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Weaving CLES-FS and talanoa to capture Fijian student's science learnings: Exploring possibilities

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Abstract

This study seeks to explain how a modified Constructivist Learning Environment Survey (CLES) was implemented together with talanoa to explore Fijian students' perceptions of a constructivist learning environment in the science classroom in New Zealand secondary schools. The modified CLES, called CLES-FS, was developed explicitly for Fijian students in the New Zealand secondary schooling context. The adapted CLES-FS instrument included five components of constructivist learning: relationship and identity, familiar context, talanoa, critical voice and shared control. The inclusion of talanoa within the CLES-survey tool has not been done before to collect data from iTaukei (Indigenous) and Fijian-Indian students. The implication of using talanoa alongside CLES-FS has provided the unfolding of possibilities when weaving together qualitative as well as quantitative data. As an emerging Pacific researcher, the exploration exercise is essential learning that helps make sense of what it means to engage in research, particularly within the post-COVID context.

Keywords

Talanoa; Fijian; education; constructivist learning environment survey; Fijian Indians; Pacific

Introduction

Talanoa vā has enabled the thinking and working-through ideas linked to research engagement and practice in this paper through the call for papers in the special section within the *Waikato Journal of Education*. Positioning the paper within education research allowed me to relate to myself.

Relational positionality is a way to ground a researcher's connection to the topic and the communities involved in their study (Fasavalu & Reynolds, 2019). I am a fourth-generation Fijian-Indian, born and raised in Fiji. My ancestors were brought to Fiji on the Indentured Labour System to work on sugarcane fields in the late 1800s by the British Government. My family and I now reside in Aotearoa, New Zealand. My service and contributions have been towards high school science teaching and leadership in Auckland and Waikato Regions. My desire for more Fijian and Pacific students to

succeed in the Science Learning Area is a priority. It places a heavy emphasis on why I do what I do, including embarking on my doctoral project.

Grounding my relational positionality is culturally appropriate and respectful. It helps to position my entry point into exploring talanoa possibilities for iTaukei (Indigenous Fijian) and Fijian-Indian young people in New Zealand. The social labels or identifiers used to refer to Fijian people with Indian heritage are Indo-Fijian, Indian Fijian, or Fijian-Indian. In this paper, I use Fijian-Indian, which refers to Fijians whose descendants were indentured labourers brought to Fiji in the late 1800s by the British Government. When referring to Fijians or Fijian students in the study, I refer to both ethnicities iTaukei and Fijian-Indians

Statistics show that more Fijian students are coming to New Zealand (NZ) for study purposes. Between 2004 and 2017, about 6000 student visas were granted to Fijian students to come and study in New Zealand (New Zealand Statistics, 2018). It is estimated that about 90,000 Fijians live in New Zealand. As more Fijian students come to New Zealand and enter secondary school, they experience science education in an NZ context. The study aims to identify their perceptions and experiences of science learning in New Zealand classrooms settings. This research uses both a quantitative survey (CLES-FS) and a qualitative approach (talanoa) to explore Fijian students' perceptions of a constructivist learning environment in science classrooms.

The study's findings can provide support for teachers through professional development programmes to accommodate Fijian students' learning needs. Furthermore, this will contribute to the literature about Fijian students' perceptions regarding learning science content in New Zealand. This study may also help highlight pedagogies used in some schools that help Fijian students engage in science learning or barriers that inhibit science learning for them.

Fijian students are engaged and interested in learning when they can relate learning experiences to their everyday life (Sharma, 2012; Thaman, 2010). A case study done by Brison (2011) found that some kindergarten teachers in Fiji successfully engage students in learning when they use local examples in their teaching. Brison (2011) concludes that students construct new knowledge based on their interaction between what they already know and believe and experience. Similar sentiments are echoed by (Eley & Berryman, 2019; McKinley et al., 1992) that most Pasifika (a label used by the Ministry of Education to group Pacific ethnicities) students learn better when the context in which they learn is familiar to them because they can relate the concepts to their everyday life. According to Bakalevu (1997) "A Fijian set to work on his own easily loses heart and becomes lackadaisical and without interest in the task" (p. 74). She further states that students become immediately enthusiastic and energetic when learning relates to their cultural context.

This study seeks to explain how CLES-FS, a modified version of CLES, incorporates talanoa to explore how Fijian students perceive the constructivist learning environment in science classrooms. The students' perceptions will be studied through a popular quantitative survey instrument, the Constructivist Learning Environment Survey (CLES-FS) and the talanoa method, an emerging cultural approach used by Pacific researchers to capture students' learning experiences.

Literature review

Talanoa

Talanoa is more than just a conversation (Vaioleti, 2006). Talanoa is an exchange of ideas or thinking, whether formal or informal. The word talanoa may mean different things to different people. In Fiji, talanoa is a practice associated with conversations enabling people to relax, share knowledge, discuss information, or resolve conflicts or disputes (Farrelly & Nabobo-Baba, 2014). The talanoa context and topics can vary from informal conversations such as making decisions about the next day's work to

formal engagement between people of status in society (Farelly & Nabobo-Baba, 2014; Robinson & Robinson, 2005). 'Talanoa lasa' means sharing a joke or talking about something meaningless. People look forward to talanoa engagement in Fiji, particularly over the kava bowl (Aporosa, 2019). Some key values associated with the practice of talanoa engagement are respect and trust. This is because the people who are involved in talanoa are trusted people and knowledge is gained or shared in these sessions.

In the context of formal research in academia, Pacific researchers have framed talanoa as either a methodology or method. Tunufa'i, (2016) argued why talanoa is a method and not a methodology for Samoan research communities. However, Vaioleti (2006) and Farrely & Nabobo-Baba (2014) have contextualised talanoa as a research methodology in Tongan and Fijian contexts. According to Farrelly & Nabobo-Baba (2014), talanoa is conceivably one of the most prominent research methodologies utilised in the Pacific. Nabobo-Baba (2008) states that a researcher needs to use culturally appropriate framings and methodologies that recognise Fijian world views, cultural knowledge, and epistemologies. This approach recognises the Fijian people as holders of the knowledge and therefore treated them as knowers and participants of research. Nabobo-Baba (2008) states the eight steps as follows:

- Conception—includes the consideration of all people who are involved in this research.
- Relationship—researchers bear in mind that in the community, people and personal relationships are significant.
- Sevusevu—customary Fijian process of a i sevusevu is thought of.
- Na talanoa—the appropriate method or tool for collecting information is through talanoa.
- Reporting or writing—are guided by Vanua values and protocols of knowledge.
- Reciprocal relationship—even after the research, the researcher will have a bond with the people involved in the research.
- Thank you—it is essential for the researcher to thank the people who have taken part in the research.
- Giving back to the people—the researcher shares the knowledge gained during the research. (pp. 147)

Nabobo-Baba (2008) further states the eight steps can be used with other methodologies (multiple methodologies) to address their research questions appropriately and their realities, as has been suggested in the case of Kaupapa Māori Research (Pipi et al., 2004).

Vaioleti (2013) states the talanoa research methodology shares a commonality with the interpretive and flexible nature of phenomenology, blending it with cultural protocol and practices to obtain the most valid data of phenomena. In interpretive/constructive approach of research, the researcher tends to rely upon the participants' views of the situation being studied and recognises the impact on the research of their background and experiences (Creswell, 2018). According to O'Donoghue (2018), interpretive research focuses on understanding and interpreting human behaviour meanings or perceptions rather than generalising and predicting the cause and effect. He further states that interpretivism seeks to understand motives, meaning, reasons, and other subjective experiences which are bound by time and context.

A similar sentiment is echoed by Ponelis (2015) that the interpretive research paradigm is categorised by a need to understand the real world as it is from a subjective point of view and pursues an explanation within the context of the participant rather than merely the objective observer of the action. Talanoa provides a platform where researchers and participants engage in a "social conversation which may lead to critical discussions, knowledge creation or co-constructed stories" (Vaioleti, 2006, p. 24). Nabobo-Baba (2008) contends that Pacific researchers need to use culturally appropriate framings and methodologies that recognise "Pacific world views, cultural knowledge and epistemologies" (p. 143).

The interpretivist ontology states that reality is multiple, created and dependant on us in our interpretation. The epistemological position is that knowledge is constructed and subjective. Interpretivism recognises personal narratives are neither true nor false, but the representation of realities conserved with subjectivities and lived experiences of participants (Makombe, 2017). The constructivist/interpretivist researcher can use qualitative and quantitative methods when carrying out research (Giddings & Grant, 2006; Mackenzie & Knipe, 2006). Many postgraduate projects by Pacific educators have focused on talanoa to collect and analyse narrative data (Tunufa'i, 2016). In this research, talanoa will be used as a qualitative method to gather information regarding how Fijian students perceive science learning in a constructivist environment.

The Constructivist Learning Environment Survey (CLES)

CLES either in its original form or modified versions have been used in various studies; (Aldridge et al., 2000; Ebrahimi, 2015; Fraser, 1991, 2003; Johnson & McClure, 2004; Kwan & Wong, 2014; Roelofs et al., 2003; Taylor et al., 1997) to investigate the learning environments. It is a valid tool and has been used by researchers a lot in different parts of the world. CLES assesses the degree to which the principle of constructivism is evident in specific classroom learning environments. Moreover, the CLES helps researchers determine the degree to which a particular classroom's environment is consistent with constructivist epistemology (Taylor & Fraser, 1991, p. 293).

CLES's autonomy scale measures the degree to which students exercised control over their learning activities in a constructivist learning environment. The items are measured by a five-point Likert-type scale, ranging from almost never 1), seldom 2), sometimes 3), often 4) to almost always 5). The numerical responses indicate the secondary school students' perceptions about the degree or frequency that the stated practices occur or are experienced. For CLES, Taylor and Fraser (1997) used the following five subscales:

- Personal relevance—the extent to which school activities and knowledge are relevant to their everyday life.
- Uncertainty—the extent to which opportunities are provided for students to experience that knowledge is evolving and culturally and socially determined.
- Critical Voice—the extent to which the students feel that their voice is heard.
- Shared Control—Extent to which students share with the teacher control for the design and management of learning design.
- Student Negotiation—the extent to which students have opportunities to explain and justify as well as test the viability of their own and other students' ideas. (pp. 299)

Taylor et al. (1997) used CLES to explore the learning environment of science students in thirteen different schools with a sample size of 494 and established the scale's factorial validity and reliability. Also, CLES was selected in a study in Korea to investigate the extent to which science curriculum reflects a constructivist view (Lee, 2001). Furthermore, Aldridge et al., (2000) cross-validated the CLES scale's internal consistency and reliability with a size of 1081 participants in Australia and 1879 from Taiwan in 100 science classrooms altogether (Aldridge et al., 2000).

Luan et al. (2010) used modified CLES to explore students' preferences toward the constructivist learning environment for a discrete ICT subject in Malaysia. The objective of Wong's study was to validate the scale to investigate students' perceptions toward constructivist ICT learning environments. A total of 449 participants took the survey in Wong's research. The data analysed supported the instrument's internal consistency, reliability, factor structure, discriminant validity, and ability to differentiate between ICT classrooms. Wong's study suggested that CLES can be modified to explore the learning environment in different settings (Luan et al., 2010). In addition, modified CLES was also validated, which explored English teachers' learning environment in Iran with a sample size of 622

(Ebrahimi, 2015). Despite the wide use of CLES in many countries, this may be the first time a modified version of CLES will be used in a Pacifika context.

Constructivism

Constructivism is a dynamic process where small localised changes in knowledge construction may lead to a significant shift in overall understanding (Jordan et al., 2008). Constructivism emphasises the importance of knowledge, beliefs and skills that an individual brings to the experience of learning. As Windschitl (1999) states, "intellectual transformations occur when students reconcile formal instructional experiences with their existing knowledge, with the cultural and social contexts in which ideas arise" (p. 9). Vygotsky's et al. (1978) work considered culture as central to social interaction. Knowledge construction and the use of language as a tool are significant for developing thinking and reasoning abilities. His sociocultural theorisation and description added a layer to constructivism. They acknowledged an individual's cultural ways of reasoning, working together, communicating ideas, and negotiating with others. Vygotsky et al. (1978) claimed, "social learning as a pre-requisite for cognitive development and the acquiring of new knowledge is enhanced when learners interact socially within their community" (p. 90).

Social constructivism

Vygotsky believed that knowledge is first constructed among the community of learners when students work on tasks in small groups and then is internalised at a personal plane. To Vygotsky, the internalisation of knowledge from a social plane to an individual plane does not happen in all individuals alike. Vygotsky recognised that for some students internalising the learning at a personal level would not have been easy if their learning was not supported. In this case, the teacher (a knowledgeable adult) and more capable peers are said to be excellent support in guiding one's performance.

Vygotsky et al. (1978) defines the Zone of Proximal Development (ZPM) as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). To Vygotsky, the difference between a child's actual potential, as in solving problems alone, and the maximum possible as in solving the problem under adult guidance or in collaboration with more capable peers must be identified. He highlighted that different students require different types of assistance to achieve their potential with the ZPD. Vygotsky et al. (1978) acknowledged prior experiences and knowledge that learners bring to the learning situation and recommended teachers to be responsive to what the learner already knows. And what the teachers can do so the learners can be assisted appropriately to achieve what is to be learnt. Learning is located centrally in a sociocultural environment, whereas individual learning can be an outcome of social learning (Vygotsky et al. 1978). The actual practices make up the learning hence the thinking that arises from the activities and tasks. The teacher is a mentor of students who works with students to develop and sustain classroom learning (Bell, 2011; Cowie, 2015). During communication and shared meaning-making, the teacher helps the student "close the gap between their existing understanding and actions and the learning goals" (Bell, 2011, p. 31).

Constructivism, as a learning theory, has assisted in the development of constructivist pedagogy. According to Gordon (2009), a constructivist approach to education helps learners actively create, interpret, and reorganise knowledge in distinctive ways. This allows students to reconcile formal instructional experiences with their existing knowledge, with the cultural and social contexts in which ideas arise, and with a host of other influences that mediate understanding. Concerning instruction, this belief suggests that students should participate in experiences that accommodate these ways of learning.

These ways of learning include problem-based learning, inquiry activities, dialogues with peers and teachers that encourage making sense of the subject matter, exposure to multiple sources of information, and each student's opportunity to demonstrate their understanding in diverse ways.

In the constructivist approach of learning, knowledge is constructed in groups or individually based on the prior knowledge, experience either separately or in the group, as shown below in Figure 1.

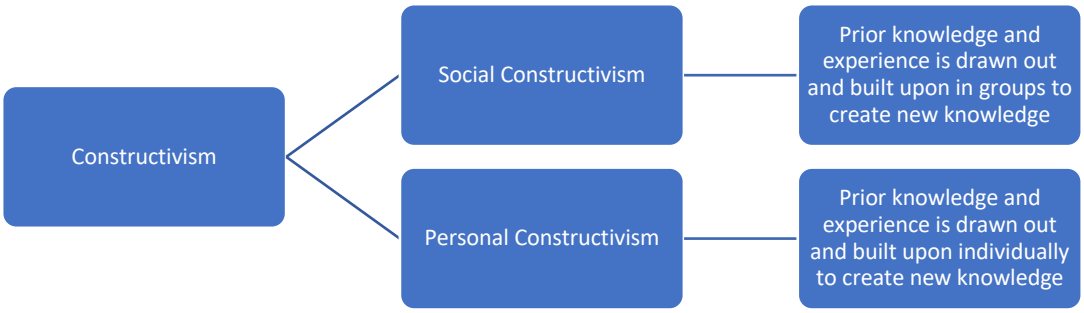

Figure 1. Showing the constructivist theory.

Furthermore, constructivist teaching can also include drawing out the learner's prior knowledge (Baviskar et al., 2009), and the initial stages of identifying a student's current ideas are the focus. The teacher can gather students' prior knowledge through informal questioning, portfolios, discussion, pre-tests, and concept maps. The second feature is where students build new ideas from the tasks given to them by their teachers. Through this activity, the student can make new links with their existing knowledge and constructs and clarifies new concepts being developed. (Baviska et al., 2009). According to Rakes (1996), the constructivist teaching approach changes the teachers' role from the sole authority to that of a guide or a facilitator. Simultaneously, the students' role shifts from being passive listeners and dependant learners to being active learners (Hirumi, 2002)

Why and how CLES was modified?

A study was done in Korea using CLES to investigate the learning environment of high school students studying science found that respondents struggled to make sense of items. Interviews revealed a severe mismatch between local cultural practices of Korean teachers and students and the cultural practices of the Australian CLES designers. (Lee, 2001). The study concluded that the questionnaire's cultural adaptability should be considered so that results can be interpreted meaningfully within its specific context. Also, the interpretation should emphasise understanding a particular context rather than merely representing the results of respondents' answers to the questionnaire numerically. Ebrahimi (2015) also modified the CLES before exploring the perceptions of the English language teacher education (LTE) version of the Constructivist Learning Environment Survey (CLES). The instrument, called the CLES-LTE, was field-tested with a sample of 622 Iranian English language student teachers in 28 classes.

This study used the literature to modify questionnaires before conducting the study. Studies have shown that Fijian students learn better when they have a good working relationship with their peers, have a sense of belongingness in class and the context of learning is familiar to them (Nabobo-Baba, 2008). Waka series is a collection of books that are being used to teach students in an everyday context, which contains small narrative stories on culture written by local authors based on Pacific myths and legends. The word waka has a dual meaning in the Fijian language. In one sense, 'waka' means the root of the yagona plant and in another sense, it means the canoe (Burnett & Lingam, 2013). The books aim

to motivate the students to read and make connections with their everyday lives (Burnett & Lingam, 2013).

Another example is Pacific Folk Tales by Benson (1993), in which he talks about local myths and legends. In one of the stories, he talks about "Burotukula island", which means gold in Fijian, on which lived beautiful birds and girls. One day while the fishermen were resting on the island, they saw a big bird coming their way. They killed the bird and took the bird's meat to their village on the other island. The next day when the people woke up, they could not see Burotukula island at all. Instead, there was only the blue sea. Stories like this fascinate the Fijian students as they can relate this to their everyday life (Benson, 1993).

Bakalevu (1997) states the term identity represents learners as an individual and also collectively. Students prefer the relationship as an essential aspect of learning, making them understand each other's values and beliefs. In one study W. Ali (2016) concludes that students' culture is linked to their identity, who they are and what they stand for. Most Pasifika parents' communities indicate a strong desire not only to engage with and succeed in the mainstream culture but also to maintain their own cultural identity (Fletcher et al., 2009).

A study conducted in Fiji reported that science taught within a constructivist learning environment, involving extensive use of group discussion based on problem solving activities, significantly improved Fijian students' performance. This approach not only reduced the performance gap between iTaukei and Fijian-Indians but precluded diminishing the performance of Fijian students (Taylor et al., 2008).

According to Veramo (1992), Fijian students who do not see the curriculum's relevance to their everyday life or are unable to relate to it can quickly get unmotivated and disengaged. In his research, he talks about how some disengaged Fijian students of science got motivated when allowed to plant cassava and learn about its life cycle in groups. Cassava is a root crop that is used as a source of food in Fiji and students are familiar with the plants.

The questionnaires developed in this study were modified based on the literature mentioned above. The themes of the five scales on CLES used by Taylor et al. (1997) were personal relevance, uncertainty, critical voice, shared control, and student's negotiation. In this research, minor adjustments were made to scale names and some questionnaires—the new scale names and their measures are listed below.

- Identity/Relationship—the extent to which secondary school students can relate to their teachers and colleagues.
- Personal Relevance/Learning in a Familiar Context—the extent to which school activities and knowledge are relevant to their everyday life.
- Uncertainty/Group Work/Talanoa—the extent to which opportunities are created for secondary school students to experience learning in groups.
- Critical Voice—the extent to which the students feel that their voice is heard.
- Shared Control—the extent to which students share the control and management of the learning protocol with the teacher.

Research design

The research design adopted CLES and modified the tool to ensure that it captured how do Fijian students perceive the constructivist learning environment in science classrooms. As a result, the CLES was renamed CLES-FS, where FS means Fijian students. A pilot study was conducted with the CLES-FS questionnaires to ensure its relevance and applicability for Fijian students in New Zealand science classrooms.

The conceptual framework is an essential feature of research design. To ground the addition of talanoa into the traditional CLES tool, this required a conceptual framework that aligned with the talanoa data from Fijian students. The conceptual framework that guided the study is called *Camakau Jahaaj*.

A conceptual framework helps frame and conceptualise the research project's overall plan that includes anything and everything that forms the underlying thinking, structures, and practices (Kivunja, 2018). The word *Camakau* in iTaukei means canoe and *Jahaaj* in Hindi means a ship. The weaving of iTaukei and Hindi languages is indicative of the knowledge and lived realities of Fijian students in the study. The Hindi word for *Jahaaj* has been used because Indians were brought to Fiji under the indentured labourer system in a *Jahaaj*, called the Leonidas (Ali, A. 1977). Sometimes Indians in Fiji refer to each other as *Jahaaji Bhai*, a term which refers to the people who came on a ship to Fiji to work on the sugar cane farms under the indentured labourer system. *Camakau Jahaaj* is relevant because it acknowledges the Fijian people, the iTaukei and Fijian-Indians.

To respect iTaukei, who are the indigenous people to the Vanua (land) of Fiji, I provide a visual representation of the Camakau Jahaaj. It carries CLES-FS and the talanoa research method to explore Fijian students' perceptions of the constructivist learning environment in science classrooms. The main hull of the Camakau has a round bottom and is made from a dugout log of a tree called Vesi (Clunie, 2015). The hull symbolises the epistemological and ontological positioning of the research which acknowledges iTaukei as well as Fijian-Indian knowledge, language, and worldviews. This study takes the interpretive approach and explores the cultural and historical interpretations of the social world as well as consider that human beings construct knowledge as they interact and engage in interpretation. Camakau Jahaaj presents possibilities within the post-COVID context to unfold the specificities linked to iTaukei and Fijian-Indian constructions and sense-making of science learning as learners of Fijian heritage in New Zealand education. Camakau Jahaaj also provides a visual representation of the design and early conceptualisation of what it means to weave and modify a predominantly western research tool with the addition of talanoa which is about capturing social-cultural narratives.

As illustrated in Figure 2, the 'centre' of the Camakau symbolises the theoretical framework that formed this study: sociocultural and social constructivism. The sociocultural theory states that learning occurs as a result of interaction between the learners, adults, and surroundings, including learning in a cultural context. Culture is central to the learner in order to internalise the knowledge. The 'mast' symbolises the direction in which the Camakau will sail. In this study, the mast signifies the method that will be used to do this study. In conclusion, an analogy of the Camakau Jahaaj as the conceptual framework grounding the design of the study. Different parts of the Camakau Jahaaj symbolises and represents the design aspects of the framework guiding the research.

During talanoa sessions, the participants discussed their chosen answers indicated in their CLES-FS. The data gathered via talanoa was analysed using a thematic based approach. Thematic analysis is a method for identifying, analysing and reporting patterns (themes) within data (Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2006). The authors state that the thematic approach is flexible, meaning that it can be modified to suit the circumstance. On the other hand, Statistical Package for the Social Sciences (SPSS) was used to analyse the CLES-FS data. According to Muijs (2011), the SPSS statistical software is widely used by researchers to analyse quantitative data as it is easy to use and extract meaningful information.

Initial findings

Figures 3, 4, 5, 6, and 7 illustrate visual graphs and representations of the findings collected in the main study using CLES-FS. A total of 133 students were surveyed using the CLES-FS, together with 30 talanoa sessions held across two different schools. The schools are co-educational and located in an urban centre with many Fijian students studying science. The participants consist of students who were recent migrants from Fiji while others were born here. The findings are grouped into five themes: (1) identity, (2) learning in a familiar context, (3) group work, (4) critical voice, and (5) shared control. An

item from each of the themes were analysed to consolidate the findings coming through the talanoa sessions.

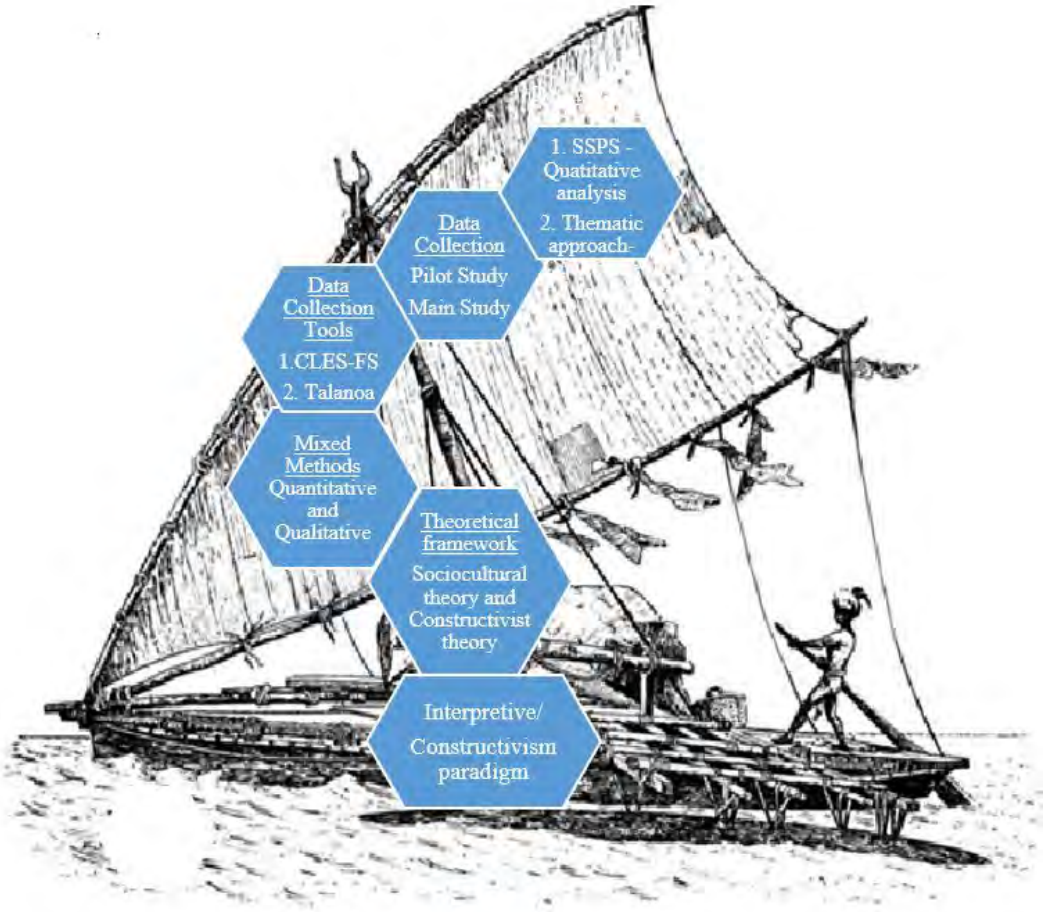

Figure 2. Camacau Jahaaj Conceptual Framework and Research Design.
(Background picture source: https://en.wikipedia.org/wiki/File:Fijian_Sailing_Canoe.jpg)

Findings from theme one indicated students have a strong sense of identity, that is, who they are and their relationship with teachers play an essential role in their learning. Figure 3 is a graph showing a large majority of students feel happy when the science teacher acknowledges them and their cultural background and identity. During the talanoa session, student A said: "Knowing my culture is vital because it is my heritage … that's where my family comes from. Also, because I want to let my children know where we come from, it is essential to keep the family traditions going."

According to student B: "At one stage, I was not proud of my culture because of the environment I was in. Primary to Junior years because students were making jokes about what I ate, e.g., curry jokes".

Figure 4 shows that a large majority of students want to learn science ideas in a familiar context. Students indicated during the talanoa sessions that they can connect to their everyday life if the context of learning is familiar to them.

Student C said: "Because it gives me a better understanding of what I am learning".

Student D was a recent migrant and she said:

> I understand science better if the teachers explain to us using everyday life examples because it will be familiar to us. In Fiji, when the teachers were explaining, I understood better because I could relate learning to my everyday life experiences. At times, I do not understand my science teachers in New Zealand because I cannot link the science ideas to my daily life.

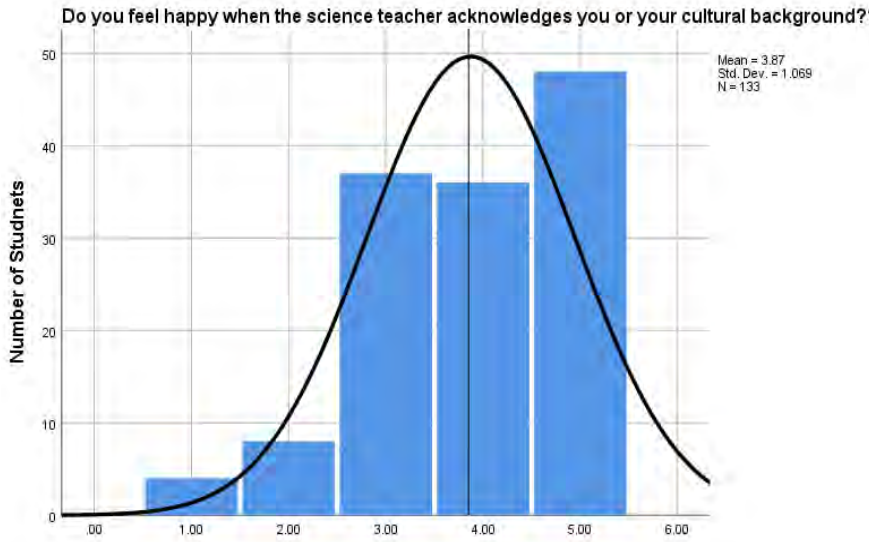

Figure 3. Showing how students feel when teachers acknowledge their cultural background.

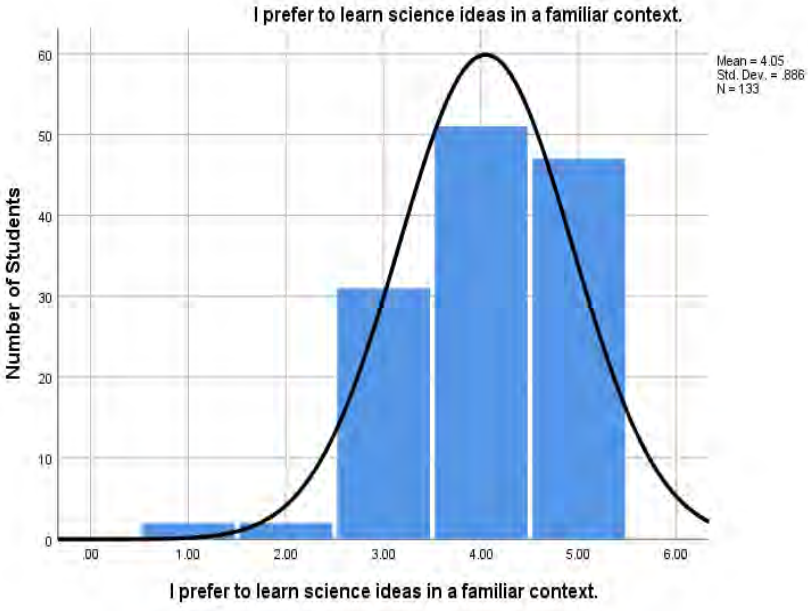

Figure 4. Showing that more students prefer learning science ideas in a familiar context.

Figure 5 suggests that students like to learn science in groups. Students indicated they were comfortable in explaining scientific ideas to their peers than the teacher. Some also said that they could converse in their mother tongue while in groups (Fiji baat—for Fijian-Indians or Fijian for iTaukei students) to explain their peers' complex concepts.

Student A said: "Everyone has different viewpoints so that we can learn from each other. We do not mind participation in class discussion but would prefer small group discussions".

Students F said: "We like working in groups because we feel safe to share ideas without fear of being wrong".

Not many students like to question the teacher how they are being taught, as shown in Figure 6. Students imply that they regard the teacher as a respected figure and do not like questioning them. Students indicated that it is our cultural thing not to question teachers because they are our gurus or

mentors. Student F said: "We can say it but in a respectful way. I believe that teachers are always correct".

Student G stated: "I am not confident because I am a shy person and sometimes, I take things home to learn by myself. What is making you shy? Because everyone looks at me."

Figure 5. Showing students like working in groups.

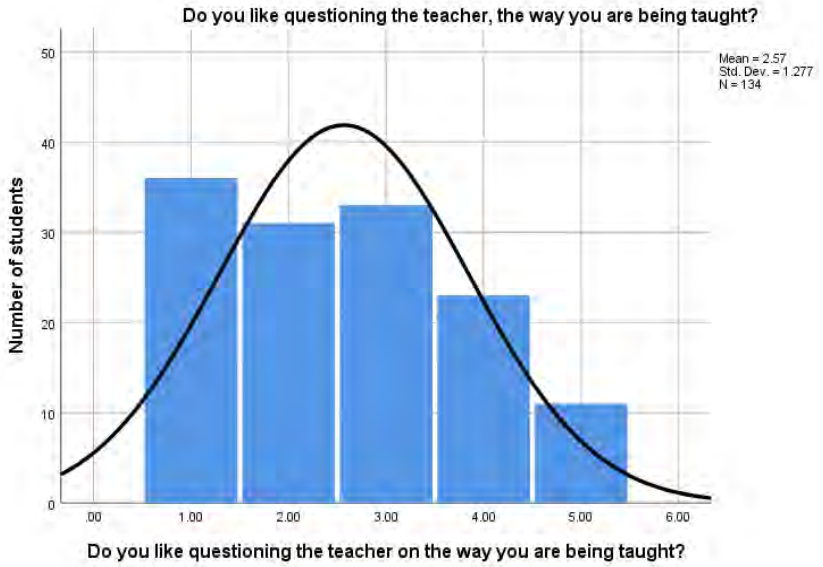

Figure 6. Showing not many students like to question the teacher the way they are being taught.

When asked, if they liked helping the teacher to decide which activities are best for them? Students were not sure what to say. Some connoted they wanted to have a say in learning about things that interested them while others didn't care as far as it made sense to them.

> Student A: No, we don't want to tell the teacher what we want to study because he knows better than us and we trust our teachers. We never thought of what and how we want to

learn. If given options, we will learn something that we understand and will not get bored.

Figure 7 shows the students' evenly spread responses when asked, do you like helping your teacher decide which activities are best for you.

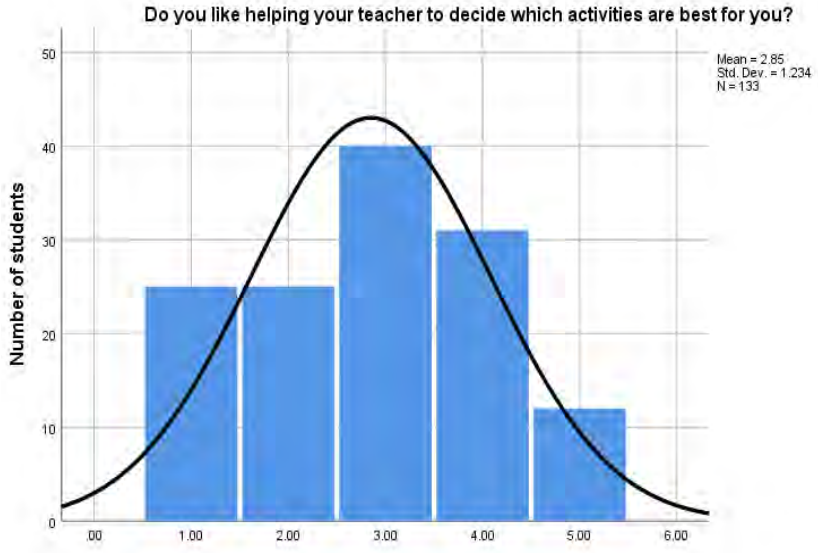

Figure 7. Showing that students have divided opinions when asked, do you like helping your teacher decide which activities are best for you?

Limitations

There are limitations to the study. Firstly, the number of participants in the initial findings is small, limiting the results' generalisability. Secondly, not all the items in the scale of CLES-FS were analysed. As the study progresses further, more data will be collected from participants, which may be used to generalise. We did not intentionally break down the results by gender and ethnicity, iTaukei and Fijian-Indians, as the sample size was small; however, it will be done once all the data is collected. Nevertheless, the study manifests that it is possible to weave indigenous research method (talanoa) with the western methods (CLES-survey) to explore the perceptions of Fijian students studying science in New Zealand.

Conclusion

CLES was modified to CLES-FS based on the literature and responses in the pilot study. Data gained through CLES-FS evince that participants understood the research purpose and were eager to engage in the discussion. Data collection through CLES-FS can be collected faster by many participants; however, it lacked the participants' descriptions or statements or their choice of answers.

On the other hand, talanoa, a Pacific research method, provides the participant's commentary to why they have chosen the answers for the CLES-FS but take time to collect data from the participants. However, it gives rich qualitative data, which affirms the interpretation of the data gained through CLES-FS. Talanoa sessions provide a platform where participants feel at ease and comfortable. This is because, during talanoa sessions, participants can relate to the researcher and understand its purpose. In this process, knowledge is shared rather than given. The feedback of the participants provides meaning and the wairua to the data gathered through surveys. Weaving CLES-FS and talanoa not only provides

the narratives and quantitative data, but it also enriches and supplements the research findings and gives rigour to the results obtained during the research.

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