Food and Textiles Technology in Sāmoan Schools: Development or Retrenchment?

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Abstract

Most countries throughout the world, including Sāmoa, have adopted anew paradigm in technology teaching. In Sāmoa, this paradigm is evident in food and textiles technology (FTT) education, which has been broadened to adopt a more inclusive localised approach, and is regarded by many as an intellectual discipline grounded in technology processes. However, the introduction of this approach has not been easily accomplished in Sāmoa, and there are potential threats to its sustainability. This exploratory qualitative study on the current status of FTT in Sāmoa involved the interview of six teachers (and two new graduates) to gather data and used the researcher's experiences and reflections to provide additional information. The results indicate that retrenchment in technology teaching is a potential problemand attention needs to be directed toward a number of corrective elements, but in particular in the first instance, provision of increased effective professional development to ensure improved student outcomes is needed. Limitations of the research are outlined and additional research recommended.

Keywords:Sāmoa, food and textiles, education, technology teaching

Background

Today there is a range of a technological knowledge and skills for males and females, and this promotes a range of meta-cognitive skills including informed decision making, evaluative and critical thinking. This new paradigm has been designed to support individual empowerment for citizenship and practical skills development (McCormick 1990; Pendergast 2006). In response, many school curricula have promoted the notion of a technological literacy (Jones 2009), so individuals can take their place in society. Nevertheless, issues have arisen in relation to the technological advancements, and how learning is perceived.

In Sāmoa, as in many countries in the world, an acknowledgement of technology developments resulted in changed thinking about technology education. A new curriculum was developed (Ministry of Education, Sports and Culture [MESC] 2004) and professional development (PD) opportunities were advanced for teachers. However, a number of problems occurred in the implementation of the revised curriculum: academic and core subjects remained a priority for many; resource availability was problematic; and early school leavers had minimal food and textiles technology (FTT) experiences resulting in restricted employment opportunities. Subsequently, it was realised that a revised FTT curriculum could provide a means for gaining skills to increase employment prospects.Then in 2013, the award of the Pacific Senior Secondary Certificate, previously carried out by the Secretariat of the Pacific Board for Educational Assessment in Suva, was delegated back to each of the participating countries, which meant more local autonomy for teaching FTT.

Nevertheless, despite these developments there is a perception amongst a number of educators that key stakeholders such as the National University of Sāmoa (NUS) and MESC do not actively promote some curricula (including FTT) and the teaching and learning practices that promote better learning in these subject areas. For instance, at NUS all 300 level papers in FTT, physical education and the visual arts have been withdrawn because of

resource implications whilst other areas will continue to be taught to the 300 level. This means that the development of higher level thinking skills associated with these subjects will be somewhat limited.

With the introduction of the new paradigm, there was a need to develop a revised concept of technology and practice. In discussing this development internationally, Jones et al. (2013) note the importance of not only procedural and conceptual knowledge, but also refer to the significance of Shulman's (1986) pedagogical content knowledge (PCK)—the 'what-how' knowledge of teaching. Developing this idea further, Mishra and Koehler (2006) identify TPACK (technology, pedagogy and content knowledge) as a modification of Shulman's ideas and highlight the intersection of content, pedagogy and technology. In relating PCK to technology, Jones and Morelands (2004) indicate that there are seven pedagogical content knowledge constructs in technology:nature/characteristics of technology;conceptual, procedural and technical aspects;knowledge of the relevant technology curriculum; knowledge of student learning;specific teaching and assessment practices; understanding the role and place of context in problem solving; and classroom environment and management in relation to technology. Accordingly, ifthe pedagogical knowledge of technology is to be achieved by both teachers and students, it is important to address these seven points in the teaching and learning in the Sāmoan schools in the context of a problem-solving approach.

For a technology teacher to be effective then, it is accepted that knowledge, skill and practice is needed for the development of content, pedagogy and in the inter-section of these two dimensions. Yet, it has been observed that the new paradigm objectives are not being achieved in many countries, despite the implementation of PD programmes (Jones et al. 2013).

Indeed, for the past 10 years or so, concern has been mounting about the lack of progress in teachers' understanding of the new paradigm and its implementation. Jones (2007) reports, for example, that the terms like creativity, design-centred approaches, and higher-order thinking were not routinely developed in technology education. Nevertheless, in a review of technology education, Jones et al. (2013) note some significant advances have been made, although the threat of retrenchment was ever present. Given this, technology still remains a fuzzy concept in many countries as it lacks a coherent philosophy. To redress this, questions such as the following need to be addressed: What are the main characteristics that constitute technology? What are the basic concepts that should be taught and learnt? What activities are characteristic for the domain? What is the role of teachers in the change? What PD is likely to be most effective? What research approaches can facilitate teacher development? How can the social and political context contribute to technology education development? What value needs to be placed on resource allocation to ensure effective teaching and learning occurs? The answers to these issues would help to advance a sound philosophical position.

According to Jones et al. (2013), philosophy and theory development is necessary, but this needs to be related constantly to practice which will in turn promote: valid assessment; effective teaching and learning approaches; recognition of technology education as a legitimate academic area of study in the context of an educational environment that emphasises 'basic' education; effective professional development; and research.

The need for these advances has under-scored the need to explore learning approaches to facilitate improved student outcomes. For example, Jones et al. (2013) note some promising developments, particularly as they relate to the adoption of a constructivist approach. An illustration of this is reported by Chikasanda et al. (2013) who describe a constructivist-centred teacher education programme in a resource poor environment and note significant positive impacts. Nevertheless, despite the adoption of a constructivist orientation, a modicum of resources and teacher education is essential, and in Sāmoa this is not always forthcoming.

However, although some developments have occurred, the value of technology education is often overlooked because many still regard it as a vocationally oriented subject, best taught via a behavioural approach, placing the constructivist approach in a position of perceived limited value (McCormick 2004). Furthermore, the validity of school technology programmes is questioned. Turner and Seeman (2012) for example, maintain that schools need to align more with post-school industry demands in food technology to validate school-based learning. Often however, it can be more fundamental teacher/student and resourcing factors that impede progress. A case in point is Arubayi's and Obunadikes' (2011) observations that negative attitudes, lack of teacher confidence, choice of unsuitable content, lack of resources, inappropriate pedagogy, and lack of improvisation resulted in problems when teaching textiles technology. It is likely that many of these issues are relevant in the Sāmoan context as well.

A further complicating issue is that curriculum change itself brings its own systemic issues. Firstly, educational change is problematic, often slow and frequently ineffective if driven from the top-down(Hargreaves and Fullan 2013). Secondly, if it is a priority that teachers lead the changes, importance needs to be given to professional learning and development. Well-trained and confident teachers, in a supportive environment, are necessary to deliver the new curriculum in technology (Thompson et al. 2013) and, what is more, it is often over-looked that teachers know their students' needs best and what engages them. As Hattie (2009)identifies, change arising from PD is likely to be less problematic if teacher knowledge and skill is emphasised because teachers can make a difference. Credibility must be given to them as powerful change agents, and this is particularly so if teachers understand the link between theory and practice (Smith and Lovat 1991). Fullan (2007: 129) identifies the importance of teachers when he states "educational change depends on what teachers do and think—it's as simple and complex as that." Furthermore, teacher ownership of the curriculum is more likely to be accomplished, and teaching confidence and efficacy developed when both teacher interests and student needs are locally recognised. According to Engelbrecht and Ankiewicz (2015), the creation of effective technology PD experiences depends upon the integration of subject-school-pedagogical knowledge sets with the teacher's personal constructs and beliefs,and this underpins the professional knowledge. This explains the importance of a localised contextual approach. According to Chikasanda et al. (2013), this needs to be developed around a model of technology teaching that emphasises four factors: contextual elements (e.g. resources, place); process (e.g. a presentation approach); structure and strategy of PD (e.g. time allocation); and content.

It is clear then that teachers' understanding of technology is critical for improved student outcomes. As Jones (1999) notes, the perceptions, worldviews, subcultures and contexts of teachers are significant for developing programmes, with Macdonald (2003) urging the importance of updating via constructivist learning approaches and unlearning of old ideas and notions. However, curriculum change is often not successfully accomplished because it overlooks the teachers' perspective (Al-Daami and Wallace 2007). A number of commentaries and research reports about FTT in Sāmoa identify this very issue. For example, Faoagali (2004) called for assistance for the teachers and curriculum administrators to bridge the gap between the old approach and the new paradigm. In a later report, Soti and McDonald (2012) indicated that FTT teaching and learning were not being positioned well in the education system, and attention needed to be directed to the development of effective teacher PD. Similar findings can be located in a study undertaken by Soti and Mutch (2010), which called for improved teaching strategies. In these studies, teacher PD designed to revise and advance thinking and practice is identified as a priority.

There is considerable literature and research studies indicating that teacher PD can improve the quality of teaching and impact upon student learning outcomes (Avalos 2011; de Vries et al. (2013); Timperley et al. 2007). It is clear however, that the traditional in-service model has often been replaced by a more contextually driven, constructivist, dynamic approach. As in all PD, this literature is of two types: PD that is directly related to the subject (i.e. technology) and the literature of a more general nature. It is beyond the scope of this paper to identify the range of approaches, but indicated below is a selection of evidence-based PD approaches.

- Avolos (2011), Bingman and Smith (2013), Borko (2004)Desimone et al. (2002), Fullan (2007) and Vega (2013) note the importance of: sufficient time for PD; linking PD to teacher work; using a range of PD teaching strategies; effective facilitation; flexibility; shared decision-making; participant reading and undertaking of research; extrinsic incentives for PD participation; reflection; use of technology to promote learning; team building; coaching, mentoring and collaborative learning; intensive examination of a lesson by number of teachers; school-based learning; university-school partnerships; teaching cases (with student work, dialogue, teacher instruction/thinking), video observation and feedback; customised in-service; student examples of work and content knowledge exercises.
- In using any PD approach, it is important to follow up with an assessment of the learning to establish whether the teachers learn and change their practices, and whether student achievement improves (Vescio et al. 2008). If theory and practice are emphasised in PD, it is more likely that teachers will incorporate suggested changes into their practice.
- Timperley et al. (2007) identify seven elements of teacher professional development that impacted on student outcomes: sufficient time for learning; external expertise; effective teacher learning; challenging prevailing discourses; communities of practice; consistency with wider trends in policy and research; active school leadership.
- Timperley (2011) stresses the importance of adopting a professional instructional sequence: identification of student needs; identification of what a teacher needs to know to satisfy student needs; deepening knowledge/skills for this to occur;

understanding what should happen when these ideas are implemented in the class; and evaluating the impact on the students.

- Kennedy (2005), in attempting to classifying PD opportunities, identifies a range of models that needed to be considered depending upon teacher needs: transmission (e.g. training approach to update skills) to transitional (e.g. coaching-mentoring; community of practice) to transformative (e.g. action research) models.
- Overall, little is known about teaching pedagogical content knowledge. However, a highly regarded approach is the content representation or CoRe model (Eames et al. 2011) which provides a tool for identifying the dimensions and links between the knowledge of content and teaching. This could readily be used by teachers in Sāmoa.
- Jones and Compton (1998) suggest that establishing links and learning connections with technology communities promotes effective technology education.
- The Developing Professional Thinking for Technology Teachers (DEPTH) model (Williams 2008) has been successfully used in technology education. It promotes a user-design approach for the learner, setting the learning path and making decisions and actions after reflecting. The graphical tool acts as a framework to identify the subject knowledge, pedagogical knowledge and school knowledge enabling teachers to become more self-aware**.**
- Bitner and Bitner (2002), although mainly describing ICT (but having applicability for other areas of technology), developed a model that delineates the key issues for effective integration of technology into the curriculum. This includes: dealing with teacher change; ensuring basics training; encouraging personal use; using a range of teaching models; appreciating that teachers and students share the learning; encouraging teacher innovation and acceptance of failure; facilitating teacher motivation; and the provision of support. Many of these issues are readily incorporated in a PD programme.
- There are numerous studies and commentaries that indicate the processes, teacher characteristics and structural elements of PD important for achieving objectives. For example, West (1994) indicates the importance of a learning organisation that values learning and promotes deliberate continuous sharing of learning. The sharing of learning amongst teachers is very valuable as all benefit—those who help others often learn more than the learner. In another setting, the relationship between PD and teacher efficacy was found to be important by Ross and Bruce (2007) because efficacy was observed to impact on teacher motivation, student participation in learning and student persistence/outcomes.
- An important factor to ensure effective PD outcomes is to ensure that the transfer of training occurs. Programmes are often characterised by a lack of transfer to the classroom (McDonald 2012) and unless the strategic implementation is planned for, teacher use of new ideas in the classroom is likely to be thwarted. McDonald (2014) recommends the use of a culturally-sensitive audit to ensure important strategies are in place to promote transfer and this tool could be useful for the Sāmoan PD context as it has been developed with an emphasis on cultural appropriateness. Throughout the world (including Sāmoa) transfer of learning is problematic. Many teachers do not transfer knowledge and skills to the classroom, and this may be due to a range of factors such as lack of support from key stake-holders, insufficient teaching resources and lack of PD facilitator knowledge on how to program for transfer. Many of these issues are evident in Sāmoa.

Given the changes in technology education, this small scale research project was developed to investigate the implementation of the FTT curriculum and its localisation, its adequacy and the ways the teachers could develop their professional learning for the new paradigm. It was anticipated that the findings would promote better understanding of Sāmoan FTT teachers' perspectives, and also add to the international literature on the perceptions of teachers regarding aspects of the new paradigm in technology education.

Methodology

The purpose of this study was to examine the implementation of the recently localised FTT curriculum in Sāmoa and in specific terms FTT teachers' perceptions about the FTT curriculum and their needs regarding professional learning. The questions addressed to the teachers were:

1. What importance do you attach to the contextualised (localised) program and is it useful?
2. Does the new curriculum adequately cover the important aspects of FTT?
3. How do you believe you can best continue to develop your teaching expertise to teach the localised programme?

A number of sub-questions (used as prompts) were also developed. These were:

1. Why are there more students involved in the food and nutrition course (in comparison to textiles)?
2. Were there any difficulties encountered in the teaching programmes?
3. Were there any problems encountered when the course was administered from Suva?
4. Is MESC providing sufficient PD opportunities for FTT teachers?

The research was undertaken in 2013 via a convenience sample of six full-time FTT teachers (three based in Savai'i and three in Upolu) from six different secondary schools. Two newly-graduated teachers were also asked to add their voices to the findings. The six teachers were selected because of their on-going involvement in professional development. Essentially, it was a qualitative exploratory survey approach informed by interviews, researcher observations and *talanoa*. *Talanoa* is a relatively informal collaborative conversational face-to-face meeting often used in the Pacific region to gather data (Vaioleti 2006). The approach was designed to capture the personal perspectives and lived experiences of the teachers. The views of the participants were recorded on audio tape and then transcribed.

The researcher was an 'insider' and 'outsider' participant. She had 20 years' teaching experience and working as a curriculum officer at MESC and six years' FTT lecturing experience at the National University of Sāmoa. During this time, a comprehensive understanding FTT teachers' professional learning was developed, placing her in an advantageous position knowing many of the teachers and aware of the curriculum and professional learning opportunities. It was important therefore, that she negotiated the research carefully and remained neutral in gathering data from the teachers.

The data collected consisted of the teachers' perceptions about the new localised Sāmoan programme, views on sewing education, food preparation and PD. The *talanoa* centred on gathering data as indicated by the research questions and the subsequent teacher interviews gathered supplementary data to follow up some of the issues that were identified. The observations were the anecdotal experiences and observations of the researcher gathered over a number of years since the changes. The interviews were analysed for key themes and the results indicated via teacher narrative; researcher observations were directly reported.

Trustworthiness (i.e., credibility transferability dependability and confirmability) of the study was established via a range of processes/strategies: making known the researcher's experience and familiarity with topic area; rapport building with participants; debriefing and scrutiny sessions with a co-researcher colleague, and auditing of data; provision of narratives; linking findings to previous research/understandings; a clear description of the research process; and, purposive sampling. Ethical approval for the research was obtained from MESC in 2014.

Results

The research centred on issues related to the significance and adequacy of the localised FTT programme and the development of teacher learning. The results identified a number of supportive factors and difficulties and four key themes emerged.

Importance of a localised program

The teachers were asked for their perspectives concerning the new localised program in Sāmoa, which had provided more local autonomy. Key ideas that emerged included the importance of the practical nature of the curriculum and development of skills.

A number of the teachers commented that the localised programme was particularly important because it attracted more students, provided improved learning opportunities, was easier to implement and resources seemed more abundant (in food technology). As one of them stated:

> *We feel that the localised FTT program has helped to improve and increase the number of students taking FTT mainly in the area of food and nutrition … [but] very little … in textiles. Furthermore, this change has enhanced the strong sense of learning skills and knowledge in the classroom for practical tasks.*

Another identified how much easier it was not having to communicate outside Sāmoa:

> *In terms of localising this program it is more relevant and much easier for me to cope, because I found it difficult to get contact with people in Suva … Sometimes, I waited for a couple of weeks and it really disappointed me.*

Resources became more plentiful for teaching (in food and nutrition), and as one teacher identified:

> *This program of localisation was essential and relevant to the schools in Sāmoa as I could see MESC is providing more consumables for the schools... This is a good change because without these resources schools may not be able to achieve a sensible way of improving the practical FTT tasks.*

Because the localised programme had become easier to teach and provided additional local opportunities to succeed, there had been an increase in student enrolments. Furthermore, sometimes the students' lack of success in other curriculum areas (e.g. mathematics) was related to enrolment. A teacher commented:

> *I found out that this issue increased the number of students taking FTT …*

Overall, the use of the localised program enhanced the teacher's sense of ownership, provided more flexibility and was perceived as more relevant. It became attractive to students who were not excelling in other areas, and gave them an opportunity to continue to achieve. More resources became available with the localised programme (but others commented later that there were still insufficient resources, such assewing machines, scissors, tape measures, fabrics, and needles for sewing).

A Need to Improve Sewing

It was reported that all aspects of the FTT curriculum had not had the desired impact, and urgent changes were needed. In particular, it was noted that attention had not been directed to the basics about fibre production, garment making and promoting the designing and creation of other articles. A strong plea was made for improved professional development to promote textiles technology development. The participants indicated that MESC had under-resourced this area of the curriculum, and more input was needed. Nevertheless, one teacher explained how the sewing PD had initially facilitated her development:

> *Sewing PD had helped better prepared me for the sewing practical activities and individual learning.*

However, a number of the teachers emphasised the need for further development of sewing for teaching and personal reasons. For instance, it was stated by one teacher:

> *I wanted to become a creative dress maker—unfortunately my skills in sewing are limited and I wanted to learn more.*

There were other problems which created additional barriers. For example, it was observed that there was the lack of sewing equipment in the home to follow up the class learning and that this meant additional resources were sorely needed then in school:

> *I found out that in the home there were no textiles equipment … like sewing machines, needles and threads, and scissors so the students could do their sewing during their free time at home.*

Another problem was the cost of the textiles and this impacted upon availability of resources:

> *I think the food consumables are much cheaper that the textiles fabrics and equipment.*

In addition to these difficulties, the researcher was aware that there had been few sewing PD opportunities for teachers over the years, and it was her belief that this needed to be attended to urgently. It was noted that although no answers were readily available for these problems, a plan for improved resources and an invigorated PD programme would be a useful start. A practical PD programme of mentoring and modelling of approaches was considered a valuable first step:

> *This is the only way to improve myself as a textile teacher is to learn the techniques and processes through practical sewing developed during PD.*

One important issue identified via the *talanoa* was the position of the young teachers and their almost absolute lack of experience in fabrics and sewing. More time to learn techniques and sustain their learning was considered to be a priority.

These findings recognise the importance of the sewing component, but overall, it was viewed as the poorer cousin in the technology education curriculum. Many believed that an overall improvement of attitudes towards the importance of this technology was required and that the limited resources and teacher knowledge were continuing to restrict development. Furthermore, the home could not always contribute or promote the school learning due to resource scarcity. It was also believed that additional and urgent attention needed to be directed to the younger teachers who required extra experience. Furthermore, although it was indicated that textiles was an expensive curriculum cost, this needed to be weighed against potential for higher-level thinking skills and the domestic and economic potential offered by learning about sewing.

Food Preparation is a Valued Easier Component

Teaching the food component as a technology was considered an easily accomplished activity as food is readily available in school and in the home environment. In many home contexts, cooking skills are introduced early in the child's life (in comparison to sewing skills), and when the children arrive at school, a basic understanding has already been achieved.

One teacher noted that:

> *Most students opted for foods and nutrition during final examination because they already a lot of cooking skills and learning about food in both school and at home … Cooking is a skill to be encouraged as a daily life-skill and it earns money quickly.*

Another teacher commented upon the quality being achieved:

> *I was impressed by the ability of my students in the cooking room where they produced very good and healthy dishes …*

Teachers noted that teaching food and nutrition in schools was more readily encouraged by teachers (in comparison to sewing) as it was easier for students to bring ingredients or cooking equipment from home:

> *We found more students responsive in getting ingredients or cooking equipment from home rather than bringing the textiles materials and tools for sewing.*

Food and nutrition aspects of the curriculum appeared to be easier to teach, and the links between the home and school were easier to maintain, providing an ongoing development of skills and knowledge advancement. The importance of being able to make money with food was noted, and this helped to make it a favoured activity.

Professional Development is Key

PD for the FTT teachers was considered a priority. However, emphasis was upon practical skills development, and little comment was made about learning technology for promoting higher level thinking skills. Transfer to the classroom of PD ideas was not always accomplished readily.

One teacher asked that all FTT teachers be able to access PD:

I think that the PD has helped me a lot to learn FTT knowledge, skills and understanding therefore all teachers should be involved in the PD programs.

Others indicated the value in the collaborative work in PD or in the schools:

I found it very useful for the FTT teachers to come together to attend PD … share the tasks to improve their practical skills. This is the key to development for the students learning and teachers.

Teachers do not often come together for PD, but it is important for them to work actively and collaboratively together.

I want experienced FTT teachers to make a lead in training teachers in their own schools to become confident in teaching knowledge and skills of FTT in order to help with student learning

PD is now school-based as required by MESC so I think that teachers need to discuss within their school context how to improve FTT learning and practical skills.

It was reported that in one school, collaboration was occurring and positive outcomes were being achieved. Nevertheless, it was clear from the focus group discussion that although a range of PD activities were of value, transferring learning to the classroom was not always well planned. The researcher confirmed that over the years she had observed that transfer was a problem probably because there was a lack of resources. On the other hand, another teacher recognised the transformatory nature of knowledgeable skilled teachers and stated:

Teachers are important because they can change the subject … they are very important then.

The researcher reported that the teachers' role was considered very significant for FTT development. If the teachers could give more support to assist families better with FTT issues in the home, this would assist domestically and also promote economic advantages in terms of employment and income for Sāmoan families.

Another teacher was less positive:

The quality of PD learning activities varied and not all teachers participated in the FTT programmes because they attended other PDs like English, science and maths.

Furthermore, it was indicated by one participant that the principals and governance personnel were not always assisting FTT development—they lacked knowledge about the technology and had less than positive attitudes. According to the researcher, school authorities and MESC should assume a more active role and provide additional resources. School-based PD could be problematic if the level of skill development and knowledge is not at a satisfactory level. The assistance to establish a FTT learning community in schools would be welcomed. It was also noted that feedback from school-based PD was not readily available from MESC to assist other interested parties (e.g. the FTT lecturer) to understand what was occurring so that provision for additional follow-up work could be planned.

Overall, the participants' viewpoints on PD indicated that PD was considered a very necessary component for ongoing knowledge and skill development. Apart from the professional benefits it was recognised that there was an inherent value in the PD—effective teachers will contribute to improved student outcomes.

Discussion

The purpose of this study was to gather information from teachers about the localisation of the Sāmoan FTT curriculum which was centred upon the new paradigm introduced early this century. Information was collected on the value and adequacy of the localised curriculum and how to ensure ongoing professional learning. Some personal observations/experiences of the researcher were also used to contribute understanding. The teachers reported positively on the localised programme relating that it led to better learning and increased enrolments. There was, however, a perception of uneven development in the FTT curriculum; textiles technology education was less well developed and regarded in comparison to the food component. Overall, PD opportunities were regarded as necessary to maintain and develop FTT skills and knowledge.

There is frequent mention of the significance of a contextualised local programme in teaching and PD. For example, Engelbrecht and Ankiewicz (2015) indicate teachers' knowledge of context interacts with the subject and personal beliefs, whilst in Chikasanda et al.'s (2013) Malawi study the interaction of local context, content and specific teachers' needs was noted. In Sāmoa, prior to the localised programme, the local context issues were under-played. As Lee (2011) notes, to bring technology alive, it is important that it be related to local history culture and society—with localisation in Sāmoa, this made technology education more meaningful for teachers and students. Lee also observes that culture and design are embedded in culture and accordingly brings life to learning. Hence, with a localised curriculum there were enhanced feelings of ownership, change could occur readily, meaning was added to the teaching and learning, value in local innovation and communication lines were more manageable.

The participants believed that the sewing component of FTT was languishing. In a country that highlights traditional, colourful, and elegant garments, and with a rapidly growing tourism market, this is somewhat surprising. It was reported, however, that teachers do not have the necessary skills and knowledge; home and teaching resources are scarce; and the immediate economic advantages are less apparent. The findings of Arubayi and Obunadike (2011) in Nigeria regarding sewing technology are mirrored to a large extent in the reported situation in Sāmoa—the status of sewing appears to be an issue in Nigeria as well, as attitudes toward sewing, lack of resources/funding, and teacher lack of expertise are problems noted in both studies. In Sāmoa, limited numbers of students are enrolling in sewing, teaching and home resources are considered inadequate, and teacher skills and knowledge reported as deficient. It is believed that unless these issues are attended to, it is unlikely this area of technology will flourish. The roles of MESC in Sāmoa and school governance bodies in promoting a more positive approach are crucial if development is to occur. The research participants all noted there was an urgent need for improved PD, but it is likely more is needed. For example, changes in attitude are needed; improved links between the school technology and the commercial sector are required; and the role of MESC and school authorities needs reassessment.

It was reported that food technology has a more prominent curriculum position and is more favourably regarded by the students, with the food links between home and school an advantage. The place of food in the Sāmoan culture(*fa'aSāmoa)* and the growth of tourism

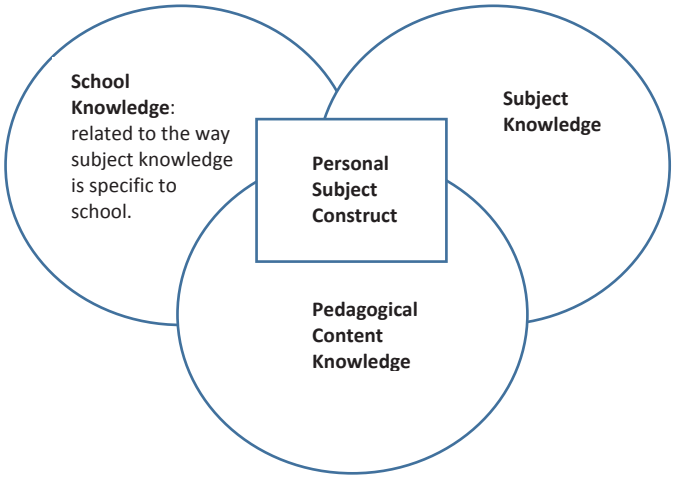
has no doubt contributed to this interest, and it is considered a valued means of employment and income. Like sewing, the teaching of food technology would benefit from having closer ties with the food/catering and hotel industries. At present the major focus is on practical food-making, but a more career-oriented approach is required, including increased attention to the scientific principles of food technology, understanding international food issues, and ensuring the technology is preparation for citizenship and employment. This is a need expressed by a number of researchers in various countries (see Owen-Jacksonand Rutland 2014).

No mention of the key higher level thinking skills (e.g. creativity, problem-solving) was expressed when the participants discussed either sewing or food technology, implying perhaps that both technologies are still regarded as vocationally-centred by the teachers. Understanding that FTT can contribute to the cognitive development of students, as well as the more practical implications, would provide a more substantial foundation for future development.

A central theme in this study is the importance attached to PD. The participants indicated that the development of the new paradigm, the introduction of the localised programme, and the constant changes in FTT require on-going teacher development. PD is urgently needed for basic sewing knowledge and skills, and the food technology curriculum needs expansion. However, although teacher PD is considered best achieved via school-based teacher learning, this is a deceptively simple approach. For example, as Poskitt (2005) notes, school based PD is effective but demands a wide range of professional skills and leadership including theoretical, practical and logistical expertise. Indeed, PD is better considered as a range of options dependent upon the needs of the teachers and students. Kennedy's (2005) options of 'transmission to transitory to transformatory' provide a more advantageous approach dependent on teacher need. School-based learning is not always the most appropriate form of PD for as Craft (2002) adds, it can pool ignorance and develop an insularity of thought. As indicated, there is a growing wealth of information and research on effective PD approaches that could promote FFT, but most importantly a knowledgeable facilitator is needed to link needs and approach, whether it is school-based or off-site PD.

One PD strategy, often discussed and researched for technology education, is the DEPTH approach (Williams 2008), see Figure 1 below.

Figure 1. A teacher Knowledge Tool Kit for PD



The purpose of this model is for the facilitator to assist teachers to examine their professional knowledge in each domain and then, together develop a PD plan to fill the knowledge/skills gaps. Subject knowledge refers to the knowledge teachers have about the technology area, while pedagogical content knowledge concerns the way the teacher presents the material to the students to ensure understanding. The way the school perceives the technology is the school subject knowledge. The past experiences of learning technology, views about what good teaching is, and the teacher's understanding of the purposes of technology constitute the personal knowledge construct. This highly regarded tool provides teachers and PD facilitators with a way of explaining what is known, understood and done, as well as expressing what beliefs are held about teaching technology. Considerable research has been undertaken on this tool (see Banks 2008).

Another PD approach that could have applicability for Sāmoa is the model outlined by Chikasanda et al. (2013). It is comprised of four phases: phase one establishes the needs and the planning for subsequent sessions; phase two consists of collaboratively based workshops examining key technology concepts; phase three is based around on-going reflections and support (interspersed within phase two to demonstrate concepts and permitted immediate reflection-in-action); and phase four emphasises reflection in a school-based context using a collaborative/cooperative learning approach. The advantages of this model are that it incorporates teachers' beliefs and practices in a collaborative environment, enabling the teachers to learn from the perspectives of the students and encourages on-going reflections which can lead to changes in practice.

This study is significant because it is further evidence that years after the paradigm change and the more recent subsequent localisation of the curriculum, considerable uncertainty amongst the Sāmoan FTT teachers persists. As previously noted, attention to this issue has been indicated in a number of studies (Faoagali 2004; Soti and McDonald 2012; Soti and Mutch 2010). It seems that the recent commentary by Jones et al. (2013) that technology education potentially remains under threat is relevant to Sāmoa unless consideration is given to the identified issues.

Although this study has highlighted a number of significant issues, caution is required in interpreting these findings. Firstly, the perceptions of the informants do not necessarily equate with reality. Subjective data is always valued, however, because participants' viewpoints and experiences can impact upon values and behaviour. Secondly, it is a small scale exploratory study utilising a qualitative approach; therefore, in a study of this nature, generalisations can be limited and indeed problematic. Nevertheless, the findings concur with other studies. Further research is needed to explore the issues in depth and a comprehensive quantitative study could add significant understanding to the issues of technology education in Sāmoa.

This study has highlighted issues regarding the state of FTT teaching in Sāmoa. Although developments have been positive, there is an ongoing need to reassess the direction and promote its growth, and in particular there is an expressed need for increased and improved PD to sustain FTT as an important and significant area of study. As Bill Gates has said, "Technology is just a tool. In terms of getting the kids working together and motivating them,

the teacher is most important." The role of increased teacher agency in FTT in Sāmoa needs to be re-evaluated.

References

Al-Daami, K. K. and Wallace, G. 2007. "Curriculum Reform in a Global Context: A Study of Teachers in Jordan." *Journal of Curriculum Studies* 39(3): 339–360. doi:10.1080/00220270601057790.

Arubayi, D. and Obunadike, J. 2011. "Problems of Teaching and Learning Clothing and Textiles in Senior Secondary Schools in Anambra State, Nigeria."*Studies on Home and Community Science 5*(2): 113–119.

Avalos, B. 2011."Teacher Professional Development in Teaching and Teacher Education Over Ten Years." *Teaching and Teacher Education* 27(1): 10–20.doi: 10.1016/j.tate.2010.08.007.

Banks, F. ed. 2008. *"*International Journal of Technology and Design Education*" 18*(3): 221–284.

Bingman, M. B., and Smith, C. 2013."Professional Development and Evidence-based Practice in Adult Education."*Toward Defining and Improving Quality in Adult Basic Education: Issues and Challenges* 69.

Bitner, N. and Bitner, J. 2002. "Integrating Technology into the Classroom: Eight Keys to Success."*Journal of Technology and Teacher Education*10(1): 95–100.

Borko, H. 2004. "Professional Development and Teacher Learning: Mapping the Terrain."*Educational Researcher 33*(8): 3–15. doi:10.3102/0013189X033008003.

Chikasanda, V. K. M., Otrel-Cass, K., Williams, J., and Jones, A. 2013."Enhancing Teachers' Technological Pedagogical Knowledge and Practices: A Professional Development Model for Technology Teachers in Malawi."*International Journal of Technology and Design Education23*(3): 597–622.doi: 10.1007/s10798-012-9206-8.

Craft, A. 2002.*Continuing Professional Development: A Practical Guide for Teachers and Schools*. London: Routledge.

de Vries, S., van de Grift, W., and Jansen, E. 2013. "Teachers' Beliefs and Continuing Professional Development."*Journal of Educational Administration*51(2): 213–231. doi:org/10.1108/09578231311304715.

Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., and Birman, B. F. 2002."Effects of Professional Development on Teachers' Instruction: Results from a Three-year Longitudinal Study."*Educational Evaluation and Policy Analysis 24*(2): 81–112. doi:10.3102/01623737024002081.

Eames, C. W., Williams, P. J., Hume, A. C., and Lockley, J. 2011. "Core: A Way to Build Pedagogical Content Knowledge for Beginning Teachers."http://www.tlri.org.nz/tlri-research/research-completed/school-sector/core-way-build-pedagogical-content-knowledge (accessed 16 March 2015).

Engelbrecht, W. and Ankiewicz, P. 2015. "Criteria for Continuing Professional Development of Technology Teachers' Professional Knowledge: ATheoretical Perspective."*International Journal of Technology and Design Education25*(2): 1–26. doi: 10.1007/s10798-015-9309-0.

Faoagali, S. 2004. "Home Economics vs.Food and Textile Technology: Bridging the Gap between the Old and New Secondary School Curriculum in Sāmoan Secondary Schools."Master's Thesis.Christchurch College of Education.

Fullan, M. 2007. *The New Meaning of Educational Change* (4th edn.). New York, NY: Teachers College Press.

Hargreaves, A. and Fullan, M. 2013. "The Power of Professional Capital."*JSD, Learning Forward*, June, Vol. 34 (3): 36–39. doi.org/10.1108/09578231311304715.

Hattie, J. 2009. *Visible learning: A synthesis of over 800 meta-analyses relating to achievement.* London, UK: Routledge.

Jones, A. 1999."Teachers' Subject Subcultures and Curriculum Innovation: The Example of Technology Education." Pp. 155–171in*Researching Teaching: Methodologies and Practices for Understanding Pedagogy.*ed.J. J. Loughran. London: Falmer.

Jones, A. 2007."Reflecting on the Development of a New School Subject: The Development of Technology Education in New Zealand."*Waikato Journal of Education* 13: 273–294.

Jones, A. 2009."The Development of Technology Education Internationally."Pp. 13–16 in *International Handbook of Research and Development in Technology Education*.eds. A. Jones and M. J. de Vries.Netherlands: Rotterdam.

Jones, A. and Compton, V. 1998."Towards a Model for Teacher Development in Technology Education: From Research to Practice."*International Journal of Technology and Design Education8*(1): 51–65.doi:10.1023/A:1008891628375.

Jones, A. and Moreland, J. 2004. "Enhancing Practicing Primary School Teachers' Pedagogical Content Knowledge in Technology."*International Journal of Technology and Design Education14*(2): 121–140.doi: 10.1023/B:ITDE.0000026513.48316.39.

Jones, A., Buntting, C., and de Vries, M. J. 2013."The Developing Field of Technology Education: A Review to look Forward."*International Journal of Technology and Design Education23*(2): 191–212.doi: 10.1007/s10798-011-9174-4.

Kennedy, A. 2005."Models of Continuing Professional Development: AFramework for Analysis."*Journal of In-service Education 31*(2): 235–250.doi: 10.1080/13674580500200277.

Lee, K. 2011. *"*Looking Back, to Look Forward: Using Traditional Cultural Examples to Explain Contemporary Ideas in Technology Education.*"Journal of Technology Education22*(2): 42-52.

Macdonald, D. 2003. "Curriculum Change and the Post-modern World: Is the School Curriculum-Reform Movement an Anachronism?"*Journal of Curriculum Studies* 35(2): 139. doi:10.1080/00220270210157605.

McCormick, R. 1990. "The Evolution of Current Practice in Technology.*"* A paper prepared for the NATO Advanced Research Workshop, Eindhoven, Netherlands. http://www.abdn.ac.uk/education/news/heconf/presentations/index.shtml (accessed 24 March 2015).

McCormick, R. 2004. "Issues of Learning and Knowledge in Technology Education."*International Journal of Technology and Design Education14*(1): 21–44.doi: 10.1023/B:ITDE.0000007359.81781.7c.

McDonald, L. 2012. "Learning, Motivation and Transfer: Successful Teacher Professional Development."*Teacher Education and Practice25(2):* 271–286.

McDonald, L. 2014. "Planning for Impact: Transfer of Training Audit."*Procedia-Social and Behavioral Sciences* 141:*129–13.* doi:10.1016/j.sbspro.2014.05.024.

Ministry of Education, Sports and Culture 2004.*Food and Textiles Technology Curriculum Statement Years 9–13 SāmoaSecondary Schools Curriculum.*Apia, Sāmoa: MESC

Mishra, P. and Koehler, M. 2006. "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge."*The Teachers College Record108*(6): 1017–1054.doi: 10.1111/j.1467-9620.2006.00684.x.

Owen-Jackson, G.and Rutland, M. 2014. "Food Technology in the School Curriculum in England: Is it a Curriculum for the Twenty-first Century?"*International Journal of Design and Technology Education.*http://dx.doi.org/10.1007/s10798-014-9293-9(accessed 14 November 2014).

Pendergast, D. 2006.**"**Sustaining the Home Economics Profession in New Times." Paper presented at theUniversity of Aberdeen: Home Economics Conference, Dundee, May 2006**.**

Poskitt, J. 2005. "Towards a Model of New Zealand School-based Teacher Professional Development."*New Zealand Journal of Teachers' Work* 2(2): 136–151.

Ross, J.C. and Bruce, C. 2007."Professional Development Effects on Teacher Efficacy."*Educational Journal of Research* (101)1: 50–60. doi:10.3200/JOER.101.1.50-60.

Shulman, L. S. 1986. "Those Who Understand: Knowledge Growth in Teaching."*Educational Researcher* 15: 4–14.doi:10.3102/0013189X015002004

Smith, D. and Lovat, T. 1991. *Curriculum: Action on Reflection*. Wentworth Falls NS: Social Science Press.

Soti, F and Mutch, C. 2011. "Teaching and Learning Food and Textiles in Sāmoa: Curriculum implementation as a contested process."*Pacific Asian Education23* (2): 89–100.

Soti, F. and McDonald, L. 2012."Perspectives on the Food and Textiles Technology Curriculum in Sāmoa."*Journal of the Home Economics Institute of Australia* 19(3): 23–30.

Thompson, D., Bell, T., Andreae, P. and Robins, A. 2013."The Role of Teachers in Implementing Curriculum Changes."Pp. 245-250 in *Proceedings of the 44th Association for Computing Machinery Technical Symposium on Computer Science Education (SIGCSE '13):* 6–9 Mar 2013.Denver, CO, USA. http://dx.doi.org/10.1145/2445196.2445272.

Timperley, H., Wilson, A., Barrar.andH. Fung, I. 2007.*Teacher Professional Learning and Development: Best Evidence Synthesis Iteration (BES)*. Wellington, New Zealand: Ministry of Education. http://www.educationcounts.govt.nz/__data/assets/pdf_file/0017/16901/TPLandDBES entire.pdp (accessed 24 March 2015).

Timperley, H.S. 2011. *Realizing the Power of Professional Learning*. Maidenhead: Open University Press.

Turner, A.and Seemann, K. 2012.*"*Food Innovation and Technacy Genre Theory: Implications for Teaching and Learning*".*Pp. 104–114in *Current Trends in Technology and Society*(Volume 1), ed.R. Van der Zwan.Brisbane: Primrose Hall Publishing Group.

Vaioleti, T. M. 2006. "Talanoa Research Methodology: ADeveloping Position on Pacific Research." *Waikato Journal of Education* 12: 21–34.

Vega, V. 2013.*Teacher Development Research Review: Evidence-based Practices and Programs*. EDUTOPIA.http://www.edutopia.org/teacher-development-research-evidence-based-practices-programs (accessed 1 April 2015).

Vescio, V., Ross, D., and Adams, A. 2008."A Review of Research on the Impact of Professional Learning Communities on Teaching Practice and Student Learning."*Teaching and Teacher Education* 24 (1): 80–91. doi:10.1016/j.tate.2007.01.004.

West, P. 1994. "The Concept of the Learning Organisation."*Journal of European Industrial Training* 18(1):15–21.

Williams, P. J. 2008. "Using DEPTH as a Framework for the Determination of Teacher Professional Development."*International Journal of Technology and Design Education 18*(3): 275–284. doi: 10.1007/s10798-007-9047-z.