Effectiveness of Matific Mathematics learning resources in selected primary schools in Fiji

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Presentation Outline

- Introduction of the problem
- What is Matific Program?
- Aim and research questions
- Significance of the study
- Conclusion
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Introduction

- Mathematical ability and problem-solving skills are critical for the 21st century (Education Report, 2000).
- Mathematical teaching has generally been dominated by the traditional transmission approaches (Shimazu, 2013). Such approaches have often led to lack of positive attitudes and interest towards learning of mathematics. One of the reasons for this as related to the way subject has been taught. Hence there is a need to focus on teaching methods that help students connect maths to everyday life.
- The primary school must build on that prior learning and offer a teaching and learning environment that both complements children's experience outside school and encourages them to interact in ways that lead to further knowledge construction.

Cont.

- Poor numeracy results are a worry at a national level.
- According to Rawalai (2016), in one of the Fiji Times article stipulated that the Ministry of Education has blamed the failure of the primary school system and subject delivery as the main contributors to the drop in Year 6 and Year 8 national examination results. Former Minister for Education, Dr. Reddy (2016) said the pass rate for Mathematics in the Year 6 examinations was 29 percent, meaning 71 percent of children failed the subject in the country.
- Children nowadays face challenges causing them to deviate from their study, raising the need to change traditional methodologies and teachers' delivery techniques, particularly in teaching of numeracy skills.

Cont.

- Any approach to improve numeracy must influence students' attitudes and behaviour, as well as their skills. This means it needs to be practical, engaging and interesting. Improving numeracy skills is best done at a young age—all children should get excellent classroom teaching, and those who are struggling should receive targeted support as soon as possible.
- The need to incorporate digital technologies into the teaching and learning of mathematics is now an integral part in the developed countries like Australia and New Zealand.
- Given that almost all young people are actively involved in game playing in either a concrete or digital form; it makes sense to expect that the use of digital games in education could assist in increasing student engagement with content such as mathematics that may otherwise feel irrelevant to students' everyday lives. Hence, we need to supplement our primary mathematics curriculum with program such as Matific.

Aim of the study

The purpose of this research is to investigate whether and how the use of Matific resources, use within a range of Fijian Primary school classrooms, can improve student engagement with mathematics and assist student in learning and understanding challenging mathematical concepts.

Research Questions

The research specifically aims to answer the following questions:

1. To what degree do the Matific digital Mathematics resources assist primary children to understand and learn difficult mathematics content?
2. In what ways do the Matific digital resources influence student engagement with mathematics?

What is Matific Program?

- Matific is a range of digital mathematics resources that aim to improve mathematics outcomes through the use of game-based applications. Each application, refer to as an episode, focuses on a specific mathematical concept.

A SHORT HISTORY OF MATIFIC

Matific around the world

- 45+ countries
- Source:Matific
- 6M+ problems daily
- 200K+ teachers

Teachers are “generalists”

Most primary school teachers did not specialize in mathematics; they specialized in **teaching**

Insufficient conceptual understanding leads to an over-emphasis of **procedures** over concepts

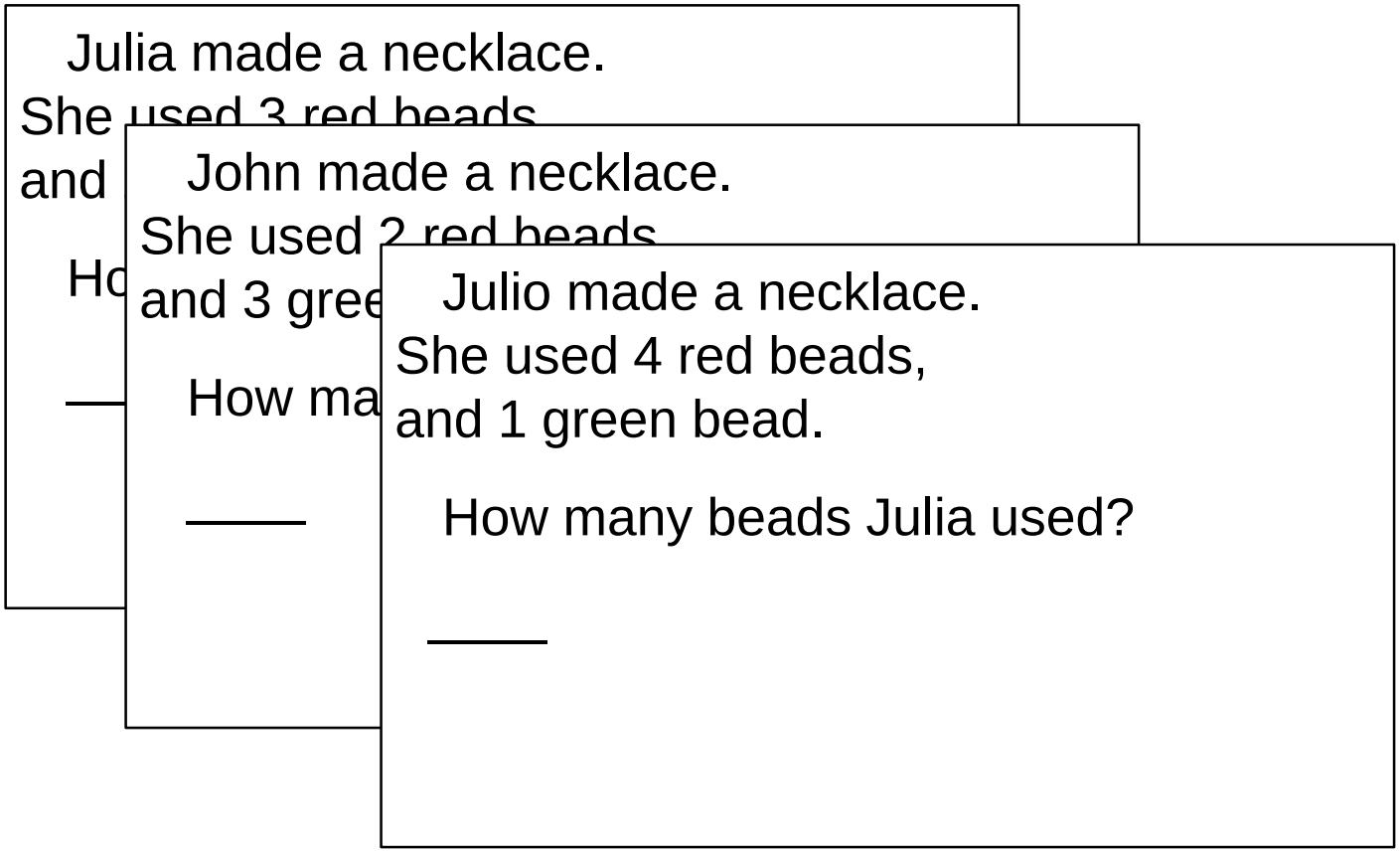
HOWEVER

Good teachers with good teaching material can do wonders

Make Mathematics…

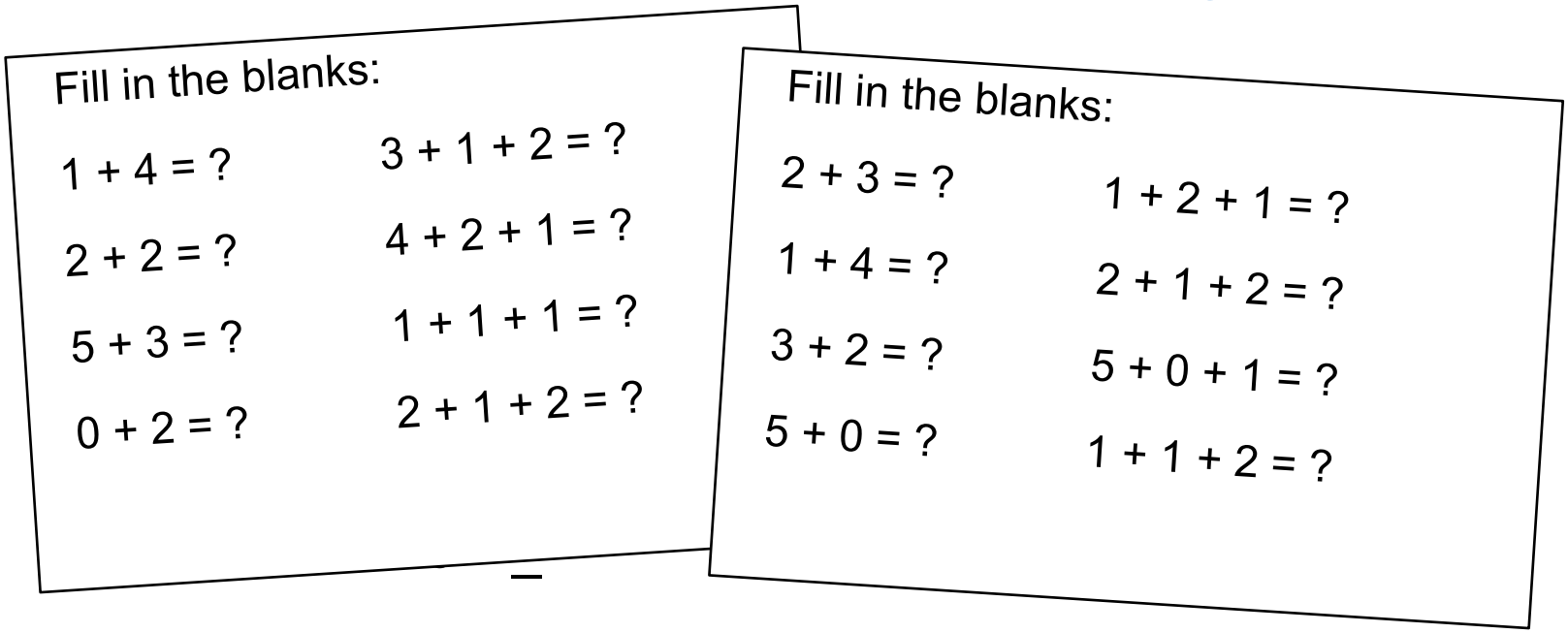
- personal
- engaging
- adaptive
- fun

The Common Way



word problems...

The Common Way



worksheets...

The Common Way

Fill in the blanks:

1 + 4 = ?

2 + 2 = ?

5 + 3 = ?

0 + 2 = ?

3 + 1 + 2 = ?

4 + 2 + 1 = ?

1 + 1 + 1 = ?

2 + 1 + 2 = ?

Fill in the blanks:

2 + 3 = ?

1 + 4 = ?

3 + 2 = ?

5 + 0 = ?

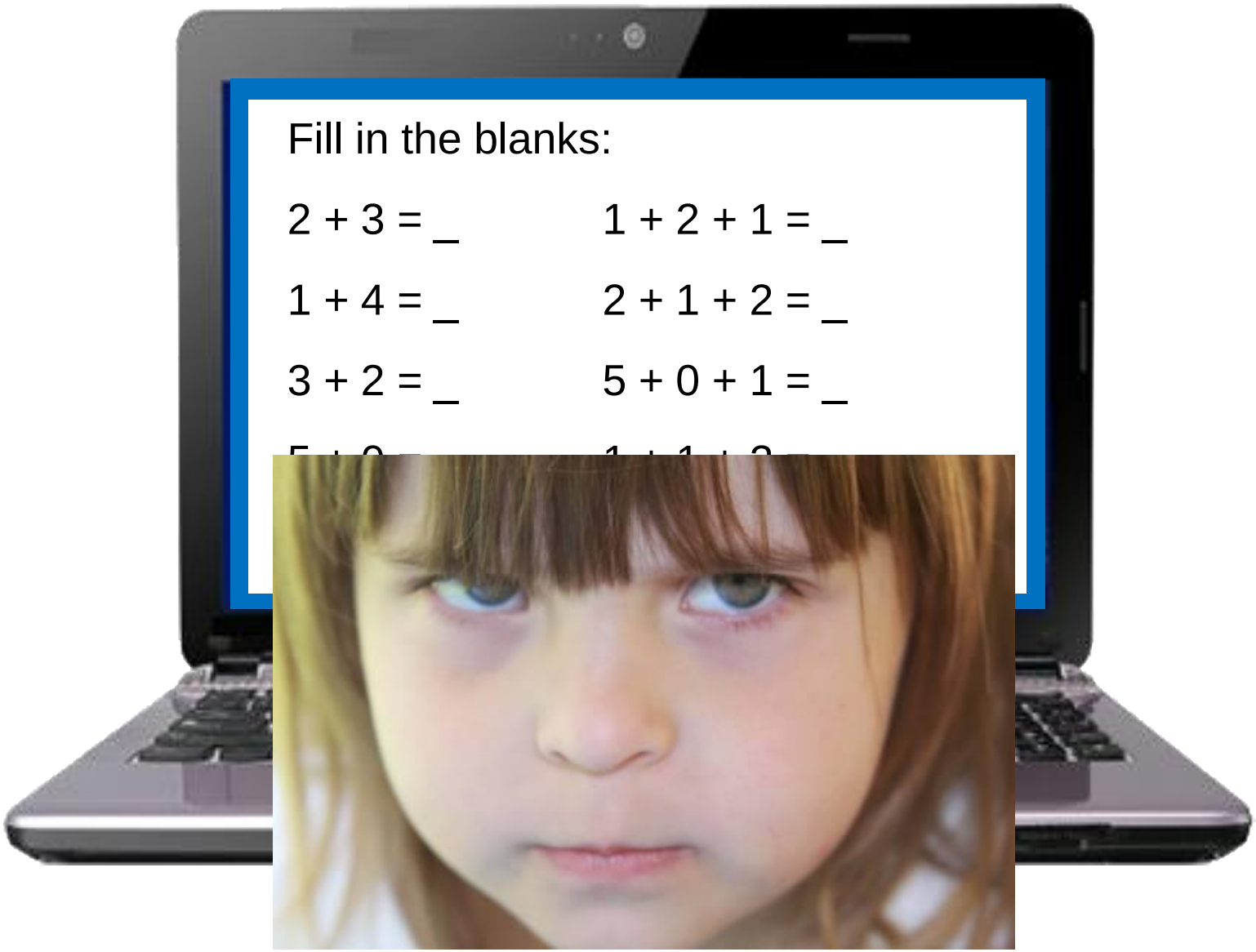
1 + 2 + 1 = ?

2 + 1 + 2 = ?

5 + 0 + 1 = ?

1 + 1 + 2 = ?

The Common Ed-Tech Solution:



matific


250
Skip forward by
3
You can only land on blocks that are multiples of 3
19
20
18
15
16
14
Level 1

matific

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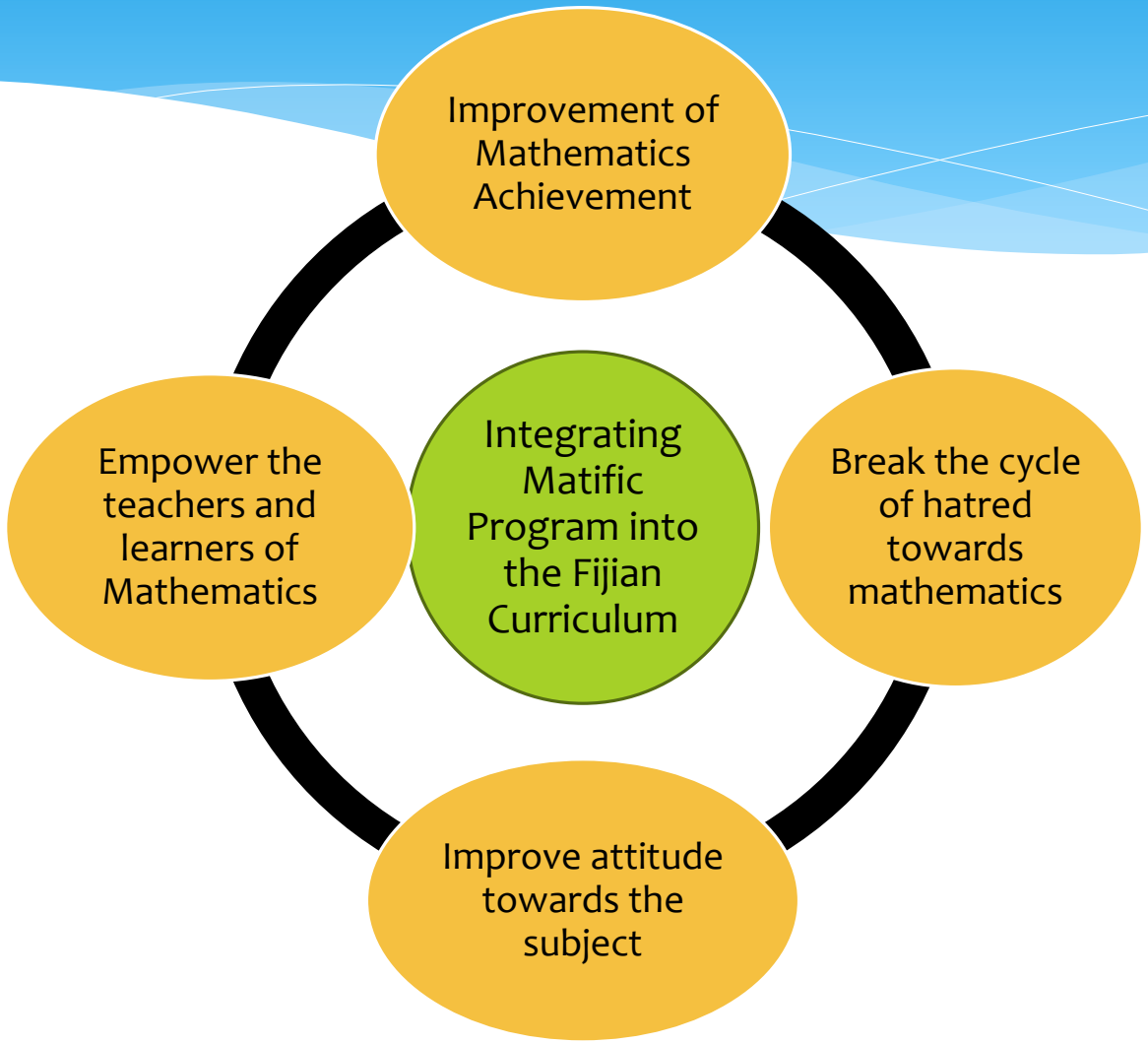
matific

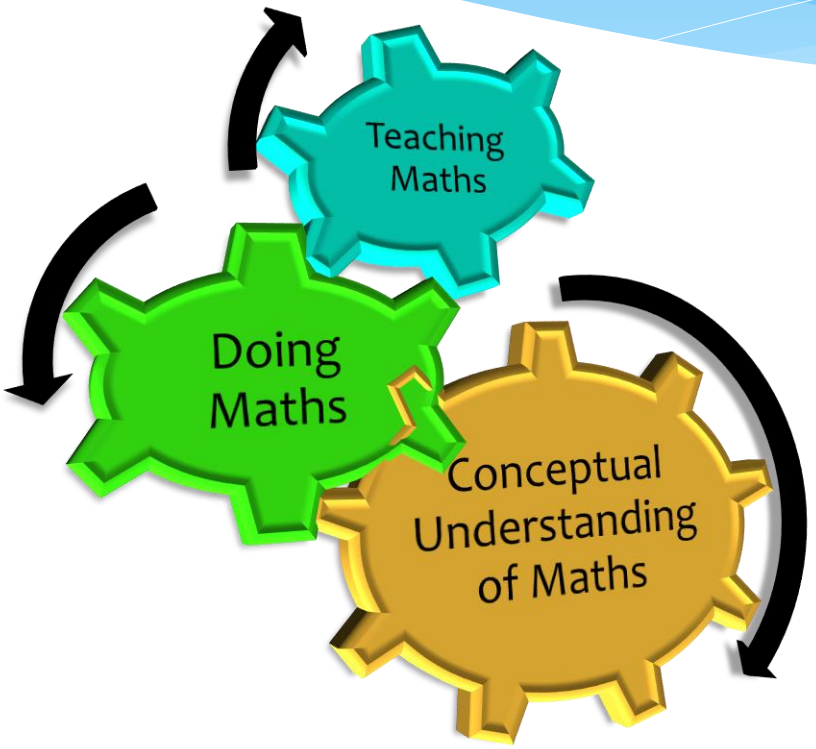

20
100
3
50
Separate and combine bubbles to calculate:
123 + 256 = ?

matific

Significance of the study



Expectation



Cont.

- The use of digital games could also assist in bridging the digital divide between how ICT is used at home and at school, as described by Selwyn, Potter, and Cranmer (2009).
- A teacher might gamify an activity or the teaching of a particular concept by adding achievement badges, rewards and levels in an attempt to increase student engagement (Goehle & Wagaman, 2016; Kingsley & Grabner-Hagen, 2015). The purpose of gamification within education is the use of game elements such as rewards and game-like activities to promote learning and engage and motivate students.

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Cont.

- In the context of this definition, the Matific resources could be considered as gamification of mathematics learning. An outstanding feature of the Matific resources is that it is fun to use. The change from seeing mathematics as something to be tolerated to something that is fun indicates that there is high affective engagement.

Cont.

- The most significant benefit of the reward system in the Matific Program is that it provides intrinsic motivation for students to continue working hard.
- Teachers will also be able to reflect on their teachings and discuss their views on the benefits of using Matific program to learn different concepts in Mathematics at Year 5 level. With evidence upon successful implementation, it can be proposed to Ministry of Education; Fiji National University (Primary Pre-service and In-service Teachers) and other stake holders to adapt Matific Program across the Nation from K- Year 6 in order to achieve quality academic results.

Cont.

- The research findings will benefit the Curriculum Advisory Services and the Ministry of Education in the curriculum that supports ICT integration and the project “one laptop per child” to be successful using Matific Program in the Maths lesson.
- The schools will also be able to use the grant given by the government in enhancing their ICT equipments to boost learning using Matific Program. Furthermore, this research will also enlighten teacher training institute’s program designers and course coordinators on the need to train teachers on the use of Matific Program to teach in the units they take in the relevant programmes in the primary schools.

Cont.

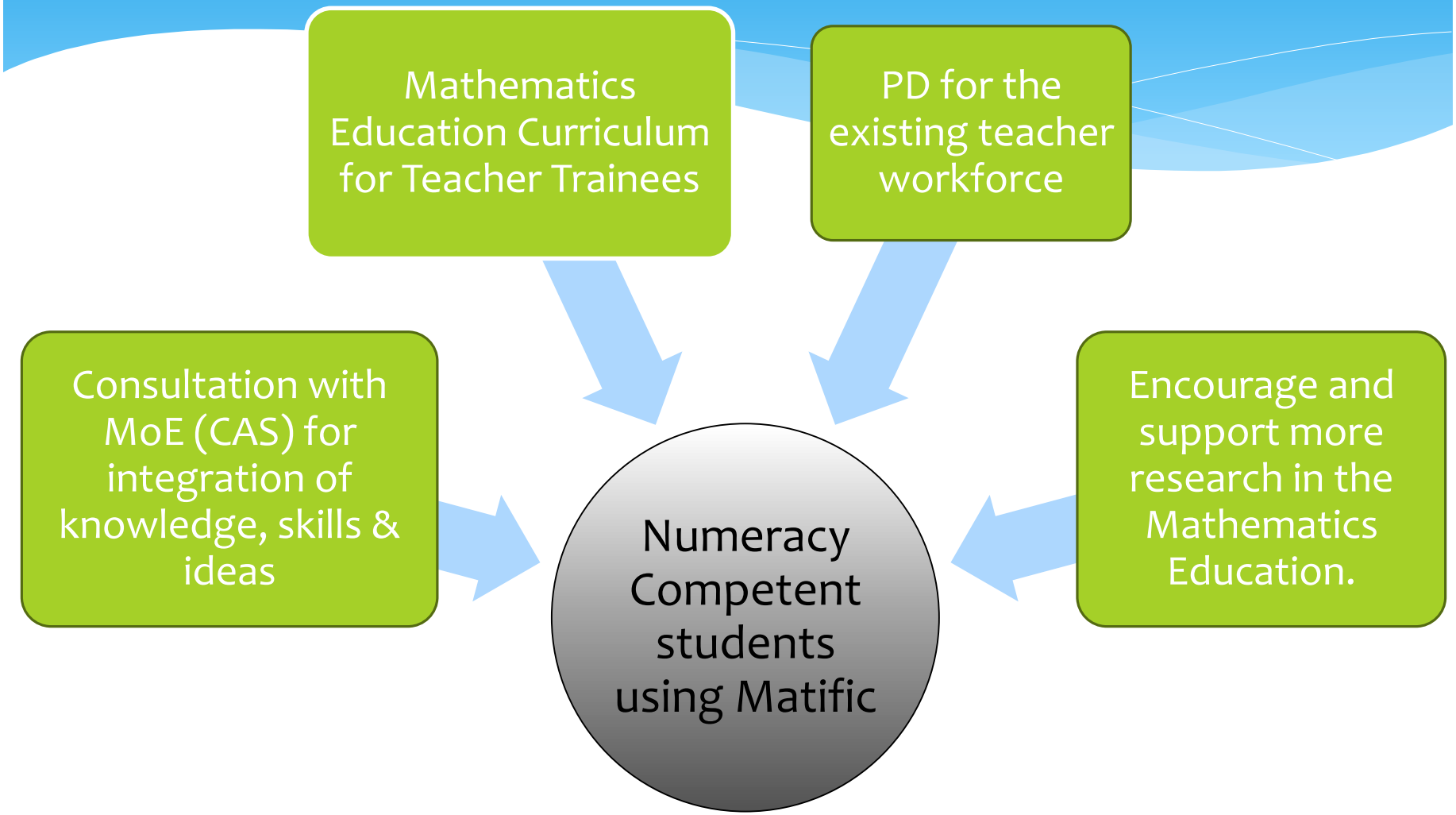
- The simple ‘super awesome’ statement will promote perseverance amongst almost all of the students, a characteristic that is important in mathematics learning, particularly in the area of problem solving.

- This collaboration will lead to students accessing the Working Mathematically or Proficiency components, providing opportunities for students to communicate and reason. Hence, the academic results will improve as it is evident in the Australian Primary schools using Matific Program. Our students will be in par with developed countries like Australia within the region. The research would open doors for other researchers to carry-out research in this field as well.

Data Collection

- This research will utilise case study methodology. A total of twelve primary schools in the Lautoka District from a range of socio-economic areas will be selected, invited and agreed to participate in the project. None of the schools had used Matific prior to their participation in this project.
- Likert scale items will be used in the questionnaires, interviews, observations, and document analysis would be selected as appropriate research tools. Data collection will be by means of (i) a survey questionnaire and (ii) Focus group interview (iii) Pre and Post-Test Year 5 Math problems. This design will utilize the concurrent Triangulation plan which ensures qualitative and quantitative data to be collected and analyzed at the same time. Evidence will be collected through a literature search, teacher questionnaires, teachers' reports and interviews.

Future Direction (Plan)



Conclusion

Although there are arguments that suggest the use of digital technologies has potential to transform education (Levin & Wadmany, 2008), to date there has been little research exploring the effectiveness of digital technologies in enhancing student learning and their engagement with mathematics, particularly in the primary classroom (Shin et al., 2012).

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THANK
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