

The Hei metaphor: An emerging conceptualisation of research from Solomon Islands

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Abstract

Western research paradigms have dominated the area of educational research. Recently, Indigenous research paradigms have emerged to help Pacific scholars in their research activities. The dominance of Western research paradigms can be a problem for understanding Indigenous cultures because communities perceive the world differently. The benefit for Pacific Indigenous researchers is to conceptualise concepts and metaphors that capture the relevance of what they are doing or studying as part of their communities. There are some existing Pacific research frameworks such as the Kakala research framework from Tonga or the Fijian Vanua research framework. The purpose of this paper is to present an emerging Pacific research framework from the Solomon Islands context, the Hei framework. The Hei framework is useful as it relates the Western notion of research to the traditional Solomon Islands process of collecting and preparing the Ngali nuts (*Canarium indicum* nut), which can be understood as a metaphor for the collaborative and collective approach to the collection and analysis of data in research. This metaphorical understanding of research provides a useful analytical framework for novice researchers from small island developing nation states (SIDNS) in the Pacific.

Keywords: Research paradigm, educational research, Pacific Indigenous knowledge, Hei

Purpose of research

As Pacific Island people who have different cultural backgrounds and experiences, the authors believe that traditional metaphors can be useful in building understanding of research in the Pacific context. The authors anticipate that ideas shared in this research paper will provide a local view towards mathematics teaching and research.

Introducing research topic

Paradigm is a term that is widely used in dominant Western educational research. A paradigm can be defined as a 'set of philosophical assumptions' (Mertens & Wilson, 2019, p. 36) which represents our views about the world or a particular phenomenon in the universe. In other words, a paradigm is a set of beliefs that guides actions (Creswell, 2017). It focuses on people's perspectives on the world and knowledge (Freebody, 2003). These are usually made up of four sets of philosophical assumptions that describe how people view things: the ontology, epistemology, axiology, and methodology. Ontology answers the question 'What is reality?' In other words, ontological questions involve what a person believes is real or true about the world. The second set of assumptions is related to epistemology, and under this, we look at and try to understand what constitutes knowledge and knowing. The third set of assumptions is axiological in nature and tends to explore how people view ethics (Wilson, 2001). The final set of assumptions is related to methodology and here the main question revolves around 'systematic approaches to gathering information' (Mertens & Wilson, 2019, p. 39) about any phenomenon that we are interested to know more about.

Western research paradigms are quite popular in the area of educational research. Four broad Western research paradigms include the positivist, pragmatic, interpretivist/constructivist and transformative paradigms (Mertens & Wilson, 2019). The assumptions underlying positivism include the belief that there is one reality (ontological) that can be studied by the researcher from a distance, in an objective manner (epistemological), using purely scientific approaches such as random experiments (methodological). The ethics of such an investigation would be guided, for example, by the need to protect all involved from any potential harm (axiological). The positivist paradigm has dominated most fields of research, beginning in the 1500s with the work of Sir Francis Bacon (Mertens & Wilson, 2019). The other three paradigms have their roots in more recent history. For example, the interpretivist/constructivist worldview rests mainly on the works of Immanuel Kant in the late 1700s. Interpretivist/constructivist assumptions include the belief that humans create multiple, socially-developed realities (ontological) by interacting with their environment (epistemological), that these can be understood by making efforts to understand peoples' lived experiences (methodological) and that it is important to work

closely and collaboratively with research participants based on accepted levels of engagement, awareness and reflection about one's own and others' values (axiological). This relatively modern understanding or worldview, which has been broadly and loosely classified as constructivist, has provided a platform through which traditional research worldviews from the world's diverse cultures can emerge.

Pacific Indigenous researchers have created research paradigms or frameworks in recent years to assist them in their work (Nabobo-Baba, 2008; Thaman, 1992, 2010). Pacific Indigenous research paradigms are focused on Indigenous peoples' beliefs, values and knowledge of their world (Nabobo-Baba, 2008). In addition, Indigenous researchers have used metaphors relating to their culture to help them understand Western research paradigms, methodologies or methods. Sanga and Reynolds (2020a) mentioned that the use of metaphor is common in the lives of many people in the Pacific. Metaphor forms a bridge between formal education and the Indigenous culture that enables them to understand formal education. Inspired by the Kakala research framework (Thaman, 1992) and the fact that Indigenous research is still in its early stages in the Solomon Islands, this paper presents another Indigenous way of conceptualising the Western notion of research – through the Hei framework. The Hei research framework, as introduced in this paper, is a metaphor to help understand how to conduct research in Solomon Islands context. The Hei framework is in its conceptualisation form and the focus of this metaphor is on the methodological aspects of the Indigenous paradigm.

Firstly, discussions surrounding Western research paradigms will be explored, critically looking at the four paradigms in educational research. Secondly, three existing Indigenous research frameworks will be briefly examined: Kakala from Tonga (Thaman, 1992), Fijian Vanua Research Framework (Nabobo-Baba, 2008) and the Tok Stori from Melanesian perspective (Sanga and Reynolds, 2020). Thirdly, the Indigenous research metaphor, known as the Hei research framework, proposed by the researchers, will be discussed, illustrating the five stages of how data can be collected and analysed. In other words, the Hei research framework illustrates the main ideas of data collection and analysis that could guide any research study intending to adopt a Pacific Indigenous research paradigm. In Solomon Islands the common language used is Solomon Pijin but there are also different languages and dialects, for example 73 distinct languages (Quinn, 2021) used by people from the different islands.

Paradigms in Education Research

Four broad Western education research paradigms include the positivist, pragmatic, interpretivist/constructivist and transformative paradigms. Under the positivist paradigm, the researcher would typically look at/for scientific methods that work with rules and explanations to understand human behaviour (Cohen et al., 2018). The

research design used in a positivist paradigm is the quantitative approach. On the other hand, the interpretivist/constructivist researcher would observe people's lives through interactions in order to understand how people view the social world (Cohen et al., 2018). The interpretivist/constructivist sees knowledge as being constructed by interaction with the environment or people, as well as through co-construction with participants (Cohen et al., 2018; Creswell, 2017). The acquisition of knowledge therefore requires the individual to consider the information based on their past experiences, personal views, and cultural background which enables them to construct an interpretation of the information that is presented to them. The research design used by the interpretivist/constructivist is the qualitative approach. While positivists believe that rules and explanations can only be discovered when using the scientific method, interpretivists/constructivists believe the world is made by individuals through experiences or social interactions. Researchers working within the pragmatic paradigm believe that they should combine the ideas of positivism and interpretivism when conducting research. Pragmatists have the freedom to choose any of the methods, techniques, and procedures from the qualitative and quantitative designs that will best suit their research problem and questions. They see no point of making one research design more valuable than the other (Biesta, 2010; Creswell & Clark, 2011; Feilzer, 2010; Morgan, 2014). The different approaches complement each other. This paradigm sees mixed methods – a combination of qualitative and quantitative approaches – as paramount in conducting research. The transformative paradigm belief system engages individuals of diverse cultural diverse groups but the focus is more on social justice (Mertens, 2009, 2010). Similarly to interpretivists/constructivists, they view knowledge as socially constructed and shaped by the individual's experiences and personal characteristics, and the influence of the community. That is, researchers using this paradigm learn from their participants and see them as important partners whose trust is paramount (Mertens, 2007). It centres on the experiences of marginalised communities such as 'women, ethnic/racial minorities, people with disabilities, and those who are poor' (Mertens, 1999, p. 4). This paradigm also uses mixed methods.

Researchers' interpretations of the world depend on their own background. Individual researcher's beliefs influence their choice of either a qualitative or quantitative approach to research. A specific research methodology that aligns well with the interpretivist/constructivist research paradigm is qualitative research as it involves discovering understanding through the researcher's active involvement in the construction of meaning (Kim, 2014). Qualitative education research focuses on individual experiences, concepts or thoughts looking at what people think and why they do so (Cohen et al., 2018; Creswell, 2017). There are different types of qualitative data collection methods used such as one-on-one interview, focus group interview, observations, or record keeping. Data are collected on sight and are non-numerical

helping the researcher to explore how decisions are made as well as providing detailed insights (Cohen et al., 2018; Creswell, 2017).

However, people or society have different worldviews and can see, and value things differently based on their experience of reality (ontology) and knowledge (epistemology). This has led to the emergence of traditional or cultural ideas in different fields of knowledge. For example, an increasing group of mathematicians and mathematics educators give value to mathematical knowledge systems of Indigenous or non-European societies, giving rise to a branch of mathematics called ethno-mathematics. Ethno-mathematics studies the relationship between mathematics and culture (D'Ambrosio, 2001). In a similar way, many Indigenous cultures acknowledge their own ways of understanding reality and knowledge, and the ways of coming to know. These ideas can be loosely classified using the umbrella term 'Indigenous research'. Research means seeking to 'know' about something using an acceptable method or approach. Patten and Newhart (2018), describe different ways of knowing – one way to know something is to look into one's own personal experiences. While such experiences may have their limitations, from a research point of view they do provide a rich and meaningful way of looking at things. The main goal of research is to realise reality as closely as possible. It is reasonable to say that each society has its own way of seeing and valuing things. Therefore, Indigenous research approaches provide a platform for researchers to explore a particular phenomenon within or using a culturally coloured lens. Three of these Indigenous Pacific research concepts are discussed in the next section.

Existing Pacific research frameworks

There are three existing Pacific research ideologies that will be explored, which are the Kakala (Thaman, 1992), Vanua (Nabobo-Baba, 2008), and Tok Stori (Sanga & Reynolds, 2020a; Sanga et al., 2020; Sanga et al., 2018).

Tongan Kakala Research Framework

The Kakala Research Framework was originally put together by Professor Konai Helu Thaman. This is a Tongan-centric Indigenous framework that focuses on teaching and learning and the purpose is to help Pacific students recognise and understand Pacific worldviews in their thinking. Originally this research framework had three components: Toli, Tui, and Luva (Malungahu et al., 2017). Today there are three additions to the framework, namely Teu, Mālie, and Māfana, which were put together by Professor Konai Helu Thaman, Dr 'Ana Taufeu lungaki, and Dr Seu'ula Johansson Fua. The women relied on Dr Linitā Manu'atu's work around Mālie and Māfana to reconceptualise the Kakala approach into a research framework. Therefore today the framework consists of six key components in the following order: Teu, Toli, Tui, Luva, Mālie and Māfana (Fua, 2014;

Manu'atu, 2000). Kakala is a Tongan word for garland. It also symbolises the process of making a flower garland, an important cultural activity in Tonga and evident in many other Small Island Developing Nation States (SIDNS) (Tui'ifua, 2014). Kakala can also be conceptualised as a research metaphor based on the practice of kakala making, or garland making (Naepi, 2019). Each step of the Kakala process has been contextualised to the Indigenous way of thinking.

Teu is the preparation stage, where baskets for collecting the flowers are prepared as well as the threads and needles. In relation to research process, this represents thinking about the research questions, objectives, data collection tools, site and participants. Toli is the picking of different types of flowers for the garland, which represents the process of collecting the data for research. Tui is the process of weaving or making the kakala by putting together the best and most fragrant flowers. In research, this represents the analysis of data where the relevant information collected is sorted and only the best quality data is considered. Luva is the presentation of the kakala to the important person/people of the occasion. This represents the final report within research, presented to important stakeholders. Mālie and Māfana (Manu'atu, 2000) represent the expressions of appreciation and acceptance from the receiver of the kakala. In research this represents when important stakeholders see the importance of the research, use it in their work with effective outcomes, then they will appreciate it and share it with (Fua, 2014; Thaman, 1992; Tui'ifua, 2014). The Kakala research framework has been used by a number of Tongan researchers such as Thaman (1992), Fua (2014), and Tu'ifua (2014).

Fijian Vanua Research Framework

The Vanua Research Framework is a Fijian Indigenous research methodology created by Professor Unaisi Nabobo-Baba. Indigenous research in the Pacific is largely dominated by Polynesian scholars (Farrelly & Nabobo-Baba, 2014) and the Fijian Vanua Research framework is one of only a few by Melanesian scholars (Tagicakiverata & Nilan, 2018). Vanua is defined as a 'universal whole' (Nabobo-Baba, 2008) which consists of four interrelated dimensions: physical, social, cultural and spiritual (Nabobo-Baba, 2008; Tuwere, 2002). Vanua refers to the 'interconnectedness of people to their land, environment, cultures, relationships, spirit world, beliefs, knowledge systems, values, and God(s)' (Nabobo-Baba, 2008, p. 143). The Vanua research framework is embedded in Indigenous Fijian worldviews, knowledge systems, lived experience, representations, culture, and values as a way to give 'power and recognition to things Fijian' (Nabobo-Baba, 2008, p. 142). This framework seems to place greater focus on axiological assumptions and seeks to highlight ethical approaches to Indigenous research, taking into account Fijian values, protocols of relationships, knowledge and ways of knowing (Naepi, 2019). In addition, Talanoa, which is an exchange of conversation between two or more people, is an important method used in the Fijian

Vanua Research Framework where the researcher and the interviewer obtain and share information (Nabobo-Baba, 2006). The Vanua research framework has been used by a number of Fijian researchers such as Nabobo-Baba (2008), Tagicakiverata and Nilan (2018), Nainoca (2011) and Lagi (2017).

Tok Stori

Tok stori is a Melanesian term for what Solomon Islanders do every day in terms of how they use stories to communicate and make sense of life (Sanga & Reynolds, 2020b) or as a way of sharing knowledge (Vella & Maebuta, 2018). Tok stori is where people tell stories together and exchange and interchange ideas. Through the stories, knowledge is being developed, collected and transmitted. Tok stori requires people to listen, share and respond. According to Sanga and Reynolds (2020b), Tok stori has its own ontology, methodology and methods. The stories that are shared reveal people's beliefs and knowledge of how they perceive the world. Tok stori is a way of being in the world and of understanding the world (Sanga et al., 2018). It can be related to the Polynesian Talanoa. As mentioned above, Talanoa is a formal or informal conversation, a talk, or an exchange of ideas and thinking between two or more people (Tagicakiverata & Nilan, 2018; Vaioleti, 2006). Tok stori research method has been used by a number of Solomon Islands researchers (Sanga & Reynolds, 2020a; Sanga et al., 2020; Vella & Maebuta, 2018).

These existing Pacific Indigenous research methods are very important as they enable voices that are silent within the wider Pacific research methodologies to be heard in the outside world (Naepi, 2019). The Kakala and Vanua frameworks help Indigenous people to re-establish engagement in their Indigenous knowledge systems, experiences, representations, imaginations and identities (Nainoca, 2011). Tok Stori helps Indigenous people to share their knowledge with each other.

A Solomon Islands traditional research conceptualisation: the Hei as framework and metaphor

Solomon Islands is located in the South Pacific and is a Melanesian country. It is comprised of six main islands and these main islands are divided into nine provinces with over eighty different Indigenous languages (Sanga et al., 2020). Solomon Islanders represent the Melanesian, Polynesian and Micronesian cultural groups as well as others. English is the stated official language of instruction at school although Solomon Pidgin (a lingua franca) or Pijin is the commonly used medium of communication. Solomon Islands have diverse cultures, languages, and customs.

Today, Indigenous Pacific people are beginning to describe and articulate their preferred processes for the gathering, processing and dissemination of knowledge in a wider move to achieve some form of self-determination in academia and in knowledge

institutions especially (Nabobo-Baba, 2008). Thus, the Hei research framework and metaphor was developed to help in understanding the processes of knowledge gathering, processing, and dissemination in a study involving mathematics teachers in Solomon Islands. The study investigated teachers' and students' perceptions, benefits and challenges of teaching mathematics with examples in one secondary school.

The first author, who hails from the Marovo Lagoon in the Western Province of Solomon Islands developed the Hei framework while she was exploring various Western research methodologies and trying to conceptualise these using local Solomon Islands understandings. The Hei framework complements the Western research methodology (Smith, 2012). For example, while the Western approach focuses on structure and data, the Hei framework focus on respect, relationships, shared experiences and practices. The Hei framework, presented next, came as a result of the first author's own reflections on existing Western and Pacific research frameworks amidst trying to understand the links between various methodological processes in Solomon Islands context using local metaphors.

The word hei comes from one of the dialects in Solomon Islands, the Marovo Lagoon in the Western Province, and refers to the baked ngali nut (*Canarium indicum nut*) (Sulifoa, 2012). This nut is an important source of livelihood for the people of Marovo Lagoon as well as other parts of Solomon Islands. The ngali nut preparation is a form of cultural heritage passed down the female line. In other words, women pass down the skills of preparing the ngali nut to girls. There are two different types of nut trees which produce two different types of nuts, one is small and the other is larger in size. The bigger nut is referred to as ngoete and the smaller one is called maria. These nuts are collected during harvest time, especially between the months of August and February but the peak time for harvesting is in December. Because the nuts are only available at certain times, people in the area collect the nuts and bake them for storage purposes. The nut is very important in traditional food preparation and in important ceremonies such as weddings, feasts in some provinces in Solomon Islands. It is a special food for only special occasions such as chief meetings or weddings for the Marovo people. However, nowadays it is eaten anytime. Some Solomon Islanders use ngali nuts in traditional dishes to show their cultural/provincial identity.

Even though Marovo terms are used, ngali nut is of cultural significance to other Solomon Islands cultural groupings. For example, in Choiseul, the ngali nut (*Saqa* – *Canarium salomonense*) is of huge cultural significance. It is used in major cultural occasions such as the Naki (a feast called by the chief), different rituals (for example, worshipping through offering praise or sacrifices), and other celebration feasts (McClatchey et al., 2006). Similarly, the chiefs and warriors of Baniata people in Rendova Island, burn sacrifices of ngali nuts to their gods for luck of fishing and headhunting/war (Koroi, 2017). In addition, the Babatana and Ririo tribe of Choiseul

used the ngali nut as a healing herb, house dedication ceremony, bride price, resin for torches during the night, boundary markers and transference of authority (McClatchey et al., 2006). It is also an important nut in the guana (ridges, hilltops, mountain saddles, and highland areas), which is a forest of nuts that be used during a disaster such as cyclone, poor harvest, and so forth. It is prohibited for the tribes to cut or remove the ngali nut trees because these trees were considered to be food of the gods/spirit and they will be cursed if they do so (McClatchey et al., 2006). Likewise, in some of the provinces in the Solomon Islands, (for example, Malaita, or Western Province) owning ngali nut trees indicated great wealth (Pelomo et al., 2016). Ngali nut has cultural significance in Malaita Province because it is used for barter system for traditional shell money, plots of land and pigs; used in feast (for example, annual traditional spear-fights Wogasia, festival of fertility, other ceremonies of Aorigi) and communal gathering and preparation for harvesting (Pelomo et al., 2016; Sulifoa & Lameta, 2014). Ngali nut is of great importance to the Solomon Islanders because it is a food source; sources of timber for canoes, houses and other wooden artifacts (custom bowls); boundary markers; resins for light, or used as canoe caulk; traditional medicines; and as firewood (McClatchey et al., 2006; Thomson & Evans, 2006). It is seen as one of the 'high ranked nut tree' in the Solomon Islands society compared to other trees because traditional and commercial importance (Thomson & Evans, 2006).

The Hei framework is also made up of the four sets of philosophical assumptions: ontology, epistemology, axiology and methodology but differs from Western paradigm approach. The Hei framework sees reality as relational and connected and knowledge comes from doing, sharing and reflecting together during the process of making hei. It is based on five core principles or values namely, respect (vinaboka, vaboka), relationship (vinari atei, vinarimekai), reciprocity (sosoamakata, vinari sosoapulei), responsibility (tinavete, chinakei) and reflection (binalabala). It uses Tok stori, observation and community engagement. On the other hand, each traditional process of making hei represents a phase in conducting the research and this is where Indigenous framework complements Western research framework.

The Hei framework can also be viewed as holistic, but unlike the Vanua framework, it consists of seven interrelated dimensions namely cultural, ecological (environment), social (relational), ethical (Axiology), spiritual, educational, and mental (cognitive). This indicated that the Hei framework emphasis on additional aspects of human life including education, ethics and cognition thus providing a more comprehensive and nuanced understanding. Additionally, it aligns with collaborative research (Armstrong et al., 2005; Firchow & Gellman, 2021; Smith & Katz, 2000) and values the knowledge, experiences and contributions of everyone who participated, and all parties learn from each other.

During the different processes of Hei making there is tok stori (vivinei) where storytelling and exchange and interchange of ideas between the mothers and their daughters are made. New knowledge is being constructed and is passed down to the next generation. While the tok stori gather new knowledge through stories, the Hei framework organises these stories into interconnected cultural, social and environmental knowledge for broader understanding.

Hei is a metaphor used to understand teaching and learning and how to conduct research in Solomon Islands context. Teaching and learning occur throughout the process of making hei with the transfer of skills and knowledge from elderly men and women to their children. The children will then pass this learning on to the next generation. In relation to teaching and learning, Hei has shown us that teaching and learning should be approached collaboratively and collectively, and that Indigenous knowledge has great cultural significance and should be included in teaching and learning so that Indigenous knowledge will be respected and cherished throughout all generations. This notion can be useful for classroom teaching and learning, similar to other Indigenous research ideas developed in order to carry out educational research.

Process of making hei

Baked ngali nuts are called hei. Among the Marovo people, the hei is not just about food, it also represents care, connection and continuity. There are five stages to the process of making hei and they are Poki, Chero, Picha, Tevaha and Vahia. Each step of the process aligns with how Indigenous research is conducted and that is with patience, respect and relational responsibility. The traditional process of making hei is seen in Figure 1.

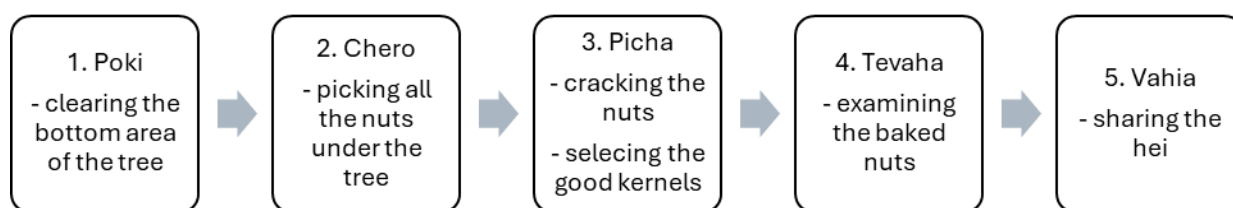


Figure 1: Traditional process of making *hei*

Poki

When it is harvesting time for the ngali nut (*Canarium nut*), the men and boys will go and clean around the base of the nut tree(s). The men and boys are responsible for clearing around the bottom of the nut tree because there are other smaller trees or shrubs growing there and men's strength is needed to cut and remove them from the area. This process is called poki which means clearing an area. Poki is about preparing

the area for collecting the nuts by clearing around the base of the tree and throwing the branches and sticks away. Clearing the bottom of the tree usually takes between half a day and a day, depending on where the trees are. Usually, the nuts picked are the ones that have already fallen to the ground so that is why the men will go and clear unnecessary plants from under the tree (s).

Poki is where the researcher works with others in the planning and preparation process. For instance, the researcher and the supervisor(s) worked together to plan the study by developing the data collection tools as well as working with the country of research's Ministry of education, authorities and schools in selecting the research site and participants. In addition, Poki focus on preparing the environment, that is, choosing the right topic to research on and making the space ready for engagement. In relation to the Kakala framework, the teu involves gathering different flowers, while the poki focuses on preparing to pick the same type of nut. In research, teu is like gathering different sources whereas poki prepares to collect one specific type of data. The researcher is mindful of the fact that initial preparations such as learning cultural protocols, understanding context, identifying a research problem, designing a research aim and procedures for conducting the research, and gaining readiness to engage respectfully are important in order to get the desired research outcomes. Likewise, in the Hei making process the experienced women in the village know what the final Hei product must look like, smell and taste.

Before the men go out to clear the area, the person who wants to pick the nuts will first seek permission from elders such as the grandfather, grandmother, uncle or aunt, even though they are family members. This process is called *tepa tinavamagua*. If the nuts are to be picked from a person who is not a family member, then packaged food (packaged or processed food has high cultural value because it is not something that everyone can afford or is readily available) will be given to the owner. If the nut trees belong to the family, then there will be no food given, and only verbal interactions will take place because in the end the hei will be shared with the family members. When approval is given then the process of clearing the area can begin. This process has specific links to the ethics of research. For example, in order for Western research to be considered ethical, permission and approval to carry out the research has to be obtained from various stakeholders (Cohen et al., 2018). Additionally, in research, it involves approaching community respectfully, seeking consent and establishing trust (Nabobo-Baba, 2006, 2008). Furthermore, the Hei framework align with the Vanua framework because it focuses on the interconnectedness of people to their land, environment, cultures, spiritual world, beliefs, knowledge systems, values and God(s). As the Vanua framework begin with ritual and respect (*sevusevu*) acknowledging ancestors and guardians (Nabobo-Baba, 2008), the Hei framework begin with seeking permission and

approval and pray to God for protection and thanksgiving before clearing the bottom of the nut trees.

Chero

After the men and boys clear the bottom of the nut tree(s), the women and girls will come with their baskets or bags to pick all the nuts. Sometimes while the men clear the surrounding, the women and children can start picking the nuts. The process of collecting or picking the nuts is known as chero. Chero means picking and the women and children bend down to pick the nuts. The picking can go on for a day, a few days, or a week if there is more than one nut tree to be worked on. At this stage it is wise to collect all the nuts because the hard covering outside makes it difficult to identify whether the flesh inside is good or bad. One will only know if the flesh inside is good or bad when cracking the nut. As the picking of the nuts continues, women and children tell stories (vivinei/tok stori) with each other and there would be joyful noises. This is a time of celebration because the harvest is abundant. Breaks are taken several times to avoid backache, and this is the time to eat and tell stories. The tok stori (vivinei) shared could be on any topic. In addition, women and children move closely forward together in a straight line to pick nuts so that all nuts in the area are collected. The ngoete/maria (nuts) are picked and put into bags or baskets. When all the nuts have been collected, the men, women, girls, and boys carry the baskets to the vanua (house). The nuts will then be poured from the baskets onto leaves, mats, bags, or plastics that have been spread out on the floor or ground in the vanua rejo (traditional outdoor kitchen). This is so the outer layer or the skin of the nut can be dried so that the nuts are easy to remove. Some of the skin will have already rotted off when the nuts fell to the ground and remained there for a while before picked.

Chero represents the collection of data in a collaborative way using Western research methods such as interviews, observations and surveys etc. This is where the researcher worked together with the school administration, participants, and assistant (e.g. camera person) to collect the data in a certain area. Taking breaks during data collection is important because it allows time to rest, reflect and discuss before moving forward. In addition, all nuts are collected because one cannot tell from the outside which are good or bad. Likewise, in research all data is gathered, as it is not possible to know in advance which information will be most valuable. The novice researcher must be aware that not all data that is collected will be useful, and during data analysis process, some of the discrepancies within the data may emerge, which might prompt the researcher to redesign the methodology and look for additional data. All data is now available for the researcher to reflect upon and later decide what to use – a practice that is common in qualitative research designs, especially where the researcher is working within an interpretivist or pragmatic paradigm.

Picha

When the nuts are brought to the vanua (house), the women and girls may start the process of cracking the nuts immediately or leave the nuts for a few days first. This process is called *Picha*, which means cracking. At this collaborative stage, more hands will be needed because there are lots of nuts to be cracked, so help is required from other family members. Likewise, in collaborative research, the researcher worked with other people (transcribers, translators, supervisors) to help in analysing the data.

The women and children will sit in a circle or not far from each other when cracking the ngali nuts. Certain number of nuts will be distributed to the different women or children, or the nuts will be put in the middle, and they will sit around the pile and begin cracking the nuts. A space is created in the local kitchens (*vanua rejo*) or in the open space under a tree for women and children to sit around and crack their nuts. During this time the women usually teach their children how to crack the nuts properly so that the meat inside is in good shape and does not get broken. Also, this is a time for *vivinei* (*tok stori* in the Marovo dialect) where the elderly will tell stories to the younger ones on any topics, talk about daily experiences and plans, some gossips of the village, and updating each other of the happenings in their surroundings. In relation to *Tok Stori*, this is a safe place for open conversation, and mothers co-construct knowledge with their daughters when passing down knowledge of how to crack the nuts properly or any other Indigenous knowledge. Traditional tools passed down by the ancestors are used to crack the nuts and these are big stones or flat slabs and small stones for hitting or cracking the nut. The person who will crack the nut must hold the nut and place it in the right position on the big stone. This is a difficult process because those who are cracking the nuts can hurt their fingers badly if they are not careful. It often takes a whole day to crack all the nuts for the *hei*. Whatever is cracked on that day must be baked immediately because the nuts have high oil content which means they will go bad quickly.

Another activity done during *picha* is *bena*. This process is the removal of the thin brown outer covering (*testa*) of the kernel. When the nut is cracked, the seed inside will be removed and soaked in a bowl of water. This is so that the thin brown coating that covers the white flesh (kernel) inside can be removed easily (Sulifoa, 2012). The white kernel will then be put in another bowl, ready to be baked. In research, this equates to the stage where all the relevant information that has been collected has to be sorted. Although *Picha* can be seen as relating to the *Tui* stage in the Kakala research framework, in terms of analysis of data there is a difference. The *Tui* stage focus on combining different flowers together to create something beautiful while *Picha* focus on extracting and discovering useful and valuable content. *Picha* represents the qualitative analysis of the data where only the most relevant information is kept and put together (Cohen et al., 2018). The hard shells represent the difficult stages in analysing

the data but the reward when crack open is most valuable. In collaborative research, working together makes it easier to understand the data and to discover the valuable knowledge and insights. This stage focus on the data analysis stage in research which is complex and requires technical skills (Cohen et al., 2018). This involves the thematic analysis approach (McMillan, 2012) which involves the transcribing and coding of the data and the proper analysis. The data is being organised, interpreted, explained and the researchers continue to have reflection and analytical questionings (Creswell, 2017). The information that is important to consider is given due consideration by the researcher, while less important information may also be considered if it fits the aims of the study. In summary, Picha can guide novice researchers to concentrate on the most useful and relevant data and let these important data form the basis on which conclusions can be drawn.

Tevaha

Tevaha is the final process whereby the white kernels are baked overnight in an earth oven (motu). In the morning the baked kernels will be extracted from the earth oven and examined by the elder women to see if the kernels are well cooked. When the women are fully satisfied with the outcome, the process is complete. The final product is known as hei. In terms of Hei making, the strength of the fire and the number of stones used, the kind of leaves used to prepare the oven are some of the things that matter. In research, this equates to the various stages of checks before it is presented to the examiner. This process is different to the Luva stage in the Kakala research framework (Tu'ifua, 2014). In collaborative research, the final write up of the different chapters in the thesis are carefully checked by the researcher and supervisors as well as proofread before is presented to the examiners, ensuring the quality and accuracy of the final work. This is like internal preparation compared to Luva.

Vahia

Hei is seen as a blessing that can be shared with the family, the community or the outside world. The process of sharing the food is called vahia. The hei is stored in bilo (containers or buckets) after being taken out from the motu (earth oven) and can then be shared with others. Families can use the hei in their cooking at home or the community can use hei in the preparation of custom dishes for big gatherings. Buckets of hei can also be given away as gifts for weddings or to important people on important occasions. Hei can also be sold locally or internationally. This is how hei is shared among people. This process is quite similar to the final stages of the Kakala research framework, but the approach is different. Mālie and Māfana are the final stages of the Kakala, and this represents the expressions of appreciation and acceptance of the receiver for the kakala (Tu'ifua, 2014) whereas with the hei, the final stage of vahia represents the distribution of the hei. In collaborative research, after the thesis is

graded, it can be shared with everyone involved including participants, the school, the Ministry of Education and other important institutions in the country, so that all will benefit from the knowledge gained throughout the research. The findings of the research can also be shared or published in journals so that the world will know about the knowledge that has been generated. This is also a time of celebration for the positive outcome of the hei, similar to the completion of the thesis. In addition, the Hei framework aligns with the Vanua framework because it focuses on the importance of reciprocity and responsibility.

In summary, the different stages of the process of making hei involves collaborative work, sequential order, concurrent sequence, difficult stage, and celebration stage. The stages poki, chero and vahia are done sequentially whereas picha and tevaha are done concurrently because the kernels can go bad quickly. The difficult stages are chero and picha because they involve constant bending and cracking carefully of the nut without hurting oneself. Chero and vahia are celebration stages because of the abundant blessings of the harvest and also the positive outcome of the baked nut.

Discussion

While dominant Western research paradigms have long influenced Pacific research, Indigenous frameworks have emerged since the late 1980s to guide researchers in culturally relevant ways (Thaman, 1988). Frameworks such as Kakala, Fijian Vanua, and Tok Stori have informed the development of the Hei framework, which draws on the cultural practices surrounding the preparation of the ngali nut in the Solomon Islands.

The Hei framework provides an Indigenous, relational and collaborative approach to research and education because it reflects the interconnectedness between people, culture, land and knowledge. This framework, rooted in the cultural practices of the ngali nut (*Canarium nut*), symbolises a cyclical and communal process of learning and knowledge. Each stage represents a sequence of relational acts grounded in care, respect and reciprocity. The framework thus reflects the way knowledge is cultivated, shared and sustained within Indigenous Solomon Islands communities (Sanga & Reynolds, 2020a). Additionally, it shares relational and ethical similarities with other Pacific Indigenous models such as the Kakala framework (Thaman, 1988) and the Vanua framework (Nabobo-Baba, 2006). These Indigenous frameworks are embedded in cultural rituals and practices that honour relationships, spirituality and reciprocity. However, the Hei framework contributes a uniquely Solomon Islands perspective grounded in local ecological practices and cultural heritage. Picking and collecting the nuts is not merely an economic or subsistence activity but a social and cultural process that strengthens community identity, cooperation and intergenerational learning.

The Hei framework is holistic and this holistic worldview affirms that knowledge is not isolated from real life experiences but develops from interaction with the environment and with others. This confirms Vygotsky (1978) sociocultural theory where knowledge is constructed through social interaction. This means that the framework not only represents a research methodology but also an Indigenous philosophy of life and learning. Additionally, it upholds seven main principles which incorporate Indigenous ethics that guide engagement, communication, collaboration and collective learning. All together, these principles serve both ethical and methodological anchors for conducting culturally and collaborative grounded research and education.

This framework aligns closely with the Tok Stori methodology used by Solomon Islands researchers (Sanga et al., 2020). Both the tok stori and the Hei framework focus on Indigenous ways of knowing and collaboration. In this way, the framework agreed with Chu-Fuluifaga (2023) on decolonising methodologies where the research is accountable to the community, responsive to cultural context, and grounded in Indigenous epistemologies.

The Hei framework shows how collaborative research involves teamwork, can be sequential and concurrent tasks, has challenges and celebrations which aligns with other researches (Armstrong et al., 2005; Cohen et al., 2018). It also reflects Indigenous research values where knowledge is co-constructed, roles are respected and both the process and outcome are valued and supports the community (Fua, 2014; Nabobo-Baba, 2008; Sanga & Reynolds, 2020a).

In the context of education, the Hei framework shows that Indigenous knowledge has great cultural significance and should be included in teaching and learning and research so that Indigenous knowledge will be respected and cherished throughout all generations. It guides both teachers and researchers to value Indigenous knowledge, promote collaboration, and ensure mutual benefit in their work. By linking learning to local culture and environment, the framework encourages teaching and research that support students' learning, community participation, and shared responsibility. For policymakers, it highlights the importance of integrating Indigenous perspectives in curriculum design, teacher education, and research practices. The Hei framework supports decolonisation and strengthens cultural identity which aligns with Owens (2023) study, making education and research across the Pacific become more inclusive, participatory, and sustainable. The Hei framework will also encourage other Pacific students and academics, given that there are only few Indigenous ways of conceptualising teaching, learning and research. Recognising traditional notions of research will give value to Pacific philosophies and customs. The Melanesian Pacific students will recognise the importance of Pacific world views in their thinking. For example, the Hei framework will provide a useful way to view cooperation and teamwork involving many stakeholders such as men, women, children, elders and

chiefs. This notion can be useful for classroom teaching and learning, similar to other Indigenous research ideas developed in order to carry out educational research. The Indigenous knowledge along with the western knowledge can help in creating development solutions that can be culturally accepted to the Indigenous societies.

The Hei framework complements Western research as it blends well with the constructivist/interpretivist view of learning and knowing (Cohen et al., 2018; Mertens & Wilson, 2019; Vygotsky, 1978). The Western framework provided clear procedures for data collection and analysis, while the Hei framework ensured that the research process reflected values of respect, relationship and reciprocity. This integration allowed research to remain systematic and analytical while also being culturally appropriate and responsive to the Solomon Islands context.

Thinking ahead

The understanding of the Hei metaphor framework blends well with the constructivist/interpretivist view of learning and knowing. The Hei framework provides a simple and easy to understand metaphor for conducting research in Solomon Islands context. From an Indigenous Solomon Islander perspective, the Hei framework makes the research process look more like a socio-cultural process that has a long tradition within Solomon Islands context, rather than being seen as something that is foreign, with European roots. The process of making hei involves collaboration, interaction and making connections – elements that blend well with Western and Indigenous notions of research. We hope that the Hei framework will be beneficial to novice researchers from the greater Indigenous societies of the Pacific region. We also look forward to using the Hei framework in conducting future research in Solomon Islands.

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