CHAPTER5: SUMMARY OF THE STUDY, RECOMMENDATIONS, AND CONCLUSION

5.1 INTRODUCTION

This chapter highlights the summary of findings of this study, which aimed to investigate and describe the teacher views and Effect of Art-integrated Learning on Academic Achievement in Mathematics of 10th Grade Students. This deliberation is presented in section 5.2. Subsequently, section 5.3 presents the implications, followed by recommendations in section 5.4. The limitation of the study is discussed in section 5.5 preceding a concluding remark in section 5.6. The interview and the observations that were conducted with the teacher and the learners were resourceful in providing data used in the description of their experiences of Art Integrated Learning in mathematics.

The investigation of the study was guided by two research questions as follows.

- What are teacher views of Art Integrated Learning in the mathematics classroom?
- What is the Effect of Art Integrated Learning on Academic Achievement in Mathematics of 10th Grade Students?

5.2 SUMMARY OF FINDINGS

The summary of findings is discussed according to each of the research questions.

5.2.1 The main findings under research question 1

Research question 1: What is teacher views of Art Integrated Learning in the AIL classroom?

The key findings from research question 1 were that the teacher viewed Art Integrated Learning as:

- an approach that gives learners equal learning opportunities,

- a way for learners to learn independently,
- opportunity for learners to ask questions, and
- as a method with which learners can actively participate in the AIL classroom.

Giving learners equal learning opportunities

The teacher viewed Art Integrated Learning as an approach that afforded learners equal opportunities to work on problems and exercises, then learn from one another on how mathematics problems are solved. He says Art Integrated Learning gives learners equal opportunities and a fair chance to work on problems and exercises and learn from one another to solve trigonometric problems.

Art Integrated Learning as a way for learners to learn independently

The teacher practiced his view of Art Integrated Learning by giving learners time to work out the mathematics problems and then each was required to explain. During the lesson, learners were given a specified time to solve exercises and five minutes to share their answers on the board.

Opportunity for learners to ask questions

The teacher viewed Art Integrated Learning activities as challenging learners to ask questions among themselves and listen to what their peers are learning. He further described Art Integrated Learning as a way to make learners participate effectively in the AIL classroom.

Active participation of learners in the AIL classroom

The teacher interpreted Art Integrated Learning as a way to make learners participate in the AIL classroom. He viewed Art Integrated Learning as resourceful towards reflecting on mathematics problems. Learners corrected one another on the board when sharing solutions to the AIL class. That helped them reflect on the mistakes and competencies they have when solving trigonometric exercises.

5.2.2 The main finding for research question 2

Research question 2: What is the Effect of Art Integrated Learning on Academic Achievement in Mathematics of 10th Grade Students?

In the study, we have found that there was a significant difference between the pre-test and post-test marks of controlled and experiment groups. Therefore, the art integration learning in the teaching and learning of mathematics had a positive impact on the experimental group's achievements.

The benefits of using Art Integrated Learning in a mathematics AIL classroom elaborated under the following headings:

- Learners working together within their groups,
- Help each other understand difficult mathematics questions,
- Learners' positive interdependence,
- Interpersonal interactions,

Learners working together within their groups

The learners perceived group work as a means of learning mathematics within a group with the other learners. Learners believed that Art Integrated Learning availed them the opportunity to learn from other learners who better understood the concept. Art integrated learning is experiential and makes all children respond with their imagination and emotional strengths. They appreciated the opportunity to learn the concept one-on-one unlike when the teacher is explaining them to the whole AIL class.

Learners' positive interdependence

The learners viewed group work as unique from individual tasks. Art can play an effective role in strengthening the child's curiosity, imagination, and sense of wonder. They should have a positive impact on the skills related to intellectual, socio-emotional, motor, language, and overall literacy. They understood that their contribution and participation in given tasks were collectively and individually beneficial. Art Integrated Learning was perceived positively as an enabler to discuss with AIL classmates with whom they hardly had opportunities to interact.

Interpersonal interactions

Interpersonal interactions in Art Integrated Learning enabled learners to identify peers who were good in mathematics and, thereafter, found what they did right, followed it, and passed. AIL can allow children to build on simple concepts as well as relate them with academic content meaningfully. Students also enhance the skill to work in groups and explore ideas together.

5.2.4 Difficulties in learning and understanding mathematics

Two prominent difficulties in learning and understanding mathematics were identified:

- The learners faced challenges with learning mathematics because the subject required more time for them to grasp concepts and
- Learners had challenges with finding the value of x because it was a frequent requirement in mathematics.

Learners also had problems with using $\sin\theta$, $\cos\theta$, and $\tan\theta$. They attributed this to the fact that they were prescribed learning materials which they had to recall and apply constantly. According to them, this hardened their attempt at assignments or tests.

5.3. IMPLICATIONS

This study implies that teachers need to implement the NCF 2005 policy to offer Art Integrated Learning opportunities effectively to learners. Strategies such as the use of charts cannot be standalone and should be accompanied by a combination of concrete illustrations, actions, and words to make connections and facilitate learners' understanding of abstract concepts in mathematics. In addition, the findings from this study imply that Art Integrated Learning should priorities interpersonal relationships among learners to improve the solving of Mathematic equations through group work. Teachers must be prepared to provide opportunities for learners to work in situations where they experience positive interdependence. Teachers will be required to implement Art Integrated Learning effectively by engaging learners about the importance of learning a concept, then a learner-centred environment can be leveraged for better understanding. For the school

environment, there is a need for an equal opportunity for Art Integrated Learning as well as exposure to teacher-centred learning approaches.

5.4 RECOMMENDATIONS

The findings of this study established gaps prevalent in the teachers' understanding of the practical implementation of Art Integrated Learning practices. Based on the findings, the study recommends:

5.4.1 Teacher training

- Pre-service teacher training to be established as a major contributing factor to better the implementation of Art Integrated Learning practices in mathematics. Teacher education training institutions should emphasise the practical implementation of Art Integrated Learning practices.
- Teacher training institutions to host practical workshops that would help teachers integrate their theoretical training with practical Art Integrated Learning experience.

5.4.2 Curriculum advisors

The findings of the study will assist curriculum advisors to create opportunities for teachers to participate in Art Integrated Learning capacity-building workshops as follows:

- The curriculum advisors should encourage teachers to attend mandatory, regular, and ongoing workshops to deepen their knowledge regarding Art Integrated Learning implementation and other approaches that are effective in learning mathematics.

- Regular workshops should be conducted on an ongoing basis to train teachers in the implementation of strategies for teaching and learning incorporating art integrated learning. It is suggested for the workshops to be conducted at the beginning of each term before the teaching season commences to avoid the disruption of AIL classes.

- Teachers should be awarded certificates of attendance to Art Integrated Learning workshops to encourage them to value and encourage attendance continuously.

5.5 RECOMMENDATIONS FOR FUTURE RESEARCH

This study was solely based on quantitative data. To overcome the weaknesses of a mono-method, it is recommended that future researchers follow a mixed-method (qualitative and quantitative) approach. This will allow for the collection of in-depth data from interviews as well as numerical findings through survey questionnaires. Further research may also conduct a comparative approach to different AIL classes in different learning districts in Limpopo. The benefit of this is the generalization of the findings to a bigger population.

5.6 LIMITATION OF THIS STUDY

This study extracted a sample of learners and a teacher and while the sample was enough to answer the predetermined research questions posed, the findings from this study cannot be generalized to Grade 10 learners and teachers.

5.7 CONCLUSION

This study employed a quantitative method to investigate the Effect of Art Integrated Learning on academic achievement and conceptual understanding of mathematics in Grade 10 mathematics. A pretest-posttest experiment design was used as a research design to get an in-depth analysis and collect detailed data using self-prepared pretest and posttest, semi-interviews of the Art Integrated Learning of mathematics in Grade 10 mathematics AIL classroom from the learners and the teacher. Participants were purposely chosen and consisted of (n=60) Grade 10 mathematics learners and their mathematics teacher. Data from learners were collected using a self-prepared pretest and posttest.

In terms of Art Integrated Learning, the study found that there was a significant difference between the pre-test and post-test marks and there is a significant difference between controlled and experimental groups. Therefore, the art

integration learning in the teaching and learning of mathematics had a positive impact on the experimental group's achievements.

AIL as pedagogy provides opportunity and spaces for 'assessment as learning, assessment for learning and 'assessment of learning'. AIL-based assessment promotes task-based performance and therefore it empowers the facilitator with a variety of tools and techniques to assess. Any art activities including, drawing, painting, singing, movement, role-play, puppetry, etc.

This study concludes that more teacher training, the appointment of a curriculum advisor, and the management of the volumes of mathematics materials can create room for implement in terms of engagement of learners during Art Integrated Learning in mathematics.