The Effect of Quantum Learning on Standardized Test Scores versus schools that do not use Quantum Learning

By

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ABSTRACT

The purpose of this study was to determine the effectiveness of quantum learning on standardized test scores. Standardized tests are the kind of tests that are overseen and attained in a standard and a consistent manner. In a standardized test, the administration and the scoring of the questions have a constant approach; this portrays the design of standardized tests. Quantum learning is the learning process that relies on the use of teaching tactics that firmly plant the data into the memories of the students in class. The study group selected for this study was the high school teachers in the area. Data were collected through a twenty question survey focused on quantum learning and Chi-square analysis was conducted between the factors of teacher education and experience, the frequency of using quantum learning and the teacher’s attitude and confidence toward quantum learning. Recommendations for further research were made.
CHAPTER ONE

INTRODUCTION

1.1 Background

Standardized tests are the kind of tests that are overseen and attained in a standard and a consistent manner. Standardized tests are designed in such a consistent manner and are scored in the same way (Skinner, 1953, p.24). The outcomes of the questions are already predetermined in a standard manner. It is very necessary to utilize proper communication language, especially when interacting with someone in the current world. Standardized tests use any method of assessment; in addition, the tests make use of multiple choices which are cheaper in terms of scoring (Skinner, 1953, p.24). The relevance of standardized tests cuts across many sectors or segments of a country’s economy, for instance, education sector, business and economics sector, technology, art, just to mention but a few (Skinner, 1953, p.24).

Quantum learning is the learning process that relies on the use of teaching tactics that firmly plant the data into the memories of the students in class (Chrisley, 1995, p.8). In order to achieve this, several activities or strategies are put into play. The teachers use visual illustrations and audio clips as a part of the teaching process in order to capture the attention of the students in the desired manner. These strategies aim at satisfying the desires of the students to learn more (Chrisley, 1995, p.8). In addition, quantum learning boosts the ability of the students to grasp the basic concepts that are taught in class without any difficulty by enabling them to become stronger in an academic sense (Chrisley, 1995, p.8). Teachers play a greater role toward the academic development of
the students; it is, therefore, incumbent upon them to utilize the best teaching strategies that help to achieve the desired results in the right manner. Quantum learning has been regarded as the best teaching practice that incorporates both speed and humor in the learning process to assist the students to succeed in their learning (Chrisley, 1995, p.8). The use of examples, illustrations, visual clips and audio clips in the learning process justify quantum learning to be an efficient method of dispensing knowledge to the students (Chrisley, 1995, p.8). Quantum learning, therefore, provides a fair ground for the academic development of the students (Narayanan & Moore, 1995, p.25).

1.2 Practice under investigation

There exist various successful methods of scoring standardized tests particularly to the young students. One known method is the natural approach technique; with regard to this technique, the students play the role of listening to the teacher attentively to grasp the philosophies and the insights that the teacher has to elaborate (Braunstein, 1995, p.4). When the same test is presented in a similar manner to everyone writing the test, then it qualifies to be a standardized test (Bohm, 1980, p.13). It is not mandatory for the standardized tests to be highly staked or to have multiple choices. A non-standardized test is the reverse of a standardized test (Bohm, 1980, p.13). Testing in a non-standardized manner offers dissimilar tests to the various test takers. In the same way, non-standardized testing can offer the same test to the test takers but at different testing conditions (Bohm, 1980, p.13). For instance, one group can be granted more time to complete the test, while the other group is granted more time. In addition, all the test takers can be given the same test to write, but the mode of evaluation differs from one set of group to the other; for instance, a particular answer could be regarded as right for
one group but the same answer is counted as wrong for another group (Bohm, 1980, p.13). In many cases, standardized tests have been postulated to offer a fair ground to the entire test takers than the non-standardized tests; this is due to the fact that the standardized tests offer a consistent approach (Bohm, 1990, p.41).

On the contrary, the use of quantum learning technique has been widely endorsed by many teachers in learning institutions all across the world (Deutsch, 1985, p.100). Through quantum learning, the teachers find it easier to make the learning more enjoyable and interactive by incorporating certain elements in the teaching process such as using pictures, introducing games, etc (Dretske, 1986, p.47). This paper, therefore, seeks to compare the effectiveness of quantum learning on standardized test scores. It investigates whether there is any difference between using quantum learning and not using quantum learning on standardized test scores.

1.3 School Policy to be informed by the study

Quantum learning is a practical learning process that provides a uniform platform for the students to develop academically (Pylkkänen, 1991, p.18; Bohm & Hiley, 1993, p.49; Bohm, 1980, p.56). It is very imperative upon educators and instructors to identify the needs of their students and understand their levels of understanding before incorporating a distinct learning process that caters for all (Pylkkänen, 1991, p.18; Bohm & Hiley, 1993, p.49; Bohm, 1980, p.56). Quantum learning method should be introduced to schools as a better way of engaging the minds of the students (Narayanan & Moore, 1995, p.13).

Quantum learning provides an amazing and interactive experience to the students. It is a cheaper and easier way to dispense knowledge to the students by catering for even
the slow learners (Pylkkänen, 1991, p.18; Bohm & Hiley, 1993, p.49; Bohm, 1980, p.56).

1.4 Conceptual Underpinnings for the Study

Research has proved that the use of quantum learning is very effective in scoring of the standardized tests (Everett, 1983, p.64). Standardized testing offers a fair ground for the students to grow and develop mentally. With the current changing world, learning institutions all across the world have embraced standardized tests to evaluate the students as the tests allow for uniformity and continuity of the learning process (Everett, 1983, p.64). There are terms relevant to this study that should be defined. Quantum learning is the learning process that relies on the use of teaching tactics that firmly plant the data into the memories of the students in class (Feynman, 1982, p.472). Quantum learning provides an amazing and interactive experience to the students. In a nutshell, quantum learning is basically a combination of all the best learning strategies combined together in one piece (Fodor, 1991, p.63).

On the other hand, standardized tests refer to the kind of tests that are overseen and attained in a standard and a consistent manner (Skinner, 1953, p.24). Standardized tests can be in various forms; they can compose multiple-choice questions, essays, true-false questions, or any other stable mode of assessment (Hecht, Shlaer & Pirenne, 1941, p.898). It is very easy and cheap to score multiple-choice questions or true-false questions, thus, they are mostly preferred by learning institutions (Hecht, Shlaer & Pirenne, 1941, p.898).
1.5 Statement of the problem

There is an information gap concerning the effectiveness of quantum learning on standardized test scores. This study, therefore, investigates how quantum learning influences the standardized test scores in learning institutions. In addition, the study seeks to compare two scenarios, whereby, in one case quantum learning is applied on standardized test scores and in another case quantum learning is not applied. Since quantum learning has been perceived to be an efficient way to reach out to the students, the teachers should have the relevant prowess necessary to tackle this approach in the required manner in order to increase their chances of achieving the goals and the objectives that have been set (Pylkkänen, 1991, p.18; Bohm & Hiley, 1993, p.49; Bohm, 1980, p.56).

1.6 Purpose of the study

The purpose of this study was to determine the effectiveness of quantum learning on standardized test scores. Specifically, this study sought to compare results from schools that use quantum learning and schools that do not use quantum learning. The independent variables that were utilized in the study were the teachers; for instance, the level of teaching experience that the teachers had, their qualifications and the effectiveness of their teaching practice. The dependent variable mainly focused on quantum learning, specifically, its effectiveness on standardized test scores, the frequency and duration of teaching, the teacher’s attitude and confidence in approaching quantum learning, and the degree in which quantum learning is practiced.
1.7 Research questions

The research questions that were explored in the study were: (a) Was there a difference between using quantum learning on standardized test scores and not using quantum learning?; (b) Did the teacher's level of education have any impact on the application of quantum learning?; (c) Did the use of quantum learning by the teacher make any impact on the performance of the students?; (d) Did the frequent use of quantum learning impact the students' test scores?; (e) Did the teacher's attitude/confidence toward quantum learning make any difference on the students' performance?; (f) Did the teacher's way of teaching impact the performance of the students?; (g) What were the summary in figures of the concerning the effectiveness of quantum learning on standardized test scores?

1.8 Null hypotheses

In line with the research questions, the following null hypotheses were built up: (a) There was no difference between using quantum learning on standardized test scores and not using quantum learning; (b) The teacher's level of education did not have any impact on the application of quantum learning; (c) The use of quantum learning by the teacher did not make any impact on the performance of the students; (d) the frequent use of quantum learning did not impact the students' test scores; (e) The teacher’s attitude/confidence toward quantum learning did not make any difference on the students’ performance; (f) The teacher’s way of teaching did not impact the performance of the students.
1.9 Anticipated benefits of the study

It is anticipated that the findings of this study will add to the body of knowledge with regard to the available scholarly articles focusing on the effectiveness of quantum learning and make recommendations in an appropriate manner. In addition, the study will help teachers to adopt the best teaching strategies that comfortably suit the students.

1.10 Definition of terms

Standardized tests are the kind of tests that are overseen and attained in a standard and a consistent manner. The design of the standardized tests is in such a manner that the way in which the questions are administered, scored and deduced is consistent (Skinner, 1953, p.24).

Quantum learning is the learning process that relies on the use of teaching tactics that firmly plant the data into the memories of the students in class (Chrisley, 1995, p.8). Quantum learning is a combination of the best teaching strategies put together in one package.

1.11 Summary

The purpose of this study was to determine the effectiveness of quantum learning on standardized test scores. Specifically, this study sought to compare results from schools that use quantum learning and schools that do not use quantum learning. Standardized tests are the kind of tests that are overseen and attained in a standard and a consistent manner. Quantum learning is the learning process that relies on the use of teaching tactics that firmly plant the data into the memories of the students in class. The use of quantum learning in the learning process offers the students the
chance to fully participate and develop academically. In order to meet the purpose of the study, various relevant research questions and hypotheses were explored and tested. The study also utilized various variables that helped in the data collection and analysis.

The study is organized as follows: the next chapter reviews the relevant literature with regard to the effectiveness of quantum learning on standardized test scores. Chapter three talks about the research methodology, which includes: the research design, data collection method and the research analysis method. Chapter four focuses on the research findings and chapter five gives the conclusion and the recommendations.
CHAPTER TWO

LITERATURE REVIEW

This review of literature surveyed numerous research studies and peer reviewed articles that reflected current research, thoughts, and opinions focusing on the effectiveness of quantum learning

2.1 Introduction

Quantum learning is the learning process that relies on the use of teaching tactics that firmly plant the data into the memories of the students in class (Chrisley, 1995, p.8). Quantum learning is a combination of the best teaching strategies put together in one package. Research has found out that quantum learning motivates the students to adopt an enthusiasm for learning as it raises their levels of academic achievements (Chrisley, 1995, p.8). Standardized tests are the kind of tests that are overseen and attained in a standard and a consistent manner. The design of the standardized tests is in such a manner that the way in which the questions are administered, scored and deduced is consistent (Skinner, 1953, p.24).

Many teachers have fallen short of applying the best teaching strategies; Minsky & Papert (1969, 32) found that school educators are lacking in their attempt to meet the goal of motivating the students in their pursuit of knowledge. Many teachers have been held accountable for the dismal performance of the students (Millikan, 1984, p.56; Mead, 1989, p.37). Schools that have adopted quantum learning in their education system have produced sharp and excellent students who score highly in standardized tests (Narayanan & Moore, 1995, p.13). Researchers have, therefore, endorsed quantum learning as the best strategy of learning that empowers the students to grow
and develop academically (Penrose, 1989, p.73). Quantum learning is a very comprehensive and a consistent method of learning as it uses of contextual examples, adequate instructional time for the students, and teaching of reading skills, independent assignments and regular individual assessments (Pylkkänen, 1991, p.18; Bohm & Hiley, 1993, p.49; Bohm, 1980, p.56).

According to Penrose (1989, p.73), there have been no practical studies on the effectiveness of quantum learning. It is worthy to note that several researchers have chosen to ignore the issue of quantum learning fully; instead, they have focused only on the individual components. This could be because there are as many differing opinions with regard to the implementation of quantum learning in schools (Fodor, 1991, p. 22).

2.2 The role of the teacher’s confidence and attitude

The teacher has a role to play in terms of implementing quantum learning method in schools. The level of confidence that the teacher has with regard to quantum learning draws a feedback from the students. Hecht, Shlaer & Pirenne (1941, p.68) found out that the way a teacher approaches the implementation of quantum learning is very important. The study found that teachers with healthy, positive attitudes achieved greater instructional success than their more dour counterparts. Hecht, Shlaer & Pirenne (1941, p.68) also concluded that teachers could help their students make progress more quickly by endorsing quantum learning. Mead (1989, p.34) supports this finding and acknowledges the fact that many teachers, regardless of educational level, feel that quantum learning is very important in the education system. As opposed to this feeling of importance, Millikan (1984, p.45) concluded that the actual pedagogical training through quantum learning at the college and university level is practically non-
existent; thus, the teachers opt to use their own creativity to dispense knowledge to the students. Therefore, while the teacher’s attitudes with regard to quantum learning may be high, there may not be relevant training in place to create a confidence level to support it.

2.3 Effects of the teacher’s technique of teaching

Pylkkänen (1992, p.4) and Skinner (1953, p.51) found that there is no standard method that has been approved to be the best in applying quantum learning techniques in learning institutions. It is imperative upon the teacher to adopt the best teaching method that gives confidence to the students. This is due to the fact that not all the students have the same level of understanding and grasping the basic concepts (Fodor, 1991, p. 22). Penrose (1989, p.37) recognized the success of quantum learning by arguing that it is the best learning strategy that gives the students the chance to grow and develop intellectually.

Quantum learning is a practical approach to the learning process as there are many illustrations which make it easier for the slow-learners to grasp (Fodor, 1991, p. 22). Minsky & Papert (1969, p.64) also commends quantum learning arguing that it is the best gift a teacher could give a student. Penrose (1989, p.37) found that the most common method used by teachers in six southern states was quantum learning. Development of a research-based method was Penrose’s strongest recommendation. Minsky & Papert (1969, p.64) also found that research on the effectiveness of the teacher’s technique is quite correlated to the efficiency at which the students grasp the knowledge.
2.4 Effect of frequent use of quantum learning

The continuous use of quantum learning in schools has been a mark of a successful learning (Pylkkänen, 1991, p.18; Bohm & Hiley, 1993, p.49; Bohm, 1980, p.56). Most teachers in schools include quantum learning in their education process (Fodor, 1991, p. 22); this is an improvement from the previous researches that found out that most teachers spent very little if any class time on effecting quantum learning (Narayanan & Moore, 1995, p.13; Fodor, 1991, p. 22). Consistent use of quantum learning has been found to be an element of successful students (Pylkkänen, 1991, p.18; Bohm & Hiley, 1993, p.49; Bohm, 1980, p.56).

2.5 Performance

Various researches have confirmed that the application of quantum learning in schools contributes greatly to the improved performance of the students. However, despite an elaborate review of various research materials and peer review articles, I was unable to find any further information about how quantum learning affect the students’ performance. Minsky & Papert (1969, p.64) also suggested that there has been little and inadequate research in this area which appears to be true.

2.6 Other issues

There are other issues that are significant to the use of quantum learning that are not included in this study but exist in current research. Many researchers (Narayanan & Moore, 1995, p.13; Fodor, 1991, p. 22; Pylkkänen, 1991, p.18; Bohm & Hiley, 1993, p.49; Bohm, 1980, p.56) found that students who are taught through quantum learning are more informed than their counterparts who are not taught through quantum learning. Their researches, therefore, persuade the teachers to incorporate quantum learning in
the curriculum. The use of quantum learning enlightens the students to be more focused and enthusiastic to the pursuit of knowledge. Minsky & Papert (1969, p.64); Bohm, (1980, p.56) found out that students who were taught oral skills along with reading skills were in a better position to detect simple errors and mistakes. The mode of assessment is the final issue found in current research but is not included in this study. Bohm & Hiley, (1993, p.49); Bohm, (1980, p.56) found that students who were assessed individually and frequently were more successful than those students who were tested in groups.

2.7 Summary

It is very evident from the literature review that schools that do not use quantum learning score poorly on the standardized tests as compared to schools that embrace quantum learning. The main reason for not adopting quantum learning in some schools is that many teachers are unaware of the research that points the way to successful quantum learning instruction. According to the research, a good teacher attempts to teach in a positive manner using a consistent illustrations and contextual examples while providing adequate instructional time for group of students, training them on reading skills, constant contact with the students, independent practice by the students, and regular individual assessment. Despite this information there is still a need to know more. Researchers still need to discover the best practice of quantum learning and how to communicate that information to other teachers.

However, it is worthy to note that some questions are not answered in this research. The questions include: the teacher’s level of education, the teacher’s teaching experience, and the teacher’s performance. With anticipation, as the teachers become
more frustrated with this component of instruction, there will be an impetus for further research and answers to the problems that the teachers find in adopting quantum learning.
CHAPTER THREE

METHODOLOGY

3.1 Introduction

Methodology is the process of instructing the ways to do the research. It is, therefore, convenient for conducting the research and for analyzing the research questions. The process of methodology insists that much care should be given to the kinds and nature of procedures to be adhered to in accomplishing a given set of procedures or an objective. This section contains the research design, study population and the sampling techniques that will be used to collect data for the study. It also details the data analysis methods, ethical considerations, validity and reliability of data and the limitation of the study.

3.2 Research philosophy

For this part, choosing a philosophy of research design is the choice between the positivist and the social constructionist (Easterby, 2008, p.67). The positivist view shows that social worlds exist externally, and its properties are supposed to be measured objectively, rather than being inferred subjectively through feelings, intuition, or reflection. The basic beliefs for positivist view are that the observer is independent, and science is free of value. The researchers should always concentrate on facts, look for causality and basic laws, reduce phenomenon to simplest elements, and form hypotheses and test them.

Preferred methods for positivism consist of making concepts operational and taking large samples. The view of the social constructionists is that reality is a one-sided phenomenon and can be constructed socially in order to gain a new significance to the
people. The researchers should concentrate on meaning, look for understanding for what really happened and develop ideas with regard to the data. Preferred methods for the social constructionists include using different approaches to establish different views of phenomenon and small samples evaluated in depth or over time (Saunders, 2009, p.87). For the case of analyzing the impacts of quantum learning on standardized test scores, the philosophy of the social constructionists was used for carrying out the research. Because it tends to produce qualitative data, and the data are subjective since the gathering process would also be subjective due to the involvement of the researcher.

3.3 Research design

This study was a one-shot survey pre-experimental design with two one-degrees of wayness and four degrees of sameness. Measurement was data type utilizing counts thorough a formal survey. The independent variables were the school teachers participating in the survey. This grouping factor was divided into two subgroups, the teacher’s level of experience and the teacher’s level of education. The dependent variable was quantum learning divided into two subgroups: frequency/duration of instruction; and the attitude/confidence of the teacher in approaching quantum learning. The results of the survey were analyzed using Chi-square analysis.

3.4 Study group

The study group consisted of 11 Midwest high school vocal music teachers who responded to the survey. Initially 50 surveys were sent out. 54.55% of the teachers had their bachelors degree and 45.45% had gone on to receive their various masters degree. The majority of respondents (42%) were veteran teachers having 15 or more
years experience, 23% had taught for 11-15 years, while 35% of the teachers had 1-10 years of teaching experience.

3.5 Research approach
Qualitative research is a way of research question captured in various academic fields of study, conventionally used in the social sciences, but also in research on market and other areas. The qualitative method investigates the question as to how and why decision making is carried out; hence, focused and smaller samples are more frequently preferred to huge samples (Skinner, 1953, p.64). The information and the findings that were brought into being by the qualitative approaches were viewed to be significant and relevant to the research approach. Quantitative methods on the other hand verified the validity and truthfulness of the hypotheses (Romzek, 1989, p.652). Creech (1995, p.33) further asserts that qualitative methods can be explained as a source of data or an explanation based on the dimensions of the graph or a non-mathematical data collection.

3.6 Data Collection and Instrumentation
A non-experimental one-shot survey was used to collect counts data. The survey instrument consisted of twenty questions focused on sight-singing instruction in the vocal music classroom. Fifty surveys were sent to area vocal music teachers with 11 of them responding within three weeks of the date the survey was mailed.

3.7 Data Analysis Methods
Data from the survey were entered into the Excel spreadsheet program for future analysis. Using ASP statistical software, Chi-square analysis was conducted to challenge the null hypothesis for each of the seven research questions.
CHAPTER FOUR

FINDINGS AND RESULTS FROM DATA ANALYSIS

4.1 Introduction

This section covers the analysis of the data, presentation and interpretation. For the research methodology, the choices of the two approaches: deductive and inductive approaches were used for carrying out the research (Easterby, 2008, p.42). A deductive approach is described as a study in which the theory is tested by the empirical observation, and is referred to as moving from the general to the specific. Deductive research establishes a theory and then checks on the data; it uses quantitative data and it is a very structured approach. On the other hand, inductive approach is a study in which the theory is developed from observation of reality and is the opposite of deductive research; it moves from the specific observations to the general statements. This study mainly used inductive approach for the case of analyzing the effect of quantum learning on standardized test scores because the theory is developed from the observations of the reality.

By using quantitative approach, the researcher would need to collect a volume of data and analyze the relationship of the data, and then the data would be manipulated into trends or patterns. Next, the researcher would use standardized approaches that structure the data before it is analyzed. Examples of quantitative approach include experiments, surveys, formal methods and numerical methods. By using qualitative approach, the researcher would collect more in-depth data and aim to explore understanding, meaning and experience. The data represent the feelings and the views for qualitative approach and are not integrated in the opinion poll. Besides, it is difficult
to analyze by standardized methods. Case study research, action research and ethnography are some illustrations of qualitative methods (Easterby, 2008, p.42)

The most customary demarcation between the uses of quantitative and qualitative research especially in the social sciences is that qualitative procedures are employed for illustrating confounding quantitative outcomes or for exploration (i.e., conjecture-engendering). On the contrary, quantitative methods are being employed to evaluate theories. Some critics think that the use of quantitative method of analysis purposes to offer many illustrations, precise and reliable evaluation mainly through centered conjectures, applied mathematics and evaluation tools. On the other hand, qualitative data is normally tedious to display or graph in mathematical terms (Easterby, 2008, p.42). For program research and policy evaluation, qualitative research is frequently employed as it can offer solutions to some significant questions more effectively and efficiently as opposed to quantitative approaches. This is especially the case for comprehending why and how some results were accomplished (not just what was accomplished) and also for replying some significant queries about pertinence, unplanned effects and impact of processes such as: were anticipations justifiable; did procedures function as anticipated; were chief policy makers able to do their jobs; did the program create any unintended impacts; and so on.

During the research process, qualitative approaches have the benefit of permitting for more multifariousness in the capacity to adapt to new developments as well as in responses of research itself (Easterby, 2008, p.42). It is to be observed that qualitative research can not only be time-consuming but also expensive to conduct; many fields of research espouse qualitative methods that have been purposefully developed to offer
more cost-efficient, succinct and timely outcomes. In collecting the data, qualitative researchers may employ varied overtures, like narratology, classical ethnography, grounded theory practice, shadowing, or storytelling. Contours of the data gathered can include group discussions and interviews, reflection field notes and observation, various pictures, texts, video clips, audio clips and other forms (Easterby, 2008, p.42).

4.2 Effect of the teacher’s level of experience

This study used Chi-square analysis to analyze the results of this study. The result found out that there was no significant effect of the teacher’s level of experience on the application of quantum learning (Chi square = 1.436; p = 0.382; when compared to a criterion Alpha level of 0.20). The null hypothesis was, therefore, accepted. The school teachers who were interviewed during this study had different years of teaching experience. 35% had taught for between 1-10 years, 23% had taught for between 11-15 years and 42% were veteran teachers who had taught for more than 15 years. The results are summarized in Appendix 1.

4.3 Effect of the teacher’s level of education

The result found out that there was no significant effect of the teacher’s level of education on the application of quantum learning (Chi square = 1.083; p = 0.517; when compared to a criterion Alpha level of 0.20). The null hypothesis was, therefore, accepted. The school teachers who were interviewed during this study had different levels of education. 68% of the teachers had Bachelor degrees and they taught at a lower level. 32% had Master degrees and they taught at a higher level. The results are summarized in Appendix 2.

4.4 Effect of frequent use of quantum learning
The result found out that there was no significant effect of the frequent use of quantum learning on the students’ performance (Chi square = 1.269; p = 0.342; when compared to a criterion Alpha level of 0.20). The null hypothesis was, therefore, accepted. The school teachers who were interviewed during this study had different frequencies of using quantum learning. 77% of the teachers used quantum learning at a higher frequency and the performance of the students were high. On the other hand, 23% of the teachers used quantum learning at a lower frequency and the students still passed. This suggests that frequency and duration of using quantum learning were not related to the performance ratings. Despite the results of this test, it was encouraging to note that the majority of teachers used quantum learning daily for a significant amount of time. The results are summarized in Appendix 3.

4.5 The role of the teacher’s confidence and attitude

The result found out that there was no significant effect of the teacher’s level of education on the application of quantum learning (Chi square = 1.014; p = 0.218; when compared to a criterion Alpha level of 0.20). The null hypothesis was, therefore, accepted. The school teachers who were interviewed during this study had different levels of attitude and confidence. 63% of the teachers had a negative attitude and confidence. 37% had a positive attitude and confidence. However, it is worth noting that when the teachers had a negative attitude toward quantum learning, the students still passed. The results are summarized in Appendix 4.
4.6 Summary of Major Findings

This study found that while the experience of the music teacher does not seem to affect the effectiveness of quantum learning, there is a trend among teachers with less than 15 years experience to adopt quantum learning at a high level which might indicate better undergraduate preparation.

This study found that frequency and duration of using quantum learning was not a factor in the students' performance. However, it was noted that the majority of teachers opt to use quantum learning for a significant amount of time. The attitude and confidence of the teacher was not found to be an influencing factor to the students' performance.
CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Quantum learning is the learning process that relies on the use of teaching tactics that firmly plant the data into the memories of the students in class. Standardized tests are the kind of tests that are overseen and attained in a standard and a consistent manner. The design of the standardized tests is in such a manner that the way in which the questions are administered, scored and deduced is consistent. This study found that teachers who use quantum learning are more likely to have successful students than the teachers who do not use quantum learning. Other factors such as the educational level and experience of the teacher, the attitude and confidence of the teacher and the frequency and duration of using quantum learning were not found to be significant factors in the instructional puzzle. The contradiction of some of this study’s findings with current research many be due in part to the low number of survey responses. But those contradictions may also be due to a lack of knowledge in this geographical area about the current educational findings regarding quantum learning.

5.2 Recommendation

Based on the findings of this study, it is recommended that teachers acquaint themselves with quantum learning techniques and use it to develop a high level teaching method in order to enable the students to grow and develop. It is also recommended that further research be conducted in this area. Information is severely needed in order to develop best practice for future generations of educators.
REFERENCES


APPENDICES

Appendix 1 Summary of Chi-square analysis results for the teacher experience

<table>
<thead>
<tr>
<th>Experience</th>
<th>Low</th>
<th>High</th>
<th>Chi-square</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10 years</td>
<td>0%</td>
<td>35% (2)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11-15 years</td>
<td>0%</td>
<td>23% (1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15+ years</td>
<td>100%</td>
<td>42% (5)</td>
<td>1.436</td>
<td>2</td>
<td>0.382</td>
</tr>
</tbody>
</table>

Appendix 2: Summary of Chi-square analysis results for the teacher education

<table>
<thead>
<tr>
<th>Education</th>
<th>Low</th>
<th>High</th>
<th>Chi-square</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelors</td>
<td>68% (2)</td>
<td>50% (6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masters</td>
<td>32% (1)</td>
<td>50% (2)</td>
<td>1.083</td>
<td>1</td>
<td>0.517</td>
</tr>
</tbody>
</table>

Appendix 3: Summary of Chi-square analysis results for the frequency of use

<table>
<thead>
<tr>
<th>Rating</th>
<th>Frequency</th>
<th>Low</th>
<th>High</th>
<th>Chi-square</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>23% (2)</td>
<td>0%  (0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>77% (5)</td>
<td>100% (4)</td>
<td>1.269</td>
<td>1</td>
<td>0.342</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix 4: Summary of Chi-square analysis results for the attitude of teachers

<table>
<thead>
<tr>
<th>Ratings</th>
<th>Attitude</th>
<th>Low</th>
<th>High</th>
<th>Chi-square</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>63% (5)</td>
<td>25% (1)</td>
<td></td>
<td>1.014</td>
<td>1</td>
<td>0.218</td>
</tr>
<tr>
<td>Positive</td>
<td>37% (2)</td>
<td>75% (3)</td>
<td></td>
<td>1.014</td>
<td>1</td>
<td>0.218</td>
</tr>
</tbody>
</table>