the absence of reinforcement, as shown by the control group which received no response from the teacher. It was also evident that praise tended to be particularly effective with introverts.

Tangible Rewards

Hoffman, Mitsos and Protz (1958) in experiments dealing with the improvement of intelligence tests found out that some students showed greater need for tangible rewards than others. They observed that when high school students from middle-class

and working-class homes were asked to undertake a task involving hand-eye coordination, middle-class students scored higher than working-class students. However, when a money reward was offered for scores above a certain standard, working class students were unable to improve their scores. The reason assigned to this research is that lower-class students are likely to look for rewards that can be achieved in the immediate present while middle-class students look at the future employment due to present success in school.

In another set of experiments dealing with the improvement of intelligence test scores under the stimulus of a money reward, both middle class and working class students improved their scores, but working class students' gains were greater and more consistent than middle class students' gains. The experimenters concluded that when middle class children are stimulated by money rewards to strive harder, the level of their performance rises.

Ruch and Zimbardo (1971) studied a fourteen-year boy who had never received a single passing grade in over eight years of schooling. This boy was reading at a second grade level. Tangible reward in the form of money was instituted in an effort to deal with the boy's reading problem. Initially, he received money for merely reading words correctly. A gradual process of shaping was employed, with the criteria for reward becoming consistent. The boy began to read sentences and then whole paragraphs. Finally, he was able to read short stories and was rewarded for answering questions relating to content. Not only did he make a great deal of progress during the training programme, but he also seemed genuinely interested in the reading material. His

progress also affected his general performance as he received passing grades in all his school subjects. Furthermore, there was a marked decline in his recalcitrant behaviour.

Lindgren (1956) also got similar results in a study of the rewarded and un-rewarded performance of middle-class and working high school students. He accounted for the differences in response by the fact that middle class parents continually compare their children to age-mates, urge them to greater and greater individual achievement and teach them to respond to symbolic rewards (such as school grades). Working class pupils, on the other hand, are not under such pressure to achieve and are taught to perform tasks in which the rewards are immediately forthcoming.

Bull and Solity (1993) studied a group of second year juniors who were boisterous and giggly. The pupils had been together for a year and knew each other well. Bull and Solity experienced difficulty in overcoming the groups' consequences merely by praising children when they were working and ignoring them when they were not. Difficulties were most apparent during morning sessions, when activities usually involved work on mathematics and English tasks. They, therefore, decided to arrange a reward for the whole group based on everyone's behaviour during the morning. Having seen that everything was systematic, they wrote three basic ground rules for a wall poster.

- i. We stay in our seats
- ii. We work quietly
- iii. We put up our hands to ask or to tell.

Bull and Solity (1993) then explained the rules to the pupils. Pupils who obeyed the rules were awarded one point on the board. Those who earned sufficient points in the

morning had the last fifteen minutes of the session for free choice activities. They continued with encouragement and reward for individual work as they had previously done. They were pleased to find that adding a group reward to their own reinforcement for individual work had the desired effect. Children worked more quietly and more work was completed in the shorter session. When they found out that good behaviours had been established in the classroom, they withdrew the game gradually.

Alberto and Troutman (1990), studied Raphael, a junior-high-school English teacher on a topic: 'Students learn to come to class on time'. The students in all three of her morning classes consistently came late. She began to record baseline data on the three classes. She recorded the number of students in their seats when the bell rang. She found that an average of five students in the first class, four in the second and seven in the third class were in their seats.

Raphael recorded an extra-credit point in her grade book for students in the first class who were seated when the bell rang. Within a week twenty-five students were punctual and seated. The baseline data for the other classes showed no change during this intervention. When the intervention was applied in the second class, the number of students on time increased dramatically.

She applied the intervention in the third class with similar results. Raphael had accomplished two things: (a) she had succeeded in getting her classes to arrive on time and (b) she had established a functional relationship between her intervention (the independent variable) and her students' behaviour (the dependent variable).

In another study by Merret and Tang (1994) about the attitude of British primary school pupils to rewards and punishment, it came to light that primary aged pupils had

the same definite idea about the effectiveness of rewards to be more suitable for academic work than for social behaviour. Girls, generally, were more likely than boys to favour rewards for academic work.

Houghton, Merret and Wheldal (1988) in a study about the attitude of British secondary school students towards rewards and punishments, concluded that the students have definite ideas about the effectiveness of rewards and punishments in school. Students regard free time and a positive letter home as being appropriate rewards for both academic and social behaviour. Girls generally were more likely than boys to favour rewards for academic work. Perhaps the most important idea that emerged of the study was the importance of communication with parents about how children progress and behave in school.

Wortman et al. (1992) studied a year-old boy who had problems in addition. They assigned him a set of additional problems and placed a large watch in front of him. He worked on the problems quietly and steadily. When he had finished he noted the time and called the teacher. The teacher collected the work, smiled and said, 'very good'. This was followed with a large candy bar. The result was that the boy's academic performance in addition was improved.

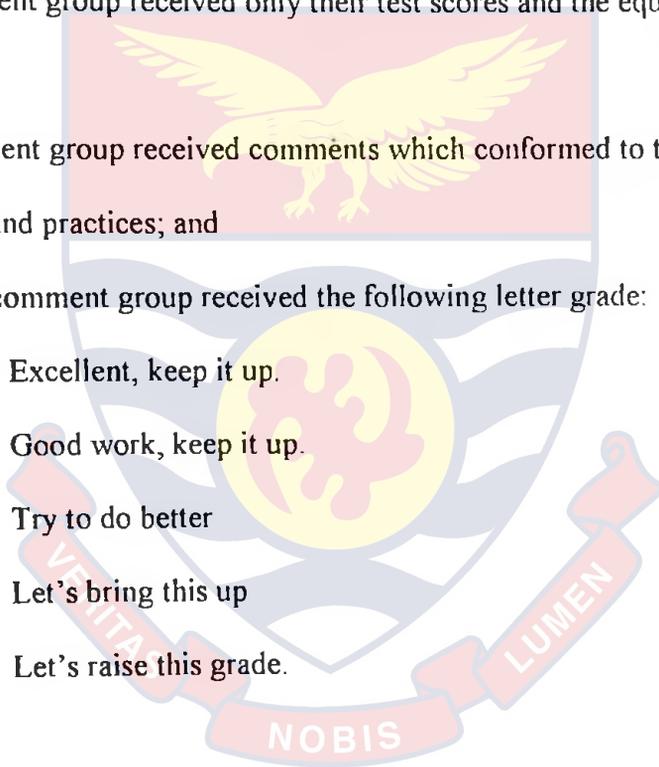
Gilmar (1973) in a study observed hundreds of college students who were working on intrinsically interesting puzzles which they reported finding enjoyable. However, some were paid money and some were not. The first thing he discovered was that once subjects began to receive money for doing an interesting activity, their intrinsic motivation to perform the activity decreased. That is, they then became less willing to perform the activity in the absence of money than subjects who had not been paid.

Apparently, the paid subjects became dependent on the money and lost their intrinsic motivation. In theory, the “locus of control of their behaviour” had shifted from within themselves to the external reward.

✓ Page (1958) studied two thousand one hundred and thirty-nine students in seventy-four classrooms, on the effects of grades, written comments and grading policies.

Teachers were asked to mark the objective tests of these students in three ways:

- (i) the non-comment group received only their test scores and the equivalent letter grade;
- (ii) the free-comment group received comments which conformed to the teacher’s own feelings and practices; and
- (iii) the specified-comment group received the following letter grade:
 - A - Excellent, keep it up.
 - B - Good work, keep it up.
 - C - Try to do better
 - D - Let’s bring this up
 - E - Let’s raise this grade.



All groups received test scores and letter grades. The student subjects were totally naïve; none of them was aware that he was an experimental subject. In the second phase of the experiment the students were given a second test to determine the effects of these three grading practices. Both the free-comment and the specified-comment groups did better than the non-comment group. The free-comment group did better than the non-comment group. The free-comment group did better (but not significantly better) than

the specified-comment group and showed the greatest improvement. Page (1958) concluded that teachers should take their time to write encouraging comments on student papers.

However, a frequent question that parents and teachers pose to psychologists is whether explicitly rewarding an activity that a pupil or adult should be interested in for its own sake, such as reading, will undermine the child's intrinsic interest in the activity. A study into this was made by Lepper, Greene and Nisbett (1973) of preschoolers' interest in drawing pictures with magic marker pens. This was a novel activity they found moderately interesting to do. Some of the children drew pictures in a laboratory room knowing that they would earn a desired toy prize if they drew enough pictures for the experimenter, and all received toys. Controlled children could draw pictures if they wanted to but no prize was mentioned or given to them. Later, in play periods in their regular classroom, the rewarded children were observed to spend less time than the controls drawing with the marker pens and they rated it as a less interesting activity than other alternatives. A symbol interpretation is that the rewarded children come to think of the marker-pen drawing as something to be done "only for pay" and so they do not engage in it when a reward is not forthcoming.

Deci and Ryan (1980) in another study of college students were asked to work on a series of puzzles that they found intrinsically interesting. Some students were paid one dollar for solving each of the four puzzles. Others were not paid. At a later point in the experiment subjects were left to occupy themselves in a room where they could work on more puzzles, read magazines, or engage in other activities. The subjects who had been paid for completing puzzles spent less time working on them during this free-time period.

These students became less interested in solving puzzles because they were no more been paid.

From the above Deci and Ryan (1980) suggest that teachers and parents should not use external rewards to promote desired behaviour unless the rewards are clearly needed to induce interest. This suggests caution in installing token economics or extrinsic systems for an entire class or group of people for every task. Without regard for whether a particular person needs the rewards to motivate his or her interest in the task.

The issue of effective use of tangible and intangible rewards on pupils' performance has been the source of debate and experimentation. Which of the two is a more powerful motivational technique? This issue is still not fully resolved and this has been this researcher's paramount objective.

Summary of Literature Review

It has been made clear in this review that the use of rewards for teaching and learning situations is very important. Views on the use of tangible and intangible rewards by psychologists varied. Both tangible and intangible rewards were powerful motivational technique for teaching and learning. However, care must be taken in their administration, especially, the use of tangible rewards. For example, Brophy (1981) was of the view that students who receive rewards for participation in an activity frequently show less interest in subsequent ones when the rewards are withdrawn.

CHAPTER 3

METHODOLOGY

Introduction

The study investigated the effects of tangible and intangible rewards on learning of primary six pupils. This chapter discusses the methodology adopted in carrying out the study. It covers population and sample, design of the study, administration of treatment and procedures used to analyse data.

Population and Sample

The population for the study comprised all primary six pupils and their teachers in the Assin South zone in the Central Region of Ghana. There are forty-one (41) primary six classes in the zone. Out of the forty-one (41) primary six classes, six were randomly chosen for the study, using the simple random technique. The six schools and subjects involved are shown in Table 1.

Table 1

Schools and enrolment

| School | No. of Pupils | | Total |
|----------------------------------|---------------|-----------|------------|
| | Boys | Girls | |
| Assin Kumasi D.C. Primary | 18 | 10 | 28 |
| Assin Nkran D.C. Primary | 21 | 16 | 37 |
| Assin Odumasi D.C. Primary | 8 | 2 | 10 |
| Nyankumasi Ahenkro D.C. Primary | 18 | 17 | 35 |
| Assin Sibirso Catholic Primary | 22 | 6 | 28 |
| Assin Bosomadwe Catholic Primary | 15 | 5 | 20 |
| Total | 102 | 56 | 158 |

The sample size is 158 pupils of which 75 were in the experimental groups and 83 in the control groups. The sample consisted of pupils with varying socio-economic background. Parents of subjects from all the six schools were predominantly farmers with few of them being artisans, carpenters, masons, drivers, teachers and petty traders.

The class six pupils were chosen for the study because they were preparing to enter Junior Secondary School. These pupils were therefore willing to participate in any intervention programmes that would improve their capacity. The age range of the pupils was from 11 to 15 years with an average age of 13 years.

The Design of the Study

The design of the study was a non-randomised pretest – posttest control group design. This design was chosen because the study attempted to show cause-and-effect of the administration of tangible and intangible rewards on pupils' performance in English language and mathematics.

The study was conducted as a quasi-experimental research involving pre-existing initial groups of pupils rather than assigning pupils to treatment at random. For a research done in a school setting, it may be difficult to randomly assign subjects to treatment because it disrupts the teaching programme in the school. Under these conditions quasi-experimental research is preferred, for it allows for some control without necessarily disrupting the school teaching programmes. The use of intact groups was also applied. These intact groups refer to what Borg and Gall (1989) define as members of administratively defined groups rather than as individuals.

The design employed six equivalent groups of pupils, the first three constituted the experimental groups while the other three formed the control groups. Both the experimental and control groups were taken through a four week tuition in English language and mathematics.

$$O_1 \rightarrow X_1 \rightarrow O_2$$

$$O_1 \rightarrow C_1 \rightarrow O_2$$

$$O_1 \rightarrow X_2 \rightarrow O_2$$

$$O_1 \rightarrow C_2 \rightarrow O_2$$

$$O_1 \rightarrow X_3 \rightarrow O_2$$

$$O_1 \rightarrow C_2 \rightarrow O_2$$

The design was set as follows:

Where X_1 is intervention using tangible rewards and C_1 the control group for X_1 .

Where X_2 is intervention using intangible rewards and C_2 the control group for X_2 .

Where X_3 is intervention using both tangible and intangible rewards and C_3 the control group for X_3 .

Three groups received the experimental treatments (X_1 , X_2 and X_3) while the three other groups did not receive any (C_1 , C_2 and C_3). The control group is crucially important in all experimental researches, for it serves the purpose of determining the effectiveness of the treatment Fraenkel and Wallen (1990).

The study, which took four weeks to complete, was divided into three phases. The first phase involved the administration of pretest to the six groups of pupils. The second phase which constituted the intervention, involved the teaching in all the six schools. The three experimental schools were administered with tangible (X_1), intangible (X_2) and both tangible and intangible (X_3) rewards. During this phase, the researcher assisted in teaching the experimental groups. The third phase was the administration of posttest to all the six groups of pupils.

The basic idea behind this research was to attempt to account for the influence of a factor. Two situations (experimental and control) were created and each situation was assessed in order to establish comparability. An attempt was then made to alter one of these situations (experimental groups) by introducing an extraneous dynamics. Each group was then reassessed after the intervention and whatever change noticed was presumed to have been caused by the extraneous dynamics.

Pilot Study

The pilot study was conducted in Cape Coast Municipality from 20th November to 11th December, 1997 in six selected primary schools: Kakumdo, Mpeasem, Pedu 'B', Abura English Arabic, Esuekyir and Efutu.

The researcher prepared all the test items by collecting various terminal test items from fifteen different schools within the Assin South schools for collation. The test items were carefully vetted with respect to content validity and face validity by my supervisor. Having incorporated these modifications and suggestions, the final test items were produced.

To assess the reliability of the instruments used in the study, the pretest and posttest items were administered to 23 primary six pupils in Cape Coast Municipality. The six primary schools were paired accordingly: Mpeasem zion (experimental, tangible) with Esuekyir M. A. (control), Pedu 'B' M. A. (experimental, intangible) with Kakumdo M. A. (control) and Abura English/Arabic (experimental, both tangible and intangible) with Efutu M. A. (control). The pretest was conducted in all the six schools.

The treatment which was administered was the teaching of English language and mathematics. Posttest was later conducted after the treatment. Both pretest and posttest utilised multiple-choice items in English language and mathematics.

The multiple-choice test responses for both English language and mathematics were scored dichotomously – one mark for a correct response and zero for an incorrect response. Consequently, the Kuder-Richardson formulae 20 (K – R 20) was applied to compute reliability coefficient. The K – R 20 yielded a coefficient of 0.78 and 0.81 for English language at pretest and posttest respectively. For mathematics the reliability coefficient was 0.81 and 0.84 at pretest and posttest respectively. On the basis of these scores, the tests were considered reliable.

A pupil was not happy about the administration of tangible rewards when he challenged a research assistant why she did not reward him but the other pupil.

Generally, pupils were interested in material rewards hence they were eager to answer questions.

Data Collecting Procedure

As a prelude to the whole research exercise, the investigator collected a letter of introduction (Appendix A) from the Head of the Educational Foundations Department, University of Cape Coast. This letter was taken to the Assin District Director of Education. The District Director in turn sent letters to the headteachers of the selected schools informing them officially about the whole exercise (Appendix B).

The researcher selected 20 primary schools out of the 41 schools in the Assin South zone for the study. However, on the advice of the District Director of Education and the circuit supervisor for the circuit, six primary schools were finally picked.

The researcher paired the six primary schools using the following process. The names of the six primary schools were written on pieces of paper and put into two different bowls. A piece of paper was picked simultaneously from each bowl to form the pairings. Assin Kumasi D.C., Assin Nkran D.C. and Assin Odumasi D.C. were designated the treatment groups while Assin Sibirso D.C, Assin Bosomadwe D.C and Nyankumasi Ahenkro D.C formed the control groups.

The three treatments – tangible, intangible and both tangible and intangible were written on sheets of paper and put into one box. The names of the three treatment schools were written on pieces of paper and also put into another box. After simultaneous pickings, the following results were obtained: Assin Kumasi D.C. primary – tangible;

Assin Nkran D.C. primary – intangible and Assin Odumasi D.C. primary – both tangible and intangible.

The researcher trained the teachers who served as the research assistants for two days in order to competently play their expected roles in their classrooms. The teachers in the control schools were advised not to use any form of reward, both oral and written during the one month duration. The teachers in the treatment schools were to apply the specific reward meant for the pupils in their classrooms. They were to reward the pupils for correct responses. The role of the teachers became inevitable because the researcher alone could not teach in the three schools within the four week period and also visit the control schools to ascertain whether the treatment had been correctly applied to achieve the designed results.

The researcher conducted the pretest in all the participating six primary schools in English language (Appendix C) and mathematics (Appendix D). There were twenty multiple choice questions for both subjects. Pupils were asked to answer all questions. The three experimental schools received treatment for one month. The normal thirty minutes duration and the class time table were adhered to in order not to let other subjects suffer. The total periods for English language and mathematics for a week which stood at nine and ten respectively were used for the experimental teaching. This was an agreement between the investigator and the class teachers. An attendance sheet was prepared by the investigator to monitor pupils' attendance in class.

In January 1998, experimental teaching which was done by both the investigator and the class teachers commenced and lasted for four weeks. The teachers in the three control schools also taught their pupils without the use of any rewards. Posttest in

English language (Appendix E) and mathematics (Appendix F) involving multiple choice questions were administered to the pupils in the six primary schools after the one month period. Pupils were asked to answer all questions.

As schools in the country follow the same time table it was highly impracticable for the investigator to teach in all the three schools the same day. In this wise, a schedule was made by the investigator and given to the class teachers to adjust their time table to enable the investigator to teach at the specific times.

Administration of Rewards

The researcher trained the teachers who were the research assistants and distributed the reward items to them. These included exercise books, pencils, pens, erasers, toffees and biscuits as the tangible rewards. The intangible rewards involved praise, teachers attention, positive note to parents, and home rewards.

The pupils of Assin Kumasi D.C. Primary School received tangible rewards, Assin Nkran received intangible rewards while Assin Odumasi received both tangible and intangible rewards. Nyankumasi Ahenkro, Assin Bosomadwe and Assin Sibirso formed the control groups.

The pupils of the three schools, who were subjected to treatment, received their rewards on performance. All pupils who made an attempt to provide correct answers were rewarded. For instance, when a pupil tried to answer a question correctly, he was rewarded with a pen, a pencil and toffee only, those in intangible school were also rewarded by the 'praise' and 'good' only and the third school both pens and praise.

Also, pupils who showed enthusiasm and willingness to learn were rewarded with both tangible and intangible rewards where applicable. For instance, tangible rewards were used at Assin Kumasi. A pupil who correlated integers in mathematics to real practical life situation as high and low temperature and debt and savings was given a bic pen. This gingered the pupil on to answer more questions to earn him or her rewards. It also motivated other pupils to earn rewards and sometimes led to simultaneous responses.

At Assin Nkran, intangible rewards were used. In an English language lesson, a pupil was able to identify five adjectives at Unit 5. The pupil was rewarded with praise for being able to identify five adjectives. This motivated the pupil to answer questions with perfection. The two examples above ran through the intervention period.

In the control schools, pretest was conducted. The teachers taught in their classes for the one month period. They were trained not to use any reward during the one month period. The researcher paid visits to the schools during the period. The pupils were unaware that they were subjects for a study. At the end of the one month period, the posttest was administered on them.

Administration of the Tests

The administration of each of the two tests took the form listed below:-

- (a) The researcher printed the test items on sheets of paper and each class teacher (research assistant) helped in the distribution of the test paper.
- (b) Pupils were asked to write their identification numbers at the space provided on the question paper.

- (c) The researcher read the instructions clearly to pupils before they started work. A duration of forty and twenty minutes was allotted to mathematics and English language respectively.
- (d) Pupils were asked to start work but prior to the commencement of work the researcher impressed upon pupils to work accurately.
- (e) To avoid disturbances, pupils were instructed to raise their hands when they finished their work.

Analysis of Data

The pupils involved in the study were given two tests, a pretest before and a posttest immediately after the intervention in February 1998. The scores from these two tests were used as a basis for the statistical analyses in this report.

The independent t-test was used to analyse the pretest scores of the experimental and control groups. This was done to find out if there was an initial difference in the groups. Where there was no difference, the same independent t-test was used to analyse the post-test scores of the experimental and control groups. When a significant difference emerged at the pretest level, the analysis of covariance (ANCOVA) was used to analyse the posttest scores. According to Borg and Gall (1989), the use of analysis of covariance reduces the effects of initial group difference statistically by making compensating adjustment of the final means on the dependent variable.

The Statistical Package for Social Sciences (SPSS) software was used to compute the descriptive statistics, the t-test and the ANCOVA to analyse the data.

Statistical Significance

The study used 0.05 level of significance to test the hypotheses. According to Som (1973), controls in researches involving the behavioural sciences tend to be so complex that it is unrealistic to set the level of significance lower than 0.05 and it is only fair to use 0.05.



CHAPTER 4

RESULTS AND DISCUSSION OF THE FINDINGS

Introduction

The chapter deals with the results of the performance of pupils studied. Whenever applicable, tables are provided to illustrate and support the findings. In analysing the performance vis-à-vis the research questions raised, the frequency, percentage, mean and standard deviation tables were constructed.

The independent t-test statistics were used to compare pupils' performance in the pretest and post-test levels for experimental and control groups in each subject area. Multivariate test involving the use of analysis of covariance (ANCOVA) was employed using the SPSS. This was done to investigate any differences found among the experimental and control groups as to the main effects of the treatments they received.

Four hypotheses were used for the study. Hypotheses 1, 2 and 3 compared experimental group with its control group in terms of pupils' achievement in the pretest and post-test for both subjects. Hypotheses 4 also dealt with comparison of the performance of pupils who received tangible and intangible rewards.

Background Information

The study was conducted in six (6) primary schools in Assin South Zone of Assin District. The number of pupils who took part in the pretest and post-test was one hundred

and fifty eight (158) made up of one hundred and two boys (102) and fifty-six (56) girls. Pretest and post-test were taken by each group at the beginning and end of the treatment period. Each test was scored out of 20 marks. The achievement scores of the pupils of Assin Kumasi D. C. primary school are presented in Table 2.

Table 2

Frequency distribution of pretest and post-test scores in English language and mathematics for Assin Kumasi D. C. primary school. Experimental group (tangible rewards)

| Score | English language | | Mathematics | |
|-------|----------------------|------------------------|----------------------|------------------------|
| | Pretest Frequency | Post-test Frequency | Pretest Frequency | Post-test Frequency |
| 3 | 0 | 0 | 4 | 0 |
| 4 | 1 | 0 | 0 | 0 |
| 5 | 3 | 0 | 1 | 2 |
| 6 | 7 | 2 | 4 | 1 |
| 7 | 8 | 2 | 6 | 5 |
| 8 | 1 | 4 | 4 | 4 |
| 9 | 3 | 5 | 6 | 4 |
| 10 | 2 | 5 | 1 | 5 |
| 11 | 2 | 4 | 1 | 5 |
| 12 | 1 | 4 | 1 | 1 |
| 13 | 0 | 2 | 0 | 1 |
| Total | 28 | 28 | 28 | 28 |

Table 2 shows that the scores in the pretest for Assin Kumasi in English Language ranged from 4-12. It ranged from 3 – 12 for mathematics. Twenty three subjects scored

below 10 while five subjects scored 10 and above. The minimum score was 6 for English language and 5 for mathematics. The maximum score was 13 in both English language and mathematics at the post-test level.

The distribution of the test scores in both English language and mathematics for Assin Sibirso catholic primary school is presented in Table 3.

Table 3

Frequency distribution of pretest and post-test scores in English language and mathematics for Assin Sibirso catholic primary school (control group)

| Score | English language | | Mathematics | |
|-------|----------------------|------------------------|----------------------|------------------------|
| | Pretest Frequency | Post-test Frequency | Pretest Frequency | Post-test Frequency |
| 3 | 0 | 0 | 1 | 0 |
| 4 | 0 | 0 | 2 | 2 |
| 5 | 4 | 1 | 3 | 2 |
| 6 | 7 | 6 | 2 | 4 |
| 7 | 4 | 5 | 2 | 2 |
| 8 | 5 | 5 | 4 | 2 |
| 9 | 0 | 5 | 5 | 6 |
| 10 | 2 | 4 | 5 | 6 |
| 11 | 1 | 2 | 3 | 1 |
| 12 | 5 | 0 | 1 | 0 |
| 13 | 0 | 0 | 0 | 3 |
| Total | 28 | 28 | 28 | 28 |

Table 3 shows that the English language pretest scores ranged from 5 to 12, while twenty subjects scored below 10 and eight scored 10 to 12. In the post-test twenty-one

subjects scored below 10. The maximum score was 12 for the pretest. The maximum score fell to 11 for the post-test.

In mathematics the pretest scores ranged from 3 to 12 while the post-test scores ranged from 4 to 13.

Table 4 displays the distribution of scores in the pretest and post-test for English language and mathematics for Assin Nkran D. C. primary school.

Table 4

Frequency distribution of pretest and post-test scores in English language and mathematics for Assin Nkran D. C primary school. Experimental group (intangible rewards)

| Score | English language | | Mathematics | |
|-------|----------------------|------------------------|----------------------|------------------------|
| | Pretest Frequency | Post-test Frequency | Pretest Frequency | Post-test Frequency |
| 4 | 1 | 0 | 2 | 0 |
| 5 | 0 | 0 | 2 | 0 |
| 6 | 1 | 1 | 4 | 0 |
| 7 | 13 | 2 | 7 | 1 |
| 8 | 10 | 3 | 12 | 5 |
| 9 | 5 | 6 | 2 | 5 |
| 10 | 2 | 7 | 7 | 5 |
| 11 | 3 | 9 | 0 | 7 |
| 12 | 2 | 7 | 1 | 13 |
| 13 | 0 | 2 | 0 | 1 |
| Total | 37 | 37 | 37 | 37 |

From the table the maximum score for the pretest is 12 for both English language and mathematics. It is 13 for both subjects in the post-test. In the pretest, the modal marks are 7 and 8 for English language and mathematics respectively. These shot up to 11 for English language and 12 for mathematics in the post-test.

The frequency distribution table for Assin Bosomadwe catholic primary school is shown in Table 5.

Table 5

Frequency distribution of pretest and post-test scores in English language and mathematics for Assin Bosomadwe catholic primary school (control group)

| Score | English language | | Mathematics | |
|-------|----------------------|------------------------|----------------------|------------------------|
| | Pretest Frequency | Post-test Frequency | Pretest Frequency | Post-test Frequency |
| 5 | 0 | 0 | 2 | 0 |
| 6 | 0 | 1 | 2 | 0 |
| 7 | 6 | 3 | 4 | 4 |
| 8 | 3 | 3 | 3 | 6 |
| 9 | 6 | 10 | 4 | 4 |
| 10 | 2 | 1 | 3 | 2 |
| 11 | 3 | 2 | 1 | 3 |
| 12 | 0 | 0 | 1 | 1 |
| Total | 20 | 20 | 20 | 20 |

Table 5 shows that the pretest scores for English language range from 7 to 11. Fifteen subjects score below 10 and five subjects score 10 and 11. In the post-test, 17 subjects score below 10 while three subjects score 10 and 11.

In mathematics the pretest scores ranged from 5 to 12. Fifteen subjects scored below 10 while five scored 10 and above. In the post-test, the scores ranged from 7 to 12. Fourteen subjects scored below 10 and six subjects scored between 10 and 12.

The frequency distribution table for Assin Odumasi D. C. primary school is presented in Table 6.

Table 6

Frequency distribution of pretest and post-test scores in English language and mathematics for Assin Odumasi D. C. primary school. Experimental group (both tangible and intangible)

| Score | English language | | Mathematics | |
|-------|----------------------|------------------------|----------------------|------------------------|
| | Pretest Frequency | Post-test Frequency | Pretest Frequency | Post-test Frequency |
| 5 | 0 | 1 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 |
| 7 | 1 | 0 | 0 | 0 |
| 8 | 2 | 0 | 0 | 0 |
| 9 | 3 | 1 | 4 | 0 |
| 10 | 3 | 1 | 1 | 0 |
| 11 | 1 | 1 | 4 | 1 |
| 12 | 0 | 3 | 1 | 1 |
| 13 | 0 | 2 | 0 | 6 |
| 14 | 0 | 1 | 0 | 2 |
| Total | 10 | 10 | 10 | 10 |

Data displayed in Table 6 shows that maximum scores for English language is 7 for pretest and 5 for post-test while the maximum scores were 11 and 14 for pretest and

post-test respectively. In mathematics, pretest scores ranged from 9 to 12 and the post-test scores ranged from 11 to 14. Table 6 further revealed that only 4 pupils obtained marks below 10 in the pretest for mathematics and all of them had scores above 10 in the post-test.

The frequency distribution table for Nyankumasi Ahenkro D. C. primary school is presented in Table 7.

Table 7

Frequency distribution of pretest and post-test scores in English language and mathematics for Nyankumasi Ahenkro D. C. primary school (control group)

| Score | English language | | Mathematics | |
|--------------|----------------------|------------------------|----------------------|------------------------|
| | Pretest Frequency | Post-test Frequency | Pretest Frequency | Post-test Frequency |
| 5 | 0 | 1 | 2 | 0 |
| 6 | 0 | 0 | 0 | 4 |
| 7 | 1 | 0 | 7 | 4 |
| 8 | 5 | 0 | 7 | 6 |
| 9 | 12 | 7 | 9 | 7 |
| 10 | 7 | 5 | 5 | 5 |
| 11 | 8 | 6 | 3 | 6 |
| 12 | 2 | 11 | 2 | 2 |
| 13 | 0 | 3 | 0 | 1 |
| 14 | 0 | 2 | 0 | 0 |
| Total | 35 | 35 | 35 | 35 |

As shown in Table 7, the subjects recorded a minimum score of 7 and a maximum score of 12 in the pretest for English language. The modal mark of the pretest scores was 9.

In the post-test, one subject scored 5 and the rest of the scores ranged from 9 to 14 with a modal score of 12.

In mathematics, the pretest scores ranged from 5 to 12. Twenty-five subjects scored below 10 while ten scored from 10 to 12. In the post-test the scores ranged from 6 to 13. Twenty-one scored below 10 and fourteen scored from 10 to 13 with the maximum score being 13.

The mean scores of the pretest and posttest for experimental and control groups are summarised in Table 8.

Table 8

The mean scores of the pretest and posttest for the experimental and control groups in English language and mathematics

| School | English language | | Mathematics | |
|----------------------------------|-----------------------|-------------------------|-----------------------|-------------------------|
| | Pretest Mean score | Post-test Mean score | Pretest Mean score | Post-test Mean score |
| Experimental groups | | | | |
| Assin Kumasi D.C Primary | 7.36 | 9.69 | 7.21 | 8.89 |
| Assin Nkran D.C Primary | 8.19 | 10.19 | 7.76 | 10.49 |
| Assin Odumasi D.C Primary | 9.10 | 11.10 | 10.20 | 12.90 |
| Control groups | | | | |
| Assin Sibinso Catholic Primary | 7.89 | 7.96 | 8.00 | 8.57 |
| Assin Bosomadwe Catholic Primary | 8.65 | 8.65 | 8.20 | 8.80 |
| Nyankumasi Ahenkro D.C. Primary | 9.63 | 10.94 | 8.71 | 9.00 |

A brief look at the mean scores of performance of the schools show that pupils in all the control groups performed better in the pretest in English language than their counterparts in the experimental groups. The performance in mathematics is consistent with that of English language except for one case where the experimental group (Assin Odumais D.C primary) did better in the pretest than the corresponding control group (Nyankumasi Ahenkro D.C primary).

Pupils in the experimental groups performed better in the posttest in both English language and mathematics than their counterparts in the control groups.

Hypothesis 1

Pupils who receive tangible rewards like toffees, exercise books and pens would perform better than pupils who did not receive any form of reward.

Hypothesis 1 sought to find out whether there was any significant difference between pupils who received tangible rewards like toffees, exercise books and pens and the control group members who did not receive any form of reward.

To deal with hypothesis 1, the mean scores, standard deviations and independent t-test values of the pretest scores in English language and mathematics for pupils in both the experimental group (Assin Kumasi D.C primary school) and the control group (Assin Sibiinso Catholic primary school) were computed (see Appendix G). The experimental group consisted of pupils who were treated to tangible rewards like toffees, pens and exercise books during teaching. The control group was made up of pupils who did not receive any form of rewards during teaching.

The summary of the results of the pretest in English language indicates that the mean score difference of .53 between the means of the experimental group and control group is not significant ($t = 0.89$, $p = .38$) at the 5% level. This implies that the two groups are initially alike. This allows comparison of the results of the post-test to be done by the use of independent t-test.

The results of the mathematics pretest indicate that there was no significant difference statistically ($t = 1.23$, $p = .23$) in the means of the experimental group ($M = 7.21$, $SD = 2.35$) and control group ($M = 8.00$, $SD = 2.45$). This implies that initially there was no significant difference statistically in the performance of the two groups. The post-test results were therefore analysed using the independent t-test.

The post-test results of the experimental (tangible rewards) and control groups in English language and mathematics are summarised in Table 9.

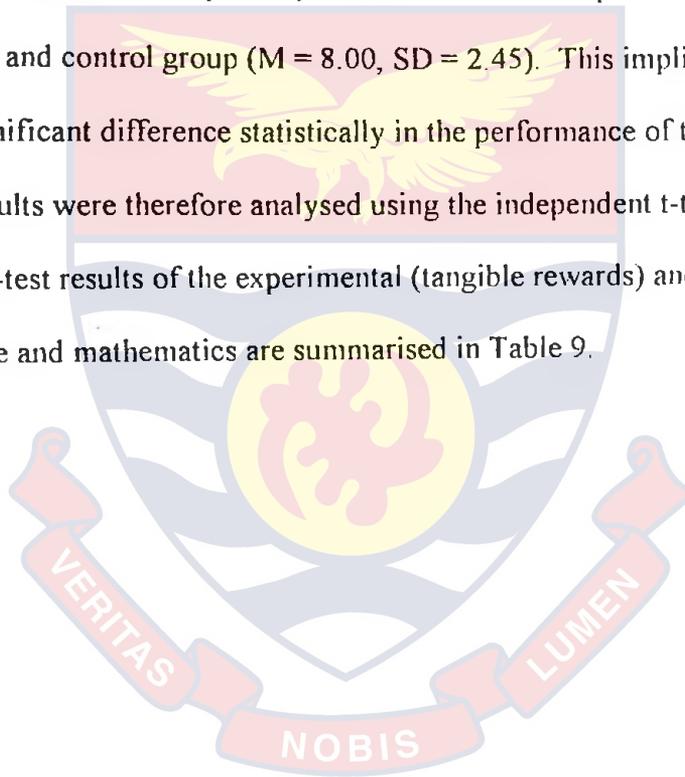


Table 9

Means, standard deviations and independent t-test values of post-test scores of experimental (tangible) group (Assin Kumasi D.C primary school) and control group (Assin Sibirso Catholic primary school) for English language and mathematics

| School | Type of test | Subject | N | M | SD | MD | df | t | P |
|---|--------------|------------------|----|------|------|------|----|------|------|
| Assin Kumasi D.C | | | | | | | | | |
| Primary Experimental group (tangible) | Post-test | English language | 28 | 9.68 | 1.98 | | | | |
| Assin Sibirso Catholic Primary. Control group | | | 28 | 7.96 | 1.69 | 1.72 | 54 | 3.48 | .001 |
| Assin Kumasi D.C | | | | | | | | | |
| Primary Experimental group (tangible) | Post-test | Mathematics | 28 | 8.89 | 2.06 | | | | |
| Assin Sibirso Catholic Primary. Control group | | | 28 | 8.57 | 2.53 | .32 | 54 | .52 | .60 |

The data presented in Table 9 reveals that in English language the experimental group who received tangible rewards during instruction ($M = 9.68$, $SD = 1.98$) did significantly better in the post-test ($t = 3.48$, $p = .001$) than the control group who did not receive any form of reward during teaching ($M = 7.96$, $SD = 1.69$).

The results show that the experimental group who received tangible rewards during teaching in mathematics did slightly better ($M = 8.89$, $SD = 2.06$) than pupils who did not receive any such rewards ($M = 8.57$, $SD = 2.53$). However, this mean difference

is not significant at the 5% level ($t = 0.52$, $p = .6$). The implication is that it cannot be concluded that the use of tangible rewards has any significant effects on the performance of pupils in mathematics.

Hypothesis 2

Pupils who receive intangible rewards like being clapped for and verbal rewards such as 'good' and 'well done' would perform better than pupils who did not receive any form of reward.

The purpose of this hypothesis was to ascertain whether there was any difference in performance between the experimental group (Assin Nkran DC primary school) which received intangible rewards and the control group (Assin Bosomadwe catholic primary school) which did not receive anything.

To highlight and to test hypothesis 2, the mean scores, standard deviations and independent t-test values of the pretest scores in English language and mathematics for pupils in both the experimental group (Assin Nkran D.C primary) (intangible) and control group (Assin Bosomadwe Catholic primary) were computed (see Appendix II). The experimental group consisted of pupils who were treated to intangible rewards like being clapped for and verbal rewards such as 'good' and 'well done' during the intervention. The control group was made up of pupils who did not receive any form of rewards during teaching.

The results for both English language and mathematics at the pretest level indicate that pupils in the control group did slightly better in the pretest in both subjects ($MD = .46$ for English language; $MD = .44$ for mathematics). However, these differences were

not significant at the 5% level ($t = 1.03, p = .31$) for both the English language and ($t = .86, p = .39$) mathematics.

The independent t-test was appropriately used to compare the posttest scores of the experimental group and the control group in both subjects. This is presented in Table 10.

Table 10

Means, standard deviations and independent t-test values of post-test scores of experimental (intangible) group (Assin Nkran D.C primary school) and control group (Assin Bosomadwe Catholic primary school) for English language and mathematics

| School | Type of test | Subject | N | M | SD | MD | df | t | P |
|---|--------------|------------------|----|-------|------|------|----|------|------|
| Assin Nkran D.C Primary Experimental group (intangible) | Post-test | English language | 37 | 10.19 | 1.71 | 1.54 | 55 | 3.52 | .001 |
| Assin Bosomadwe Catholic Primary Control group | | | 20 | 8.65 | 1.27 | | | | |
| Assin Nkran D.C Primary Experimental group (intangible) | Post-test | Mathematics | 37 | 10.49 | 1.63 | 1.69 | 55 | 3.83 | .001 |
| Assin Bosomadwe Catholic Primary Control group | | | 20 | 8.80 | 1.51 | | | | |

The performance of the pupils at the post-test level in the experimental group was better than that of pupils in the control group for both the English language and mathematics. The mean differences were 1.54 for English language and 1.69 for mathematics. The results further indicate that these differences are significant. The t-value for English language was ($t = 3.52, df = 55, p = .001$). The t-test values for mathematics were ($t = 3.83, df = 55, p = .001$)

This implies that the use of intangible rewards in teaching English language and mathematics has a positive effect on pupils learning of the subjects.

Hypothesis 3

Pupils who receive both tangible rewards (toffees, pencils) and intangible rewards (well done, good) would perform better than pupils who did not receive anything.

This hypothesis was postulated to determine how effective the combination of tangible and intangible rewards would be on pupils' performance.

To test hypothesis 3, the mean scores, standard deviations and independent t-test values of the pretest scores in English language and mathematics for pupils in both experimental (both tangible and intangible) group (Assin Odumasi D.C. primary school) and the control group (Nyankumasi Ahenkro D. C. primary school) were computed (see Appendix I). The experimental group consisted of pupils who were treated to both tangible and intangible rewards during teaching. The control group was made up of pupils who did not receive any form of rewards during teaching

There was a mean difference of 0.53 in favour of pupils in the control group for the English language pretest. This difference is, however, not significant at the 5% level ($t = 1.20$, $df = 43$, $p = .24$). However, there was a significant difference in mathematics ($t = 2.54$, $df = 43$, $p = .015$) in the pretest mean scores of pupils in the experimental group ($M = 10.20$, $SD = 1.14$) and of pupils in the control group ($M = 8.71$, $SD = 1.74$). The independent t-test was thus further used to analyse the post-test results in English language. The summary is presented in Table 11.

Table 11

Means, standard deviations and independent t-test values of post-test scores of experimental (both tangible and intangible) group (Assin Odumasi D.C. primary school) and control group (Nyankumasi Ahenkro D.C. primary school) for English language

| School | Type of test | Subject | N | M | SD | MD | df | t | P |
|--|--------------|------------------|----|-------|------|-----|----|-----|-----|
| Assin Odumasi D.C. Primary Experimental group (both tangible and intangible) | Post-test | English language | 10 | 11.10 | 2.60 | .16 | 43 | .22 | .83 |
| Nyankumasi Ahenkro D.C. primary. Control group | | | 35 | 10.94 | 1.80 | | | | |

From the table, the mean score of 11.10 (SD = 2.60) for the experimental group did not differ significantly ($t = .22$, $df = 43$, $p = .83$) from the mean score of 10.94 (SD = 1.80) for the control group.

Thus the use of both tangible and intangible rewards in teaching does not have any significant influence on the performance of pupils in English language. The t-value for the mathematics pretest scores indicate that there was significant difference between the control group and the experimental group. To take care of this initial difference calls for the use of analysis of covariance, (ANCOVA) at the post-test level. Since there was initial difference in performance in mathematics at the pretest level the analysis for the posttest called for the use of ANCOVA which is presented in Table 12.

Table 12

ANCOVA of mathematics posttest scores of experimental group (Assin Odumais D.C. primary) and control group (Nyankumasi Ahenkro D.C. primary)

| Source of Variation | Sum of Squares | df | Mean Squares | F | P |
|---------------------|----------------|----|--------------|-------|--------|
| Between groups | 67.14 | 1 | 67.14 | | |
| Within groups | 177.31 | 42 | 4.22 | 15.90 | 0.0049 |
| Total | 244.45 | 43 | | | |

In analysing the mathematics posttest scores the ANCOVA was applied using the pretest scores as covariate, to compare the performance of the treatment group and control group on the posttest scores. It was found out that there was a significant difference ($F = 15.90$, $p = .005$) between the two groups. The treatment group which

received both tangible and intangible rewards performed better than the control group which did not receive any form of reward.

Hypothesis 4

Pupils who receive tangible rewards (pens, pencils) would perform better than pupils who receive intangible rewards (good, well done).

Hypothesis 4 was to examine any difference in the effectiveness of the use of either tangible or intangible rewards on pupils' performance.

In response to hypothesis 4, the means, standard deviations and independent t-test values of the pretest scores in English language and mathematics for pupils in the two experimental groups tangible group (Assin Kumasi D.C. primary school) and intangible group (Assin Nkran D.C primary school) were computed (see Appendix J)

The summary of results (at Appendix J) indicates that the mean difference of .83 between the means of the experimental group (Assin Kumasi D.C. primary school) which had tangible rewards and the other experimental group (Assin Nkran D.C. primary school) which received intangible rewards was not significant ($t = 1.79$, $p = 0.78$, at 5% level). This implies that the two groups were initially alike. This allowed comparison of the results of the post-test to be done by the use of independent t-test.

The results of the mathematics indicated that there was no significant difference ($t = 1.06$, $p = .30$) in the means of the performance of pupils who received tangible rewards and those who had intangible rewards.

The post-test results were, therefore, analysed using the independent t-test. The post-test results for the two experimental groups in English language and mathematics are summarised in Table 13.

Table 13

Means, standard deviations and independent t-test values of post-test scores of the two experimental groups (Assin Kumasi D.C. primary school) tangible rewards and (Assin Odumasi D.C. primary school) intangible rewards for English and mathematics

| School | Type of test | Subject | N | M | SD | MD | df | t | P |
|--|--------------|------------------|----|-------|------|------|----|------|------|
| Assin Kumasi D.C. | | | | | | | | | |
| Primary Experimental group (tangible) | | | 28 | 9.68 | 1.98 | | | | |
| Assin Odumasi D.C. | Post-test | English language | | | | .51 | 63 | 1.11 | .27 |
| Primary. Experimental group (intangible) | | | 37 | 10.19 | 1.71 | | | | |
| Assin Kumasi D.C. | | | | | | | | | |
| Primary Experimental group (tangible) | | | 28 | 8.89 | 2.06 | | | | |
| Assin Odumasi D.C. | Post-test | Mathematics | | | | 1.59 | 63 | 3.49 | .001 |
| Primary. Experimental group (intangible) | | | 37 | 10.49 | 1.63 | | | | |

The difference in performance in English language for the two experimental groups was not significant ($t = 1.11, p = .27$).

The results indicated a statistical difference between the post-test means in mathematics of those who received intangible rewards ($M = 10.49, SD = 1.63$) and those who had tangible rewards ($M = 8.89, SD = 2.06$), ($t = 3.49, P = .001$). The result implies that it is better to use intangible rewards than tangible rewards.

Discussion of Research Findings

In this section, the findings are discussed. The discussion covers findings on:

- i. The use of tangible rewards
- ii. The use of intangible rewards
- iii. The use of both tangible and intangible rewards

The use of Tangible Rewards

Tangible rewards refer to concrete materials given for right responses and action. Examples include toffees, pens and erasers. The Assin Kumasi D.C. primary school pupils were the experimental group. They were treated to tangible rewards during teaching in English language and mathematics. Their performance in both subjects was compared with the performance of pupils in the control group, Assin Sibiho Catholic primary school in each case. It was evident that the experimental group performed better in English language at the posttest level than the control group.

From the results obtained, it is clear that the tangible rewards like toffees, exercise books and other material things had positive influence on pupils' performance at the

posttest level in English language. This result is consistent with the findings of Ruch and Zimbardo (1971) who concluded that tangible rewards like money motivated a fourteen-year-old boy to overcome his reading problem. When money reward was administered, he was initially able to read words correctly, then sentences and then whole paragraphs. He was finally able to read short stories and answered questions relating to the content. This boy developed interest in reading which was extended to other subjects to enable him pass in all his school subjects. There was also a marked decline in his destructive behaviour.

Merrett and Tang (1994) also in dealing with the issue of the attitude of British primary school pupils towards rewards and punishment found out that primary school pupils have a definite idea about the effectiveness of rewards to be more suitable for academic work than for social behaviour. The researchers used tangible rewards like candies to achieve this.

The findings of this study were also consistent with the conclusion drawn by Hoffman et al. (1958) in their study conducted into the improvement of intelligence test that some students showed greater need for tangible rewards than others.

In another study to support the use of tangible rewards, Wortman et al. (1992) studied an eight year-old boy with difficulty in working additional sums. The boy was assigned additional problems followed with a large candy bar. This motivated the boy to improve in solving additional problems.

The use of Intangible Rewards

Intangible reward refers to non-concrete materials that are given for right responses or actions to specific questions for instance, good, excellent and well done.

Assin Nkran D.C. primary school was an experimental group that was treated to intangible rewards during the intervention in English language and mathematics. The performance of the pupils in this experimental group was statistically significantly higher than the performance of pupils in the control group, Assin Bosomadwe D.C. primary school.

Thus, the influence of the use of intangible rewards like praise during teaching on pupils' performance in both English and mathematics was positive.

In comparing the experimental group (tangible) and the other experimental group (intangible) it was evident that the use of intangible rewards in mathematics lesson was more effective than the use of tangible rewards.

The findings on the use of intangible rewards is in line with the view point expressed by Engle and Snellgrove (1974) in a study on arithmetic addition for five consecutive days. At the end of the fifth day, members of the experimental group who received praise showed marked improvement in solving arithmetic problems. It was also observed that praise sustained them till the end of the experiment.

The result of this study also confirms another study by Engle and Snellgrove (1974) who specifically used verbal reward such as 'good' to motivate the pupils of the experimental group who were able to form sentences which contained verbs and pronouns, 'I' and 'we' very often. The researchers printed six pronouns, namely: he, I, she, they, we and you on cards. Whenever a sentence containing the pronouns I or we

was given, the verbal reward 'good' was used on the experimental group. The production of sentences containing the other pronouns was not rewarded in the control group. In the course of eighty trials there was a steady increase in the number of sentences containing I and we. There was no increase in the control group who were not rewarded.

Deci (1975) supports the use of intangible rewards. He used praise on men who were working on puzzles to sustain their performance.

In another study Alberto and Troutman (1990) observed a child who was praised in studying mathematics to improve his grades from Ds and Fs to As and Bs. Lindgren (1956) also conducted an informal conversation and used praise to sustain it. When praise was withdrawn the responses decreased. The finding also confirms the observation by Petty and Thomes (1994) that successful teachers praise students who answer questions correctly.

It is clear that the use of praise has positive influence on pupils' learning. Praise serves many purposes in classroom instruction. However, it is primarily used to reinforce low-achieving students for good work as observed by Brophy (1981). It follows that the use of intangible rewards enhances the performance of both the low and high achieving pupils.

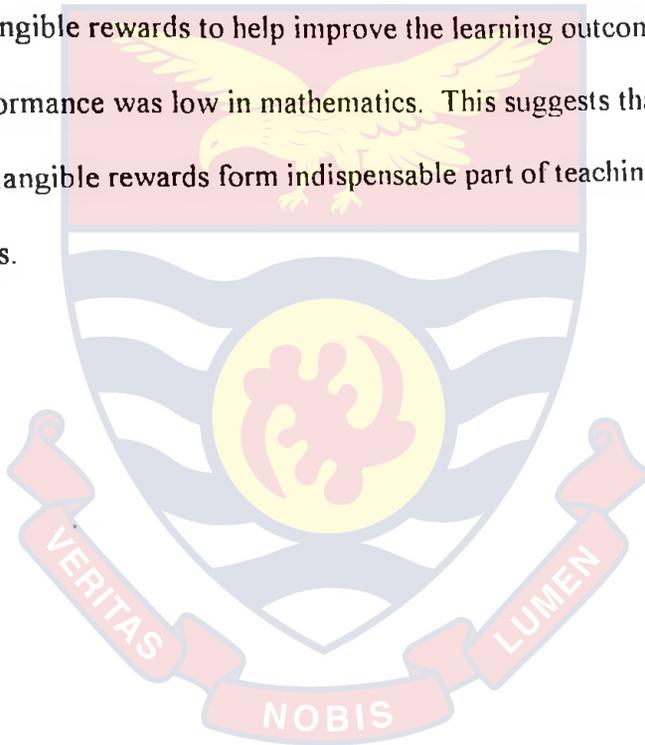
The use of both Tangible and Intangible Rewards

The pupils from Assin Odumasi D.C. primary school who received both tangible and intangible rewards formed an experimental group. The control group was Nyankumasi Ahenkro D.C. primary school. The two rewards, tangible and intangible

used separately proved to be effective in the teaching of mathematics but not for English Language.

There was a significant difference between the experimental group and the control group at the pretest level hence the use of ANCOVA for the analysis of the posttest scores in mathematics. From the analysis of covariance it was evident that the experimental group performed better than the control group in mathematics.

The finding of the study confirms the work of Wortman et al. (1992) who used both tangible and intangible rewards to help improve the learning outcomes of a boy whose academic performance was low in mathematics. This suggests that the use of rewards especially intangible rewards form indispensable part of teaching and learning process in our schools.



CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary of the Study

The objective of this study was to find the effect of tangible and intangible rewards on pupils' performance in primary schools. Six mixed primary schools were selected from forty-one schools in the Assin South zone. The study was restricted to primary six classes in the selected schools. Three schools were designated experimental groups – Assin Kumasi D.C. primary, Assin Nkran D.C. primary, Assin Odumasi D.C. primary. The other three schools formed the control groups, namely Assin Sibirso Catholic primary, Assin Bosomadwe Catholic primary and Nyankumasi Ahenkro D.C. primary. The subjects involved in the study were 158. This was made up of 102 boys and 56 girls. There were 75 pupils in the experimental group and 83 in the control group. The pupils used for the study were from the same environmental setting.

All the test items in English language and mathematics used in the study were developed by the investigator and were vetted by the supervisor. The test items in each subject, English language and mathematics contained twenty multiple-choice questions for both pre-test and posttest. To carry out the study, pupils in both experimental and control groups were pretested. Treatments were administered to the experimental groups by the researcher. The researcher was assisted by the research assistants, who were the class teachers, to teach in the three experimental schools. Pupils received both tangible

and intangible rewards during teaching when they were able to answer questions correctly. Normal teaching by the class teachers also took place in the control groups. Teachers in the control groups were taught not to use any reward in their teaching. The normal thirty minutes duration and the class timetable were used in order not let other subjects suffer. A post-test was administered to both experimental and control groups at the end of the experiment.

Four hypotheses were formulated and used in the study. Independent t-test and analysis of covariance (ANCOVA) were used to analyse the hypotheses. The statistical package for social science (SPSS) software was used to compute the descriptive statistics, the independent t-test and the analysis of covariance (ANCOVA) to analyse the data. The level of statistical significance adopted for the study was 0.05.

The major findings are stated below:

1. Pupils who received tangible rewards performed better than the pupils in the control group in English language.
2. Pupils who received intangible rewards performed better in both English language and mathematics than the pupils in the control group.
3. Pupils who received both tangible and intangible rewards performed better than the control group in mathematics.
4. When the performance of pupils in the two experimental groups who received tangible and intangible rewards was compared, the experimental group which received intangible rewards performed better than the experimental group which received tangible rewards in mathematics.

5. Among the three treatments, the use of intangible rewards has a higher significant gain than the other forms.
6. The effect of the use of the three forms of treatments on pupils' performance in mathematics was more positive than in English language.

Conclusion

An attempt has been made to evaluate the effectiveness of the use of tangible and intangible rewards for improving of pupils' performance. From the results of the current study it could be stated that, both tangible and intangible rewards were effective for improving pupils' performance. Specifically the following conclusions are drawn.

Tangible rewards were not as powerful as intangible rewards in promoting learning. Pupils who received tangible rewards improved in English language at the posttest level as compared with their control group.

Providing intangible rewards proved to be a powerful teaching technique. Pupils who received intangible rewards performed better in both English language and mathematics than their counterparts in the control group.

Pupils who received intangible rewards performed better in both English language and mathematics than their counterparts in the control group. Pupils who received the three forms of treatments in the study showed improvement in the learning of mathematics. Pupils showed enthusiasm and willingness to learn and were eager to answer questions.

Recommendation

The findings of the study call for recommendations for practice by teachers. In the study, the use of tangible and intangible rewards proved effective in promoting learning. However, intangible rewards should extensively be used in all schools because of their positive effect on pupils' performance as it was paramount in the study.

- i) Teachers should be educated through in-service training on the importance and the use of intangible rewards in the classroom.
- ii) Circuit supervisors and officers from the Inspectorate Division should also encourage teachers on the use of intangible rewards.
- iii) Tutors of the Training Colleges should pay attention to the importance of the use of intangible rewards and impart this knowledge to the teacher-trainees.

Areas of Further Research

To further extend the literature on tangible and intangible rewards the following suggestions are made for further studies.

- i) The topic researched should be studied on a very large scale at District and Regional levels to find out what actually goes on in the classroom when it comes to the use of tangible and intangible rewards by teachers.
- ii) Given time, a thorough research should be done to find out whether pupils who are motivated by the use of tangible and intangible rewards would be able to sustain their performance.
- iii) Studies should be done using pupils from urban centres.
- iv) Pupils from affluent homes and those from the rural communities could also be studied.

REFERENCES

- Alberto, P. A. & Troutman A. C. (1990). Applied behaviour analysis for teachers (3rd ed.) New York: Macmillan Publishing Company.
- Bandura, A. (1969). Principles of behaviour modification. New York: Rinehart and Winston.
- Brophy, J. E. (1981). Teacher praise: A functional analysis. Journal of Educational Psychology, 28, 140 - 174.
- Berliner, D. C. & Gage, N. L. (1984). Educational psychology (3rd ed.) Boston: Houghton Mifflin Company.
- Borg, W. R. & Gall, M. D. (1989). Educational research. An introduction (5th ed.) New York: David McKay Company Inc.
- Bruce, D. (1995). The use of motivational techniques by teachers in the classroom. A case study of Aboom primary and junior secondary school in Cape Coast. A project work, University of Cape Coast.
- Bull, S. L. & Solity, J. E. (1993). Classroom management: principles to practice. New York: Routledge.
- Chaplin, J. P. (1968). Dictionary of psychology. New York: Dell Publishing Co.
- Crider, A. B., Goethals, G. R. Kavanaugh, R. D. & Solomon, P. R. (1983). Psychology Illinois: Scott Foresman and Company.
- Deci, E. L. (1975). Intrinsic motivation. New York: Plenum Publishing Corporation.

- Deci, E. L. & Ryan R. M. (1980). The empirical exploration of intrinsic motivational processes. Advances in experimental social psychology. New York: Plenum Publishing Corporation.
- Durojaiye, M. O. A. (1976). A new introduction to educational psychology. Ibandan: Evans Brothers Ltd.
- Engle, T. L. & Snellgrove, L. (1969). Psychology: Its principles and applications. (5th ed.) New York: Harcourt, Brace and Word Inc.
- Engle, T. L. & Snellgrove, L. (1974). Psychology: Its principles and applications. (6th ed.) New York: Harcourt, Brace Jovanovich Inc.
- Flanders, N. A. & Simon, A. (1969). Teacher effectiveness. New York: Macmillan Co.
- Fraenkel, J. R. & Wallen, N. E. (1990). How to design and evaluate research in education. (2nd ed.) New York: McGraw Hill Inc.
- Gage, N. L. & Berliner David, C. (1991). Educational psychology. (5th ed.) Boston: Houghton Mifflin Company.
- Gilmer, B. V. H. (1973). Psychology (2nd ed.). New York: Harper and Row Publishers.
- Guthrie E. R. (1952). The psychology of learning. New York: Harper and Row.
- Harold, B. W. (1965). Psychology of learning and teaching. (2nd ed.). New York: McGraw - Hill Book Co.
- Hoffman, M. L., Mitsos, S. B. & Protz, R. E. (1958). Achievement striving, social class and test anxiety. Journal of Abnormal and Social Psychology, 56, 401 -- 403.

- Houghton, S., Merret, F. & Wheldal, K. (1988). Attitudes of British secondary school teachers and pupils to rewards and punishments New Zealand. Journal of Educational Studies, 23 (2), 223 – 243.
- Jones, V. F. & Jones, L. S. (1990). Comprehensive classroom management motivating and managing students (3rd ed.). Boston: Allyn and Bacon.
- Lefrancois, G. R.. (1988). Psychology for teaching (6th ed.). Belmont Wadsworth Publishing company.
- Lepper, M. R., Nisbett, G, & Greene D, (1973). Over justification effects following multiple-trial reinforcement procedure. Unpublished Manuscript Stanford University, Psychology Department.
- Lindgren, H. C. (1956). Educational psychology in the classroom (2nd ed.). New York: John Wiley & Sons Inc.
- Mace (1968). The psychology of study. New York: Renguin Books Ltd.
- Martin, G. & Pear, J. (1988). Behaviour modification. What it is and how to do it (3rd ed.). New Jersey: Garry Prentice Hall
- McCarthy, M. A. & Houston, J. P. (1980). Fundamentals of early childhood education. Massachusetts: Winthrop Publishers Inc.
- Merrett, F. & Wai Man Tang (1994). The attitudes of British primary school pupils to praise. Rewards, reprimands in The British Journal of Education Psychology, 64, 99 – 103.
- Munn, N. L., Fernald, L. D. Jr, & Fernald, P. S. (1972). Introduction to psychology (3rd ed.). Boston: Houghton Mifflin Company.

Page, E. B. (1958). Teacher comments and student performance. Journal of Educational Psychology, 49, 173 – 81.

Perrot Elizabeth (1990). Effective teaching: A practical guide to improving your teaching. New York: Longman Inc.

Petty, G. & Thornes, S. (1994). Teaching today: A practical guide. U.K Publishers Ltd.

Rosenshine, B. (1971). Teaching behaviours and student achievement. I.E.A. studies No.1 National Foundation of Education Research: Slough

Ruch, F. L. & Zimbardo, P. G. (1971). Psychology and life. Illinois: Scott Foresman and Company

Skinner, B. K. (1953). Science and human behaviour. New York: Macmillan Publishing Co.

Skinner, C. E. (1990). Educational psychology (4th ed.). New Delhi: Prentice Hall.

Slavin, R. E. (1991). Educational psychology. Theory into practice. New Jersey: Prentice Hall Inc.

Som, R. K. (1973). A manual of sampling technique. London: Heinemann Educational Book Ltd.

Wortman, C. B. (1992). Psychology (4th ed.). New York: Mcgraw-Hill Inc.

APPENDIX A

UNIVERSITY OF CAPE COAST
CAPE COAST, GHANA
FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL FOUNDATIONS

TELEPHONE 32440-9 & 32480-9
Head Ext. 286
TELEX 2552, UCC, GH.

Cables & Telegrams: UNIVERSITY, CAPE COAST

Our Ref.: DE.71

Your Ref.:

29th October, 1977.

LETTER OF INTRODUCTION

Mr/~~MISS/MS~~ DANIEL KWAKU ARUIN
the bearer of this note is a final year/M.Phil. II
student of this University.

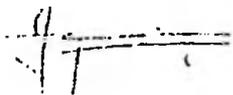
As part of his/~~her~~ degree requirements, he/~~she~~
is expected to work on a project entitled:

.A STUDY ON THE RELATIVE EFFECT ON TANGIBLE AND
.REWARDS ON PUPILS PERFORMANCE.....

He/~~she~~ has opted to make a study of your
institution/establishment for the project.

I should be most grateful if you could afford
him /~~her~~ opportunity to make the study.

Any information provided will be treated as
strictly confidential.



(DR. J.K. ESSUMAN)
AG. HEAD.

APPENDIX B

GHANA EDUCATION SERVICE

In case of reply the number and date of this letter should be quoted

GES/ASD/106/Vol.2/18
My Ref No.....

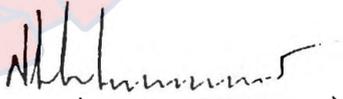
Your Ref No.....



DISTRICT EDUCATION OFFICE
ASSIN
.....DISTRICT
P. O. BOX.....
ASSIN FOSO
.....
13th December 19.....

The bearer of this note, Mr. Daniel Ekeku Ephie is a graduate student of the University of Cape Coast who is coming to conduct a research study in your school.

Please co-operate with him since he has obtained permission from the District Education Office for the study.


(H.K. JIRPOH)
DISTRICT DIRECTOR OF EDUCATION
ASSIN FOSO

HEADTEACHERS OF:
ASSIN KUMASI PRIMARY SCHOOL,
NYANKOMASI-AHENKRO,
ASSIN NKRAN,
ASSIN ODUMASI.

APPENDIX C

PRETEST ITEMS

ENGLISH LANGUAGE

CLASS: BS6

TIME: 20 MINUTES

Answer all questions

COMPREHENSION

Read the passage and answer the questions that follow:

It was four o'clock in the afternoon. All the pupils and teachers were ready to go home. After closing prayers, the school prefect came forward with some letters and started calling out the names.

One after another, the owners of the letters ran to collect them. Now, there was only one letter left. "Kwesi Anokye", the prefect called.

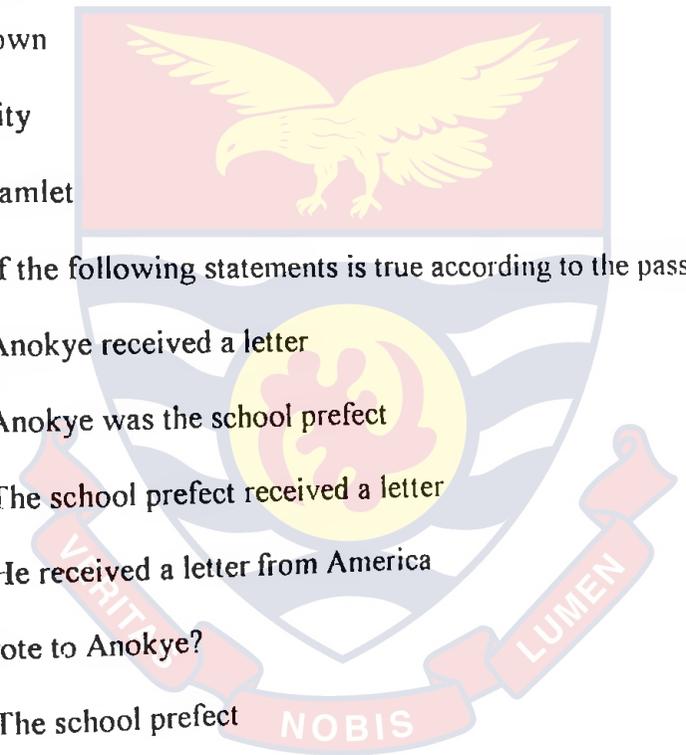
Anokye ran forward for it. He looked at the postage stamp. It was from England. He smiled. "Daddy's letter at last", he said to himself.

In the letter, his father, asked him to spend the Christmas holidays with him in Manchester, a city in England.

1. What did the school prefect do after closing prayers?

- a) He asked the pupils to go home
- b) He called out the names of all the pupils
- c) He distributed letters
- d) He shut the doors

2. Why did the prefect call Anokye?
- a) He wanted to punish him
 - b) He gave Anokye's letter to him
 - c) Anokye was his friend
 - d) The prefect liked him
3. Manchester is a
- a) village
 - b) town
 - c) city
 - d) hamlet
4. Which of the following statements is true according to the passage?
- a) Anokye received a letter
 - b) Anokye was the school prefect
 - c) The school prefect received a letter
 - d) He received a letter from America
5. Who wrote to Anokye?
- a) The school prefect
 - b) His friend
 - c) Anokye's father
 - d) The Headmaster



From the list of words lettered A to D, choose the one which is most nearly opposite to the word underlined in each sentence.

6. King Kuntu was a cruel ruler.

- a) kind
- b) bad
- c) good
- d) happy

7. The knife was so sharp that it cut my finger.

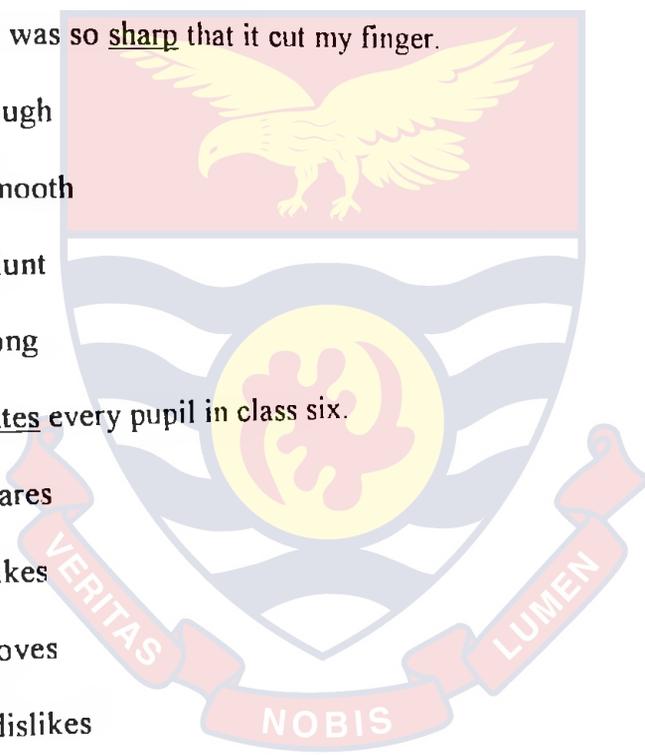
- a) rough
- b) smooth
- c) blunt
- d) long

8. David hates every pupil in class six.

- a) cares
- b) likes
- c) loves
- d) dislikes

9. The fat girl was absent from school.

- a) big
- b) thin
- c) small
- d) huge



10. Moses is on a temporary appointment.
- a) daily
 - b) permanent
 - c) week
 - d) yearly

Choose from the list of words given below the one which correctly and most suitably fills the gap in the sentence.

11. He looked the picture carefully
- a) to
 - b) for
 - c) in
 - d) at
12. Ghana is very friendly her neighbours.
- a) with
 - b) for
 - c) by
 - d) to

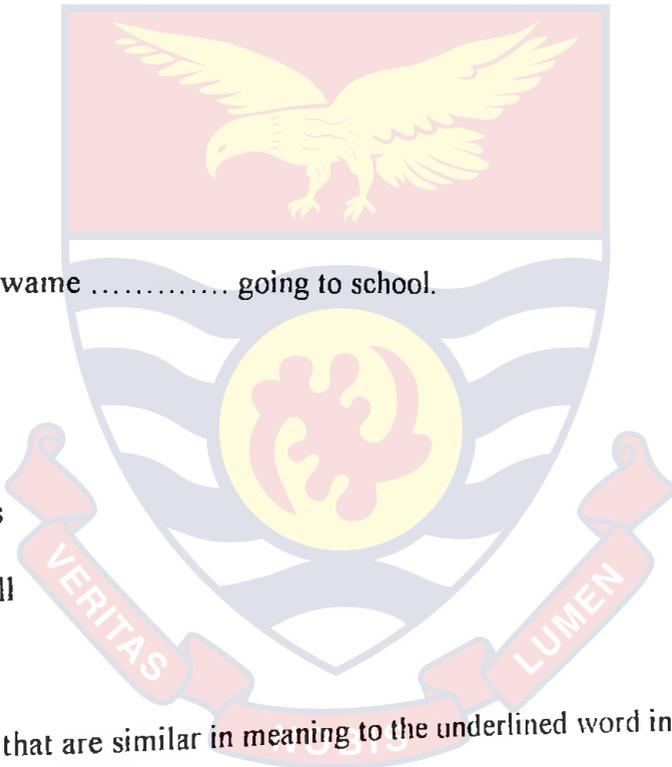


13. Thieves broke the school office
- a) for
 - b) into
 - c) in
 - d) at

14. The aeroplane travels faster the ship.
- a) from
 - b) for
 - c) than
 - d) to

15. The box is full second-hand clothing.
- a) for
 - b) to
 - c) of
 - d) by

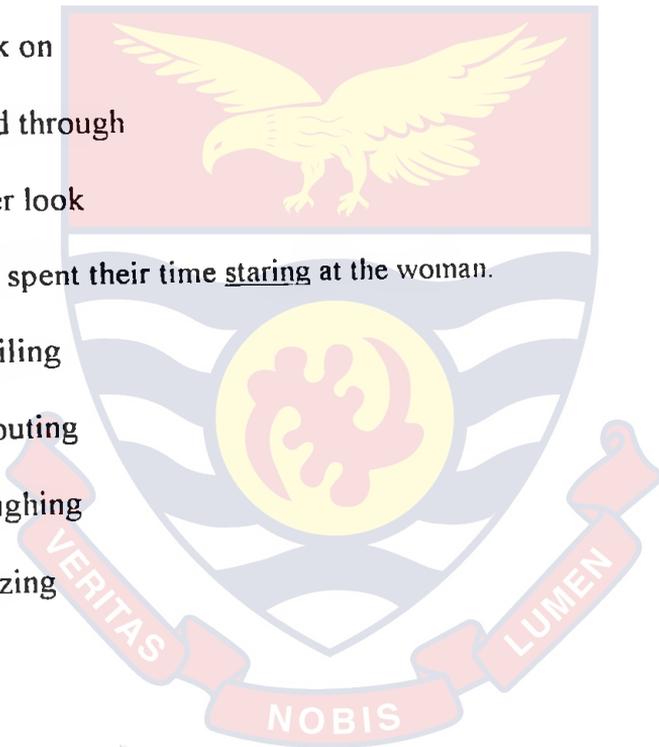
16. Kofi and Kwame going to school.
- a) is
 - b) are
 - c) was
 - d) shall



Choose the words that are similar in meaning to the underlined word in each sentence.

17. He appears to be the ablest child in the class.
- a) tallest
 - b) weakest
 - c) shortest
 - d) cleverest

18. The meeting was postponed to another date.
- a) cancelled
 - b) removed
 - c) called
 - d) deferred
19. Remember to look over your work when you finish.
- a) watch
 - b) look on
 - c) read through
 - d) over look
20. The pupils spent their time staring at the woman.
- a) smiling
 - b) shouting
 - c) laughing
 - d) gazing



APPENDIX D

PRETEST ITEMS

MATHEMATICS

CLASS: BS6

TIME: 40 MINUTES

Work out and circle the correct answer.

1. Add $\begin{array}{r} 347 \\ 897 \\ \underline{304} \\ \hline \end{array}$ a) 1538 2) 14000 a) 2272
b) 1548 $\begin{array}{r} -1728 \\ \hline \end{array}$ c) 12272
c) 15138 _____ c) 13232
d) 15314 _____ d) 13382

3. $\begin{array}{r} 317 \\ \times 21 \\ \hline \end{array}$ a) 1251 4) $7\sqrt{2121}$ a) 33
b) 8657 _____ b) 30
c) 8757 _____ c) 313
d) 885557 _____ d) 303

5. $\square + 3 = 9$. What number must be put in the box?
a) 1
b) 2
c) 3
d) 6

6. $5x = 25$, What does x stand for?

- a) 5
- b) 25
- c) 30
- d) 125

7. $-3 + 2 = n$, What is n ?

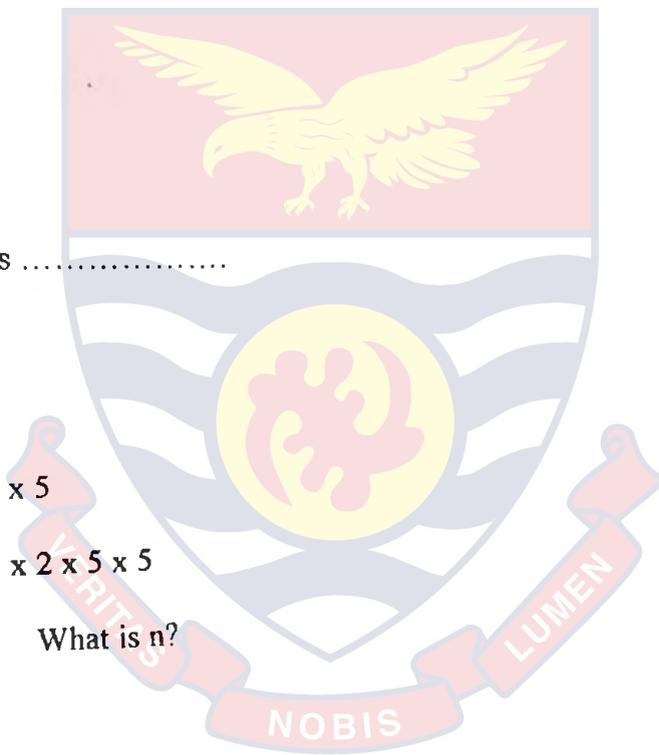
- a) -5
- b) -1
- c) 1
- d) 5

8. $2^3 \times 5^2$ means

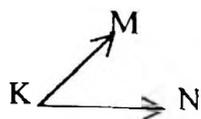
- a) 2×3
- b) 5×5
- c) $2 \times 3 \times 5$
- d) $2 \times 2 \times 2 \times 5 \times 5$

9. $3 \times 10^2 = n$, What is n ?

- a) 30
- b) 100
- c) 300
- d) 3000



10. M and N are showing rays. What does the point K show?



- a) chord
- b) circle
- c) square
- d) vertex

11. Kofi scored 18 marks out of 40 in a class test. What percentage of the 40, did he score?

- a) 40%
- b) 45%
- c) 50%
- d) 55%

12. What is the area of a rectangle with the length 18cm and width 7cm?

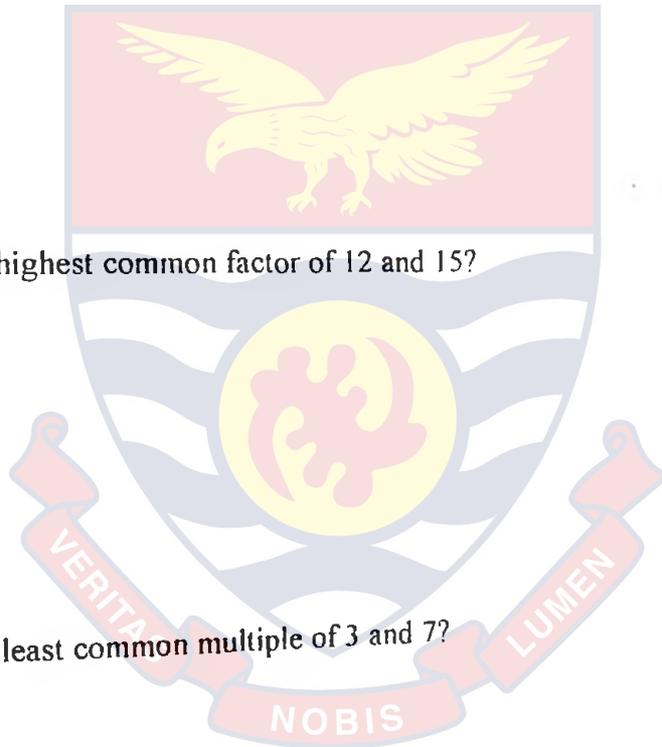
- a) 25cm^2
- b) 56cm^2
- c) 126cm^2
- d) 756cm^2



13. What is the prime factorisation of 40?

- a) $2 \times 4 \times 5$
- b) $2^3 \times 5$
- c) 5×8
- d) 2×20

14. Express the ratio 4 : 16 in its simplest form
- 1 : 2
 - 1 : 4
 - 2 : 4
 - 4 : 8
15. What counting number is a factor of every number?
- 0
 - 1
 - 2
 - 3
16. What is the highest common factor of 12 and 15?
- 3
 - 4
 - 5
 - 30
17. What is the least common multiple of 3 and 7?
- 1
 - 3
 - 7
 - 21



18. Which instrument do we use to measure angles?

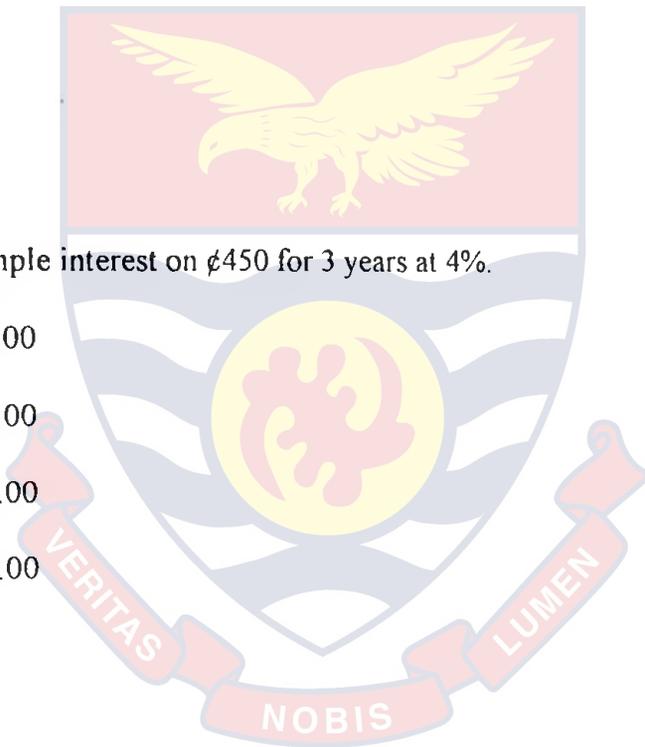
- a) a pair of compasses
- b) a pair of dividers
- c) protractor
- d) square

19. Express 20 as a percentage of 40.

- a) 30
- b) 40
- c) 50
- d) 60

20. Find the simple interest on ₵450 for 3 years at 4%.

- a) ₵18.00
- b) ₵27.00
- c) ₵36.00
- d) ₵54.00



APPENDIX E

POSTTEST ITEMS

ENGLISH LANGUAGE

CLASS: BS6

TIME: 20 MINUTES

SECTION A

COMPREHENSION

People travelling by air use aeroplanes. Two brothers in America made the first aeroplane. They were Orville Wright and Wilbur Wright. They flew the first aeroplane in 1903. Their aeroplane could carry only the pilot.

The biggest aeroplane is the Jumbo jet. It can carry about four hundred passengers. The fastest aeroplane now is the Concorde.

In Ghana there is only one International airport which is in Accra. Kumasi, Takoradi, Tamale and Sunyani have airports, but they are not very often used.

Pilots drive aeroplanes. They start slowly to one end of the runway. The speed increases and it begins to go up. Soon the aeroplane is in the air.

1. Who made the first aeroplane?
 - a) Orville Wright
 - b) Wilbur Wright
 - c) One person
 - d) Orville Wright and Wilbur Wright

2. How many people could the first aeroplane carry?
- a) Two passengers
 - b) Six passengers
 - c) The pilot
 - d) Four hundred passengers
3. What is the name of the biggest aeroplane mentioned in the passage?
- a) Swiss
 - b) Jumbo jet
 - c) Concorde
 - d) Jet jumbo
4. How many passengers can the Jumbo jet carry?
- a) Four hundred passengers
 - b) One passenger
 - c) Two passengers
 - d) One hundred passengers
5. Where is the only international airport in Ghana?
- a) Tamale
 - b) Sunyani
 - c) Kumasi
 - d) Accra

From the list of words lettered A to D, choose the one which is most nearly opposite to the word underlined in each sentence.

6. My father uses a sharp cutlass to work in his garden.

- a) big
- b) rough
- c) blunt
- d) long

7. The water is too hot for bathing.

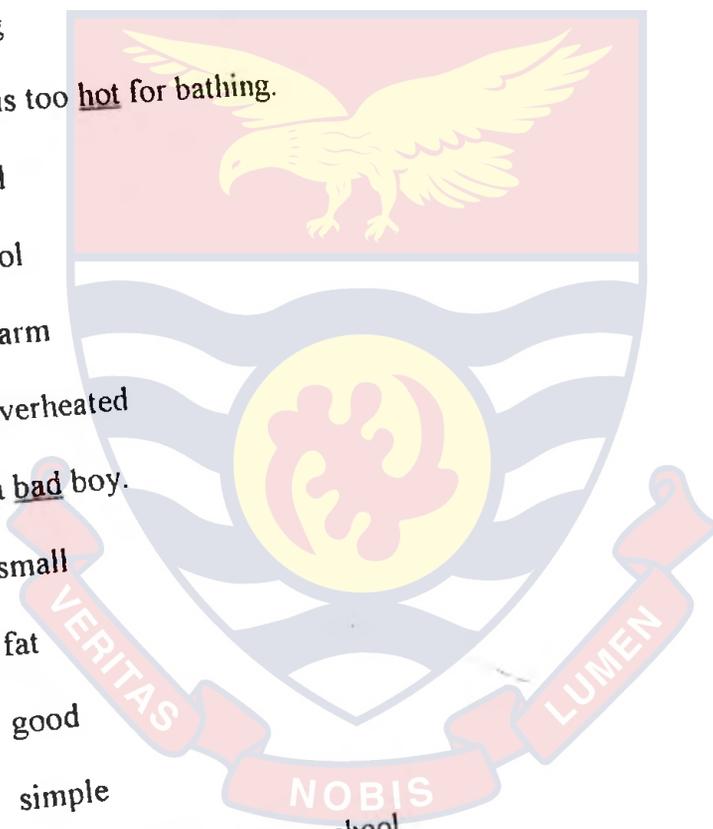
- a) bad
- b) cool
- c) warm
- d) overheated

8. John is a bad boy.

- a) small
- b) fat
- c) good
- d) simple

9. My sister teaches in a private school.

- a) national
- b) mine
- c) international
- d) public



10. Kofi is a lall boy.

- a) taller
- b) short
- c) slim
- d) long

Choose from the list of words given below the one which correctly and most suitably fills the gap in the sentence.

11. I visited both Assiedu Boateng last week.

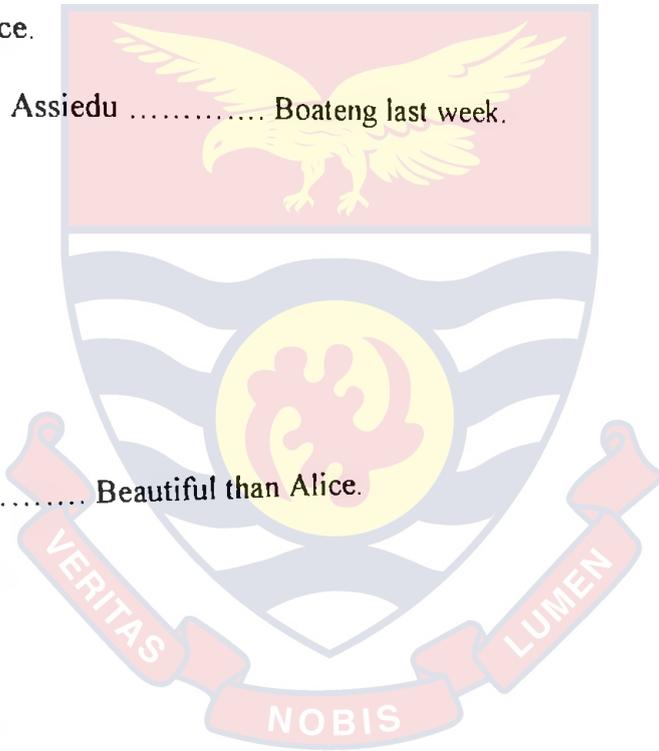
- a) and
- b) nor
- c) or
- d) with

12. Akua is Beautiful than Alice.

- a) most
- b) very
- c) once
- d) more

13. The boy won the prize is my brother.

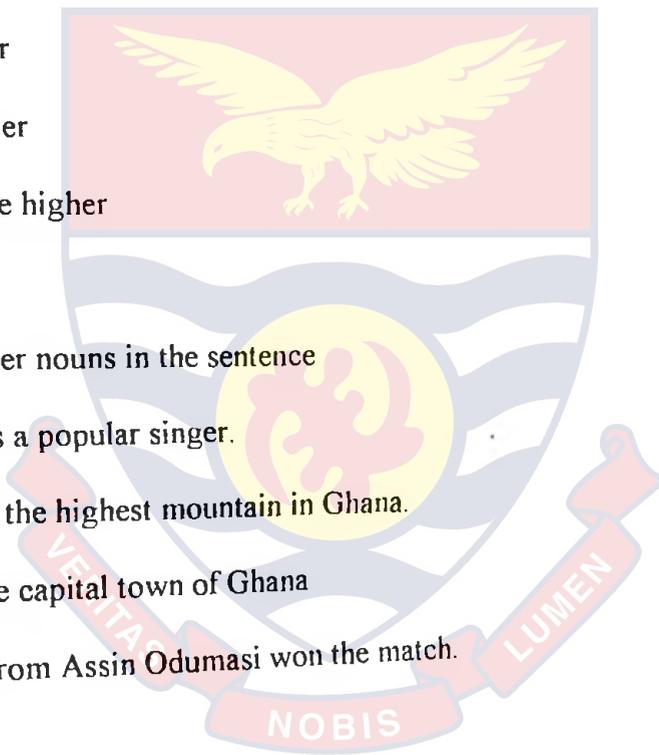
- a) whose
- b) who
- c) whom
- d) which



14. Adamu is neither hungry thirsty.
- a) nor
 - b) or
 - c) either
 - d) more
15. The woman jumped than her husband.
- a) too high
 - b) taller
 - c) higher
 - d) more higher

Underline the Proper nouns in the sentence

16. Bob Cole is a popular singer.
17. Afadjato is the highest mountain in Ghana.
18. Accra is the capital town of Ghana
19. The team from Assin Odumasi won the match.



6. What is the value of 3^3 ?
- a) 3
 - b) 9
 - c) 27
 - d) 30
7. What is the least common multiple of 8 and 12?

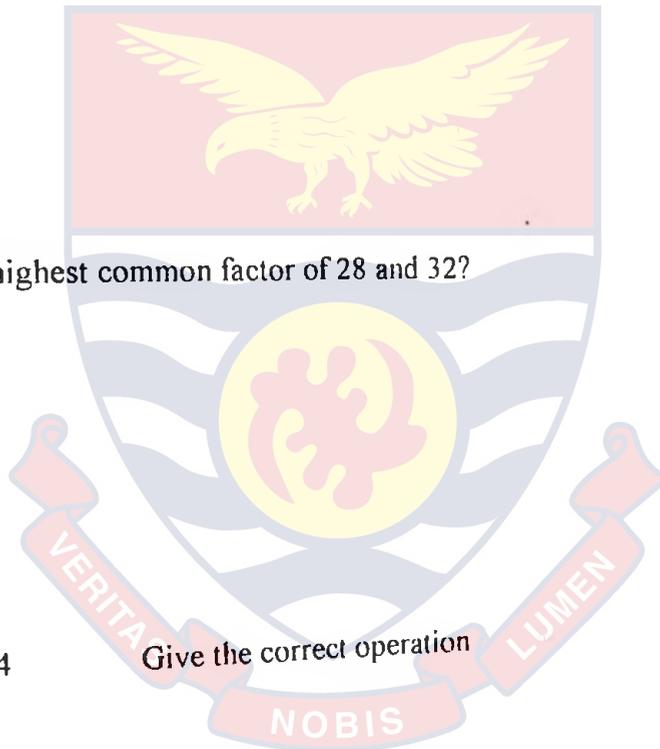
- a) 24
- b) 12
- c) 6
- d) 2

8. What is the highest common factor of 28 and 32?

- a) 2
- b) 7
- c) 8
- d) 5

9. $(14, 6) \rightarrow 84$

- a) -
- b) x
- c) +
- d) ÷



10. $(180, 25) \rightarrow 205$ What operation makes the sentence true?
- a) \times
 - b) \div
 - c) $+$
 - d) $-$

11. Find the square root of 36.

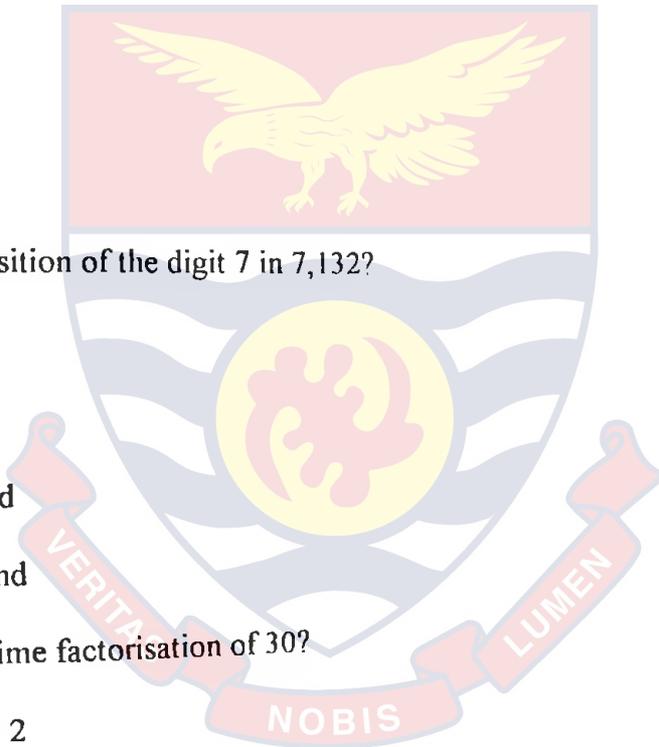
- a) 3
- b) 6
- c) 9
- d) 12

12. What is the position of the digit 7 in 7,132?

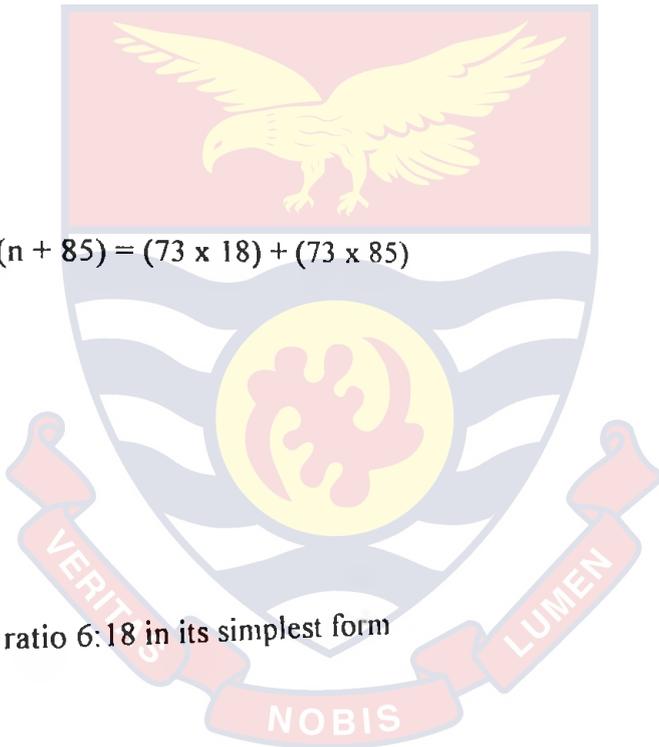
- a) ones
- b) tens
- c) hundred
- d) thousand

13. What is the prime factorisation of 30?

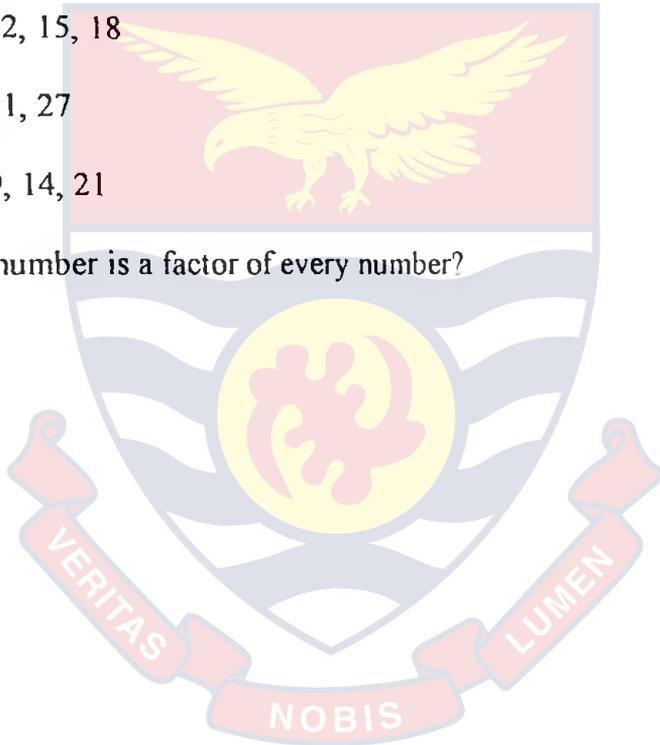
- a) $5 \times 3 \times 2$
- b) $5 \times 2 \times 3$
- c) $2 \times 3 \times 5$
- d) $2 \times 3 \times 5$



14. Find n if $10,000 = 10^n$
- 6
 - 5
 - 3
 - 4
15. Express 20 as a percentage of 40
- 30
 - 40
 - 50
 - 60
16. Find n , $73 \times (n + 85) = (73 \times 18) + (73 \times 85)$
- 73
 - 85
 - 18
 - 1
17. Express the ratio 6:18 in its simplest form
- 1:3
 - 2:9
 - 2:6
 - 1:6



18. What is the value of 3×7
- a) 23
 - b) 42
 - c) 21
 - d) 147
19. What is the set of positive multiples of 3
- a) 1, 3
 - b) 3, 6, 9, 12, 15, 18
 - c) 0, 3, 9, 21, 27
 - d) 1, 3, 7, 9, 14, 21
20. What counting number is a factor of every number?
- a) 0
 - b) 1
 - c) 2
 - d) 3



Means, Standard Deviations and Independent t-test Values of Pretest scores of Experimental (Tangible) Group and Control Group for English Language and Mathematics

| School | Type of test | Subject | N | M | SD | MD | df | t | P |
|---------------------------------------|--------------|------------------|----|------|------|-----|----|------|-----|
| Assin Kumasi D.C | | | | | | | | | |
| Primary Experimental Group (Tangible) | Pretest | English language | 28 | 7.36 | 2.04 | .53 | 54 | .89 | .38 |
| Assin Sbinso Catholic | | | | | | | | | |
| Primary. Control Group | | | 28 | 7.89 | 2.47 | | | | |
| Assin Kumasi D.C | | | | | | | | | |
| Primary Experimental Group (Tangible) | Pretest | Mathematics | 28 | 7.21 | 2.35 | .79 | 54 | 1.23 | .23 |
| Assin Sbinso Catholic | | | | | | | | | |
| Primary. Control Group | | | 28 | 8.00 | 2.45 | | | | |

Means, Standard Deviations and Independent t-test Values of Pretest Scores of Experimental (Intangible) Group and Control Group for English Language and Mathematics

| School | Type of test | Subject | N | M | SD | MD | df | t | P |
|-----------------------------------|---|------------------|----|------|------|-----|----|------|-----|
| Assin Nkran D.C | Primary Experimental group (Intangible) | English language | 37 | 8.19 | 1.70 | | | | |
| Assin Bosomadwe Catholic Primary. | | | 20 | 8.65 | 1.42 | | | | |
| Assin Nkran D.C | Primary Experimental Group (Intangible) | Mathematics | 37 | 7.76 | 1.80 | | | | |
| Assin Bosomadwe Catholic Primary. | | | 20 | 8.20 | 1.96 | | | | |
| | | | | | | .46 | 55 | 1.03 | .31 |
| | | | | | | .44 | 55 | .86 | .39 |

APPENDIX I

Means, Standard Deviations and Independent t-test Values of Pretest scores of Experimental (both Tangible and Intangible) Group and Control Group for English Language and Mathematics

| School | Type of test | Subject | N | M | SD | MD | df | t | P |
|---|---|--------------------------|----|-------|------|-----|------|------|------|
| Assin Odumasi D.C | Primary Experimental Group (both Tangible and Intangible) | Pretest English language | 10 | 9.10 | 1.20 | | | | |
| | | | | | | .53 | 43 | 1.20 | .24 |
| Nyankumasi Ahenkro D.C. Primary (Control Group) | | | 35 | 9.63 | 1.34 | | | | |
| Assin Odumasi D.C | Primary Experimental Group (both Tangible and Intangible) | Pretest Mathematics | 10 | 10.20 | 1.14 | | | | |
| | | | | | | | 1.49 | 43 | 2.54 |
| Nyankumasi Ahenkro D.C. Primary (Control Group) | | | 35 | 8.71 | 1.74 | | | | |

APPENDIX J

Means, Standard Deviations and Independent t-test Values of Pretest Scores of the two Experimental Groups Tangible and Intangible Rewards

| School | Type of test | Subject | N | M | SD | MD | df | t | P |
|--------------------|---|--------------------------|----|------|------|-----|----|------|------|
| Assin Kumasi D.C | Primary Experimental group (tangible) | | 28 | 7.36 | 2.04 | | | | |
| Assin Odumasi D.C. | Primary Experimental group (intangible) | Pretest English language | | | | .83 | 63 | 1.79 | .078 |
| Assin Kumasi D.C | Primary Experimental group (tangible) | | 28 | 7.21 | 2.35 | | | | |
| Assin Odumasi D.C. | Primary Experimental group (intangible) | Pretest Mathematics | | | | .54 | 63 | 1.06 | .30 |
| Assin Odumasi D.C. | Primary Experimental group (intangible) | | 37 | 7.76 | 1.80 | | | | |