Teachers' perceptions of ICT integration as a pedagogic reform in classroom instruction

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Abstract: While information and communication technology (ICT) is not a panacea for all educational issues, they are no doubt, essential tools for teaching and learning in the 21st century. Technological expansion and emerging digital environments have permeated and changed the learning patterns at all levels and including primary education. Teaching the digital generation of learners without a firm grasp of how they learn is like embarking upon an everlasting journey. This study explores students' technological affinity as perceived by teachers and how they adapt their teaching pedagogies to suit the learner environment at primary level. An exploratory research design adopting meta-analysis of relevant literature and a survey consisting of Likert type scale with an open ended question was implemented. The data collected was analysed using SPSS statistical software and discussed in coalescence with pertinent literature. Findings reveal that young digital native students have grown up appreciating the power of digital connectedness and look forward to ICT integrated lessons. The findings indicate that most of the teachers participating in this study were enthusiastic about the possibilities ICT holds for classroom use. It concludes with apparent implications for teachers, school heads, curriculum and educational institutions and lays down a solid platform for further dialogue and research in the field of ICT integration as a pedagogic reform.
Key words: Information communication and technology, digital natives, technology, millennial, social media, internet, integration

I.   INTRODUCTION

Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and modern technologies are demanding teachers to learn how to use these technologies. Dynamic infusion of information technology has led to major investments in technological innovation and infrastructural development globally (Young & Hsin-Ho, 2008). Almost a decade before the dawn of the new millennium saw the first surge of the digital natives or the Net Generations entering our schools, forcing educational institutions to deal with a new pedigree of learners with unique characteristics and demands. The Net Generation is the cohort of young people born between 1982 and 1991 and who have grown up in an environment in which they are constantly exposed to computer-based technology. The term 'Digital Native' was coined by Marc Prensky in 2001 where he defined 'digital natives' as young people who grew up surrounded by, and using computers, cell phones and other tools of the digital age (Prensky, 2001).

As such, Governments worldwide are implementing national policies on implementing ICT in education at school level (Albugarni & Ahmed, 2015; Beauchamp & Parkinson, 2008; Blau & Shamir-inbal, 2017; Brun & Hinostroza, 2014; Drossel, Eickelmann, & Gerick, 2017; Fu, 2013; UNESCO, 2002). Some schools have integrated digitized learning resources in the delivery of regular curriculum. However, the curriculum in many places is still examination-oriented, and the integration of ICT in teaching in schools remains marginal. There are a number of factors that can affect the successful implementation of ICT in schools, for example, the availability of ICT resources, access to electricity, knowledge base of the teachers, student readiness and sound internet connectivity to mention a few. The use of ICT such as Internet applications, video technology, and various computer attachments and software programs have positively contributed towards creating a digitally knowledge society.

Many of the major institutions of our society have changed and how we live our daily lives has been affected by the advent of technological tools. However, the impact on education has just been starting to be felt as teachers have begun integrating new technologies into their teaching and learning. Use of ICT in classroom has opened up new horizons and dramatically expanded its use, which makes resources from all over the world, available to students and teachers at the click of a button. For example, the Internet brings information, data, images, and even computer software into the classroom from places otherwise impossible to reach, and it does this almost instantly. Access to these resources through internet can facilitate meaningful learning individually

as well as through collaborative learning arrangements. This study reports on an investigation of uses of ICT in primary education and documents teachers' perceptions of ICT integration as a pedagogic reform in classroom instruction.

Aim of the Study

This paper intends to provide a better understanding of how the use of ICT affects pedagogy and practice in teaching. This study aims to establish teachers' perception on use the use of ICT tools and digital contents for student-centered education in primary schools in Fiji. While research evidence proves that smart phones and relevant applications are technologies that have an impact on students' education and psychological wellbeing (Jesse, 2015), this study intends to find out the perceptions of teachers about ICT integration in teaching and learning.

Research Questions

The following overarching question guided this study:
What are the teachers' perceptions about the integration of ICT in their teaching and learning?

This study further explores students' technological activities as perceived by teachers and how they adapt their teaching pedagogies to suit the learner environment. With this in mind, the study was further guided by the following underlying questions:
1. What are your views about integrating ICT in learning and teaching?
2. How do your students perceive learning with ICT?
3. What are students learning gains in ICT immersed learning environment?

The foregoing underlying questions assisted in getting a better understanding of teachers' perceptions about the integration of ICT in their teaching and learning.

Significance of Study

There are several reasons why this research is considered to be significant. There has been a paucity of previous research regarding teachers' perceptions about the integration of ICT in their teaching and learning. This study will contribute to local literature on the subject, which in turn could be used by relevant authorities in improving their understanding and developing of relevant professional development programs. Teachers may realize the importance of undertaking studies in information technology and online modes as a means of up-skilling their teaching abilities. This study will provide important insights into teaching and the professional learning enabling teacher education institutions to strengthen the pre-service teacher preparation programs to better prepare teachers to cope with varying demands of the digital generation in the schools.

Furthermore the study makes contribution through its findings by revealing the difference between various groups of teachers and their attitudes towards the integration of ICT in teaching and learning. Notably, the findings will be of great value to the teachers as they are in constant touch with the students and will be able to better understand their behaviour and address classroom supervision issues amicably. It will also provide valuable information to the Education Ministries to give due recognition to the integration of information communication and technology as appropriate pedagogic reform in education. The findings will inform schools to appraise their understanding of the millennial to make learning more effective, applicable and enjoyable.

The following section provides a robust corpus of literature on teachers' perspectives in coalescence with the integration of ICT, which is characterized as being at the heart of the new digital orientation.

II. LITERATURE REVIEW

There is substantial literature on the integration of ICT in classrooms. In a global context, both developed and developing countries recognize the value of integrating ICT tools for their economic development. Developed countries, like US, for instance, spends more than US$10 billion annually in educational technology in public schools while Australia spends approximately AUD$8 billion in ICT integrated related activities in schools (Albugarni & Ahmed, 2015). Likewise, a number of developing countries like India and Uganda have adopted programs aimed at implementing ICT integrated pedagogies to reinforce the teaching learning process (Ssewanyana & Busler, 2007). As they believe the use of considerable ICT tools act as sufficient drivers to boost the country's education towards creating economy based development. Previous research indicates that the sheer presence of ICT does not directly influence teaching but instead it should be effectively integrated with teaching contents and pedagogies (Earle, 2002). Likewise, Chen (2010) supports the views of Russell, Bebell, O'Dwyer, and O'Connor (2003) that teachers can use ICT for improving the productivity of conducting daily tasks such as preparing and delivering lessons, keeping student records and communicating with parents. Not only ICT integration benefits students, it also provides a learning platform for

the teachers by enabling them to take ownership and practice knowledge renewal on their own (S. Li, Yamaguchi, & Takada, 2018).

The insights drawn from synoptic literature review shows that with widespread access to technology our students from very young age are able to intuitively use a variety of information technology devices and navigate the internet with ease (Corrin, Bennett, & Lockyer, 2011). A survey undertaken in America about the lifestyle of the millennial reveals they have exceptional attachment with technological tools. According to Taylor and Keeter (2006) it is not their propensity towards their gadgets but it is the way they have fused their social lives into them that makes them unique. On the same note, Cheta (2014) supports the views of Taylor and Keeter (2006) that the millennials have very good multi-tasking ability and an instantaneous ability to move between the real and the cybernetic sphere. Subsequently, Kurkovsky and Syta (2010) assert that students not only check email and media messages daily for social reasons, they use their mobiles as a major mechanism for communicating with faculty and classmates . Accordingly, Cheta (2014) describes the digital native environment as learner-centered where they have little patience for waiting for the teacher to give direction and information rather they try to actively search for the needed information on their own. As such, the integration of ICT in classroom instruction creates a more interacting environment for our students.

Likewise, the integration of ICT in classroom instructional activities has changed the way students learn and this integration is generally seen to be beneficial to student learning (Somekh et al., 2006). This conception is also strong with teachers who have long experience in utilizing ICT in education and it has been proved that, with the aid of ICT, students are more engaged with learning (Schrum et al., 2007). However, it also must be established that teachers need to have basic ICT knowledge in order to successfully implement ICT tools in classroom instruction activities. On similar note, Siplia (2011) states that although Finnish schools have been equipped with networks and computer technology, the Finnish National Board of Education has organized immense in-service teacher-training programs in order to raise teachers' ICT knowledge and skills. Literature further entails that despite initiatives like in-service training, there are still many teachers who lack basic ICT skills to effectively use ICT tools (Sipilä, 2011). Subsequently, Lambert & Sanchez (2007) assert that integrating ICT in teaching praxis requires time and planning on part of the teachers. None the less there is ample evidence in literature that the integration of ICT in the teaching and learning process has been very well received in many the schools (Smith, Rudd, & Coghlan, 2008). A study undertaken in Tanzania by Roy, Kihoza, Suhonen, Vesisenaho, and Tukiaianen (2014) reveal that ICT induced learning allows nurturing students' ability to think critically, and pro-actively search for possible solutions. Findings further reveal that students look forward to lessons that are delivered using ICT tools as they find the lessons more interesting and meaningful.

Given the relentless advent of ICT in education arena, its use in enhancing classroom based instruction to support student-centered education has been widely discussed. American Psychological Association, as one of its recommendations has encouraged teachers to consider implementing appropriate technological and instructional practices to facilitate student-centered learning (S. Li et al., 2018). However, Vrasidas (2015) is quite skeptical about the use of ICT despite being equipped with computers and internet services as there may be lack of adequate time for lesson preparations and unsupportive curriculum design. He reiterates that just having the resources does not imply that ICT can be easily implemented but there needs to be the presence of other supportive factors and one such factor is teacher readiness (Vrasidas, 2015). That is why Yunus (2007) is assertive that before ICT can be effectively integrated teachers should be provided adequate training and support in ICT and pedagogy. In this regard, Veen (Veen, 1993) establishes that teachers' pedagogical skills were more important than their technical ICT skills in influencing their use of computers for teaching and learning.

Whilst considering the benefits of integrating ICT in the lessons, one needs to bear in mind a number of perquisites in form of resources and facilities. There needs a presence of ample ICT resources with appropriate infrastructural support. Active integration of ICT also requires a constant supply of electricity and access to internet (Shaibou, Moluayonge, & Park, 2017). It also needs to be established that the availability of resources, with lack of technical support to implement ICT in classrooms implies there will be no positive outcome (Newhouse, 2002). While there is ample literature that supports the effective integration of ICT in lesson delivery, it must be established that it is not all plain sailing. In spite of considerable investments to emphasize the integration of ICT in the classroom, such educational technologies are not being fully exploited by teachers. While it may not be an issue in developed countries, it is a subject of concern in all but some of the developing nations like Cameroon. According to an empirical study by Shaibou et al (2017) the use of information and communication technologies in teaching and learning in Cameroon secondary schools are quite low due to low teacher competence, lack of technical support and "opposition by teachers to use pedagogical tools that they were not initially trained to use" (p. 152).

Nevertheless, the use of ICT in education is considered an important innovation in classroom teaching, and is advocated by many educational policy-makers (Hassan Mirzajani, Mahmud, Ayub, & Wong, 2016). The integration of technology in the classroom is viewed as an important strategy to increase the effectiveness of the teaching-learning process. As such, teachers are encouraged to integrate technology into their instructional practices, as ICT is believed to have the potential to revolutionize an outmoded educational system (Aczel, Peake, & Hardy, 2008). Similar views were held by Hew and Brush (2007) who are confident that integration of ICT in the field of education is inevitable, as technology becomes a 'need' and not just a 'want' in our lives. ICT induced pedagogy favours our students as they prefer to discover and create unique solutions to learning problems (Wheeler, Yeomans, & Wheeler, 2008). Hence they do not view the teacher as the one who has all the answers, rather view the teacher as a resource person, model and helper who should encourage explorations (Cheta, 2014). Subsequently, this generation has a special affinity to mobile devices such as smart phones as they want to be connected with a special appetite for digital media (Kurkovsky & Syta, 2010). The preceding views are supported by a study undertaken by the Government of Canada where they found that millennials like to be connected 24/7 and they prefer using mobile phones over land lines and texting over talking using the phones (Tanner, 2010).

Indeed digital environments have infiltrated and changed the lives of young people the world over and this alteration in them needs to be understood and appreciated by all. Ultimately, integrating ICT in classroom instruction is one way of making learning meaningful and interesting for our young minds and successfully contribute towards creating knowledge based economies.

Methodology

This section explains in detail the methodology used in gathering the information necessary in this study. It highlights the sources of data and the survey design, which includes the sampling plan and data analysis method employed. The steps involved were elaborated in details and have been carried out systematically in order to achieve a high degree of reliability and validity. Therefore, this section focuses on the research technique adopted and used for this study with the aim of achieving the research objectives.

Research paradigm

Education research, as well as research in other similar areas of inquiry, is typically conducted within appropriate research paradigm. Positioning a research project within a paradigmatic framework is a worthwhile task as it enables researchers to reflect upon the broader ontological and epistemological consequences of their action (Guba & Lincoln, 1994; Johnson & Onwuegbuzie, 2004; Krauss, 2005). Each research paradigm has certain assumptions and a researcher must therefore, understand the nature of the chosen paradigm, and document the paradigmatic choice in writing (Lincoln & Guba, 1985; Robottom & Hart, 1993; Tashakkori & Teddlie, 2003). This research falls within the interpretive paradigm because interpretivism is based on a life-world ontology that argues all observation is both theory- and value-laden and investigation of the social world is not, and cannot be, the pursuit of a detached objective truth (Leitch, Hill, & Harrison, 2010).

Exploratory Research Design

This is the most useful and appropriate research design for those projects that are addressing a subject about which there are high levels of uncertainty and ignorance about the subject, and when the problem is not very well understood . In the present case, not much is known about teachers' perception of ICT integration in teaching at primary level. Exploratory studies are a valuable means of asking questions to establish baseline information (Yin, 2011). A likert type survey was developed with an open ended question. Survey research does not belong to any one field and it can be employed by almost any discipline (GarcÃa, 2014). Hence, surveys are a favoured tool for many who are engaged in research as it provides a quick and effective way of collecting data (Wilkinson & Birmingham, 2003). Previous research in this field has revealed that scholars have often used survey as a preferred research tool.

Evidently, Jesse (2015) adopted survey research design in his study about the usage and the effects of smartphones on student's social lives, education lives, and physical activity. Similarly, Kurkovsky and Syta (2010) implemented a survey research design in their study of over 330 young people aged 18 to 25, to evaluate their use of mobile technology as well as their perceptions of different ways how security and privacy could be improved in future mobile devices. Similarly, In a study about undergraduate students' perceptions towards the use of technology for teaching and learning employed survey research design surveying 1438 students at The Chinese University of Hong Kong (Lam, Lee, Chan, & McNaught, 2011). Having considered previous procedures, a survey using assorted Likert type scales were used for numbers 1 to 15 in the survey to develop an understanding of the teachers' perception of ICT integration as a pedagogic reform in the school system.

Research Sample

Selecting research sample is an imminent issue frequently raised by researchers and students (Minichiello, Aroni, & Hays, 2008). An extensive discussion has existed in academic literature on sample size and selection of a correct sample size is still a big challenge for researchers. According to Fraenkel & Wallen (2006) researchers are always concerned with what can be labelled as an adequate size for a sample. They further suggest that despite shortage of time and financial constraints into consideration, it is advisable to obtain "as large a sample as they reasonably can" (Fraenkel & Wallen, 2006, p. 104). For the purpose of this study 30 teachers enrolled in a postgraduate program were randomly selected and 24 responded positively giving a response rate of 80% which is acceptable for discussion.

Reliability of the Study Constructs

Diverse variables were considered for the various items in the survey to assess teachers' perception of ICT integration in the teaching and learning. The Cronbach's coefficient alpha [α] was used to assess the reliability of the study constructs as it is widely used for assessing the reliability of measurement scales with multi-point items. The reliability of the constructs was .724 on 11 items. To get an acceptable level of reliability only 11 items out of 15 are discussed for the purpose of this study. Table 1 shows the average value of Cronbach's Alpha and it reveals that the constructs are at an acceptable level to address the research questions (Kline, 2005).

Table 1Reliability Statistics of Study Constructs

Cronbach's Alpha	No of Items
.724	11

Validity and reliability of data were issues taken into consideration during the entire study as the data was analysed and discussed neutrally without any bias and preconception.

Ethical Considerations

Ethical issues were taken into consideration throughout the course of this study. A number of commentators of educational research have stressed the importance of adopting a set of ethical procedures. This is in line with the views expressed by Fontana and Frey (1994), that is, research should not exploit informants but enhance their confidence by voluntarily sharing worthwhile information with the researcher. The participants have not been identified in order to maintain confidentially and anonymity. To further maintain the ethical etiquettes relevant information such as the aim and the purpose of the study were communicated well in advance to the participants of the present study. Subsequently, the survey was administered by respective lecturers and no direct contact or interference was made with the participants in order to strengthen the integrity and ethical standards.

III. FINDINGS AND DISCUSSION

This section discusses the findings as per the research questions according to thematic approach. For the purpose of this study, only 11 items in the survey and an open ended question are discussed in relation with appropriate literature. Table 2 shows the item statistics for the study.

Table 2 Item-Total Statistics

Constructs	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The use of ICT helps teachers to improve teaching with more updated materials.	39.21	22.868	.240	.720
I integrate ICT in most of my lessons	40.33	22.841	.069	.748
The use of ICT enables the students' to be more active and engaging in the lesson.	39.12	22.288	.370	.709
Most of my students are familiar with Google	39.50	23.304	.115	.731
Social media can be used as a learning platform	39.46	23.042	.153	.728

I am aware of the bonding today's students have with ICT tools like smart phones	39.33	23.014	.220	.722
Teachers need to be assisted so that their ICT skills are improved	39.29	23.346	.144	.728
Integrating ICT in lessons has implications for teacher training	39.75	15.761	.717	.632
My head teacher is very supportive of integrating ICT in lessons	40.67	18.754	.495	.683
The curriculum is adaptive to ICT integration	40.17	14.232	.809	.604
ICT integration is still a new phenomenon in Fiji	40.25	17.587	.565	.668

The findings section will discuss the items in the table with reference to pertinent literature wherever possible.

ICT integrated Pedagogy

The integration of technology in the classroom is viewed as an important strategy to increase the effectiveness of the teaching-learning process. Teachers are encouraged to integrate technology into their instructional practices, as ICT is believed to have the potential to unlock the future. The findings of the current research are in concurrence with the views of Gupta and Dharamveer (2017) as all the teachers either agreed or strongly agreed that ICT helped teachers to improve teaching with more updated materials. Previous research reveals that investors in education in many countries have expected ICT to act as a catalyst to improve educational outcomes and enhance the quality and effectiveness of teaching and learning (Jaffer, Ngambi, & Czerniewicz, 2007). The rapid ICT and its integration in the teaching learning domain have brought remarkable changes in the twenty-first century, as well as affected the demands of modern societies (Buabeng-Andoh & Totimeh, 2012). According to a UNESCO Report ICT has the ability to change the nature of learning as well as educators and learners roles in teaching and learning process. Therefore, there is a growing demand on educational institutions around the globe to use ICT to teach the skills and knowledge students need for the 21st century (UNESCO, 2002).

This changing landscape of education focuses on learning, rather than on teaching and pedagogy, curriculum and instruction. Findings further reveal that all the teachers found students to be more active and engaging in the lessons that integrated ICT in their lessons (see Table 3).

Table 3 The use of ICT enables the students' to be more active and engaging in the lesson.

	Frequency	Percent
Strongly Agree	14	58.3
Agree	10	41.7
Total	24	100.0

In recent years, there has been an increasing interest in the development and use of multimedia-enhanced content through the use of ICT to enhance the quality of teaching and learning. Multimedia contents are digital instructional materials that combine text, graphics, audio, and animations. Teachers tend to use these content to liven up classroom lessons by using them to better demonstrate and explain difficult concepts that cannot be easily explained using text alone (Lanzilotti, Ardito, Costabile, & De-Angeli, 2006; Thomas & Israel, 2013). Studies have indicated that the appropriate use of multimedia-enhanced content in educational context provides several benefits. According to Lee, Hsiao and Ho (2014) use of ICT tools can help to improve students' understanding of instructional materials. They can also simulate real processes and allow learners to execute virtual experiments that would, otherwise be perilous and expensive to be conducted in a school laboratory (Hennessy, Deaney, & Ruthven, 2006).

Likewise, integration of ICT goes beyond an emphasis on the possession of tools to enabling learners to identify, manipulate, and evaluate existing information (T. Brown, 2003). The infusion of ICT and, in particular, multimedia technology into education has created a significant impact on the instructional content development and the methods of communicating information to learners. This leads to the evolution of new concepts and innovative teaching techniques in the instruction-learning process, changing the way teachers teach and students learn (Neo & Tse-Kian, 2009). There is ample support in the literature that integrating ICT in

lessons makes teaching more enjoyable and meaningful for the children (Agnew, Kellerman, & Meyer, 1996; N. M. Lambert & McCombs, 1998; Neo & Tse-Kian, 2009). As such it can be stated that the finding are in acquiesce with Agnew, Kellerman and Meyer (1996) that ICT has been shown to affect students' motivation and self-esteem levels, as well as it allows them to become creative and self-directed thinkers.

For many researchers and teachers, an increase in student engagement is one of the greatest effects of integrating technology (Banitt, Theis, & Leeuwe, 2013). Engagement is defined as students being attracted to school work despite challenges and obstacles, and show visible delight in accomplishing them willingly (Downes & Bishop, 2012). While responding to the open ended questions, majority of the teachers found that students always looked forward to ICT integrated lessons and they always liked and enjoyed them. Findings further reveal that students look forward to their computer classes and are quite familiar with search engines like Google. Majority (63%) of the teachers agreed or strongly agreed (30%) that their students were familiar with searching for information on the Google.

Table 4 Most of my students are familiar with Google

	Frequency	Percent
Strongly Agree	7	29.2
Agree	15	62.5
Disagree	2	8.3
Total	24	100.0

Teaching students which keywords to use and how to analyze search results helps them find better sources and think more critically about any information they find on the internet. It was encouraging to discover that teachers found their students search for meanings and information on the Google then looking for meanings on the dictionary. Literature reveals that Google is the most popular and, possibly, the purest search engine on the Web today and its major strengths were its speed, simplicity, ease of use, and convenience (Georgas, 2013). Google has many special features to help students find exactly what they're looking for. Teachers perceive their students are familiar with Google because it is even able to search for information even if they are not very sure of spellings. Moreover, it must be established that in order to access Google and do online searches one needs to be connected with internet. There is no doubt that the integration of the Internet as a teaching tool in academic courses has grown at a rapid rate. In a study undertaken by Laird and Kuh (2005) confirm that students' responses to the technology items suggest that many students use information technology regularly for personal and academic purposes

The internet is deeply embedded into our daily activities and it has become an integral part of the lives of millions of people in modern world. This phenomenon has enveloped not only large developed countries but as well as small developing states (Tran Dinh Tan, Polyakova, & Shipilova, 2015). Internet communication is used in all spheres of human activity and has become very popular amongst the students. Consequently, much of the research on Internet use has focused on the college student population (Byun et al., 2009). According to Jones (2002), many students are able to benefit from the use of the Internet for research and communication purposes. Findings from one of my earlier studies reveal that some (30%) of the students are connected to internet most of the time while few of them (12%) are connected to internet all the time. Majority (58%) of the students get connected to internet sometimes only meaning when there is a need they do get connected to internet (Ali, 2018). The Internet's ability to provide students quick access to documents, scholarly articles and databases makes it a valuable information source for students

Social Media

Our everyday lives are becoming more and more dependent on digital technologies. Life without a computer, a tablet or a mobile phone has become unimaginable to many as internet has infiltrated homes at an accelerated rate. Table 5 presents teachers views in regards to social media being used as a learning platform.

Table 5 Social media can be used as a learning platform

		Frequency	Percent
Valid	Strongly Agree	8	33.3
	Agree	14	58.3
	Disagree	2	8.3
	Total	24	100.0

While there were a few (8%) disagreements, majority (92%) of the teachers were assertive that social media could be used effectively as a learning platform. This technological revolution has resulted in unanticipated increase in the popularity of social network sites over the past several years which in turn has encouraged scholars from various disciplines to study its impact from different perspectives (Boyd & Ellison, 2007). Although there are mixed reactions in regards to the use of Facebook and its impact on students' academic performance, Irwin, Ball, Desbrow, and Leveritt (2012) argue that social media such as Facebook can be an excellent tool if properly used as they found that students were very receptive to incorporating it into their academic lives. This notion is also supported by Aghaee (2010) who maintains that social media provides a platform for collaboration and it is considered a tool in education used by many students. As such, it can be concluded that if Facebook is used properly, it can be an effective tool for educational purposes but if abused it could result in the negative performance of the students. Further research is needed to determine whether other Internet related interventions would help students improve their academic performance, in light of appropriate regulations to control potentially non-productive use of Internet.

Students Bonding with ICT

As discussed earlier in the literature section, our students have been given a wide range of names, including Digital Natives (Prensky, 2001), Millennials (Howe & Strauss, 2000) , and Net Generation (Tapscott, 1998) to mention a few. All of today's children are born after the widespread adoption of digital technology and are categorized as digital natives as they have grown up using technology like the Internet, computers and mobile devices. As such they tend to have a strong bonding with ICT as shown in Table 6**.**

Table 6 Awareness of the bonding students have with ICT tools like smart phones

	Frequency	Percent
Strongly Agree	9	37.5
Agree	15	62.5
Total	24	100.0

All the teachers either agreed (63%) or strongly agreed (38%) that today's students have a special bonding with ICT. The usage of ICT is the norm of the contemporary civilization, and the mobile phones have become one of the most 'ubiquitous' devices found in most parts of the world (Shava, Chinyamurindi, & Somdyala, 2016). Previous research reveals that 99.8% of students have cellphones and they regard it as indispensable in their lives (Jesse, 2015). Jesse further claims that more students use mobile phones for texting and running apps as compared with those making calls. Moreover, mobile social media applications enable users' access to their social media sites anywhere, anytime instead of having to sit in front of their computers. As educational systems fully incorporate ICT into curriculum and teaching, access to the Internet at school and at home may become as important a predictor of literacy in the library or at home (Willms & Corbett, 2003). Research indicates that ICT can change the way teachers teach and it supports student-centred approaches to instruction and promotes collaborative activities (Haddad, 2003). Hence, ICT immersed lessons provide a motivating and encouraging learning environment for our students and also it leads to self-directed learning.

Practicality of ICT integration

One will not be able to implement ICT based teaching and learning as there are certain preconditions required. Albugarni and Ahmed (2015) stress that in order to successfully implement ICT based learning there needs the presence of technical support staff and training for teachers on how to use ICT in the classroom. Moreover, Newhouse (2002) believes the most important factor is the availability of ICT resources. Lim and Khine (2006) are in concurrence with Newhouse (2002) that the availability of resources without technical support, makes ICT tools difficult to integrate at school level. Surprisingly, while all the teachers are aware of the benefits of integrating ICT in lessons, only half (50%) of the teachers integrated ICT in their lessons (see Table 7).

Table 7 I integrate ICT in most of my lessons

	Frequency	Percent
Strongly Agree	2	8.3
Agree	10	41.7
Disagree	7	29.2

Strongly Disagree	5	20.8
Total	24	100.0

In other words, half (50%) of the teachers did not integrate ICT in their lessons. This speaks volumes as despite knowing that our students are technology savvy, yet they are taught using traditional methods. It can be assumed that teachers need basic training in ICT as all the teachers either agreed (58%) or strongly agreed (42%) that teachers needed to be assisted so that they are able to integrate ICT effectively in their lessons. On similar note, Coll, Mauri, & Onrubia, (2009) agree that in spite of varying degrees of ICT acceptance in schools in many countries, not many changes have occurred in teaching practice and classroom activities . Having similar concerns, Mirzajani, Mahmud, Ayub, & Wong (2016) under took a study to identify factors that affect teachers' motivation to use ICT in the classroom. Findings revealed that teachers in the study had not received sufficient ICT training to enable them to use the technology for teaching confidently and effectively. Some teachers could not have easy access to ICT, while others who were keen to use ICT were let down by inadequate technical support (Hassan Mirzajani et al., 2016). Long-term continuous development of teachers and support from leaders and administrators were also major factors that influenced teachers' motivation to integrate ICT in their lessons (Hassan Mirzajani et al., 2016).

Moreover, it must be established that the integration of ICT is still an emerging phenomenon in Fiji as perceived by the teachers in the current research. Almost half (46%) of the teachers either agreed or strongly agreed that ICT integration is still a new phenomenon in Fiji
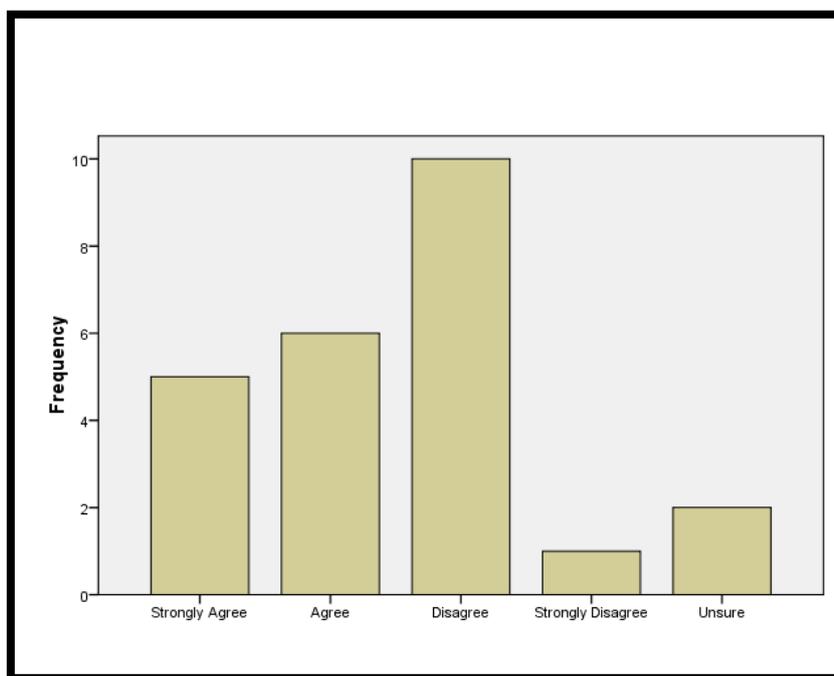

Figure1 ICT integration is still a new phenomenon in Fiji

Findings further reveal that similar number (46%) of teachers disagreed and believed that integration of ICT has been in Fiji for some time but may not have been fully implemented. This study neither confirms nor denies the speculations like, teacher readiness, lack of resources and lack of knowledge to mention a few. However a more in-depth study will be conducted in the future to establish issues regarding the practicality of ICT implementation in classroom teaching. A few (8%) of the teachers were unsure in regards to the prevalence of ICT in our education system. Literature reveals that without teachers' acquiring the skills, pedagogical application of educational technology will always remain questionable as is the case in Jamaica. For teachers need to have clear vision as to the purpose of the new technologies and the most effective way of integrating them in their program design and delivery (Thompson, 2008). As such, it can be assumed that there may be benefits of ICT integration, but its true implementation can only be realized subject to the provision of basic support structures.

Curriculum Adaptability

Curriculum materials play a pivotal role in the teaching and learning process. Findings reveal that although a few (37%) of the teachers find the current curriculum incompatible for ICT integration majority (50%) of them believed otherwise (see Table 8). They believe that the curriculum was adaptable for easily incorporating ICT tools for teaching and learning. A few (13%) of them were unsure as they may be the ones not implementing ICT in their lessons. Previous literature reveals the importance of the relevance of the curriculum material (Hu & McGrath, 2012). Likewise Brown, Czeriewicz, Huang and Mayisela (2016) views curriculum as typically the key resource for teachers' planning and practice. One of the most important manifestations of teacher's professional knowledge is the ability to adjust existing teaching activities to the curriculum and to design technology-enhanced activities according to pedagogical goals and student needs (McKenney & Mor, 2015; Mor, Ferguson, & Wasson, 2015).

Table 8 The curriculum is adaptive to ICT integration

	Frequency	Percent
Strongly Agree	8	33.3
Agree	4	16.7
Disagree	8	33.3
Strongly Disagree	1	4.2
Unsure	3	12.5
Total	24	100.0

There is abundance of literature justifying the need for curriculum to be adaptable for ICT integration for it be easy for teachers to integrate them (Fu, 2013; C. P. Lim & M. Khine, 2006; Hassan Mirzajani et al., 2016; Sipilä, 2011). Some of the curriculum can be easily digitalized and delivered using basic multimedia technologies. The design of digital learning materials enables teachers to develop the ability of integrate technologies in teaching and learning in meaningful ways, hence enhancing teachers' professional self-efficacy (Ertmer & Otternbreit-Leftwich, 2019). Moreover, Fu (2013) points out the added value of re-designing learning materials through small and systematic adjustments made by teachers. Integrating ICT into the existing curricula is no doubt a demanding and a daunting task. However, with minor curriculum adjustment, ICT can be very well integrated in the classrooms.

Leadership Support

School culture encompasses the vision, plans, norms and values that are shared by school members. Focusing on the importance of school culture for ICT integration, Pelgrum and Law (2009) indicate that effective ICT integration depends on the perceptions and vision of school leaders rather than teachers' ICT skills. School heads have a mediating role that influences teachers' actions, beliefs, and attitudes (Fu, 2013). Therefore, for the successful integration of ICT, school heads need to be supportive and create ICT conducive learning environment. Findings reveal that many (46%) head teachers are supportive of their teachers integrating ICT in their lessons. According to Banitt et al. (2013) many of the teachers are digital immigrants rather than digital natives (see Prensky, 2001), and as such encounter numerous barriers and fears to incorporating technology within their classrooms. Much of this trepidation and resistance stems from the fact that many teachers today did not grow up with ubiquitous technology so they need professional development to effectively implement ICT based classroom instructions. No doubt why about similar (46%) of the head teachers were unsupportive of integrating ICT in teaching.

A few (8%) of the teachers were unsure whether their head teachers were really supportive or not. The findings are in concurrence with that of Hassan Mirzajani, Mahmud, Fauzi Mohd Ayub, and Wong (2016) who claim that despite considerable investments have been made to emphasize the integration of ICT in the classroom, such educational technologies have not been fully exploited by the majority of teachers. This is because the integration of innovative technology in schools is a complex process, and its success depends on the involvement of the school leadership and the readiness of the teaching staff (Blau & Shamir-inbal, 2017).
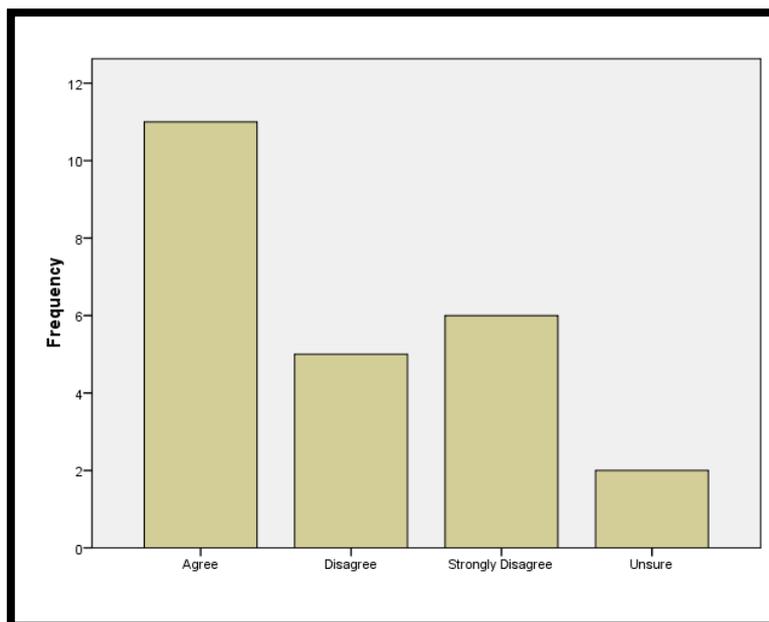
Figure 2 My head teacher is very supportive of integrating ICT in lessons

As expressed by Afshari, Abu Bakar, Abu Samah, & Fooi,(2009), "technology is about change and change requires strong leadership" (p. 238), which can help in overcoming the different and numerous challenges that normally comes along with implementing ICT in schools. There is ample support in the literature that teachers are seen as the key players in this process, so it is important to note that they need to up-skill themselves first before they can effectively implement ICT in classroom instruction.

ICT in teacher training

Knowledge of teachers on how to use technology in the teaching-learning process has an important impact for using them effectively. The past two decades witnessed continuous uptake of ICT in education, and the importance of teachers' beliefs for adopting ICT in education was revealed in the context of teacher training. Previous research shows that the meaning of teachers' use of ICT in education has evolved over the past decades (S. Li et al., 2018). However, it must be established that ICT itself does not directly influence teaching or learning until it is integrated effectively with teaching contents and pedagogies (Earle, 2002). Literature further reveals teachers' awareness towards ICT is important and also an added advantage to the implementation of ICT related programmes (Kamaruddin, Abdullah, Idris, & Nawi, 2017). The effective implementation of ICT programmes clearly depends on teachers' readiness and also on initial teacher training.

Table 9 Integrating ICT in lessons has implications for teacher training

	Frequency	Percent
Strongly Agree	8	33.3
Agree	13	54.2
Unsure	3	12.5
Total	24	100.0

Likewise majority (88%) of the teachers in the current study either agreed (54%) or strongly agreed (33%) that ICT integration has major implications for teacher training. This is because they have realized the need for basic ICT knowledge for teachers for its effective implementation. The findings are in acquiesce with that of Kamaruddin et al (2017) who also found in his study that preschool teachers in Malaysia require intensive training in the use of ICT to facilitate integration into the classroom in ways that enhance thinking and creativity. Their findings show that teachers still have difficulty using particular tools and applications. For long term, it is recommended that in order to remain confident in their knowledge about the application of technology, teachers need to improve their skills on a regular basis and stay up to date through continuing professional development (Kamaruddin et al., 2017).

Literature entails urgent need to produce preschool teachers with skills and knowledge in the use of technology in instructional design and delivery. Likewise, Brun & Hinostroza (2014) ascertain that for effective implementation of ICT in the schools, teachers need to have covered them well in their teacher training programs. While new technologies increase teachers' training needs, they also offer part of the solution. Jung (2005) is confident that ICT can provide more flexible and effective ways for pre-service teachers to learn the skills and later be able to use them in the classrooms. Recognizing the importance of ICT in teaching and learning, a majority of the countries in the world have included ICT as a subject in their teacher training programs. This is because many teachers report that they do not have adequate training to prepare themselves to use technology effectively in teaching and learning (Jung, 2005). On similar note, Kamaruddin et al (2017) are assertive that effective implementation of ICT programmes clearly depends on teachers' readiness and also professional training in ICT. Therefore, preschool teachers in Malaysia go through intensive training in the use of ICT to facilitate integration into the classroom in ways that enhance thinking and creativity (Kamaruddin et al., 2017).

Overall, governments and teacher training institutions seem to recognize the importance of integrating ICT in education and teacher training. Apart from including ICT as a subject at teacher training institutions, countries such as UK, USA, South Africa, Sweden and Korea have developed extensive online resources and encouraged active exchanges of new pedagogical ideas to upgrade teachers' knowledge and skills at the national or international level (Jung, 2005). Likewise according to Yildirim and Göktas (2007), ICT has become a compulsory part of the curriculum in the pre-service education of teachers for both primary and secondary education in almost one third of the fifteen EU countries while in Germany, teacher training institutions are required to offer ICT-related courses as a core curriculum option. As such it can be concluded that a well-designed teacher training program is essential to meet the demand of today's teachers who want to integrate ICT effectively in their teaching.

In General

While responding to the open ended question about any final comments that they wanted to make, teachers revealed a wide spectrum of views. Quantification of the qualitative information reveals that majority of the teachers have a positive outlook for ICT integrated pedagogy. Literature further entails that integrating ICT just for the sake of delivering lessons is not good enough for holistic development. The sentiments expressed in the preceding statement embodies the views of Downes and Bishop (2012) that there tends to be a gulf between students' in-school and out-of-school lives. This abyss is due to their continuous engagement and interaction with technologies outside of school in contrast to certain school policies banning them from using ICT in the classroom or only allowing limited access to technology. On similar note, Buabeng-Andoh and Yidana (2014) are in acquiesce with the views of Earle (2002) that today's students demand new, innovative learning methods that bridges the digital divide between their in-school and out-of-school lives. This impetus in students calls for teachers to be more vigilant and means fusing proven pedagogy and curriculum with technology integration in innovative, meaningful, and engaging ways (Reid, 2002; Russell et al., 2003; Shaibou et al., 2017; Wild, 1996). No doubt teachers have realized that technology integration in classroom instruction has become a focus and priority in today's 21st-century classrooms. This importance was highlighted by teachers in their response to the open ended question stated earlier. Figure 3 shows the overall perception of teachers in regards to the integration of ICT in classroom instruction.
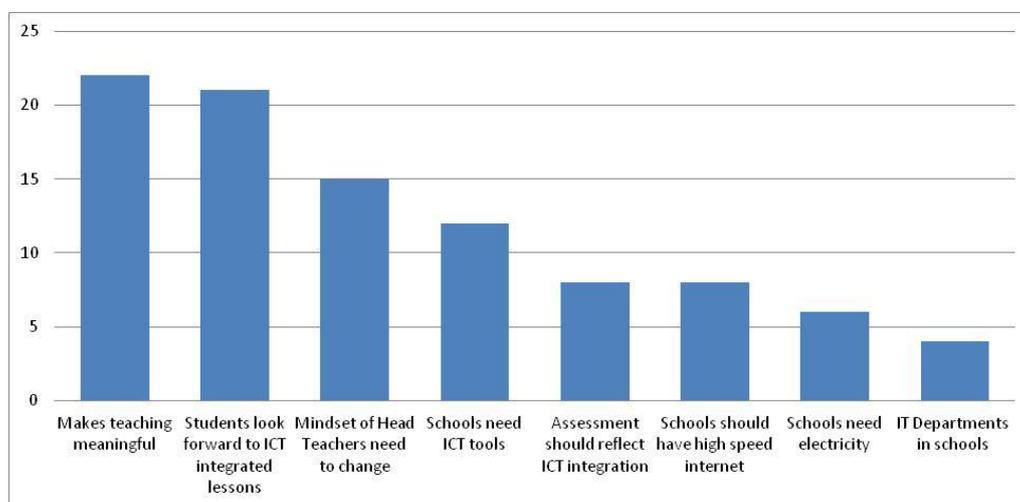

Figure 3 Issues associated with ICT integration

Majority of them believed that ICT made teaching and learning more interesting and engaging and that student look forward to ICT integrated lessons. An important revelation was that most of the teachers ascertained the need for change of mindset of the head teachers. This is because they feel they are not getting the support and encouragement from the head teachers as many of them still seem to prefer the traditional methods of teaching. One of the teachers stated that "My head teacher believes that daily use of overhead projectors will make them go bad" while another one stated that "My head teacher does not believe that students are ready for ICT integrated teaching." Teachers' perceptions amount to the fact it takes time for digital immigrants to accept the reality of ICT integrated pedagogy. A few of the teachers raised the issue of the importance aligning ICT integrated lessons with appropriate assessment tasks while, some of them realized the importance of electricity and access to quality internet connection. Since all the teachers are not computer literate, a few of the teachers expressed the need for setting up of ICT departments that could provide the support and assistance needed by the teachers to effectively deliver ICT integrated lessons. With the type of financial support provided by the Ministry of Education in Fiji, having such resource personnel can become a reality in not too far distance.

On similar note, Huang & Liaw (2005) confirm that the attitudes of teachers and their willingness to embrace the technology have significant impact on the success of student learning with computer technology. Similar sentiments are shared by Yuen and Ma (2002) that development of teachers' positive attitudes towards computers is considered to be a key factor in fostering computer integration and enhancement of quality learning and teaching using computers. Previous researchers have suggested that there are differences in how teachers in different school levels regard ICT implementation in teaching (Agyei & Voogt, 2011; Albugarni & Ahmed, 2015; C. P. Lim & M. Khine, 2006). Evidence for in support of this position is found in the work of Lim and Khine (2006) who confirm that one of the key determinants of the success or lack of success of any ICT initiative in education is the teacher. Similar views are being shared by Martin (2000) who strongly advocates the important role played by teachers as he labels them as gatekeepers of the classroom and the understanding is also shared by Yunus (2007).

Limitations of the Study

The time available for this research was very limited as certain deadlines had to be met. The self-reported nature of the data was obtained from a survey only. As such, the results in this study could not be verified by observations or other independent measures. In addition, the sample only included teachers enrolled in a postgraduate program for this research as such the findings may not be generalizable to the entire population of classroom teachers. Consequently, these results should be viewed as a snapshot of primary school teachers' perception about the integration of ICT in their teaching and learning, while, the findings sets a solid platform for discussion and further investigation.

Implications

The perception of teachers about the integration of ICT in their teaching and learning has certain significant implications for institutions, educators and students alike. Foremost, in order to implement ICT effectively teachers need to have the basic ICT tools. ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computers/laptops, overhead projectors as well as the various services and applications associated with them, such as videoconferencing and use of social media and YouTube platforms. They also need the knowledge and the skills capacity to use the ICT tools effectively to offer lessons in such a mode. Much of this trepidation and resistance stems from the fact that many teachers today did not grow up with ubiquitous technology so they need professional development to effectively implement ICT based classroom instructions.

Subsequently, this study has been able to produce further evidence to support the claim that providing teachers with computer technology will lead them to integrate computers into teaching activities, which in turn will give them more support in their perceived proficiency at computer use and help them to advance in the stage of computer integration. Before ICT can be effectively integrated teachers should be provided adequate training and support in ICT and pedagogy. It can be established that teachers' pedagogical skills are more important than their technical ICT skills in influencing their use of computers for teaching and learning. Likewise, these tools would be useless without electricity and internet. Almost all the tools need electricity to operate and good internet connection. Teachers' perception further reveals that they need the support and guidance from their supervisors, particularly the head teachers who need to be more receptive to ICT based pedagogy and practice.

IV. CONCLUSION

The use of information technology has shown a very rapid growth during the last decade in almost every country in the world. Increasing computer ownership and access to the Internet and social media like Facebook have changed the lives of millions of people who get online on a daily basis. Having being exposed to these types of environment our students would also like to learn differently in a more technology oriented

context. Findings reveal that teachers have a positive view of integrating ICT in classroom instruction as they see it as a meaningful pedagogical tool that makes learning more engaging and motivational for students. They see the high level of student satisfaction and interest as the learning gains in ICT immersed learning environment.

Teachers' perceptions about the integration of ICT in their teaching and learning are diverse and numerous. However, majority of them see ICT integrated pedagogy and practice as a need for the students in the 21st century. Findings provide an awakening call for primary educators who now need to adopt and adapt their pedagogy and practice to suit the digital native students. This study's findings provide a strong platform for further research and discussions around technology based pedagogy and practice for learning and teaching in primary schools in Fiji, the region and beyond.

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