

2013

# Food skills in secondary schools

Sandra Paula Anne Fordyce-Voorham  
*University of Wollongong*

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## Recommended Citation

Fordyce-Voorham, Sandra Paula Anne, Food skills in secondary schools, Doctor of Philosophy thesis, Faculty of Science, Medicine and Health, University of Wollongong, 2013. <http://ro.uow.edu.au/theses/4049>

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**UNIVERSITY OF  
WOLLONGONG**



**Faculty of Science, Medicine and Health**

**Food Skills in Secondary Schools**

**Sandra Paula Anne Fordyce-Voorham**

**"This thesis is presented as part of the requirements for the  
award of the Degree of Doctor of Philosophy  
of the  
University of Wollongong"**

**October 2013**

## ABSTRACT

This thesis has a focus on the teaching of food skills to young people to assist them to plan and prepare tasty meals that will support their health and nutritional requirements. Hitherto, the food skills have not been well articulated in healthy eating programs purporting to improve young people's eating behaviours. Nor has research been conducted on the teachers, as key practitioners who design and teach these programs, about the food skills they believe essential to teach. This thesis addresses these gaps and identifies the essential food skills that need to be included and taught in such programs. As part of the evaluation of skill-based healthy eating programs, an agreed set of food skills need to be identified and described. The thesis aimed to determine the food skills that teachers believe are essential to teach to potentially change young people's eating behaviours.

The aim of Study 1 was to identify the food skills which should form the basis of skill-based healthy eating programs, specifically those operating in secondary schools. These food skills would enable students' to make positive changes to their diet through appropriate food selection and shopping and the preparation and cooking of healthy meals.

In Study 1, interviews with fifty-one food experts were conducted to identify the essential food skills they thought were required by young people to plan and shop for food and to prepare and cook healthy meals for themselves and their families, now and in the future. Analysis of these qualitative data determined twelve essential skills which were then classified into two discrete areas as the *declarative* skills required to plan meals and the *procedural* skills required to shop for food and then prepare and cook meals.

The aim of Study 2 was to determine whether the essential food skills and recommendations put forward by the food experts matched those of the teachers. A quantitative survey of 251 predominantly home economics teachers was undertaken. The results of the survey were that the primary aim of the majority of teachers was to teach their students how to make healthy and tasty meals. The teachers reported they

wanted to achieve this in ways that motivated their students to enjoy the process of making and then eating good food, typically with their peers and friends.

The respondents reported using a variety of evaluation tools to measure their students' food skills acquisition. However, the use of evaluation tools to measure participants' food skills acquisition has not been well documented. The aim of Study 3, therefore, was to develop a practical and easy-to-use tool that teachers could use at any stage of their program to measure their students' food skills. As the majority of teachers had been found to focus on the procedural and task-centred skills required to make a meal, a tool was developed to measure the skills from the meal pre-preparation to meal service and post-meal cleaning-up.

Through an on-line experimental study, forty participants used a Food Skills Rating Checklist to compare three skill scenarios (low skills, good skills and excellent skills) relating to the preparation of an Asian-style stir-fry meal. The results of Study 3 indicated that the participants were able to use the Checklist to discriminate between the three different levels of skills demonstrated in the videos. The Checklist was found to be a valid and reliable evaluation tool; however, more research would need to be undertaken on the design of the tool and to be tested by a larger sample and a broader range of age and experience of teachers.

In summary, the results of this thesis showed that food skills need to be defined, articulated and measured as indicators used in the evaluation of skill-based healthy eating programs. The teachers who design and deliver these programs in schools need to be aware of the essential skills and incorporate them into their course content to support the success of their program. They need to identify and utilise the resources available to enhance their program and make it more enjoyable for their students to learn and acquire the skills. While the focus of this thesis is on the work of home economics teachers, since they teach food skills to young people, the research could be more broadly applied and used by practitioners delivering skill-based programs in non-school settings. Further research is required and to extrapolate the findings' suitability for use in community and school settings in Australia and elsewhere.

## ACKNOWLEDGEMENTS

My sincere gratitude is extended to Professor Anthony Worsley who has given me the utmost support throughout the duration of this seven year project. It has been my great fortune to have such a distinguished and experienced professor as my supervisor. As a true friend and advocate of the home economics profession, Tony has shared my thesis journey from the early days of its inception through to its culmination.

It has been my delight to have the specialised public health expertise of Associate Professor Heather Yeatman who joined me at the second part of my thesis journey. I have enjoyed our vibrant conversations and am most grateful to Heather for her insightful comments and her 'new eyes' to give my work a fresh perspective.

I am indebted to both Tony and Heather for their dedicated efforts to help me ensure that the thesis has met the rigorous and quality standards of education research.

To my family Jan Willem, Stefan, Alexander and Willem, I am grateful for their gracious support and love throughout the project over many years.

To my friends and colleagues in the home economics profession in Australia and across the globe, I thank you for your support of this project. Without you, the research would not have been possible. In return, I dedicate this work to you as one small contribution to the ongoing work that needs to be done.

Special thanks are extended to the team at Home Economics Victoria and the members of the Larnook Ex-Students' Association.

Finally, thank you to Sue and Andrew O'Brien for leading our running group and keeping me physically and mentally fit for the thesis endurance! Simultaneous with our runs along the bay, Dr O'Brien's PhD top tips have been powerfully helpful.

## **PUBLICATIONS AND CONFERENCE PRESENTATIONS BASED ON THE WORK PRESENTED IN THIS THESIS**

Fordyce-Voorham, S (2006). *Evaluation and implementation of healthy eating programs in junior secondary schools*. Oral presentation at the Annual Exercise and Nutritional Sciences HDR Student Symposium Program, Melbourne, Australia.

Fordyce-Voorham, S (2008). *A model for a skill-based healthy eating program in secondary schools*. Presentation at the International Federation for Home Economics Congress, Lucerne, Switzerland.

Fordyce-Voorham, S (2009). *The essential food skills required in skill-based healthy eating programs*. Presentation at the Home Economics Institute of Australia's Biennial Conference *Daring to Dream: Preferred futures in home economics*, Darwin, Australia.

Fordyce-Voorham, S (2009). *National Curriculum: Food Skills covered in home economics across Australia*. *Journal of Home Economics*, 48 (2) pp. 20-24.

Fordyce-Voorham, S (2009). *The essential food skills required in skill-based healthy eating programs*. Presentation at the Home Economics Victoria's Annual Conference, Melbourne, Australia.

Fordyce-Voorham, S (2010). *Identification of food skills for healthful eating programs in secondary schools*. *Journal of Nutrition Education and Behaviour*, 43 (2) pp. 116-122.

Fordyce-Voorham, S (2010). A national overview of the home economics curricula. Session Chair and presenter at the Public Health Association of Australia's Annual Conference *Food Futures: An Australian Approach*, Canberra, Australia.

Fordyce-Voorham, S (2012). *Predictors of the importance of food skills amongst home economics teachers*. Presentation at the International Federation for Home Economics, Melbourne, Australia.

Fordyce-Voorham, S (2012). *Food Skills Rating Checklist: an evaluation instrument for use in skill-based programs in schools*. Presentation at the International Federation for Home Economics, Melbourne, Australia.

Fordyce-Voorham, S (2012). *Food skills – what are they and how do they inform the development of food curriculum in Australian schools?* Symposium presentation at the 16th International Congress of Dietetics, Sydney, Australia.

## **OTHER PUBLICATIONS**

Compton L, Fordyce-Voorham S, Prescott A (2010). The Food Book Oxford University Press, Melbourne, Australia.



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## **GLOSSARY OF KEY TERMS**

Declarative skills - the pre-cursory skills required by individuals to make decisions about meal planning, food shopping and meal preparation.

Procedural skills- the 'hands-on' skills required by individuals to prepare and cook meals and clean up after the meal is prepared.

Twelve Essential Skills- a list of the declarative and procedural skills required by individuals to plan meals; shop, store and prepare food safely and hygienically; make tasty meals and clean up after the meal is prepared.

## **1.0 CHAPTER 1 INTRODUCTION**

The need for healthy eating programs in food skills classes in schools that develop practical ‘hands-on’ food shopping, food preparation and cooking skills has been identified (Hartmann C et al., 2013; Lichtenstein AH & Ludwig DS, 2010; Pendergast D & Dewhurst Y, 2012; Reynolds J, 2000). These skills, collectively known and described as ‘food skills’, are generally taught in subjects variously titled ‘home economics’, ‘food technology’ or similar names (Fordyce-Voorham S, 2009b). In addition to the development and application of nutritional knowledge, these skill-based programs are designed to improve young people’s eating behaviours through positive food experiences and to equip them with life skills that support them into adulthood (Satter E, 2007b; Slater J, 2013).

Eating behaviours linked with the increased rates of childhood obesity (Booth ML, Dobbins T, Okely AD, Denney-Wilson E, & Hardy LL, 2007; Magarey AM, Daniels LA, & Boulton TJ, 2001; Waters EB & Baur LA, 2003) and the inadequate dietary intake of healthy foods, especially fruits and vegetables, of young Australians (Magarey A, Daniels LA, & Smith A, 2001; Savige G, Ball K, Worsley A, & Crawford D, 2007) are a significant concern for health professionals (Lobstein T, Baur L, & Uauy R, 2004).

As health professionals working in schools, home economics teachers have a significant role in young people’s lifelong learning about nutrition and healthy eating behaviour (Contento IR, 2008; Home Economics Institute of Australia, 1997; Klepp KI & Wilhelmsen BU, 1993; Nowak M & Buttner P, 2002; Pendergast D & Dewhurst Y, 2012; Slater J, 2013; Worsley T & Crawford D, 2005). They have the nutritional background and pedagogical expertise to understand young people and their world, crucial components in designing successful healthy eating programs (Backman, Haddad, Lee, Johnston, & Hodgkin, 2002; Pendergast D & Dewhurst Y, 2012).

Home economics teachers in Australia work almost exclusively in schools (Corstorphran B, Fordyce-Voorham S, & Warren C, 2005) and are in a unique

position to design programs that are sequential and match the age with the developmental needs and skill levels of their students (Centers for Disease Control and Prevention, 2000; Easthorpe G & White R, 2006).

Home economics teachers design and facilitate many programs (Cyr CA, 2013; Reynolds J, 2000, 2005, 2006; Worsley T & Crawford D, 2005) but these skill-based programs are seldom evaluated by the very people who teach the young people. Reasons for lack of evaluation include time constraints, lack of any perceived need to do so by the facilitators (Gussow & Contento, 1984; Slater J, 2013; Worsley T & Crawford D, 2005) and lack of valid evaluation tools (Barton KL, Wrieden WL, & Anderson AS, 2011). Hitherto, the views of home economics teachers have not been reported and for this reason the thesis focuses on teachers and the food skills *they* believe are essential to teach their students to live healthy and independent lives. While the outcomes of program delivery focus on students in secondary schools, it is beyond the scope of this thesis to determine *their* views as young people on the food skills they believe are important.

Instead, young people's likely influences on these behaviours are explored and then discussed how they may be addressed in a skill-based program. A review of the literature on the current dietary status and eating behaviours of Australian young people revealed gaps in their food intake. An understanding of the relationships between influences and eating behaviour is important to inform the design and planning of skill-based programs which focus on the development of young people's food skills, an integral part of their independent living skills and healthy eating patterns.

Several models which explore the relationships between influences and eating behaviour were then assessed for their relevance to the research. These models were Bandura's Social Cognitive Theory (Bandura A, 2002), Ajzen's Theory of Planned Behaviour (Ajzen I, 1991) and the ecological models postulated by Glass and McAtee (2006), Grunert, Brunso and Bisp (1993), Furst, Connors, Bisogni,

Sobal and Falk (1996), Verplancken, Herabadi, Perry and Silvera (2005), Satter (2007) and Contento (2011). Of these, only two of the models (Grunert KG, Brunso K, & Bisp S, 1993; Satter E, 2007b) specifically address food skills, whilst a third (Contento IR, 2011) positions skills within a model that guides the design of theory-based programs. Two new conceptual models, based on components of the Food-related Lifestyle model (Grunert KG et al., 1993) and the Eating Competence Model (Satter E, 2007a), subsequently were developed to inform the three studies. The first conceptual model depicted the declarative and procedural skills in context with their use in skill-based programs and informed the classification of the essential skills identified in Study 1 and the objective measurement of the procedural skills in Study 3. The second conceptual model incorporated the two types of skills within the components which operated as likely predictors of teacher practices.

Current skill-based healthy eating programs in Australia and internationally were explored and evaluated. Criteria used for program evaluation included: program development based on a theoretical model; program methodology; inclusion of food skills content, evidence of measurable outcomes of healthy eating behaviours; and program sustainability.

The term ‘food skills’ is used here to include procedural or ‘cooking’ skills because it is the term typically used in skill-based healthy eating programs. The term ‘food skills’ is defined within the thesis and a proposal to measure the procedural food skills is outlined. Specifically, evidence was sought in each program of the link between food skills acquisition and healthy eating behaviours in young people. A conceptual framework derived from the work of Wu and other researchers (Wu M, Seeley A, & Caraher M, 2008) was used to evaluate these programs.

The main finding from this component of the literature review was that there is a dearth of food skill information, reporting of teachers’ views on food skills and evaluation of skill-based programs in the young people’s ‘healthy eating’

literature. This thesis aimed to address this gap. It aimed to identify and describe food skills and, explore how their acquisition can be measured.

Only a few skill-based programs are reported in the literature and these mostly operate in secondary schools (Carleton et al., 1991; Klepp KI & Wilhelmsen BU, 1993; Rescinow K et al., 1999; Wu M et al., 2008) and in community settings (Thomas H & Irwin JD, 2011; Wrieden WL et al., 2002, 2007). Generally, these programs have been small-scale studies and employed short term evaluation (usually over a period of three months from baseline to post-intervention) if at all (Engler-Stringer R, 2010; Green J et al., 2007; Worsley T & Crawford D, 2005). Few have been conducted and evaluated within health and education systems by professionals employed in those systems (for example, teachers, community workers and preschool teachers). These programs tend to be dated (Slater J, 2013) and address specific health issues such as 'healthy heart programs' (Carleton et al., 1991; Gans KM et al., 1990) or more recently, diabetes (Archuleta M, VanLeeuwen D, Halderson K, Wells L, & Bock MA, 2012).

In contrast, this thesis has a focus on a preventive and positive approach to healthy eating that aims to create a comprehensive framework for the range of food skills that need to be taught in secondary schools. The research for this thesis comprised three studies.

The aim of Study One was to identify the essential food skills required for young people to meet their dietary needs and to be able to cook for themselves when they live independently. The data were obtained by interviews with a range of food experts, including home economics teachers, chefs, nutritionists and dietitians, community educators, homemakers and young people living independently.

The aim of Study Two was to investigate the range of food skills taught, the importance attached to these food skills, and the resources used by home economics teachers who teach skill-based healthy eating programs in Australian

secondary schools. Also examined was the teacher respondents' strength of agreement of desirable food skills compared with those of the food experts interviewed in Study One. A further aim of Study Two was to examine the demographic and orientation characteristics of teacher respondents as predictors of the importance teachers might place on teaching particular food skills including what they believe should be taught and what they actually teach in their food skills programs.

The aim of Study Three was to develop a valid and reliable evaluation tool for food education programs. Specifically, the aim was to design a food skills rating checklist that teachers in schools and health professionals in community settings could easily use to measure the development and progress of their participants' procedural skills. The checklist design was based on the essential food skills identified in Study One and endorsed by teacher survey respondents in Study Two. The checklist covered the procedural skills required by young people to safely and hygienically prepare, cook and serve a meal and to clean up afterwards.

The overall aim of the research was to inform food education policy and practice, and help to generate the design of effective food skills programs that can be implemented in schools and community settings in Australia and elsewhere.

The thesis is set out in six chapters with the methods set out in individual chapters under the literature review and the three studies that comprise the research. Chapters 1 and 2 consist of the Introduction and Literature Review. In Chapter 2, an overview of Australian young people's dietary status is provided and the likely influences on their eating behaviours are explained in context with several theoretical models. Skill-based programs are evaluated for their theoretical rigour and food skills content. Food skills are described, defined and explored how they can be measured. A rationale proposes the case for why food skills should be taught in school skill-based programs. Chapter 3 presents the methodology and findings of a qualitative study of food experts culminating in the identification of the essential food skills that should be taught in schools. Chapter 4 presents the

methodology and findings of a follow up quantitative study of teachers who design skill-based programs and teach the food skills to young people. A proposal to measure the procedural food skills is tested in a qualitative survey of teachers and reported in Chapter 5. Finally, the overall findings, conclusions and recommendations for future research in this area are presented in Chapter 6.

## **2.0 CHAPTER 2 LITERATURE REVIEW**

### **2.1 Introduction**

The purpose of this literature review is to present the current state of knowledge of food education in schools, specifically in Australian secondary schools. The focus is on young people and their dietary habits and the likely influences on their eating behaviours. Theoretical models and skill-based programs are evaluated for their relevance on how they might explain and address these behaviours. The literature is scrutinised for evidence of food skills acquisition in young people and subsequent improvement in their eating behaviours. Based on this synopsis of the literature, there is a need for skill-based programs designed to address eating behaviours through the development of young people's food skill acquisition.

The literature review is divided into four sections. The first section outlines the dietary status and the eating behaviours of young people in Australia and how these might be addressed in food skills programs. The influences on the eating behaviours of young people are described and then positioned in context to various theoretical models in the second section. A review of the skill-based healthy eating programs used in schools and designed to address young people's eating behaviours are then outlined and evaluated for any changes in their eating behaviours and skills acquisition. In the third section, the term 'food skills' is described and defined. Within this section, the case is argued for why they should be taught in schools and taught by home economics teachers. Finally, a proposal of how these food skills could be measured is outlined in the fourth section.



## **2.2 Section 1**

### **2.2.1 A Rationale for focusing on young people**

This section describes young people's health status and the influences on their eating behaviours. This cohort has been selected for the research as they represent the students participating in food skills classes in secondary schools. Home economics teachers working with young people need to have an understanding of the health issues and the influences which affect young people so such needs are incorporated into the curriculum design of skill-based programs.

### **2.2.2 Definition of young people**

Young people have been denoted by various terms that have been used to describe this time in the human lifespan. 'Adolescence', 'youth' and 'teenager' are all terms that describe this transitional lifespan stage between childhood and adulthood (McLaren K, 2002). 'Adolescence' has been described as "the interval between childhood and the assumption of adult roles and responsibilities, a broad interval of maturation that encompasses physical, mental, and emotional development, as well as coincident cognitive changes and change in social roles" (Dorn LD, Dahl RE, Woodward HR, & Biro F, 2006, p. 31).

For the purposes of this study, the term 'young people' is used to describe the secondary school-aged children commonly known as 'adolescents', aged 12-18 years of age. The term 'young people' is the term most frequently used in government reports; however, the term 'adolescent' is used interchangeably in this thesis when this term has been used in the original report.

### **2.2.3 Health and dietary health status of young people in Australia**

To determine current knowledge on the health status and eating behaviours of young people, a systematic search of the literature of online databases including Pub Med, CINAHL, Medline, Medtext, Education A+ ,Science Direct, SAGE, Scopus and electronic search engines such as ‘Google’ and ‘Google scholar’ was conducted, including searches of websites of governments and relevant organisations. Key words and their variations (including using the prefix of the word plus the asterisk such as you\* and food\*) ‘youth’, ‘adolescent’, ‘young people’, ‘school-aged’, ‘health status’, ‘food\*’, and ‘nutrition\* status’ yielded relevant data from journal articles, government records including the Australian Bureau of Statistics (Australian Bureau of Statistics, 1998, 2005) and government reports such as *Australian National Children's Nutrition and Physical Activity Survey* (Department of Health and Ageing, 2008) and *Australia's Food and Nutrition 2012* (Australian Institute of Health and Welfare, 2012). These reports and journal articles provided information about young people’s eating habits, patterns of food consumption and general health status.

Several health issues of concern for young Australians have been identified in the literature. Whilst adolescent overweight and obesity health risks associated with poor eating behaviours have often been reported in government reports (Australian Bureau of Statistics, 2009; Australian Institute of Health and Welfare, 2008) and in peer-reviewed (Booth ML et al., 2007; Lobstein T et al., 2004; Magarey AM et al., 2001; Swinburn B & Bell C, 2003) and lay literature (Catford JC & Caterson ID, 2003; O'Dea J, 2003), there are many health issues contributing to the burden of disease in young people. These include eating disorders, sexual health, road traffic injuries and fatalities, mental health issues, and tobacco and alcohol substance abuse (Australian Institute of Health and Welfare, 2007; Department of Human Services, 2005; VicHealth, 2008). These conditions currently affect young people’s health and potentially their lives but it is beyond the scope of this thesis to discuss them all. It is most appropriate to contextualise them in relation to young people’s prevalence of overweight and

obesity and aberrant dietary behaviours, which are the health issues of significance for this thesis.

### **Obesity and overweight prevalence among young people**

In Australia, between 1985 to 1999 the prevalence of overweight and obesity in children and adolescents doubled (Booth ML, Chey T, Wake M, & al, 2002) and in some studies tripled (Magarey AM et al., 2001) compared with the preceding sixteen years. Since then, the prevalence of obesity for children increased from 5 per cent in 1995 and peaked to 8 per cent in 2007–08, with the proportion overweight remaining around 17 per cent over this time period (Australian Bureau of Statistics, 2009). **Appendix A** displays the overweight and obesity rates according to the World Health Organisation's International Standards (Cole TJ, Bellizzi MC, Flegal KM, & Dietz WH, 2000) of young people found in Australian studies (Australian Bureau of Statistics, 1998; Booth ML et al., 2007; Booth ML, Wake M, Armstrong T, & et al, 2001; Commonwealth of Australia, 2008; Magarey AM et al., 2001).

These figures were more recently confirmed in a review of Australian and New Zealand national and Australian state wide nutritional surveys conducted from 1999 to 2009 (Bai L, 2010). Bai found the prevalence of overweight and obesity remained high in young people and had progressively increased over the last twenty years as the consequences of disordered eating behaviours amongst Australian young people. At the time of writing, it has been predicted that the prevalence of obesity in adolescent males and females aged 15-19 years in 2025 will be 41.0 per cent and 30.2 per cent respectively (Department of Human Services, 2008).

#### **2.2.4 Eating behaviours in young people and how they may be addressed in food skills programs**

There are a number of young people's eating behaviours and patterns that can be considered to have relevance for this thesis. These include meal skipping, especially breakfast, and overconsumption of foods with too much saturated fat, salt and sugar and not enough calcium, especially in older girls (Australian Institute of Health and Welfare, 2012). Most young people do not eat enough fruit and vegetables (Australian Institute of Health and Welfare, 2012; National Health and Medical Research Council, 2013) or wholegrain cereals (National Health and Medical Research Council, 2013).

The over-consumption of energy-dense and nutrient-poor snack foods forms an increasing proportion of the diets of Australian young people (Bell AC, Kremer PJ, Magaey AM, & Swinburn BA, 2005; National Health and Medical Research Council, 2013; Savige G, Macfarlene A, Ball K, Worsley T, & Crawford D, 2007), which exceeds recommendations for energy, saturated fats, sugar and salt intake (Australian Institute of Health and Welfare, 2012; CSIRO, 2009). A more detailed overview of the nutrient and dietary intakes of young Australians is reported in **Appendix B**.

Young people's over reliance on foods such as snacks, sweetened beverages and take-away foods is often coupled with a narrowness of diet (Crawford & Worsley, 2004; Savige G, Macfarlene A, et al., 2007; Worsley T & Crawford D, 2005) and meal skipping (O'Dea J, 2005; Savige G, Macfarlene A, et al., 2007). This combination places them at risk of non-communicable diseases such as Type 2 diabetes and heart disease and micro-nutrient deficiencies (Ternier S, 2010). The consumption of these foods also may increase their risk of overweight and obesity (Bell AC et al., 2005; Lytle LA & Kubic, 2003).

Home economics teachers have an important role to teach young people the nutritional knowledge and the culinary skills they need to ameliorate the effects of

these poor dietary habits on their health, especially as they move from childhood into adolescence (Lichtenstein AH & Ludwig DS, 2010). They can, for example, teach topics that focus on a plant-based diet in line with recommendations made in the Australian Dietary Guidelines. The preparation of vegetarian-based dishes in their skill-based healthy eating programs expose young people to a wide variety of plant-based foods (Magarey A et al., 2001; National Health and Medical Research Council, 2013) and may incidentally promote an increase in fruit and vegetable consumption in alignment with dietary recommendations (Ternier S, 2010) and a decrease in high saturated fat intake associated with animal protein consumption (Lea E & Worsley A, 2002).

Such programs may address young people's identified barriers of time and inconvenience of preparing vegetarian dishes (Lea E & Worsley A, 2002) and provide them with opportunities to explore these dietary issues at a time when health and ethical information about vegetarian diets and physical aversion to consuming animal food sources become influential (Jabs J, Devine CM, & Sobal J, 1998; Lea E & Worsley A, 2002; Worsley A & Skrzypiec G, 1998). For young people from low-income families these programs have particular merit as a correlation has been observed between lowered fruit and vegetable consumption and socio-economic status (Giskes K, Turrell G, Patterson C, & Newman B, 2002; Macfarlane A, Crawford D, Ball K, Savige G, & Worsley A, 2007).

Finally, young people complain they lack the time and appetite to eat breakfast (Booth M et al., 2006) and report a habit of snacking on high energy dense foods. These behaviours imply that young people could benefit from the development of food skills *and* provision of the opportunity to prepare for themselves quick and tasty healthy snacks to eat when *they* are hungry and which meets their nutrient needs more effectively (Savige G, Macfarlane A, et al., 2007).

### **2.2.5 Summary of Section 1**

Most Australian young people enjoy good health although the prevalence of overweight and obesity is of great concern. Other food-related concerns include over-reliance on snack foods and meal skipping. These concerns are coupled with young people's consumption of too much energy dense food and insufficient consumption of fruits and vegetables, wholegrain cereals and milk. As a consequence they have high current and future risks of developing obesity and non-communicable diseases as well as some micro-nutrient deficiencies.

An understanding of these dietary and nutrient patterns and eating behaviours would inform teachers of the food issues to include in programs to ensure that young people are exposed to a wide variety of nutrient rich foods that could improve the nutritional quality of their diets.

The next section outlines the influences on young people's eating behaviours reported in the literature. These influences would also be important for teachers to factor into program design.

## **2.3 Section 2**

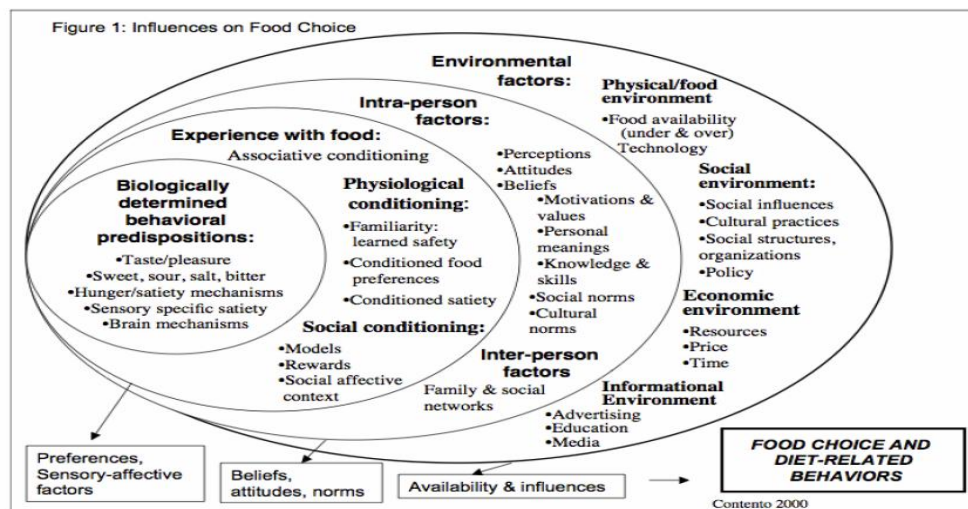
### **2.3.1 Influences on young people's eating behaviours**

#### **Introduction**

This section outlines four broad levels of factors identified in the literature as exerting influence, independently and interdependently, on the eating behaviours of young people (Birch LL & Fisher JO, 1998; Contento IR, 2008; Story M, Neumark-Sztainer D, & French S, 2002; Videon TM & Manning CK, 2003; Vidgen H & Gallegos, 2012). These levels of factors have been identified within the Bronfenbrenner Social Ecological Model and described by Story (Story M,

Neumark-Sztainer D, et al., 2002) as: Individual (intrapersonal); Social environment (interpersonal); Physical environment (school and community settings); and the Macrosystem (societal). An ecological model was developed by Contento (Contento IR, 2008), positioning these four broad factors and their influence on food choice.

**Figure 2.1 Contento’s Food Choice and Diet-Related Behaviours model depicting influences on food choice (Contento IR, 2008)**



### Individual (intrapersonal) influences

Individual influences include physiological factors such as hunger and appetite, food taste and sensory appeal. These biological factors may be modified by the values and motivational goals of individuals.

Physiological factors are important determinants of food choices in young people (Contento IR, 2008; Croll JK, Neumark-Sztainer D, & Story M, 2001; Steptoe A & Pollard TM, 1995; Story M, Neumark-Sztainer D, et al., 2002). They are more likely to choose foods for its taste, convenience and easy access (Caraher M, 2006; Contento IR, 2008; Contento IR, Michela JL, & Williams SS, 1995; Croll JK et al., 2001) rather than for its health properties (Story M, Neumark-Sztainer D, et al., 2002). Choosing foods on this basis, however, can lead to consumption

of high fat foods (Lytle LA & Kubic, 2003; Savige G, Macfarlene A, et al., 2007; Steptoe A & Pollard TM, 1995).

Consumption of healthy foods to reduce disease risk has been found to not be a priority for most young people (Story M, Neumark-Sztainer D, et al., 2002) and not considered to be appealing (Chapman G & Mac Lean J, 1993). Instead the motivation to eat healthy foods has been found to be linked to young people's desire to improve their body shape, stamina, sports performance and overall wellness (Contento IR, 2011; Contento IR et al., 1995). These findings imply teachers in schools need to select recipes that are nutrient-dense, possess taste appeal to young people (Backman et al., 2002; Neumark-Sztainer D, Story M, Perry C, & Casey MA, 1999) and match their motivational goals (Contento IR, 2011; Contento IR, Randell JS, & Basch CE, 2002).

### **Social environmental (interpersonal) influences**

Family, friends and peer networks have been identified as important social environmental influences on young people's eating behaviours (Contento IR, 2008; Story M, Neumark-Sztainer D, et al., 2002; Vidgen H & Gallegos, 2012). Interactions within and between these groups, through modelling, reinforcement, social support and what is considered to be 'normal eating', have an impact on food choices.

Family influences are important to establish eating patterns and behaviour in children as parents have control over the purchase and preparation of food as well as the acceptance of particular eating habits (Klepp KI & Wilhelmsen BU, 1993). However, as young people move from childhood into adolescence, eating behaviours change (Baranowski T, Cullen KW, & Baranowski J, 1999) and the influence of family becomes secondary to physiological (hunger, sensory food properties such as taste and visual appeal) and convenience reasons for eating particular foods (Caraher M, 2006; Contento IR et al., 1995; Croll JK et al., 2001; Steptoe A & Pollard TM, 1995). Nevertheless, several studies (Allen H, 2005;



Macfarlene A, Crawford D, & Worsley A, 2010; Neumark-Sztainer D et al., 1999; Slater J, 2013; Vidgen H & Gallegos, 2012) have found that the family remains an important influence on adolescents' eating and meal time behaviours including family meal patterns, scheduling of family meals, family rules associated with food and eating and socio-cultural and religious rituals.

Other studies have shown an association between the involvement of young people in family meal planning with parents who negotiated food decisions with their children (Barlow SE & Dietz WH, 1998; Kremers SPJ, Brug J, de Vries H, & Engels RCME, 2003) and prepared healthy foods that they enjoyed (Contento IR, Cichela JL, & Goldberg CJ, 1988) with the consumption of healthy meals. Similarly, those families who frequently dined together were more likely to have healthier diets, eat more fruits and vegetables and less saturated fat (Gillman M et al., 2000; Videon TM & Manning CK, 2003). Eating together provided opportunities to enhance social and communication skills between family members (Allen H, 2005) and was nominated as the most significant benefit of sharing family meals for young women (Allen H, 2005; Vidgen H & Gallegos, 2012).

Home economics teachers have an important role in teaching food skills and encouraging parents to provide opportunities for their children to practise and participate in the planning and cooking of family meals. These tasks not only increase young people's food skills they incidentally generate feelings of independence, self-worth and pride (Allen H, 2005; Vidgen H & Gallegos, 2012). These attributes, described as 'personal agencies' (Contento IR, 2008), are developed when an individual acquires the behavioural capabilities of confidence, skills and motivation to master their own environment and behaviour.

The findings in all these studies (Barlow SE & Dietz WH, 1998; Macfarlene A et al., 2010) support the broad aim of this thesis which is to foster independence in young people to be able to cook for themselves and with their families. They reinforce the recommendations made elsewhere (Lichtenstein AH & Ludwig DS,

2010; Satter E, 2007a, 2007b; Satter EM, 2008; Slater J, 2013; Vidgen H & Gallegos, 2012) for young people to be supported in their food decisions and encouraged to enjoy (healthy) food in a supportive and positive mealtime environment. For teachers in schools, this means that they need to cultivate a positive environment, where young people can sit down at table to eat and enjoy the food they make with their friends.

### **Physical environment (school influences)**

The school's physical and social environment has an important influence in shaping young people's eating patterns (Bauer, Yang, & Bryn, 2004; Contento IR, Koch PA, Lee H, & Calabrese-Barton A, 2010) and broadening their taste preferences by encouraging them to try new foods (Jonsson M, Ekstrom MP, & Gustafsson IB, 2005; Worsley T & Crawford D, 2005). Since young people spend the majority of the day at school and consume the majority of their energy intake there (Bauer et al., 2004; Story M, Neumark-Sztainer D, et al., 2002), it makes sense to target programs which promote healthy eating behaviours at school.

Developing practical food skills through structured lessons is one opportunity that can be provided in the school environment to promote healthy eating behaviours. However, skill-based healthy eating programs in schools have seldom been evaluated (Contento L, Balch G, & Bronner Y, 1995; Gussow & Contento, 1984), even in more recent times (Engler-Stringer R, 2010; Vidgen H & Gallegos, 2012; Wu M et al., 2008). It thus is difficult to ascertain the level of influence these programs might have on young people's eating behaviours.

### **The Macrosystem (societal influences)**

Societal influences include advertising, mass media (television, radio and the Internet), government policies, food production and distribution. These factors affect the cost, exposure to, and availability of food; however, have been

nominated as *less* important influences (Contento IR et al., 1995; McCullough FSW, Yoo S, & Ainsworth P, 2004) in shaping adult and adolescent eating behaviours (Story M, Neumark-Sztainer D, et al., 2002). For this reason, societal influences are not explored and sit outside the scope of this thesis.

### **2.3.2 Summary of Influences on young people's eating behaviours**

In summary, several factors have been shown to influence the eating behaviours of young people. Food taste preferences and convenience appear to be the most important factors which influence young people's eating behaviours (Caraher M, 2006; Carter OBJ, 2006; Croll JK et al., 2001; Jones SC & Fabrianesi B, 2007; Steptoe A & Pollard TM, 1995; Story M & French S, 2004). A focus on these and on food skills acquisition as likely factors to develop healthy eating behaviours in young people may help teachers gain insight into the development of programs that improve eating behaviour in young people.

The next sub-section identifies theoretical models for their relevance to the aims of this thesis. They are identified for their application in skill-based healthy eating programs, which have been evaluated and reported in the health literature.

### **2.3.3 The use of theoretical models to explain behaviour**

Several theoretical models are relevant to the aims of this thesis because they provide insights into eating behaviour. A conceptual model of the components in the food choice process (Furst T, Connors M, Bisogni C, Sobal J, & Falk L, 1996), for example, has a focus on understanding of young people's motivational behaviours behind their food choice. Like The Theory of Planned Behaviour (Ajzen I, 1991), it seeks to identify the reasons why people make the food choices they do, and not simply identify the influences on eating behaviours.

These and other models [including the Precede-Proceed Model (Green LW & Kreuter M, 1991), Consumer Purchasing and Snacking Habits Relationship Model (Verplanken B, Herabadi AG, Perry JA, & Silvera DH, 2005), Society Behaviour

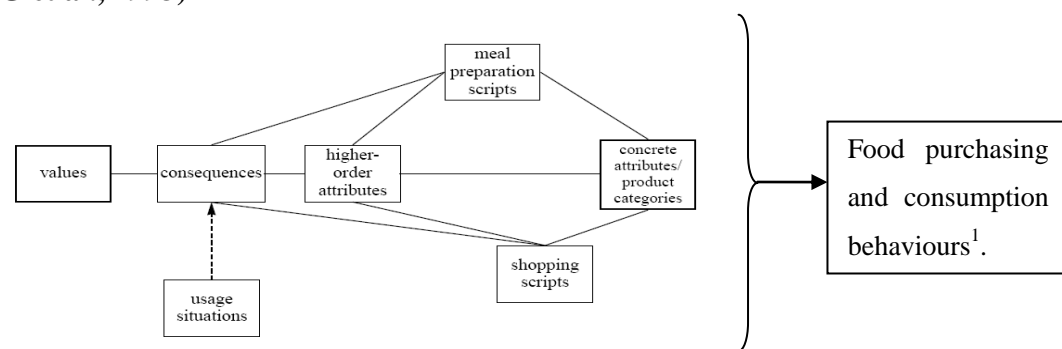
Nexus Model (Glass TA & McAtee MJ, 2006) and the Procedural DESIGN Model (Contento IR, 2011)] do not specifically relate to food skills acquisition but do help to inform the design of a skill-based healthy eating program designed to improve eating behaviours. All these theories, their components and their use in skill-based programs, if relevant, are described in **Appendix C**.

The two models considered most relevant to this thesis were The Food-related Lifestyle model (Grunert KG et al., 1993), with its focus on values held and relevant food selection, shopping and cooking scripts, and The Eating Competence model (Satter E, 2007a) with its focus on positive eating behaviours and food competencies. These two models are described and their relevance to this thesis is explained.

### **The Food-related Lifestyle Model (Grunert KG et al., 1993)**

The Food-related Lifestyle Model (Grunert KG et al., 1993) identifies seven key interrelated influences on eating behaviours and people’s food beliefs, choices and consumption. The model builds on the components in the food choice process outlined in the conceptual model by Furst et al (1996) that aims to identify the motivating factors which lead to eating behaviour. There are several basic components of the Model and how they relate to young people which are of significance in this thesis, as presented in **Figure 2.2**.

**Figure 2.2 A cognitive structure model for food-related life style (Grunert KG et al., 1993)**



1. All components within the model are predictors that lead to consumer behaviours

*Values* are considered to motivate eating behaviours. For example, young people may choose to eat healthy food if it is tasty (Story M, Neumark-Sztainer D, et al., 2002), accessible (Story M, Neumark-Sztainer D, et al., 2002; Videon TM & Manning CK, 2003) and available to be purchased at a reasonable cost and in convenient locations (Story M, Neumark-Sztainer D, et al., 2002);

*Perceived negative or positive consequences* of eating a particular food can be considered to relate to, young people's desire to 'fit in' with their peers. Such desire for conformity may create both positive and negative perceptions of eating particular foods (Neumark-Sztainer D et al., 1999);

*Higher-ordered attributes* pertain to health, aesthetic or nutritional properties attached to a particular food or situation. For example, young people who dine more frequently with their family are more likely to enjoy and eat healthy food (Story M, Neumark-Sztainer D, et al., 2002);

*Concrete attributes/product categories* include sensory properties, food availability and accessibility and product expectations based on prior food-related experiences;

*Meal preparation scripts* (cooking skills) incorporate how young people plan, prepare and cook food (including how much time they are willing to spend cooking it). Similarly, *Shopping scripts* cover how young people shop and, use food labelling and expert personnel information; and

The *Usage situation* is the final lifestyle component and includes the situation where the food is consumed (eating alone, with family or friends, celebratory or family meals).

The use of the Food-related Lifestyle Model in studies of young people's food behaviours has not been reported in the literature; however, there are components that have relevance to this thesis. The *shopping and meal preparation scripts*

component of the Model has particular relevance to this thesis with its application to the ‘declarative’ (‘knowing’ about the facts and information) and the ‘procedural’ (knowing how to apply) skills (Reynolds J, 2000; Worsley A, 2002) required to shop for food and to be able to prepare and cook it well.

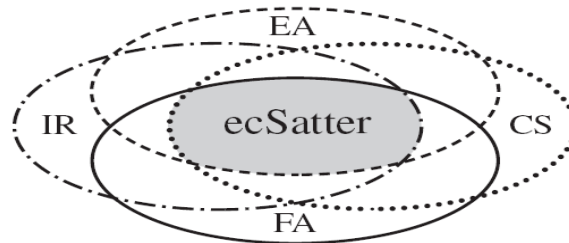
The Food-related Lifestyle Model has direct relevance to educators. Application of this model to development of cooking skills programs would indicate that teachers need to teach students self-efficacy skills; how to plan and make meals that will help them to meet the health and wellbeing goals that are reflective of the values held by each individual. They need to provide opportunities for their students to practise and apply practical food preparation and cooking skills (Backman et al., 2002; Caraher M, 2006; Caraher M, Dixon P, Lang T, & Carr-Hill R, 1999; O’Dea J & Wilson R, 2006; Slater J, 2013) and allow them to choose and make food they enjoy eating (Allen H, 2005; Vidgen H & Gallegos, 2012).

This concept of ‘enjoying food’ simply for its intrinsic value also underpins the principles of the Satter model (Satter EM, 2008), which postulates that young people can be encouraged to become ‘competent eaters’ through awareness of intuitive eating capabilities and exposure to a wide variety of foods, including ‘unhealthy’ food.

### **Eating Competence Model (Satter E, 2007b)**

The Eating Competence Model focuses on the attributes of eating for enjoyment and fostering attitudes and competencies to enable individuals to manage their eating behaviours. It has four components: Eating Attitudes, Contextual Skills, Food Acceptance and Internal Regulation. The Eating Competence model is shown below (**Figure 2.3**). The model is applicable for use in educational settings and proposes that individuals have intuitive eating capabilities that can be utilised and developed in nutrition education programs in schools.

**Figure 2.3 Satter’s eating competence model: Eating attitudes, contextual skills, food acceptance, and internal regulation. (Satter E, 2007b)**



The Eating Competence Model has a focus on fostering positive attitudes towards eating healthy food by providing individuals with the behavioural capabilities to be able to make tasty family meals. This directly aligns with the key rationale for this thesis. The model provides practical recommendations, based on the age and stage of learner, for teachers in schools and outlined below under the four interrelated components of the Eating Competence Model (Satter EM, 2008).

The model proposes that **Eating Attitudes (EA)** focus on fostering flexible and positive attitudes toward eating and food itself. Eating attitudes are considered to reflect the individual’s attitudes and emotions, and the social and environmental determinants in which the individual interrelates and lives. For teachers in secondary schools, the model’s suggestions include building on young people’s understanding of their own attitudes and beliefs in guiding their food behaviours. Questions<sup>1</sup> for consideration by teachers are suggested, including: *What are social attitudes about food? What attitudes do your parents have about food and eating? How do their attitudes affect your own? Are you comfortable with those attitudes, or do you want to change them?*

These questions relate to the first aim of this thesis which was to identify the essential skills that young people need as individuals to be able to cook sustainably for themselves and others. The teacher’s role here is to help each

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<sup>1</sup> These questions were not the same as those used in Studies 1 and 2

student to clarify his/her own values and beliefs about food so that they align with their personalised concept of what constitutes healthy food choices and eating behaviours.

The **Contextual Skills (CS)** component of the model focuses on meal-planning skills and resources to enable individuals to create family meals. For teachers in secondary schools, it suggests teaching young people how to manage time as a limited resource to plan meals, shop for food and then cook simple meals. Suggested questions<sup>1</sup> included: *What, where, when and how of feeding.*

These questions relate to the first and second aims of the thesis which were to incorporate the essential skills (to be identified in the first aim) into the food curriculum designed as relevant by the teacher (to be identified in the second aim).

The **Food Acceptance (FA)** component of the model focuses on maintaining nutritional status by developing the individual's learned food preferences and by encouraging him/her to try new foods and eat and enjoy a variety of food (particularly nutritious food). For teachers in schools the model suggests permitting young people to express their individuality and make their own risk assessments when making food choices. Suggested questions<sup>2</sup> include: *What are the consequences of eating 'healthy', 'unhealthy' food?*

These questions relate to the second study of the thesis which was to examine the teacher's perceptions of the importance of a variety of food skills that should be taught in the curriculum. The main assumption of this second study was that teachers' want to expose their students to a wide variety of foods through their food skills programs and to ensure that they enjoy and consume these foods as part of the daily social ritual of eating with their friends and family and to achieve their daily nutritional requirements. The aim of the study was to identify the food skills that teachers' communicate to their students.

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<sup>2</sup> These questions were not the same as those used in Studies 1 and 2



The fourth component of the model, **Internal Regulation (IR)**, has a focus on training individuals to recognise physiological responses such as hunger, appetite and food satiety in order for them to achieve energy balance and manage their body weight. Internal Regulation considers the individual's activity levels and body weight but strictly avoids prescriptive advice about managing weight and regulating food intake. For teachers in schools suggestions include young people becoming familiar with their own food-regulated strategies and evaluating and using those strategies. Suggested questions<sup>3</sup> include: *How does it feel when I am hungry? When am I full? What do I believe I need to eat for my energy needs?*

These questions relate to the second study of the thesis which was to examine the teachers' perceptions of the importance of a variety of food skills that should be taught in the curriculum.

The Satter Feeding Dynamics Model (Satter EM, 2008) is an adjunct to the Eating Competence Model and consists of a series of recommendations (rather than a conceptual model) for the adults, who in this thesis are the teachers and parents, to take responsibility for the type of food served and when and where the food is to be served. Children take responsibility for how much and whether to eat the food served by adults. Based on the principles outlined in the Eating Competence Model (Satter E, 2007a), the recommendations made in the Feeding Dynamics Model include practical guidelines for teachers and other food providers such as canteen managers, to support school-aged children in their choice and consumption of a wide selection of food.

Satter's models have particular relevance to this thesis, with their links to classroom food education programs and their emphasis on providing individuals with the meal planning and cooking skills to be able to meet their food needs. Furthermore, their aim to encourage the enjoyment of eating by making it a positive, joyful and intrinsically rewarding experience (Satter E, 2007a) makes it an appropriate fit with the goals of teachers in schools and aligns with the

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<sup>3</sup> These questions were not the same as those used in Studies 1 and 2

recommendations made by other researchers (Contento IR et al., 2010; Vidgen H & Gallegos, 2012; Warash BG, Fitch C, & Bodnovich K, 2003).

#### **2.3.4 A review of skill-based healthy eating programs**

A review of the literature for skill-based programs was undertaken by searching electronic databases (Pub Med, Medline, Pro Quest Central, CINAHL, COCHRANE, Scopus), electronic search engines such as 'Google' and 'Google scholar' and searching of references cited within references and grey literature. Key words and their variations (including using the prefix of the word plus the asterisk such as food\*) 'food skills', 'cooking', 'healthy eating', 'programs' and schools yielded relevant data from journal articles. The aim of this review was to identify and evaluate each healthy eating program for its relevance to this thesis that is; the use of food skills and measurable outcomes based on improvements in participants' skill acquisition and healthy eating behaviours.

Once relevant skill-based programs were identified in the reviews or through manual searches of electronic databases, the original studies were located and analysed for description and validity of methodology.

The results of the literature search identified four reviews obtained from the United Kingdom (Food Standards Agency, 2005), England (Wu M et al., 2008), the United States (Contento IR et al., 2002) and Australia (Crawford & Worsley, 2004). In addition separate manual searches were undertaken outside these reviews to identify more skill-based programs.

A five-level classification based on the Moveable Feast Review (Wu M et al., 2008) was used to evaluate the quality of the evidence, including the use of any theoretical models, reported in the skill-based programs. Details of each review, the classification levels and each of the relevant skill-based healthy eating programs are described and presented in **Appendix D**.

### **2.3.5 Conclusions of the review of skill-based programs**

The findings from the review revealed that there is a dearth of skill-based healthy eating programs reported in the literature. Those that have been reported, operate mostly in primary schools, and tend to be knowledge, rather than skill-based. The skewed tendency towards the introduction of ‘knowledge only’ over ‘skill-based’ based healthy eating strategies in schools, particularly at the primary school level, may potentially contribute to obesity remaining a problem of childhood (Magarey AM et al., 2001).

In this thesis, the candidate argues that food education programs need to incorporate the development of practical skills in addition to conveying nutritional knowledge as knowledge alone is insufficient to change eating behaviour (Caraher M, 2006; Contento IR et al., 2002; Roe L, Hunt H, Bradshaw H, & Rayner M, 1997). Nevertheless, knowledge-based healthy eating programs used in schools have reported success in the reduction of the prevalence of obesity and overweight in children in those schools that have incorporated such programs into the curriculum (Auld GW, Romaniello C, Heimendinger J, Hambidge C, & Hambidge M, 1998; Contento IR, 2011; Contento IR et al., 2010). Whilst such programs do not develop food skills, they do provide other important components recommended in successful programs such as the development of motivational and health-oriented behaviours (Contento IR et al., 2010; Veuglers PJ & Fitzgerald AL, 2005).

The School Meals Review Panel (School Meals Review Panel, 2005) advocated for the extension of existing knowledge-only based programs (Australian Bureau of Statistics, 2005; Block K & Johnson B, October 2009; Thonney PF & Bisogni CA, 2006; Webster B & Hayman J, 2006) to include the practical hands-on skills. Within such programs, practical skills would help young people to build their knowledge, confidence and self-efficacy (Contento IR et al., 2010; Levy J & Auld G, 2004; Liquori T, Koch PD, Contento IR, & Castle J, 1998; Slater J, 2013) to be able to shop for, prepare and cook foods.

Most of the reported findings in relation to skill acquisition have been based on surveys of adult participants in community cooking programs (National Health and Medical Research Council, 2013; Stead M et al., 2004; Wrieden WL et al., 2002, 2007). These findings are nonetheless relevant as an understanding and a consideration of the effects of lack of food skills in adults can help teachers to ameliorate potentially the same effects in their students.

A report on the relationship between food knowledge and cooking skills based on data obtained from the 1993 Education Authority and Health and Lifestyles Survey of England included important recommendations (Caraher M et al., 1999). The authors commented broadly on the outcomes of food knowledge and cooking skills of English people ranging from 16 -74 years in the 1993 Survey, but focused attention on the need for ‘hands-on cooking skills’. These skills were considered to be an important component of any health promotion project since people would be unlikely to act upon nutritional advice if they lacked the skills to implement them (Caraher M et al., 1999). Further, the authors noted that it was not simply a matter of teaching people the technical (procedural) skills but to provide them with ideas, knowledge, shopping skills and menu planning (declarative) skills in organising a meal (Lang T & Caraher M, 2001). This endorses the argument of this thesis.

The next section describes and defines food skills. To date they have not been well-articulated in the skill-based programs reported in the healthy eating literature. The identification of these food skills is the main aim of Study 1. The Food-related Lifestyle (Grunert KG et al., 1993) and Satter (Satter E, 2007a, 2007b) models are used to position food skills and support their application in a skill-based program to provide a theoretical base.

## **2.4 Section 3**

### **2.4.1 Description and definition of food skills**

This section investigates the use and application of the term ‘food skills’ in the food literature. ‘Food skills’ are described and classified as declarative and procedural skills. The case is made for teaching food skills in schools to equip young people with the ability to plan meals and shop, prepare and cook food for themselves and their families in the future.

Few skill-based programs reported in the literature define food skills, although implicitly what they describe are cooking skills. Thus this investigation of the literature concludes with the development of an operational definition of food skills to guide the research for this thesis.

### **Background to the development of a food skills definition**

This section outlines the evolution of a proposed definition by describing how researchers have used and applied the term ‘food skills’ in the food literature.

Short (Short, 2007), for example, used the term ‘cooking skills’ to describe the process of meal-making. The term ‘food skills’ is used in this thesis as it more broadly describes and encompasses the planning (declarative) and process (procedural) skills required to put together a meal.

In the food literature, however, the terms ‘cookery skills’ (Children's Food Trust, 2013) or ‘cooking skills’ (Engler-Stringer R, 2010; Lang T & Caraher M, 2001; Short F, 2003) are typically used to describe what are essentially ‘food skills’. It was found that these terms are seldom defined or well-articulated in skill-based programs and their use assumes a shared understanding of these terms between practitioners. The term ‘cooking skills’ itself has been described as task-centred (Singleton WT, 1978) or procedural (Reynolds J, 2000) skills that focus on the

processes required to make a meal. Person-centred (Singleton WT, 1978) or declarative (Reynolds J, 2000) skills focus on the context in which that meal is constructed: the suitability of the meal occasion, decisions and resources required to complete the meal to a level considered satisfactory to the food preparer and for the other individuals consuming the meal. They include the food literacy skills which refers to an individual's ability to make effective consumer decisions such as weighing-up the monetary versus the time-saving costs of purchasing convenience foods (Lang T & Caraher M, 2001).

Food literacy, like food skills, is an evolving term that has an assumed understanding (Pendergast D & Dewhurst Y, 2012; Stinson E, 2010; Thomas H & Irwin JD, 2011; Vidgen H & Gallegos, 2012) and has been applied to a community setting and defined most recently as 'a collection of inter-related knowledge, skills and behaviours required to plan, manage, select, prepare and eat foods to meet needs and determine food intake' (Vidgen H & Gallegos, 2012). Applied to an education setting, food literacy is described in this thesis as a declarative skill and more narrowly defined as 'the ability of consumers to understand and act upon the food labelling and nutritional information they need to prepare tasty and nutritious meals for themselves and their families' (Fordyce-Voorham S, 2010).

The idea of task-centred versus person-cooking centredness has varied with different researchers. Short (Short F, 2003), used the terms 'domestic' skills to refer to task-centred skills and 'professional' skills for the person-centred skills. In this thesis, it is argued that both task- and person-centred skills are used and applied in both domestic and professional situations. Singleton (Singleton WT, 1978) posited that cooking was not simply a mechanical process (task-centred) but a combination of other (person-centred) skills such as task allocation, knowledge application, design and planning ability and confidence to carry out such a seemingly straight-forward task.

The declarative skills component of food skills aligns with the Eating Attitudes (EA), Contextual Skills (CS) and Food Acceptance (FA) articulated by Satter (Satter E, 2007a), which are described in context in **Appendix E**.

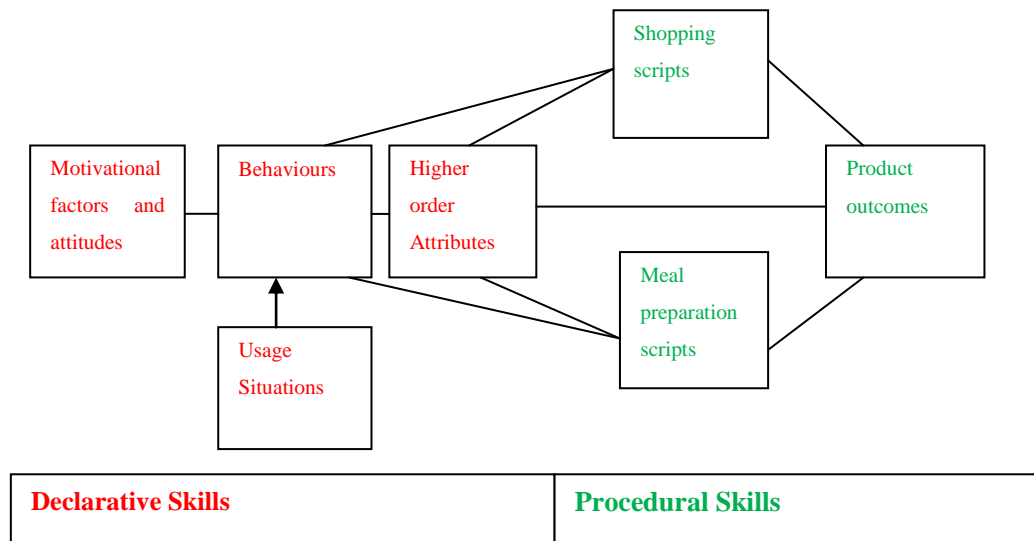
Person-centred or declarative skills, which act as pre-cursory skills to produce a meal, require an individual to make a series of complex decisions to solve the daily ‘challenge’ of ‘what shall we have for dinner tonight?’ Arguably, these skills require as many, or even superior, skills to the task-centred procedures to prepare and cook the meal itself (Lang T & Caraher M, 2001).

Regardless of whether an individual chooses to cook ‘from scratch’ or use convenience foods (Short F, 2007), they still need to use the declarative or person-centred skills to make that decision. For example, an individual’s food literacy (Vidgen H & Gallegos D, 2010), which includes an ability to read and act upon food labels, may help them to decide on the healthier choice between convenience food items (Caraher M et al., 1999; Vidgen H & Gallegos D, 2010).

Teachers and other facilitators of food skills programs and those who seek to evaluate these programs need to specify whether the types of skills they use to assess their programs are declarative or procedural.

Based on the Food-related Lifestyle Model (Grunert KG et al., 1993) and components of the Eating Competence Model (Satter E, 2007a), an adaptation that incorporates the procedural and declarative skills is shown in a proposed model and described in more detail in **Appendix E**.

**Figure 2.4 A proposed model depicting declarative and procedural food skills in context**



### **Definition of Food Skills**

Descriptions of what food skills encompass were examined in the food literature; (Caraher M et al., 1999; Contento IR, 2008; Engler-Stringer R, 2010; Lang T & Caraher M, 2001; Short F, 2003; Vidgen H & Gallegos D, 2011). These descriptions can be described as a continuum which ranges from reheating commercially pre-prepared food in a microwave oven appliance through to modifying recipes, substituting ingredients and ‘guesstimating’ raw ingredient quantities to prepare complex dishes using a variety of food preparation and cooking techniques (Lang T & Caraher M, 2001; Short F, 2003). Based on a compilation of these descriptions a simplified definition was developed to guide the research for this thesis.

For the purpose of this thesis, food skills are defined as, ‘the process of purchasing, preparing and cooking food materials (ingredients) using available resources to produce well-balanced and tasty meals appropriate to the age and needs of the individuals consuming them’ (Fordyce-Voorham S, 2009a).

This definition includes, the terms ‘resources’ and ‘needs’.



*Resources* include knowledge, availability of time and personal energy, money, appropriate kitchen facilities, food materials (ingredients), cooking equipment and utensils. They also include the personnel who are used to assist in the construction of those meals: teachers, teacher assistants, parents, guest speakers and members of the community. *Needs* include nutritional and health requirements, aesthetic and satiety meal properties and suitability of the meal occasion.

This definition provides boundaries but allows flexibility to accommodate the variable knowledge, skills, age and needs of the individuals at any lifespan stage. The definition is sufficiently dynamic to cover a range of *usage situations* (Grunert KG et al., 1993) and individuals such as:

- a twelve-year old child accessing bread and tomatoes to prepare a toasted sandwich cooked in a sandwich maker appliance and consumed alone as an afternoon tea snack;
- an adult male allocating more money to purchase organic meat from a specialist butcher and preparing the marinades, from raw ingredients and commercial convenience products, for a summer barbeque for himself and his family;
- an adult female in the same family, choosing to purchase pre-packaged salads and pre-prepared salads from a salad bar in the local supermarket on her way home from work and then assembling those salads but using a home-prepared vinaigrette dressing.

Food skills may be considered as a continuum of skills, which range from low level skills such as, assembling a sandwich and toasting it in a sandwich maker appliance or reheating a meal in a microwave oven; medium level skills of assembling a pre-prepared salad purchased from the supermarket, peeling, boiling and mashing potatoes and grilling lamb chops for an evening family meal; to high level skills that require a series of complex processes, such as making a filled lemon tart, which involves making, chilling and rolling out a sweet shortcrust

pastry into a flan tin, blind baking and then filling with a crème patisserie made in a double boiler.

This definition (Fordyce-Voorham S, 2009a) is used as the basis for the evaluation of skill-based programs designed to develop food skills. It will be tested and refined as one component in Study One, which comprises the interviewing of food experts, including chefs, home economics teachers, nutritionists and dietitians, community and youth workers, homemakers and independent young people.

#### **2.4.2 Food skills in schools**

Based on the proposed definition and model (**Figure 2.4**) above, the goal of any food skills program is to develop people's (specifically young people's) food skills so that they can produce a tasty, healthy and well balanced meal on the majority of eating occasions and, which meets the appetite, nutritional and situational needs of family members. People need to be taught how to prepare such meals within a limited time, as time is perceived to be a scarce resource and limited time is recognised as a barrier to healthy eating (Kalenkoski CM & Hamrick KS, 2013; Kearney JM & McElhone S, 1999). This goal relates to the first aim of the thesis which is to identify the essential food skills which will enable young people to be able to manage their time well enough so that they are able to cook sustainably for themselves and for others.

The need for these skills are more relevant than ever in the twenty-first century, as families continue to work longer hours (Shepanski P & Diamond M, 2007) and have less time to shop for food and prepare and cook meals (Kalenkoski CM & Hamrick KS, 2013). Many researchers (Baderoon G, 2002; Bonzo G, Kitson N, & Wardrop J, 2000; Foodshare, 2002; Pendergast D & Dewhurst Y, 2012; Perinau L, 2002; Rodrigues SSP & de Almeida MDV, 1996; Zubiada S & Tapper R, 2001) report concern about the decline in food skills. However, other researchers consider it is inevitable that people favour industrially produced, pre-packaged

food (Levy J & Auld G, 2004; Lichtenstein AH & Ludwig DS, 2010; Mintz S, 1996; Ripe C, 1993; Ritzer G, 1996; Shapiro L, 2004; Slater J, 2013; Ternier S, 2010) and take away food (Caraher & Coveney, 2004; Contento IR, 2008; Lichtenstein AH & Ludwig DS, 2010) as a means of solving their time-related dilemmas and daily challenges of meal making.

With women spending around one hour on daily meal preparation (Australian Bureau of Statistics, 2008), it makes sense for them as food preparers to use time and labour-saving devices such as microwave oven appliances (Ironmonger DS & Aitken CK, 1996) or convenience foods (Shapiro L, 2004; Ternier S, 2010), which may include fresh, raw, processed *or* pre-prepared food, to prepare the family meal. Arguably, this is preferable to people's exclusive reliance on external food providers for their family meals, which could arise when people have the discretionary income but not the perceived or actual skills and time to prepare a healthy meal at home for themselves (Caraher & Coveney, 2004; Kalenkoski CM & Hamrick KS, 2013).

Home economics teachers have an important role to address the modern day reality of families' reported over-reliance and consumption of take-away and pre-packaged foods, which are expensive and often nutritionally-poor (Lichtenstein AH & Ludwig DS, 2010). The judicious use and incorporation of convenience foods into family meal planning and production are suggested as time- and cost-saving and realistic alternatives to take away foods.

As food educators, home economics teachers need to help students identify their own values of health and use of discretionary time, as factors that might contribute to their eating behaviours. Teachers then need to consider these factors in their teaching practices, alongside the declarative and procedural skills the students need to make healthy meals for themselves and others, so that they do not need to rely on external food suppliers.

There have been no reports of Australian home economics teachers' views of the food *skills* that they believe important to teach their students or of the resources that they use to support their teaching of these skills in schools. An international study of 1118 home economics teachers endorsed the recommendations made by others (Lichtenstein AH & Ludwig DS, 2010; Vidgen H & Gallegos, 2012) that a food *literate* curriculum is commensurate with food safety and hygiene and preparation and cooking skills (Pendergast D & Dewhurst Y, 2012).

The World Health Organisation in collaboration with European nutrition educators developed The *Healthy Eating for Young people in Europe - A school-based nutrition education guide* (Dixey R et al., 1999). The group nominated three crucial components which underpinned all successful nutrition education programs. These are:

1. The framework for the taught curriculum (what happens in the classroom);
2. Nutrition education in the whole school community (what happens outside the classroom, including the school canteen, fund-raising and fetes);
3. Nutrition education for the family and the community (what happens at home and beyond).

Only the first and third components are relevant to this thesis. *The framework for the taught curriculum (what happens in the classroom)* is the most relevant and is utilised in Study 2.

The aim of Study 2 is to determine the predictors that might influence teachers to choose the food skills that they consider important to teach their students. A secondary aim is to identify the resources that teachers might use to support their classroom teaching.

### 2.4.3 Predictors of Teacher Practices

A conceptual model was developed based on the earlier findings reported in the literature review. The model, depicted in **Figure 2.5**, illustrates how teacher beliefs (orientations) work as predictors which might influence the food skills that are taught. The model takes into account the factors that may influence young people's behavioural capabilities to acquire the declarative and procedural skills. The declarative and procedural skills introduced in **Figure 2.4** (A proposed model depicting declarative and procedural food skills in context) have been incorporated and shown how they are positioned into the model (**Figure 2.5**) below. The figure presents the relationships between each component of the model, how they are sequenced and interrelate with, and between each other.

In the model, the *behavioural capabilities* include students' *food exposure* and *nutritional knowledge* and their *motivation and practice*, which together contribute to the declarative component of students' *skill acquisition*. The model positions the *behavioural capabilities* of the students and the *human and material resources* available to the teacher and how these might influence or operate as modifiers to teacher practices. These influences are interrelated with the teacher *beliefs*, as predictors which may affect teacher practices: the content and skills they choose and how they teach them in their food skills program.

The predictors that might influence which skills are taught and how they operate as pre cursors to the teachers' practices are explored in Study 2. However, the outcomes of the teachers' practices are beyond the scope of this thesis.

The components of the model are described as follows:

*Resources* are classified as *human resources* and include support personnel (teacher assistants, parents and guest speakers) and *material resources* (kitchen facilities, equipment, access to information such as books and the Internet) that may be used by the teacher to enhance or to teach their skills program successfully.

*Material resources* such as the kitchen facilities, location and the financial viability of the school would contribute to the successful delivery of a food skills program. For example, access to broadband Internet, books and a generous food skills budget would contribute to the *food exposure* of students and allow the teacher to purchase a range of different foods.

The *Behavioural capabilities* of the students include *Student motivation and practice* and *Food Exposure and Nutritional Knowledge*. The procedural skills component of the *Skill acquisition* of students depend on how *motivated* they are to learn and to gain *knowledge* and whether they have the opportunity to *practise* the procedural skills at home with their parents. Likewise, teachers have their own *beliefs* which will influence what they choose to include for their students to learn *nutritional knowledge* and be *exposed to new foods* through excursions and external classroom experiences, in addition to their food skills lessons.

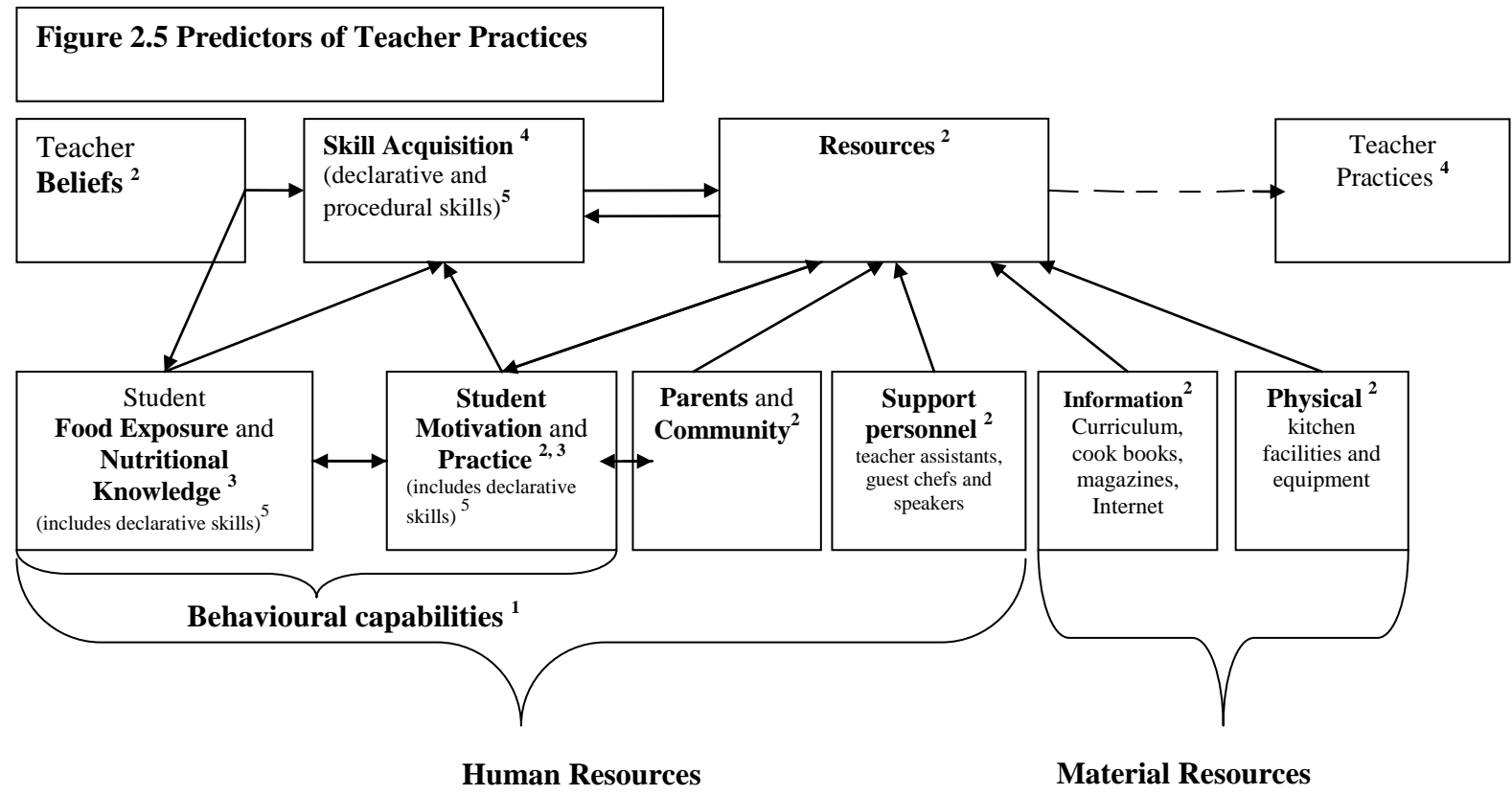
#### **2.4.4 Food education for the family and the community: a collaborative approach between class, school and home**

A particularly relevant component in this model is the collaborative role of parents and the community to support what happens in the classroom. As a *human resource*, parents provide their children with the opportunity to practise at home the food skills learnt in class. Parents have been identified as key players in food literacy education (Pendergast D & Dewhurst Y, 2012).

Some school-based programs such as the English ‘Let’s Get Cooking’ program (Children's Food Trust, 2013) actively involved the parents through information and practical workshop sessions. Such programs have shown higher success rates but have not been evaluated for long term success (Lyle L & Achterberg C, 1995).

Guest speakers and food providers drawn from the local community and beyond are examples of other *human resources* who have been included to support and enhance food skills programs. For example, involvement of local community

food growers and suppliers was shown to be an important feature in the success of the Wicked Vegies skill-based healthy eating program in Tasmania (Tasmanian Community Fund, July 2008). More details of these skill-based programs can be found in **Appendix D**.



1 Described by Contento as ‘personal agencies’ (Contento IR et al., 2010)

2 Described as ‘Inputs’ (Contento IR, 2011)

3 Described as Motivational phase of ‘Outputs’ (Contento IR, 2011)

4 Described as Action component of ‘Outputs’ (Contento IR, 2011)

5 Incorporates **Figure 2.4** A proposed model depicting declarative and procedural food skills in context



#### **2.4.5 Summary of recommendations and rationale for program design**

The rationale and requirements of a successful food skill-based program design based on previous discussions of the literature are summarised in **Table 2.1**. This includes the three crucial components for program design made in the WHO Healthy Eating Guide and the recommendations made in the five Reviews of skill-based healthy eating programs. Component 1, the framework for the taught curriculum, is the crucial focus and intent of this thesis. Component 3 is relevant and needs to be considered in the design of any food skills acquisition program, as parents and community personnel remain significant influences in the lives of young people.

While it is beyond the scope of this thesis to design and evaluate a skill-based program, the food skills and their acquisition need to be measured as one part of program evaluation. The final section proposes the use of an evaluation tool that teachers could use to help them measure the skill acquisition of their students.

**Table 2.1 Summary of recommendations and rationale for program design based on WHO guidelines and reviews**

Component 1 -The framework for the taught curriculum (what happens in the classroom)	
Recommendations	Rationale
<ul style="list-style-type: none"> <li>• use peer-led programs incorporating fun, novel approaches and art and drama <sup>2</sup></li> <li>• identify ways of targeting young people <sup>2</sup></li> <li>• focus on eating positively for health, food enjoyment and wellbeing rather than on prevention on disease <sup>3</sup></li> <li>• educate on the value of whole foods and where food comes from, in addition to nutrition, food preparation and food safety <sup>1,3</sup></li> <li>• provide information about cost-effectiveness of programs <sup>2</sup></li> <li>• use internet and multi-media to assess the feasibility of incorporating technology (DVDs and computer software programs) into nutrition education <sup>1,2,3</sup></li> </ul> <p>(Klepp KI &amp; Wilhelmsen BU, 1993)</p> <ul style="list-style-type: none"> <li>• use small targeted programs focusing on hands-on cooking and gardening programs to increase life skills <sup>2</sup></li> <li>• create opportunities for young people to sit down together and eat the meal they prepared <sup>2</sup></li> <li>• compare single versus multi-component programs (knowledge-based programs versus knowledge <i>and</i> skill-based programs) <sup>2</sup></li> </ul>	<p>Programs that are sustainable and relevant to young people need to include:</p> <ul style="list-style-type: none"> <li>-food knowledge and hands-on shopping, preparation and cooking skills (Caraher M, 2006; Caraher M et al., 1999; Contento IR et al., 2002; Lang T &amp; Caraher M, 2001; Roe L et al., 1997)</li> <li>-a fun, enjoyable food environment that encourages the enjoyment of being exposed to and eating a wide variety of (healthy) food (Satter E, 2007a; Satter EM, 2008)</li> <li>-issues including food security and sustainability (Caraher &amp; Coveney, 2004; Clancy, 1999; Cyr CA, 2013; Gussow JD, 1999)</li> <li>-eating for wellbeing now rather than long-term health (O'Dea J, 2005; Satter EM, 2008; Story M, Lytle LA, Birnbaum AS, &amp; Perry CL, 2002)</li> <li>-motivational influences including taste, convenience and cost (Caraher M, 2006; Contento IR, 2008; Contento IR et al., 1995; Croll JK et al., 2001)</li> <li>- both genders and young people from all ethnic backgrounds (culturally sensitive) (Caraher M et al., 1999; Caraher &amp; Coveney, 2004; Dixey R, 1996; Satter EM, 2008)</li> </ul>

<ul style="list-style-type: none"> <li>• compare culturally tailored programs <sup>2</sup></li> </ul>	
Component 2 - Nutrition education in the whole school community (what happens outside the classroom, including the school canteen, fund-raising and fetes)	
Recommendations	Rationale
<ul style="list-style-type: none"> <li>• undertake cost analysis to address identified barriers such as staff training and lack of facilities <sup>2</sup></li> <li>• develop and influence policies at all levels from kindergarten to governments <sup>3</sup></li> <li>• include new foods introduced in the cooking sessions in the school lunches <sup>1</sup></li> <li>• use school kitchens and lunchrooms for cooking sessions and involve cooking personnel <sup>1</sup></li> </ul>	Programs that are sustainable and relevant to classroom and school community need to include: - all key stakeholders including all teachers delivering the program, school management, canteen staff parents (Liquori T et al., 1998; Satter E, 2007a) - collaboration between teachers and canteen staff to ensure consistent nutrition education messages and delivery of healthy food (Liquori T et al., 1998; Worsley T & Crawford D, 2005)
Component 3- Nutrition education for the family and the community (what happens at home and beyond)	
Recommendations	Rationale
<ul style="list-style-type: none"> <li>• use multi-level programs that target and involve families (newsletters, meetings, as potential cooking instructors or facilitators) and young people <sup>1,2,3</sup></li> </ul>	Programs that are sustainable and relevant to classroom and school community need to include:

<ul style="list-style-type: none"> <li>• implement and evaluate programs that focus on an inclusive whole-school community approach <sup>2,3</sup></li> <li>• use open communication and ‘strong working links’ between all key stakeholders to address identified barriers <sup>2,3</sup></li> <li>• use action research that makes small sustainable changes that is applicable to a large number of people <sup>3</sup></li> <li>• use recipes that have accessible ingredients and equipment so that young people can prepare the recipes at home <sup>1</sup></li> <li>• provide professional development to health professionals <sup>3</sup></li> <li>• develop and influence policies at all levels from kindergarten to governments <sup>3</sup></li> <li>• develop partnerships and coalitions between government bodies, NGOs and community health practitioners in order to collaboratively address healthy eating practices in young people <sup>3</sup></li> </ul>	<p>-fostering a positive relationship between the school and local community food growers and suppliers (Tasmanian Community Fund, July 2008)</p> <p>- development of school policy that involves all key stakeholders (Chenhall C, 2010; Cyr CA, 2013; Worsley T &amp; Crawford D, 2005)</p>
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1. English Review
2. UK Review
3. Australian Review

## 2.5 Section 4

### 2.5.1 Food Skills- how can they be measured?

The goal of any food skills or ‘cooking’ program is to develop people’s food skills. Facilitators of food skills programs need to be clear of this goal and to know when and how this goal is achieved.

The focus of this section is to investigate how food skills are measured, if at all, in food skills programs that currently operate in Australia and elsewhere. One of the aims of the third study of this thesis was to determine how food skills can be measured *objectively*. For the purposes of this research, ‘food skills program’ is the generic term used to describe any program that purports to teach food preparation and cooking skills to others.

While there has been anecdotal reporting of food skills measures used in skill-based programs in schools, the extent of such measures reported in the literature has been limited to program participants’ self-reporting of ‘confidence’. The use of ‘confidence’ as an indicator has been typically used by facilitators of food skills programs to measure program success (Caraher M, Seeley A, Wu M, & Llyod S, 2013; Children's Food Trust, 2013; Contento IR et al., 2010; Larson NI, Story M, Eisenberg ME, & Neumark-Sztainer D, 2006; Rocha Leal FM, Oliveira BM, & Rodrigues Pereira SS, 2011) but is potentially subject to bias (Auld GW et al., 1998) and error (Contento IR, 2008). As designers and facilitators of food skills programs, home economics teachers need to do more than develop young people’s confidence and allow them to self-report on their use of convenience foods or a list of food skills that *they* have deemed to have achieved.

Therefore, the aim of the third study of this thesis is to develop an evaluation tool that provides teachers and potentially, other facilitators of food skills programs, with an easy-to-use checklist on which to measure participants’ procedural food skills *objectively*.

## 2.6 Overall Summary

The focus of this thesis is on healthy eating and improving young people's eating behaviours through food skills acquisition. Evidence was identified to support the premise that young people's nutritional status and healthy body weight may be improved if they acquire the skills to know what foods to choose and how to make healthy meals for themselves.

There is, however, a paucity of knowledge of young people's eating behaviours in relation to skills acquisition and this is exacerbated by a lack of a theory-based or conceptual model to explain the relationship. This is further compounded by a dearth of skill-based programs in secondary schools that have been evaluated in the long-term.

To inform the design of skill-based programs, individual and environmental influences which impact on young people's eating behaviours were considered and positioned within several existing theoretical models. Each model was examined and evaluated on their relevance to young people and application to skill-based healthy eating programs in schools. The Grunert (Grunert KG et al., 1993) and Satter (Satter E, 2007b) models incorporated the most useful features, which were then used to develop two conceptual models to guide the research for the thesis.

The first model positioned the motivating factors on young people's eating behaviours as precursors that should be built into program design. The model was developed as a flow chart which incorporated these precursors and the food skills themselves, depicted as two discrete components known as the declarative and procedural skills. Interviews undertaken in Study 1 were interrogated for reference to these skills.

Procedural skills have been featured and incorporated into the design of many of the skill-based healthy eating programs evaluated in the literature review. For this

reason, they were selected to inform the design of an evaluation tool in Study 3, which teachers could use to measure the skill acquisition in their students.

Ideally both the declarative and procedural food skills need to be measured in any skill based program; however, it is beyond the scope of this thesis to explore both due to logistical and time constraints. This is acknowledged as a limitation.

The second model positioned the predictors which might influence teachers to select the food skills they believe to be important and use in their programs. This is the aim of Study 2.

It is anticipated that the predictors, combined with an understanding of the essential skills (collected in Study 1), would provide the evidence for teachers to design and implement a skill-based healthy eating program of their own.

## **2.7 Study Aims**

The broad aims of the thesis were:

### **Aim 1**

To identify the essential food skills required by students and that need to be taught and acquired in food skills classes in order for them to be able to cook for themselves when they live independently.

### **Aim 2**

To examine teachers' perceptions of the importance of a variety of food skills that should be taught in the curriculum and the actual teaching of those skills.

### **Aim 3**

To design a valid and reliable evaluation tool for teachers and other health professionals to measure the skills acquisition of their students.

### **3.0 CHAPTER 3 STUDY 1**

#### **3.1 Introduction**

This chapter outlines the qualitative research procedures undertaken in Study 1. The chapter commences with an outline of the conceptual model that informed the Study. The recruitment procedure, description of the sample, design, pre-test and piloting of the interview questions, and the results of the interviews are then reported.

Evidence of food skills content was indicated in several well-designed skill-based programs (Klepp KI & Wilhelmsen BU, 1993; Larson NI, Perry CL, Story M, & Neumark-Sztainer D, 2006; Liquori T et al., 1998) and anecdotally in other skill-based programs in schools designed by home economics teachers (Crawford D & Worsley T, 2005; Reynolds J, 2005, 2006). However, the food skills were not well articulated, even in those considered to be methodologically sound (Wu M et al., 2008).

Specifically, the majority of these programs included the methodology, program design and outcomes, described here as the ‘macro components’, but they did not explicitly describe the ‘micro components’ that underpin program planning. These micro components include an operational definition and program content; that is, the ‘food skills’ content which should be included so that the essential skills are taught. Part of the reason why these micro components are overlooked may be that program designers report to health professionals working in the same field. It is possible that the assumption is made that there is a shared and implicit understanding that the micro components, a ‘food skills’ definition and essential skills content, are the same for everyone. Lack of explicit description of the micro components of programs does not provide a strong foundation on which to design a successful and sustainable skill-based program which can withstand the rigours of evaluation.

For this reason, the aim of Study 1 was to identify these essential ‘need to know’ practical food skills which should underpin all skill-based healthy eating programs (and provides the foundation on which the actual recipes are planned and taught).



As part of the examination of skill-based healthy eating programs in the literature, several theoretical models were reviewed (Contento IR, 2008; Furst T et al., 1996; Grunert KG et al., 1993; Satter E, 2007b). None of these models focused specifically on food skills acquisition; however, they did provide conceptual insights to inform the development of two *new* conceptual models. The two conceptual models were then used to guide the methodological procedures used in the first and second studies and to position the evaluation tool tested in the third study.

The first conceptual model (**Figure 2.4**) was based on the Food-related Lifestyle Model (Grunert KG et al., 1993) and components of the Eating Competence Model (Satter E, 2007a). This model incorporates the declarative skills required by individuals to plan meals and shop for food and the procedural skills required to prepare and cook food. These declarative and procedural skills were positioned within a framework of pre-cursory influences on an individual's eating behaviours. Pre-cursory influences included individual motivational factors and attitudes together with the higher ordered attributes and the usage situations which are largely shaped through an individual's food experiences and exposure at home, and modified later by peers (Story M, Lytle LA, et al., 2002; Vidgen H & Gallegos, 2012) and at school (Bauer et al., 2004; Jonsson M et al., 2005; Worsley T & Crawford D, 2005).

The second model aimed to position the broader influences on students with the influences of teachers, including the resources available to teachers and the food skills they considered to be important and selected to teach their students. Thus components of the first conceptual model (**Figure 2.4**) were incorporated within the second conceptual model (**Figure 2.5**).

These two models helped to inform the process of the identification by the food experts of essential food skills. However, as these were only conceptual models which had not been tested previously in the food skills context, a systematic research approach was used. This approach enabled the first conceptual model to be derived from the qualitative data and the subsequent emergence of common themes generated by the interviews.

## **3.2 Aim of Study 1**

The aim of this study was to identify the food skills deemed essential for young people to be able to live healthy and independent lives.

## **3.3 Methodology**

### **3.3.1 Recruitment and selection of participants**

Food experts from a range of backgrounds were recruited through advertising in community centres, universities, local gyms and youth centres, professional association newsletters, state, national and international home economics conferences and websites or identified and contacted by mail or personally and invited to participate in the research.

If an expert agreed to participate in the research he/she were briefed fully about the research process and then supplied with a Plain Language Statement and Consent Form (**Appendix F**).

The participants (the ‘food experts’) were identified and selected on their potential to identify the essential food skills required for a skill-based healthy eating program. Different categories of ‘food experts’ were recruited to gain a wide perspective of the perceptions of essential food skills.

‘Professional’ food experts were selected for their nutritional knowledge, food handling and food skills knowledge, experience with working with young people or sometimes for all of these criteria. These experts worked in food-related professions and included home economics teachers, chefs, nutritionists, dietitians, food technologists and food writers. The potential participants were subsequently approached for an interview. Two groups, food technologists and food writers, declined to be interviewed.

Food technologists are employed for their expertise in food product research and development in the commercial food industry. They were sought for their understanding of consumers in relation to their food purchasing decisions and shopping skills. They were

approached through their professional association but after initial acknowledgement, made no further contact with the researcher to proceed with the interviews.

Likewise, food writers were approached and they either declined or felt that they could not make a valuable contribution to the research. Food writers are employed to write for the lay population about food. They were sought initially as their views would provide a contemporary view of relevant skills, despite their possible lack of necessary nutritional knowledge. The information provided from them would have helped to identify the relevant practical skills for young people deemed important by food commercial experts.

The 'professional' food experts thus included home economics teachers, chefs, nutritionists and dietitians. The decision was made to amalgamate the 'nutritionists' and 'dietitian' groups into one group due to the small number of individuals who agreed to be interviewed. Their professional qualifications in nutrition and dietetics were sufficiently broad and similar enough to be included as one group, for the purposes of this study. This resulted in three groups of 'professional' food experts in this study.

Community educators were included as a further group. Two community educators expressed an interest in contributing to the research based on their direct contact with young independents through their roles as facilitators of cooking and general life skills programs. Their background in health promotion and community work and expertise in working with young people, analogous to the demographics of the young independents in the sixth group, meant that these participants contributed novel data, which would otherwise not have been provided by the other professional food experts.

Young independents and expert homemakers were two further groups considered to be food experts. Young independents lived independently from their parents and planned, shopped for, prepared and cooked their own food. For the purposes of this research, they were considered to be 'food experts' as they had experience of making meals. These 'young independents' were three to ten years older than the targeted students. They were selected to provide a retrospective insight into the essential food skills required to be taught and practised in a skill-based healthy eating program in schools.

Expert homemakers were selected based on a minimal of ten years experience in planning, shopping, preparing and cooking meals for their families. They were considered to be food experts as they have experience in making a range of family meals.

A description of the participants in each of the six groups and how they were recruited is shown below (**Table 3.1**).

**Table 3.1 - Description and recruitment of participants in Study 1**

Food Expert Group	Age range (years)	Interview Venue	Expertise relevant to this project	Recruitment process
<p><b>Group 1</b> Home economics teachers  (n=15)</p>	<p>21-70</p>	<p>Workplace offices or private homes</p>	<p>These participants were members of the home economics teaching profession and/or members of the professional associations of the state, national and international professional teachers' associations.  They designed skill-based programs and taught food skills to young people in secondary schools.</p>	<p>Home economics teachers were contacted via the school's web site or directly to identify the home economics teacher in that school or TAFE (Technical and Further Education) institution.  A random selection of twenty schools (Catholic and independent single sex and Government co-educational) and TAFE institutions in a 20 kilometre area (covers low- middle to high SES) was selected from the researcher's place of work.  This recruited home economics teachers from – Catholic single sex girls schools (n=3) Government co-educational schools from low-middle SES (n=3) and an independent single sex girls' school (n=1) the Hospitality department of a TAFE institution (n=1)  Retired teachers (n=3) were recruited through the Secretary of the Professional ex-students' association.</p>

				Home economics teachers working in schools or industry in Europe (n=4) were recruited by direct invitation by the researcher at an international home economics conference.
<b>Group 2</b> Industry chefs and cooks  (n=10)	25-55	Offices in restaurants, hotels, commercial cooking schools and TAFE Hospitality Training Centres	These experts had backgrounds in hospitality and commercial cookery. They had experience in food preparation, costing of food and budgeting relating to food provision.	<p>Chefs and cooks were contacted through three TAFE websites via the co-ordinator of TAFE Hospitality programs (n=3)</p> <p>These participants suggested names of chefs in restaurants (former alumni) who might be interested in participating in the research (n=3)</p> <p>The researcher contacted celebrity chefs with a high profile purporting interest in the development of food skills in children and young people through kitchen garden projects and through private cooking schools.</p> <p>Of the ten chefs contacted – 3 agreed to participate in the research (n=3).</p> <p>Chefs in five star CBD hotels were contacted – this recruited 1 participant (n=1).</p>

<p><b>Group 3</b> Dietitians and nutritionists  (n=7)</p>	<p>25-65</p>	<p>Offices in workplaces.</p>	<p>These participants were separated from Group 1 (home economics teachers) as they tended to focus more on nutrition issues than on food matters in their responses.</p>	<p>Dietitians and nutritionists were contacted through an advertisement circulated via the networking membership link to the Dietitians Association of Australia – this recruited one community dietitian in Queensland (n=1).</p> <p>Several community dietitians were recruited through a response to the advertisement in community health centres (n=3)</p> <p>Several members and employees of nutrition organisations (Nutrition Australia) were recruited through an emailed invitation to members (n=3)</p>
<p><b>Group 4</b> Community Educators  (n=2)</p>	<p>25-30</p>	<p>Offices in community centres</p>	<p>These participants responded to the same advertisement designed to recruit community dietitians. They emerged as a potential interest group and helped to inform the research with their background in youth, health promotion and community work.</p>	<p>One participant was recruited through their response to an advertisement placed in a community health centre.</p> <p>A young health professional delivering youth cooking programs was recruited through a recommendation by a staff member at a Community Health Centre.  (n=2)</p>

<p><b>Group 5</b> Homemakers  (n=9)</p>	<p>43-55</p>	<p>Private homes</p>	<p>These experts had experience of planning, preparing and cooking the family meals.</p>	<p>Participants were recruited through a local letterbox drop of twenty homes in the researcher's area (n=4).  The responses made in these interviews were used as a pilot to test the questions.  Parents and staff members at the researcher's school were recruited through their response to advertisements in the staff room and the parents association newsletter (n=3)  A broader range of participants were recruited through their response to advertisements placed in twenty community organisations including Maternal and Child Health Centres, Community Health Centres, Neighbourhood Houses and local gyms (n=2)</p>
<p><b>Group 6</b> Young independents  (n=8)</p>	<p>18-26</p>	<p>Private homes and workplaces</p>	<p>This group of participants were young people who lived in shared households with other singles or as a couple residing in a separate household.</p>	<p>Advertisements were placed in the researcher's staff room, student common rooms at two universities, youth centres, community health centres, TAFE institutions and local gyms.  This process generated responses from 3 teachers from the researcher's school (n=3) 3 young adult children of neighbours (n=3) 2 university students (n=2)</p>



### 3.3.2 Pilot testing

Prior to the interviews, a pilot interview of a convenience sample of three experts from the ‘expert homemaker’ group was used to test the face validity of the four questions. This enabled the interview technique to be refined and ensured that the questions would generate the responses required to identify the skills considered essential in a skill-based healthy eating program.

The following procedures based on the recommendations made by Peat and others (Peat J, Mellis C, Williams K, & Xuan W, 2002) were undertaken in the pilot test and later in the full-scale study to ensure the internal validity of the questions-

- the participants in the pilot test were asked for feedback to identify ambiguities and difficult questions;
- the questions were posed in exactly the same way and the same order in the full-scale study;
- the time taken to complete the pilot-tested interviews was recorded and a decision was made whether the time taken was reasonable; and
- each question was assessed as to whether it provided relevant responses.

### 3.3.3 Interview Questions

The interview questions were informed by the two conceptual models developed by the researcher. The first three interview questions were based on the first conceptual model which emphasised the importance of declarative and procedural skills.

The ‘Knowledge’ and ‘Information’ questions explored the declarative skills that the interviewees thought would be required by individuals to make consumer decisions and plan meals (**Table 3.2**).

The ‘Skills’ question explored the procedural skills that the interviewees’ thought would be required by individuals to shop for, store food and then prepare and cook the meal (**Table 3.2**).

The fourth and last question on ‘Resources’ was based on the second conceptual model of the predictors of teacher practices which positions resources as assets used by the teachers’ to enhance or deliver their skills program successfully. This question explored the interviewees’ thoughts on the resources required by individuals in addition to the information, knowledge and skills (Table 3.2).

**Table 3.2 Definitions of terms and interview questions posed to food experts**

Definitions	Interview Questions
<p>‘Knowledge’ includes a personal awareness and understanding about nutrition and what would constitute a nutritious family-type meal.</p> <p>For example, knowing the Australian Dietary Guidelines (<a href="http://www.nhmrc.gov.au/guidelines/publications/n55">http://www.nhmrc.gov.au/guidelines/publications/n55</a> accessed October 15, 2013) and applying the <i>information</i> to help select ingredients to make a well-balanced and appetising meal</p>	<p>1. Thinking about nutritional family-type meals what <i>knowledge</i> must individuals have to shop, prepare and cook such meals?</p>
<p>‘Information’ includes examples of written or electronic data such as recipe and nutrition books, periodicals and pamphlets and web sites and online help from personal contact experts. Information obtained from these sources would help to inform an individual’s knowledge.</p>	<p>2. Thinking about nutritional family-type meals what <i>information</i> must individuals have to shop, prepare and cook such meals?</p>
<p>‘Skills’ require an application of <i>knowledge</i> and include hands-on practical ability to be able to plan, shop, prepare and cook a meal.</p>	<p>3. Thinking about nutritional family-type meals what <i>skills</i> must individuals have to shop, prepare and cook such meals?</p>
<p>‘Resources’ may include human (energy, motivation, people other than teachers or facilitators of cooking programs) and non-human (time, cooking equipment and transport) assets that would assist an individual to plan, shop, prepare and cook a meal.</p>	<p>4. Thinking about nutritional family-type meals what <i>resources</i> (other than knowledge, information and skills) must individuals have to shop, prepare and cook such meals?</p>

### **3.3.4 Data Collection Procedure**

The questions were posed to the food experts through face-to-face, semi-structured interviews to determine the knowledge, information, skills and resources required by individuals to make nutritional ‘family-type’ meals.

Prior to the interviews, participants were provided with a written (on request) or oral definition of the terms used in the Interview Questions (**Table 3.2**). These definitions were provided to ensure that participants had a clear understanding of the terms ‘knowledge’, ‘information’, ‘skills’ and ‘resources’. These terms were closely linked to each other and often used interchangeably and so it was important for the purposes of this study that the data generated were precise in order to facilitate clear categorisation during data analysis. Probes (such as: *What are some examples of these? How is this knowledge informed by your own experiences?*) were used to clarify or to extend the participants’ responses, or when they used the defined terms interchangeably.

The interviews with the food experts were conducted in their workplace office or private home between September 2007 and February 2008. The duration of the interviews ranged from twelve minutes to fifty-seven minutes with an average duration of thirty minutes.

Each participant was provided with the Plain Language Statement and the Consent Form (**Appendix F**) in advance of the interview. All participants agreed to continue with the interview process and signed the Consent Form prior to the interview being recorded. The participants received no incentives or gifts for their participation.

The interviews were audio-taped, transcribed and then analysed by the researcher using the *N-Vivo 7* software program (QSR International Pty Ltd, 2006).

### **3.3.4 Ethical approval**

Deakin University Human Resource Ethics Committee provided ethics approval for this study (EC 127 – 2007).

### **3.4 Data Analysis**

#### **3.4.1 Content analysis and coding procedures**

Content analysis based on Mayring's recommendation for thematic analysis (Mayring P, 2000) was used to identify emerging themes from the interviewees' responses.

The transcribed text was segmented into similar categories, which were then organised and coded by common themes and patterns in the text. Coding was manually checked by returning to the *N-Vivo* program to check that the text content matched the coding of specific concepts. For example, text describing the concept of 'motivation' but did not specifically use the word 'motivation' was able to be pinpointed through a manual check.

Dated memos were recorded in the *N-Vivo* program which served as the researcher's reflective diary, deemed as a mandatory step towards achieving data validity and minimising researcher bias (Britten N, Jones R, & al, 1995; Malterud K, 2001; Rolfe G, 2006).

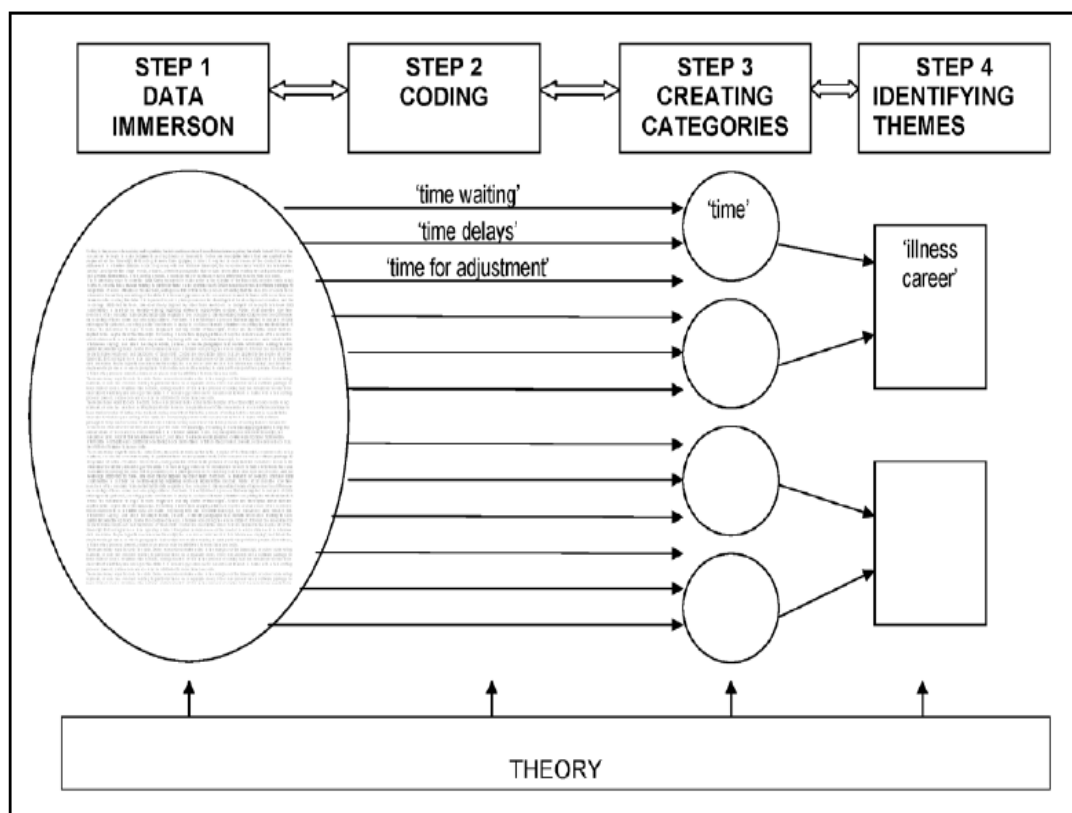
The immersion and diarising process enabled the researcher to move constantly in and out of the data, a critical feature of data analysis known as constant comparative analysis (Glaser B & Strauss A, 1967). This process was used to identify comparisons and contrasts to be made between the food experts (Green J et al., 2007).

The data were scrutinised for contradictions made between and within the groups of food experts and to minimise bias towards one group of food experts (home economics teachers) sharing the same professional background as the candidate (Green J et al., 2007; Lincoln YS & Guba EG, 1985; Patton MQ, 2001).

The immersion process helped to ascertain saturation, the point at which there were no new ideas and insights generated from the data (Green J et al., 2007). At saturation, strong repetition in the categories was observed which signalled the next stage of the data analysis process of selective coding.

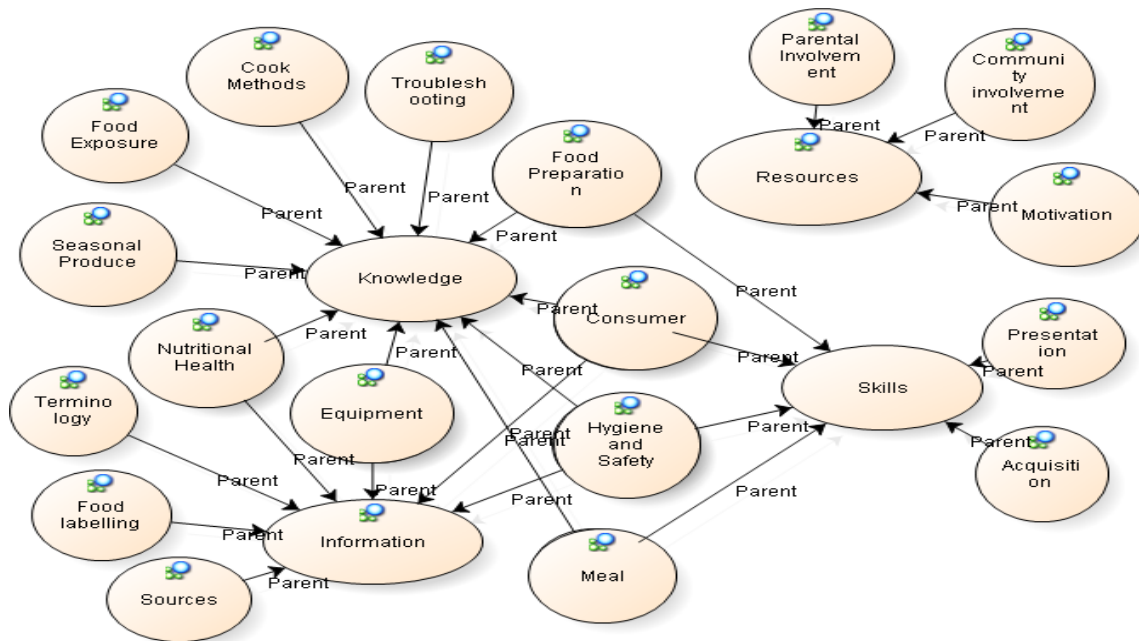
The transcribed text was organised and integrated into selected codes to form the preliminary categories of ‘Information’, ‘Knowledge’, ‘Skills’ and ‘Resources’ deemed important to include in skill-based healthy eating programs in schools. From these categories, ‘themes’ emerged which signalled the point of interpreting the issue under investigation. The process is illustrated in **Figure 3.1** below which was used as a guide to the data analysis for this study.

**Figure 3.1** Four steps of data analysis to generate best qualitative evidence (Green J et al., 2007)



**Figure 3.1** was used as a guide to develop a model (**Figure 3.2**) to depict the relationship between the emerging codes and categories from the content analysis of the transcribed interviews. After checking for duplication of content through the iterative process of data analysis, several of the original sub-themes were conflated into the themes depicted below (**Figure 3.2**).

**Figure 3.2 Model depicting the relationship and interrelationship between categories and themes in Study 1 (screen captured in *N-Vivo* program)**



### 3.5 Findings

The themes and sub-themes were classified into twelve individual declarative or procedural skills which represented the twelve essential food skills identified by the food experts. Three themes, ‘Safety and Hygiene’, ‘Consumer’ and ‘Meals’ were classified as declarative *and* procedural skills when they were subsequently represented in more than one of the categories by the interviewees.

#### 3.5.1 Declarative skills

This section describes the pre-cursory decision making knowledge and information required by an individual to make a healthy meal as summarised in **Table 3.3**.

More detail and selected comments made by food experts are included in text following the Table.

## Declarative skills

**Table 3.3 Summary of the Essential Declarative (Knowledge and Information) Skills**

<b>Meal</b>	<b>Consumer</b>	<b>Nutritional Health</b>	<b>Equipment</b>	<b>Cookery Methods</b>	<b>Hygiene and Safety</b>	<b>Use of Terminology</b>
<p><b>Knowledge</b></p> <p>Plan a variety of appetising meals that meet the dietary and sensory requirements of household members.</p> <p>Accurately calculate food amounts based on portion size and appetite demands of household members to reduce food wastage and plate waste.</p> <p>Match allocated food budget with recommendations</p>	<p><b>Knowledge and Information</b></p> <p>Recognise and purchase quality and value-for-money food produce through personal or on-line shopping. <sup>1.</sup></p> <p>Purchase appropriate quantities of food to match personal demands and reduce plate waste. <sup>1.</sup></p> <p>Negotiate food purchases with food vendors. <sup>1.</sup></p> <p>Know how to store, prepare and cook food post-purchase.</p>	<p><b>Knowledge</b></p> <p>Know the importance of eating a healthy meal in relation to meeting daily activity requirements.</p> <p>Know the importance of enjoying and consuming a wide variety of nutrient dense food.</p> <p>How to select nutrient dense food in relation to vegetarian and healthier alternatives and portion size. <sup>1.</sup></p>	<p><b>Knowledge</b></p> <p>How to use a cook’s knife confidently, safely and skilfully.</p> <p>How to choose, use, clean, maintain and store essential items used in the kitchen.</p> <p>How to select alternative items of equipment in situations where the most appropriate item of equipment is not available.</p> <p>How to adapt different items of equipment for different cooking or preparation purposes.</p>	<p><b>Knowledge</b></p> <p>Know the basic traditional and modern methods of cookery and how they affect the nutritional value, energy use, preparation and cooking time of foods and product outcome.</p> <p>How to match food products with appropriate cookery methods to achieve the best product outcome and value-for-money.</p>	<p><b>Knowledge</b></p> <p>How and where to store food.</p> <p>Know the longevity of fresh food produce.</p> <p>How to safely defrost frozen food</p> <p>How to clean and use purposefully designed equipment and safe food handling techniques to prevent cross contamination of raw and cooked food.</p> <p>How to clean equipment, appliances, cooking and</p>	<p><b>Information</b></p> <p>Follow instructions to deconstruct and accurately follow recipes and produce successful meals and food products.</p> <p>Understand descriptive and generic instructions.</p> <p>Understand complex health terms and health promotional</p>

<p>made in healthy eating guidelines.</p> <p>Allocate time in advance to write a shopping list.<sup>1</sup></p> <p>Know how to stock a pantry and refrigerator of perishable and non-perishable items consumed on a regular basis.</p>	<p><b>M</b>ake ‘food miles’ and ethical purchase decisions.<sup>1</sup></p> <p><b>C</b>onsider food packaging on the environment.<sup>1</sup></p> <p><b>C</b>onsider food processing on cost and nutritional value of raw food.</p>		<p><b>H</b>ow to operate small and large kitchen appliances.</p> <p><b>H</b>ow to evaluate appliances purchase value in terms of frequency and versatility of use.<sup>1</sup></p> <p><b>H</b>ow to use a microwave oven as a cooking as well as a re-heating or defrosting appliance.</p>		<p>eating utensils.</p> <p><b>H</b>ow long to cook ‘at risk’ fresh food (fish, meat, poultry and dried soaked beans) to reduce food poisoning risk.</p>	<p>terms.</p>
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1. Incorporates procedural consumer and meal knowledge ‘shopping scripts’



## **Meal Knowledge**

This skill encompassed the decisions required to plan and budget for healthy meals which accommodate family members' taste preferences and dietary requirements.

All food experts spoke about the need to plan ahead and make a shopping list based on the meals scheduled for the week and the household budget. Homemakers indicated that planning ahead allowed time for young people to check pantry and refrigerated food stock and consult information sources such as recipes, web sites (and mothers!) to ensure that a variety of interesting and flavoursome meals using seasonal produce was produced. Several dietitians highlighted budgeting and healthy meal planning based on the five food groups, complementary protein sources (animal protein replacements to reduce costs or to cater for vegetarians), food combining and fresh produce.

## **Consumer Knowledge**

This skill encompassed the development of confidence in young people to shop for fresh food in the marketplace and to consult with food vendors.

Food experts spoke about the importance of providing young people with shopping experiences to broaden their perceived and actual over-reliance on supermarkets for their food purchases (as verified by the young independent food experts). Knowledge of the costs and uses of different cuts and varieties of meat and whether it was organic was indicated as an important factor enabling young people to make effective consumer decisions. Emphasis was made on schools taking responsibility for increasing young people's awareness on environmental sustainability and 'food miles'.

*I think schools have a responsibility in helping children understand environmental sustainability in terms of food and the costs of food practices and production – and how young people can make better choices, particularly in regards to knowing about ethical farming and manufacturing practices.*

**KL, Community Dietitian** (lines 45-48)

## **Nutritional Knowledge**

This skill encompassed the importance of nutritional knowledge for young people in the context of them enjoying a wide variety of food and fulfilling their daily activities.

Those experts working with young people acknowledged that teaching young people nutrition in terms of short or long dietary health outcomes was pointless. They considered it was more productive to focus on the energy and stamina producing qualities of food and how nutrient dense food would contribute to ‘looking good’ and achieving optimum body shape and weight.

Health professionals including dietitians, chefs and home economics teachers were keen to connect young people with nutrition but they all recognised the dilemma that teaching nutrition could jeopardise the healthy relationship young people have with food.

*It would be better to link poor nutrition to sport or peak performance ability – that’s important for young men and for girls who might be interested. But for girls you could focus on their needs for dancing or study. It might also be useful to incorporate information about alcohol as it is linked to kilojoule intake and weight and therefore that has a place in a school foods program too.*

**KL, Community Dietitian** (lines 46-50)

Supporting this, young independents made no mention of wanting to know about nutrition in terms of their short or long term health. Instead, they were keen to know about nutrition to help them make effective food purchase decisions as they felt that food shopping was confusing. They wanted nutritional knowledge about food additives, food portion sizes, vegetarian diets and making healthier food options tastier.

## **Equipment Knowledge**

This skill encompassed the confident and correct use of equipment, particularly knives and the ability to substitute cheaper or alternative items of equipment when the more appropriate item was unavailable.

Home economists (those working in industry) and chefs recommended introducing young people to a cook's knife rather than compromising with a small utility knife, to develop confidence and proficiency in an environment where young people could practise safely and experts could oversee and correct technique. Homemakers, home economics teachers and chefs nominated basic items of equipment to stock a kitchen but recognised that young independents would not have the money, nor would be willing to spend that money, on what could be perceived as unnecessary kitchen gadgets or 'toys' if they could utilise cheaper alternatives.

*... on cooking shows they don't show you a substituted utensil or item of equipment – for example you don't need a whisk – you can use a fork to whisk up scrambled eggs. So those very practical skills and knowing what to do when you don't have a particular item of equipment.*

***KL, Home Economist freelance*** (Lines 69-72)

### **Cookery methods**

This skill encompassed knowledge of the basic traditional (steaming, roasting, boiling, poaching, grilling, baking, frying, stewing) and modern methods of cookery (microwaving, stir-frying in the western world) and how they affect the nutritional value, energy use, preparation and cooking time of foods and product outcome.

*Knowing about different methods of cooking- steaming, frying and healthier ways of cooking such as oven-baking instead of deep frying. And knowing that different methods of cooking provide creative opportunities to adapt recipes so instead of frying or grilling fish you can steam it Asian style which is a lot healthier for someone trying to reduce their cholesterol intake. Also, if you steam something it's less likely to be crumbed and then it is suitable for coeliacs.*

***EL, Young independent, training to be a chef*** (lines 43-48)

Chefs, homemakers and home economics teachers talked about the individuals' need to evaluate the time, energy and labour costs involved with preparing and cooking food depending on the method and the cost of the meat cut selected, and to factor these into their purchase decisions.

*Knowledge of traditional versus more modern cooking methods such as stir frying and to realise that you don't always have to have the latest gadget – you can get the same effect of a slow cooker with a simple casserole dish. There is a trade off there because it takes gas and a long time to cook a casserole and you have to pay for the energy used to cook the food if you are undertaking long slow cooking.*

**DR, Home economics teacher, retired** (lines 19-23)

## **Hygiene and safety knowledge**

This skill encompassed knowledge on personal hygiene, food safety and handling and cleaning operations of kitchen and equipment.

All the food experts identified hygiene and safety knowledge as an important component to incorporate into skill-based healthy eating programs. Chefs, home economics teachers and dietitians outlined specific hygiene and safety measures already incorporated into their training programs and daily practice whilst homemakers mentioned that their knowledge often came through their own experience. Like homemakers, young independents indicated that this knowledge was acquired frequently either through trial and error through experiencing an unpleasant bout of food poisoning or through their training at fast food providers.

## **Use of Terminology**

All the participants talked about the need for clear, generic and accurate terminology so that individuals have a shared understanding of how to confidently follow recipe instructions and produce successful meals and food products:

*People say to me “what’s sauté?” and I say “stir fry” or “heat for a few minutes in a fry pan” and these are the terms I use in my adult education classes. So you make the terms generic. So when you write up a recipe and you use a term like sauté you put in brackets ‘stir fry’ so it’s not such an exclusive club because when people use language it excludes people. If they use language or acronyms, some people in your audience don’t know what you’re talking about so I think that it’s important to make*

*it really easy for people to understand so that it's welcoming.*

**WK, Freelance Chef** (lines 76-82)

## **Summary**

The knowledge required to make a healthy meal includes the declarative skills to plan a meal based on the budgetary demands and the nutritional and sensory requirements of the family; the identification of appropriate equipment available; the evaluation of suitable cookery methods and understanding of food safety and handling of equipment and kitchen hygiene.

### **3.5.2 Procedural skills**

The next section is divided into two parts: the procedural shopping skills and the procedural task skills required to store, prepare and cook food and clean up after the meal. The procedural shopping skills encompass the shopping scripts of **Figure 3.3** and include the consumer skills, food exposure and seasonal produce knowledge and the sources of information that may be used in this task. The procedural skills are summarised in **Table 3.4** and include how these skills may be acquired (skills acquisition). More detail and selected comments made by the food experts follow the Table.

## Procedural skills

**Table 3.4 Summary of the Procedural (Shopping<sup>1</sup> and Meal Preparation<sup>2</sup>) Skills and Skill Acquisition**

<b>Consumer<sup>1</sup></b>	<b>Seasonal Produce<sup>1</sup></b>	<b>Food Exposure<sup>1</sup></b>	<b>Use information sources<sup>1</sup></b>	<b>Hygiene and Safety<sup>2</sup></b>	<b>Meal Skills<sup>2</sup></b>	<b>Trouble-shooting<sup>2</sup></b>	<b>Skills Acquisition<sup>2</sup></b>
<p><b>Information</b></p> <p>Interpret and act upon food labelling.</p> <p>Evaluate basic and optional equipment items required to stock a kitchen.</p> <p>Compare fresh, frozen, canned and processed foods when purchasing and assessing suitability of those foods for recipes.</p> <p><b>Budget, manage and make good food choices around</b></p>	<p><b>Knowledge</b></p> <p>Select fruits and vegetables in season when cheaper, tastier, more nutritious and readily available.</p> <p><b>Know</b> fruits and vegetables in season when selecting recipes.</p> <p>Evaluate and purchase food produce that is value-for-money, fresh, seasonal and ripe.</p>	<p><b>Knowledge</b></p> <p>Experience a variety of foods from different cultures.</p> <p><b>Support and encourage</b> new food experiences, particularly at a young age.</p> <p><b>Acknowledge</b> importance of family, friends, school and community groups for broadening food</p>	<p><b>Point of Sale</b> food sources provide recipe cards and magazines, informed personnel who assist with produce selection.</p> <p><b>Cook books</b> provide step-by-step and pictorial instructions to construct recipes; shopping information and terminology to assist with recipe construction.</p> <p><b>Internet-</b> provides international food recipe and multiple recipe ideas for one or more ingredients; access to food products not locally available through</p>	<p><b>Skills</b></p> <p>Use knives safely and skilfully to prepare food efficiently and appropriately.</p> <p>Use cooking appliances and equipment appropriately and safely.</p> <p><b>Prepare</b> for food preparation tasks.</p> <p><b>Apply</b> first aid when necessary.</p> <p><b>Store, freeze and</b></p>	<p><b>Skills</b></p> <p><b>Prepare</b> fresh food produce when constructing meals.</p> <p><b>Use</b> flavouring ingredients and seasonings to enhance food and create flavoursome meals.</p> <p><b>Accurately weigh and measure</b> ingredients.</p> <p><b>Use and adapt</b> basic food processing ‘universal’ skills to extend culinary repertoire.</p>	<p><b>Knowledge</b></p> <p><b>Know</b> that successful food product outcomes depends on careful reading and following of recipe instructions.</p> <p><b>Know</b> why food product outcomes were not successful.</p> <p><b>How</b> to rectify</p>	<p><b>Provide</b> opportunities to practise and repeat tasks to develop confidence, especially those with special needs.</p> <p><b>Allow</b> individuals to work individually to develop independence when preparing food.</p>

<p>money.</p> <p><b>Skills</b></p> <p>Make informed decisions to plan, prepare and cook quick healthy meals and snacks instead of buying take away dishes or convenient pre-prepared food products.</p> <p>Share resources including information, time, energy, transport and motivation with others involved with decision making about product outcomes.</p>		<p>preferences, fostering positive food interest and experiences.</p>	<p>on-line shopping services; a source of food and nutrition information for some people.</p> <p>Television- provides inspirational and fun ideas to motivate individuals to cook, particularly if programs have matching cookbooks or DVDs; advertising about food products and health education to assist individuals with purchase decisions.</p>	<p>defrost food to avoid cross-contamination, microbial spoilage and rodent infestation.</p> <p>Evaluate food product labelling information and act upon if and how that food should be used, stored or discarded.</p> <p>Manage the physical environment of a kitchen – keep it clean, hygienic and safe for users.</p>	<p>Deconstruct and organise a recipe into small tasks when constructing meals.</p> <p>Select temperature and adjust timing to control the cooking process.</p> <p>Sequence cooking processes so that all meal components are optimally cooked and ready for service at the same time.</p> <p>Assess, tailor and match food preparation tasks with product outcomes so that food is attractively presented and looks appetising.</p>	<p>unsuccessful food product outcomes.</p>	<p>Allow individuals to work in teams to encourage co-operation and scheduling skills.</p> <p>Encourage individuals to take risks to trial new food tasks.</p> <p>Expose individuals to positive real and simulated independent living experiences.</p>
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<p><b>Adjust serving sizes</b> and purchase precise amounts of food that meet the appetite and budgetary requirements of household members.</p> <p><b>Economise-</b> buy and cook in bulk when food produce is cheaper and store for later use.</p> <p><b>Recognise</b> and purchase cheaper but equally nutritious food alternatives.</p>						<p><b>Manage and perform</b> cleaning tasks.</p>		<p><b>Allow</b> individuals the trial and error process of creating recipe variations to improvise and problem solve.</p>
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### **3.5.3 Procedural shopping skills**

#### **Consumer Skills**

This component encompassed an individual's ability to be an 'informed and smart shopper' who is able to decipher food labels, recognise quality value-for-money food produce and evaluate kitchen tools and kitchen equipment appropriate for their own requirements. These skills would be applied when the individual confidently negotiated with food and product vendors in the marketplace to purchase the tools and the fresh food produce he/she needed to make their own meals, instead of them relying upon take away food and expensive convenience food.

Consumer information included advertisement of new product availability and where individuals could source the product. The skills component included how to use the product or decide between an item of equipment for a particular function, for example why a metal spoon was more effective than a wooden spoon for folding in egg whites.

Chefs and home economics teachers nominated consumer information about purchasing a good set of knives, chopping boards, mixing bowls and saucepans as basic equipment items but acknowledged that other individuals might consider those same items as optional extras. Home economics teachers and chefs recommended that individuals be provided with information so that they could evaluate fresh, frozen, canned and processed foods when purchasing and assessing suitability of foods for recipes and meal requirements.

Some food experts used the term 'food literacy' to describe the preliminary skill required by a young person to read, understand and act upon labels on fresh, frozen, canned, frozen, processed and take away food. This included discriminating between "best before", "use by" and "sell by" terms which is a food safety as well as a consumer issue. This means that individuals have access to information about acceptable levels of additives so that they can discern between the different types of food product.

Information about new food products coming on to the market and how best they could be incorporated into the diet was discussed. Food experts explained how food manufacturers

and advertisers promoted their products for market share and acknowledged how bewildering this was for consumers to make effective food purchasing decisions. One young independent spoke about making young people aware of product placement in the supermarket “and for them to realize that the most accessible foods within easy reach are not always the healthiest.” *GC, Young independent* (lines 17-18)

Providing opportunities for young people to know how to interpret food label information, including meaning of amounts and serving sizes was mentioned by several home economics teachers. This became even more important for consumers to be ‘food literate’ as more people experienced food intolerances and allergies. One young independent food expert articulated this:

*Food labels are ambiguous – even if you can read labels then how does that equate to the individual and what they need and where does that fit into the daily diet? Also a product might be 99 per cent fat free but it might be higher in sugar and sodium. So it’s not simply having an understanding of being able to read the food labels it’s more about understanding the nutritional background. And it’s not just a matter of picking off something off the supermarket shelf and saying that’s low in fat – because it might be low in fibre or have high sodium as a trade off.*

*EL, Young independent* (lines 10-16)

The more experienced food experts acknowledged that young people are discriminating consumers. However, they recognised that their confidence in negotiating with food vendors at markets, local greengrocers and butchers may be limited. They also may have limited access to such retailers. This may preclude them from buying quality and cheaper produce from these sources and subsequently lead to a reliance on supermarkets for their food requirements.

Young independents reported using sources other than supermarkets and they shopped around for bargains, understood marketing terms, recognised value-for-money produce and used this knowledge to help them make purchase decisions. Whilst these participants agreed that supermarkets were convenient as a ‘one-stop’ shop, issues such as family-sized packaging created storage and scaling down recipe problems.

Finally, the older informants spoke about consumer skills that would help young people to evaluate and purchase value-for-money food produce. They included buying second grade vegetables for soup, and identifying seasonal and ripe fruits and vegetables and fresh meat, fish and poultry. ‘Buying the best they can afford’ was a recommendation made by several chefs to ensure that the end product was successful and consumed by other household members.

Home economics teachers and chefs suggested teaching young people about cheaper but equally nutritious food alternatives to expensive premium meat and fish and how best to store food in preparation for successful cooking.

### **Seasonal Produce Knowledge**

Whilst seasonal produce knowledge was applied in fresh food purchasing, this skill was identified as a separate component to consumer skills by the food experts.

Seasonal produce knowledge was specifically identified by chefs, dietitians, home economics teachers and homemakers as the basis for selecting recipes according to the seasons when fruits and vegetables are usually at their best and cheapest. This component was not nominated by any of the young independents.

*You also need to know about seasonal variations of food – I know that you can buy food all the year around now but if you know what to buy fruit and vegetables in season it has the best flavour , the best nutritional value and the best price.*

***DR, Home Economics teacher, retired*** (lines 11-13)

### **Food exposure**

This component encompassed the experiential food opportunities in a positive school and home setting that encouraged young people to try new foods and to practise trialling new recipes so that their food preferences are broadened.

Both professional food experts and young independents agreed that it was important for adult carers to take initial responsibility to tap into children’s innate enjoyment and curiosity of

experimenting with food by helping in the kitchen. Young independents acknowledged that most of their food exposure experiences came initially from their families or adult friends of their families. They reported gaining such experiences through direct observation, experience in helping with cooking or serving tasks and later through shared cooking experiences with their own friends:

*I think I got a lot from family as I was growing up. Not just my own mother but all my friends' mothers – I'd go out for dinner a lot at friends and I would see a lot of different things and we were always asked to help so you knew how everything was prepared and how to do it even at friends' houses ...*

**BI, Young Independent** (lines 22-25)

In contrast, older food experts reported they thought parents were resistant to such experiential learning as food preparation tasks took longer and were messier when children were involved. They expressed the belief that young people did not have the opportunity to cook at home as parents were too tired or sick or did not have the skills to cook. Consequently, they believed that young people experienced their first time cooking and trialling of some new foods at school.

Schools were thus identified by these food experts as a critical setting to expose young people to positive food tasting and cooking experiences, particularly for those young people who have had limited access to positive food and eating experiences with their families.

*...it should start in school. If they haven't had the training in school of course they are going to buy take away. It's because they don't know how to make a meal in 5 minutes. It's a lack of knowledge, it's a lack of education and because it's a young person who didn't do it in school, they buy take away as a teenager and when they have their own families they are going to do the same thing.*

**CRR, Freelance Chef** (lines 30-34)

Home economics teachers in schools were nominated by all the food experts as having an important role in exposing young people to new food taste experiences outside their traditional and culturally acceptable foods. Taking students to restaurants and markets or having them host international days at school were identified as opportunities that would help

young people to enrich their outlook culturally and socially, not only by exposing them to different foods but establishing links between food and people from different cultures.

### **Use of Information Sources**

Awareness and use of information sources were identified by the food experts as useful resources that would provide young people with ideas to assist them to prepare tasty and quick meals. They explained how each of the information sources had merit.

### **Point of sale food sources**

Point of sale food sources (supermarkets, farmers markets and food expos) were considered to be useful for providing accessible and simple information via recipe cards and supermarket magazines. Supermarket magazines were considered to be more accessible than 'static' and expensive cook books while recipe cards were considered helpful because the relevant ingredients required to make the recipe were available at the same location.

*Young people could get information from the supermarket via the magazine 'Fresh' but they could also have a magazine aimed at young people with recipes that they can do and are healthy and meet their budget and have the products available in the store. This could be the basis of their cooking and it could help them to build their repertoire as they get older and more experienced.*

***EL, Young Independent*** (lines 27-31)

Home economics teachers and chefs were more likely than young independents and homemakers to mention green grocers, butchers, markets, farmers markets and food expos as information sources as they considered store holders to be informed and could assist the individual with product selection and cooking ideas. They identified that these sources sometimes provided written information about fresh food produce to further assist the consumer at point-of-sale.

All the food experts talked about people's tendency to make impromptu meal decisions at the time of shopping so these sources were recognised as helpful for meeting these behaviours.

## **Cook books**

All the participants nominated cook books as useful sources of information, particularly if they included pictorial, step-by-step instructions, a glossary of culinary terms and terminology of processes, such as basting, whisking, sautéing, blanching and folding in. Nevertheless, chefs and home economics teachers bemoaned that whilst ‘coffee table’ cook books looked attractive they were too expensive, complex or ‘static’ (provided no variations). Conversely the ‘perfect’ cookbook provided all the attributes listed above and included ‘no fail’ recipes.

## **Internet**

Everyone nominated the Internet as the most popular source of recipe ideas for young people. Young independents verified this and spoke about the ease of ‘googling’ an ingredient to identify recipes but expressed feeling overwhelmed when too many different recipes or recipes using unfamiliar terminology or imperial measures were returned.

Some food experts shared these experiences and spoke about the need for young people to discriminate between web sites in order to generate accurate food and nutrition information as many recipes sourced from the Internet were not properly trialled and ‘don’t work’.

*They will get their information from the Internet and to some extent from magazines – they are bombarded with information- there is no shortage of information but accurate information from the Australian Consumers’ Association and Nutrition Australia would be helpful. But I think that the Internet and even SMS (Short Message Service) and podcasts are good sources of information; however, these need to come from credible sources and it’s important for teachers to teach their students’ consumer literacy so that they can discern between the information put out by a food manufacturer, compared with a fast food chain compared with Nutrition Australia. Schools have ICT and visual literacy but they also need to have food and nutrition literacy.*

**HA, Home Economics teacher** (lines 31-39)

## **Television**

The food experts debated the merits of television, particularly television chefs, as a practical source of food and nutrition information. Cooking programs were perceived as fun but were considered to be more ‘infotainment’ than educational. Chefs and home economics teachers felt that the recipes produced by television chefs were too complex and not relevant to families and were screened at times that did not reach target audiences.

Food and health information on television had potential but the community youth worker, young independent and chef food expert groups felt that this advertising did not fulfil consumer needs nor was it screened at times which had the most impact on young people and families.

### **3.5.4 Procedural meal preparation skills**

In addition to the information, knowledge and skills to be able to shop for food, the participants identified that young people needed to have the hands-on skills required to make quick and healthy meals and to manage and clean the kitchen. The next section outlines the procedural meal making skills including the hygiene and safety and meal skills and the troubleshooting knowledge to anticipate and rectify culinary mistakes.

#### **Hygiene and safety skills**

The participants identified that hygiene and safety skills required by young people to include the application of the knowledge required to prepare and store food safely and hygienically and to manage the kitchen environment.

All the experts nominated hygiene and safety skills in the kitchen as a fundamental component to include in any skill-based program. At the operational level, they identified that these skills included an ability to use and store sharp knives and cooking equipment (saucepans, baking trays, blenders, food processors, grillers and ovens) safely to prevent cuts, scalds and burns.

They all spoke about the importance of individuals' preparation behaviours for food preparation tasks, including tying hair back, washing hands before and after food handling and wearing an apron and applying first aid skills when necessary.

One homemaker spoke about the skills required to act upon food labelling and evaluate whether food should be stored or discarded. Other food experts spoke more generally about food storage skills such as transporting food home from the supermarket, how best to store fresh food produce (particularly fresh meat and poultry) to prolong freshness and quality and how best to safely thaw frozen food and to preserve its quality.

Most of the experts nominated kitchen management as an important skill. These skills included cleaning, maintaining and storing equipment (knives and other utensils, saucepans, chopping boards) and cleaning work surfaces to reduce food cross-contamination and rodent and insect infestation. Those food experts working with young people explained that they trained young people to incorporate these tasks as an essential component, and not an adjunct, to the routine and process of preparing and cooking meals.

### **Meal skills**

Meal skills incorporate all stages of the food preparation and cooking process from the moment a meal component is taken from the pantry or the refrigerator, to the food being prepared and cooked ready for meal service. This component includes choosing and applying food preparation techniques (peeling, slicing, dicing, chopping and browning) safely and correctly and matching appropriate technique with the style and purpose of the dish. This means adapting meal components and basic food preparation skills to create meal variations. Young independents nominated this as a useful skill.

The participants included the declarative skills involved in the preliminary thinking through the meal process and carefully reading recipes; deconstructing them into manageable tasks so that the meal components are prepared and cooked sequentially, ready for service at the same time. Homemakers and young independents nominated the importance of coordination of the cooking process, though it is one of the hardest skills to learn and to get right. Many commented that food preparation timing and sequencing were skills they learnt through trial



and error whereas chefs and home economics teachers talked about this being a crucial component that they taught in their skill-based programs.

Some chefs spoke about the skills to assess, tailor and match food preparation tasks with product outcome. For example, an individual might invest more time and effort dicing vegetables when used in a clear vegetable soup, compared with roughly chopping vegetables in preparation for a pureed soup, so that the soup was presented attractively and stimulated the appetite of the diners.

Finally, the chefs and home economics teachers recommended teaching young people how to manage cleaning tasks pre- and post- food preparation and cooking as part of the process of meal preparation.

### **Troubleshooting**

Troubleshooting refers to the set of skills used by individuals to anticipate or avoid culinary mistakes and to know how to rectify meals when something goes wrong. Chefs, homemakers, home economics teachers and dietitians talked about troubleshooting as an important component to include in a skill-based program. Teaching troubleshooting skills would serve to reassure young people that mistakes do happen but can be anticipated with cooking practice and experience or avoided by assessing recipes and reading and following instructions before and during the cooking process. Troubleshooting was not identified specifically by the young independent food experts.

*So a lot about cooking is trial and error and you never see chefs on TV making mistakes because all their mistakes are made off-screen. A lot of people think that when you make something the first time it should turn out perfectly and that's simply not true. I think troubleshooting ideas are important to include as it gives people an explanation of why something didn't turn out.*

***KL, Community Dietitian*** (lines 59-63)

## Skills acquisition

Finally, everyone felt that the process of learning was equally important as learning the essential skills. Suggestions and how these skills could be acquired are summarised in **Table 3.4**.

### 3.5.5 Resources

Question four focused on ‘Resources’ and provided opportunities for food experts to identify components (additional to knowledge, information and skills) that *they* perceived as essential to include in a skill-based healthy eating program. Rather than specifying individual assets, however, food experts interpreted the term ‘resources’ more broadly as recommended strategies they had experienced (as young independents and homemakers) or had incorporated into, and used successfully in their own programs.

Resources are those components which support the success of skill-based healthy eating programs but they do **not** form part of the essential skills checklist. Instead, they consist of recommendations and suggestions made by the food experts on how these skills could be taught and incorporated into a school skill-based healthy eating program.

The resources were classified as one of three themes: motivation, parental involvement and community (friends, peers, community and government) involvement as summarised in **Table 3.5**. The participants’ suggestions and comments related to the development of education programs follow the Table.

**Table 3.5 Resources identified to support skill-based programs**

<b>Motivation</b>	<b>Parental involvement</b>	<b>Community involvement</b>
<p>Allow young people to cook food that they enjoy eating.</p> <p>Allow young people to practise tasks, make mistakes and learn through trial and error.</p> <p>Teach skills through recipes and meals relevant to young people’s world.</p> <p>Encourage young people and their peer group to keep an open mind when trying new food.</p> <p>Allow young people to be involved with program design.</p> <p>Provide opportunities for young people to enjoy cooking through fun, simulated ‘cooking show’ contests.</p> <p>Reward young people with prizes.</p> <p>Use food-related and environmental projects to generate interest in cooking.</p> <p>Match new food experiences with enjoyable social experiences.</p> <p>Provide opportunities for young people to start with recipes that ensure success to build confidence.</p> <p>Use ‘story telling’ to entertain and create a positive feeling when exposing young people to new food.</p>	<p>Acknowledge parents are role models and influence the eating patterns of their children.</p> <p>Encourage parents to provide opportunities for their children to practise food skills at home.</p> <p>Encourage parents to work alongside their children to learn new food skills and rituals that could be used at home.</p>	<p>Community resources provide information to support skill-based healthy eating programs.</p> <p>Community resources extend, enrich and endorse skill-based healthy eating programs in schools.</p>

## Motivation

One of the recurring themes throughout the interviews was the topic of motivation. The experts perceived motivation to be integral to the success of the program and the key that engaged young people. They made many suggestions on how development of motivation could be incorporated into program design.

All of the participants spoke about the importance of creating a positive and fun atmosphere that allowed young people to experience success through practice, trial and error.

*...if food is taught as an enjoyable thing then practice will come. Practice is essential- you can do well the first time but you can do better the next time. It's like learning to drive – practice brings speed, competence and ongoing motivation.*

**KL, Freelance Home Economist** (lines 110-112)

*Behaviour changes not only when it is achievable but also when it is pleasurable.*

**RZ, Chef delivering community cookery programs** (line 108)

Those who worked with young people spoke about the importance of engaging the peer group, recognising that young people valued each other's opinion. They encouraged young people to keep an open mind when trying new food and to participate in program design. They recognised the role of television in young people's world and subsequently provided opportunities for them to have fun with food by simulating television cooking shows.

Several experts spoke about engaging young people through food related projects that tapped into young people's environmental awareness and involved them in growing their own vegetables at home or at school.

*So bring in an environmental focus. Vegetable gardens – and that can be a source of inspiration – create a vegetable garden at school might motivate them to create their own vegetable garden at home. It comes back to how best we can engage young people into enjoying food and the cooking process. And young people have a real affinity with what is happening with the environment.*

*So even excursions or mini camps so that they have a practical experience with what is happening in the environment.*

**KE, Community Nutritionist** (lines 142-147)

Professional food experts (home economists and chefs who delivered community-based cooking programs) successfully used ‘story telling’ and ‘games’ to engage not only young children but older young adults. They linked history, amusing anecdotes and culture with the food experiences, especially new food that was beyond the realm of young person’s taste experiences.

*And I tell them funny stories like a funny thing happened with the beetroot and how it boiled over and went on the white tablecloth not (in an authoritative voice) ‘don’t cut the stems off because the colour will bleed.’ People love something which makes it accessible and enjoyable ...and human. And it adds something to people’s lives – why would people learn to cook otherwise? And I will say to young kids ‘do you love cooking?’ and I say to them ‘cook what you love to eat...enjoy cooking’ and I think just to encourage them –young people and older people. I think that it’s really important to make it a positive thing.*

**WK, Chef, delivers community cooking programs** (lines 29-35)

Several recommendations from food experts tapped into cultural values, including this young independent woman who linked Australian ‘mateship’ mores as a way of fostering cooking interest in young men.

*There’s still the blokey Australian ideology that women belong in the kitchen and the men, if they are going to cook anything, it will be outside on the barbecue. So I think one way of engaging young men is to start with a barbeque because there is no social stigma attached to men having success with the barbeque... And there are so many recipes that you could cook on a barbeque that take time and effort – so that’s a fantastic way of getting men involved in cooking. And most of them will enjoy that and then they will transfer that knowledge to the frying pan or the oven – and it’s a stepping stone. In Australia there is such an emphasis on mateship – I mean that’s what Australians do - have a beer with their mates around the barbie. I mean even in boys’ schools you could have barbeque workshops alongside woodwork classes.*

**GC, Young independent** (lines 122-126)

Experienced food experts including chefs, home economics teachers and homemakers spoke about how they prepared young people for independent living (students and their own young adult children leaving home for the first time) so that they associated cooking with enjoyment. These tasks were made easier if young people were given a selection of basic tools and equipment, a list of essential pantry items and basic favourite recipes along with the opportunities for them to practise the associated skills before they left home.

One home economics teacher encapsulated this and the relevance of the link between creating the love and enjoyment of cooking and motivating young people to cook healthy meals.

*So if it's relevant they are going to be more likely to go home and practice; and more likely to do it and love it. So if they have the passion and the motivation they are less likely to get take away. And if you teach them the healthy, quick way of cooking then they are more likely to just do it. So keep it relevant to keep them engaged...*

**TO, Home Economics Teacher** (lines 56-60)

## **Parental Involvement**

All the informants acknowledged that parents shape their children's eating behaviours, certainly in the childhood years, in a positive or negative way and are subsequently a major influence on young people's eating behaviours.

*...so getting the link back to the parents is important because they are a significant influence on a child's life. So if you are trying to expect a kid to practise these skills at home it's going to be challenging if the parents aren't engaged. And a lot of kids don't leave home until after they finish university so a lot of the skills they have learnt at school are forgotten if they don't have the opportunity to practise the skills at home. So you end up cooking the same way as your parents.*

**MQ, Nutritionist** (lines 125-130)

A skill-based program involving parents provided opportunities for parents to learn new food skills and eating rituals alongside their children (particularly if the parents have limited skills or are recent immigrants). However, the experts agreed that it was difficult to involve parents in these events if both parents worked during school hours. Some of the strategies that the

experts used to involve parents included inviting parents or grandparents along to workshops, special celebratory occasions or cultural days at schools.

The experts spoke about supporting and encouraging parents to allow their children to practise food skills at home and be more involved in family decision making related to shopping, preparing and cooking family meals. They considered that early involvement of children helped to ‘future proof’ families’ in their daily challenge of meal making when families are busier than ever with both parents working and young people involved with after-school activities. One home economics teacher described it like this:

*...Dad or Mum might work late or the kids might be darting off to all their activities. So perhaps they could even share the cooking if their children are old enough. So they could prepare the vegetables, or get the meat out of the freezer or even start cooking the vegetables or the meat when they come home from school ...then pop it in the oven and finish off cooking it for an hour. That way they share the jobs of cooking within the family rather than Mum and Dad who usually organise these things...*

**TI, Home Economics teacher** (lines 53-59)

Homemakers and young independent food experts agreed that parents needed to take responsibility to allow their children to build up their food experiences, praising them for the effort and overlooking the ‘mess’ as that was part of the learning process too.

*It's also important to encourage young people to cook and if you stuff up the first time that's okay just keep trying. So if they stuff up the first time they think 'oh well the first and last thing I ever made in the kitchen was a mess'. So often they won't try it again so one thing that I think needs to be developed is to keep trying. I don't think too many parents are happy if kids go nuts in the kitchen and want their kids to clean up after themselves 'cos they never do.*

**GC, Young Independent** (lines 132-134)

## **Community Involvement**

The experts spoke about community resources for two groups of young people: those able to access skill based healthy eating programs in schools and those who needed to rely upon community resources for help with developing their independent living skills. For those

young people unable to access skill-based healthy eating programs in schools, there are community resources available to them but they needed to know how and where to access them and to be able to afford them.

The participants endorsed skill-based healthy eating programs in schools as the most accessible means for young people to develop the skills required for independent living. Further, they recognised that community resources could ‘value-add’ to existing school programs by extending and enriching program content, making it more interesting and fun for the learners and connecting them with their local community. Restaurant and market visits, street culinary tours, guest speakers from industry and chefs-in-residence were all examples of community resources cited by food experts that could be incorporated into program design. Non-government (for example, Nutrition Australia for the Healthy Living Pyramid) and government agencies (for example, National Health and Medical Research Council for the Australian Guide to Healthy Eating model) contributed health promotional information via web sites and pamphlets that enriched and validated program content.

The informants spoke about the importance of exposing young people to such community resources so that they could access them once they left school and lived independently. The friends and peer group of young people as well as their parents were nominated as a collective community resource available to help young people once they left school and lived independently. These networks remained an important source of information and skill development through recipe exchanges and communal food making in each other’s homes, thereby extending the team work experiences gained through skill-based programs at schools.

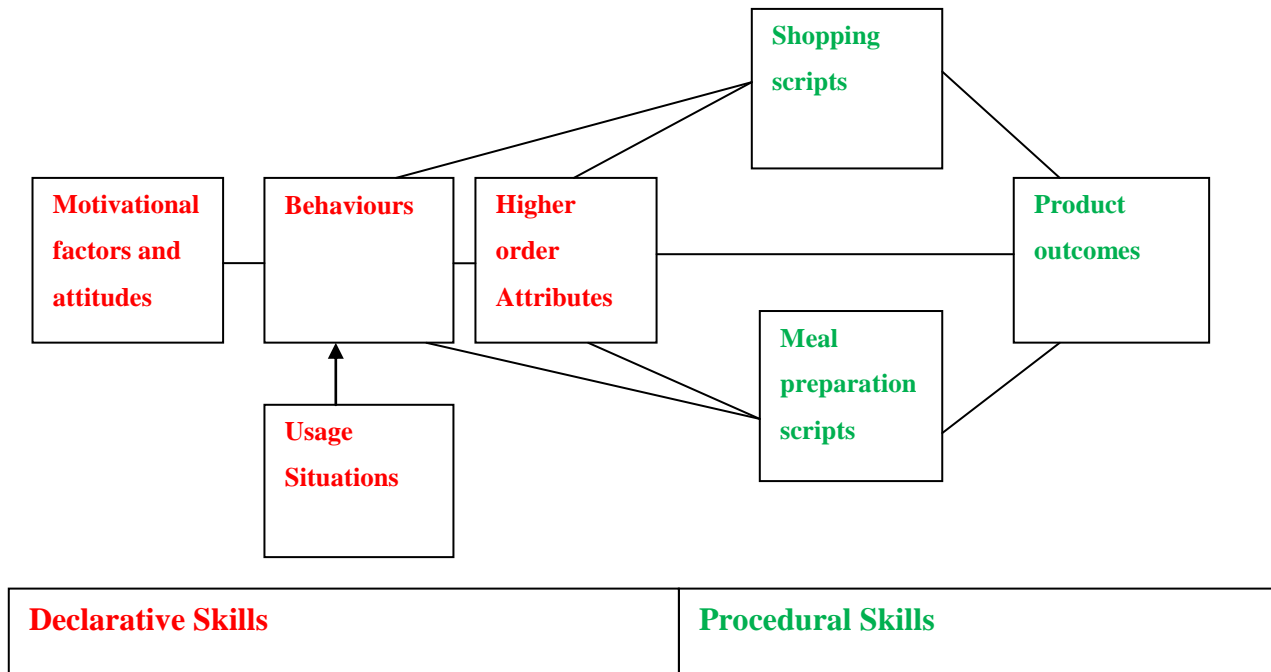
### **3.5.6 Summary of Results**

The interviewees identified twelve essential skills that should be included in skill-based programs and required by young people to be able to cook ‘family-type’ meals and ultimately to be able live healthy and independent lives. In addition to these essential skills, the interviewees made three recommendations which were proposed as adjuncts to enrich and support the success of skill-based programs. The twelve essential skills and the three recommendations are positioned in the proposed model (**Figure 3.3**) based on the Food-



Related Lifestyle Model (Grunert KG et al., 1993) and components of the Eating Competence Model (Satter E, 2007a) (**Figure 2.4**).

**Figure 3.3 A Proposed Model used to position Declarative and Procedural Food Skills identified in Study 1**



<p><b>Recommendations</b></p> <p><b>Motivation</b></p> <p><b>Parental involvement</b> (provide learning opportunities at home)</p> <p><b>Community involvement</b> (healthy eating information, guest speakers, market and restaurant visits)</p>	<p><b>Essential Skills</b></p> <ol style="list-style-type: none"> <li>1. Consumer information and knowledge</li> <li>2. Nutritional health knowledge</li> <li>3. Equipment knowledge (kitchen tools and small and large appliances)</li> <li>4. Cookery methods knowledge</li> <li>5. Hygiene and safety knowledge</li> <li>6. Meal knowledge</li> <li>7. Terminology information (culinary terms and techniques defined and described).</li> </ol>	<p><b>Essential Skills</b></p> <p><b>Shopping Scripts</b></p> <ol style="list-style-type: none"> <li>1. Consumer skills<sup>1</sup>.</li> <li>8. Seasonal produce knowledge (when fruits and vegetables are in season)</li> <li>9. Food exposure knowledge (restaurant, market visits, guest speakers)</li> <li>10. Sources information (where information obtained; cookbooks, Internet, food magazines, television, markets, supermarkets)</li> </ol> <p><b>Meal Preparation Scripts</b></p> <ol style="list-style-type: none"> <li>5. Hygiene and safety skills</li> <li>6. Meal skills</li> <li>11. Troubleshooting knowledge (how to anticipate and rectify culinary ‘disasters’)</li> <li>12. Skill Acquisition</li> </ol>
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1. The 12 essential skills are categorised as declarative and procedural skills and therefore not presented in numerical order.

## 3.6 Discussion

### 3.6.1 Introduction

This study provides original findings which articulate the twelve essential food skills which are recommended for inclusion in skill-based healthy eating programs for young people. For the first time, there is a comprehensive list with the ‘micro-components’ on which program designers can design their programs. This list and an operational definition of ‘food skills’ (Fordyce-Voorham S, 2009a) are the micro components which enable teachers to develop a shared understanding of what they need to include into their programs.

The findings from this study extend the previous work reported by other researchers and program designers of skill-based healthy eating programs. Specifically, they articulate the skills that, hitherto, have been included *ad hoc* or incidentally in many of the skill-based programs which currently and formerly operate in schools and communities throughout the English-speaking world (**Table 3.6**).

**Table 3.6 Inclusion of food skills content in skill-based programs**

<b>Skill-based program</b>	<b>Food skills content</b>
<i>The Cookshop Program</i> (Liquori T et al., 1998)	Listed recipes but failed to match these with the essential skills that would be developed when students prepared and cooked these recipes.
The <i>CookWell</i> program (Wrieden WL et al., 2002)	Designed for low income adults in several Scottish communities, included some of the essential food skills including safety and hygiene skills, terminology and food storage.
<i>Cooking Up Fun</i> (Thonney PF & Bisogni CA, 2006)	Included some of the essential food skills including safety and hygiene skills, terminology and food storage.
<i>Food is Elementary</i> (Demas A, 2001)	Designed for primary children, outlined several essential skills alongside the recipes list, including ‘basic preparation’ and knife skills, consumer skills including reading and evaluating food labels (for older children), seasonal produce

	and food exposure knowledge, hygiene and safety knowledge and skills.
Program (un-named) (Auld GW et al., 1998)	Limited the reporting of food skills in the program to ‘inclusion of food preparation activities’ but described the resources relevant to parental and community involvement.

These reviewed skill-based programs (Auld GW et al., 1998; Demas A, 2001; Klepp KI & Wilhelmsen BU, 1993; Wrieden WL et al., 2002), even those considered to be well designed (Larson NI, Perry CL, et al., 2006; Liquori T et al., 1998), have seldom described their content down to the level described in this thesis as the ‘micro components’. The essential skill findings obtained by this research could be used to extend these programs with the inclusion of the remaining essential skills and recommendations.

The experts made three sets of recommendations for teachers to improve the success of their food skills programs. These included how to motivate students, how to involve parents and how to utilise the resources available in the community. These recommendations were generally consistent with those of designers of prior programs, particularly in relation to the involvement of parents and the community. The programs which involved parents and the community included *Licence to Cook* (Davies LT, 2008), *The Cookshop Program* (Liquori T et al., 1998) , and the *Food is Elementary* (Demas A, 2001) program.

The recommendation regarding motivation of young people was consistent with the work of program designers with such strategies as involving young people in the early stages of program design (Caraher M, 2006; Contento IR, 2008; Thonney PF & Bisogni CA, 2006), making them feel comfortable working with a team (Chenhall C, 2010; Thonney PF & Bisogni CA, 2006; Wrieden WL et al., 2007) and allowing them to select and cook their own recipes (Klepp KI & Wilhelmsen BU, 1993; Thonney PF & Bisogni CA, 2006).

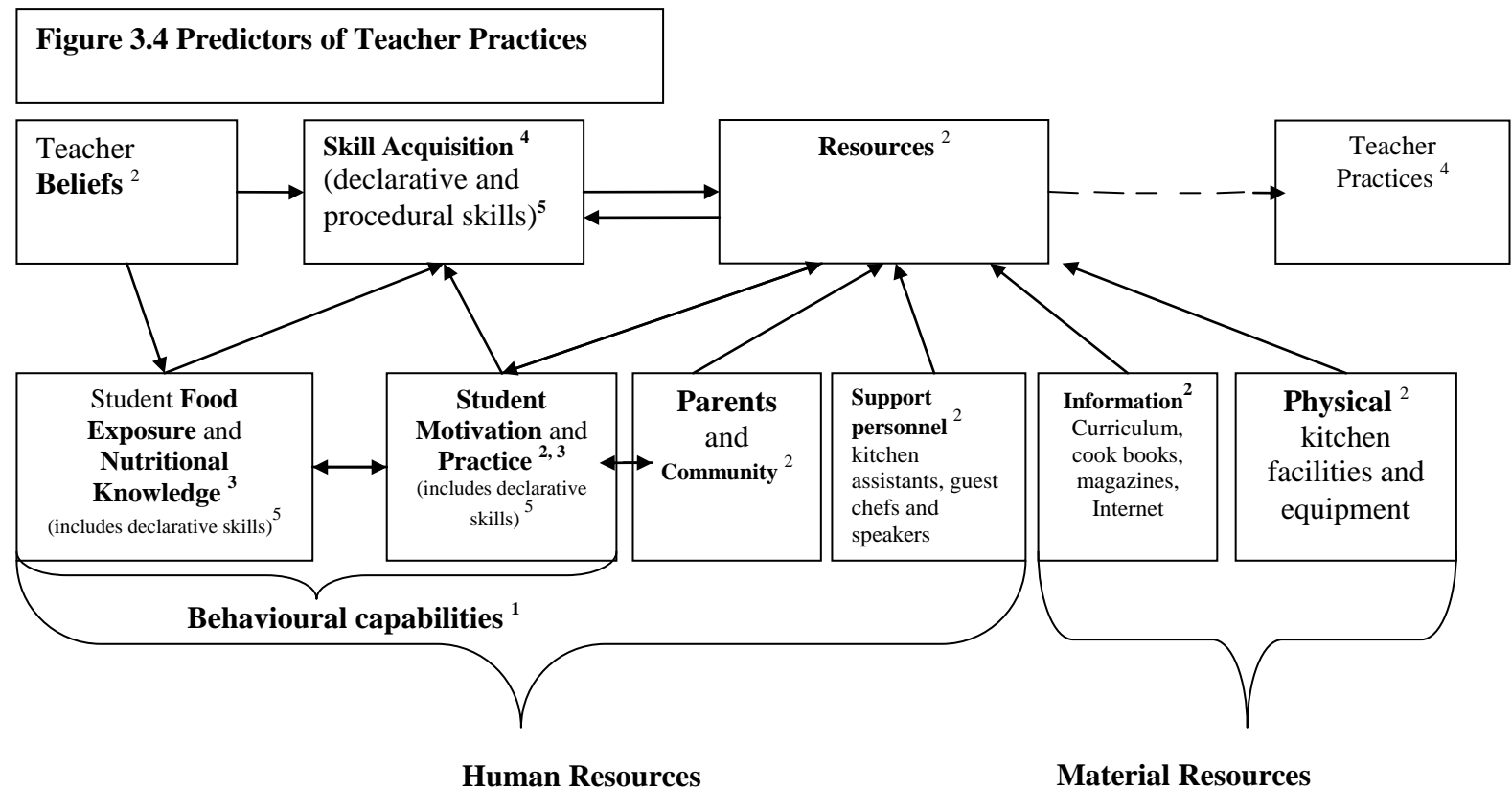
### 3.6.2 Towards a conceptual framework linking the recommendations

The model **Figure 2.5** Predictors of teacher practices presents how the micro components of the essential food skills might fit alongside the recommendations of motivating students' and involving parents and the community. In the model, the behavioural capabilities of the students are depicted as being modified by their familial experiences and influences.

These behavioural capabilities are described as the higher ordered attributes and usage situations in **Figure 3.3** as one component of the declarative skills which shape the behaviour of the individual. They operate as the pre-cursors to decisions regarding choice of meals and where to shop for the ingredients. The declarative skills include the information and knowledge components of the twelve essential skills. The 'hands-on' skills required to prepare and cook a meal are represented under the procedural skills in **Figure 3.3**.

The twelve essential skills help to define a professional standard of what should be taught in the classroom. The selection of what and how these skills are taught depend on the teacher and the resources available to him or her, within and beyond the classroom.

The recommendations made by the food expert participants encompassed the three crucial components for program design made in the WHO Healthy Eating Guide (Dixey R et al., 1999) and the recommendations made in the five reviews of skill-based healthy eating programs (**Table 2.1**). The skills and recommendations operate as predictors of teacher practices and are depicted in the conceptual framework reproduced below (Predictors of Teacher Practices **Figure 2.5** renumbered in this chapter as **Figure 3.4** Predictors of Teacher Practices). These predictors are explored and tested in Study 2 on how they might modify teachers' practices in the classroom.



1 Described by Contento as ‘personal agencies’ (Contento IR et al., 2010)

2 Described as ‘Inputs’ (Contento IR, 2011)

3 Described as Motivational phase of ‘Outputs’ (Contento IR, 2011)

4 Described as Action component of ‘Outputs’ (Contento IR, 2011)

5 Incorporates Figure 2.3 A proposed model depicting declarative and procedural food skills in context

### **3.7 Strengths and limitations of Study 1**

The method for this study was found to be well suited to its purpose (Gibbs L et al., 2007; Hsieh H-F & Shannon SE, 2005; Mayring P, 2000). The findings confirmed the essential skills identified in the skill-based healthy eating programs reported in the literature. Consistency in the different themes and categories was stabilised after half of the interviews were analysed, with the remaining interviews confirming the interpretations.

This study had several strengths including the theoretical underpinning of the methodological design which informed the sequential step-by-step procedure followed to collect the data. This ensured that the data collection and analysis undertaken was systematic, and the participants were treated as similarly as possible.

The duplication of the responses shown in the common themes within and between the six groups of food experts suggested that ‘saturation’ had been achieved and the sample size of fifty-one participants was sufficient to obtain the data required to achieve the aim of the study, which was to identify the essential skills required for young people to be able to make family type meals.

Another strength of this study was its generalisability. For the first time the findings provided researchers from other countries with the methodological procedures to design a similar study elsewhere. The results may be helpful to program designers working with similar populations. However, their transferability would need to be assessed through further research.

The limitations of this study included a relatively small-sized group of selected food experts, which may represent a sampling bias. Whilst efforts were made to overcome the potential sampling bias by inviting a broad range of food experts to participate not all invitees agreed to participate. The refusal to participate in the research by the food writers and the food technologists’ food experts group, for example, may have robbed the study of further insights into the essential food skills identification.

Other groups including the home economics teacher group had more participants, including four from overseas, and this may have skewed the results. Duplication, however, suggests that this is unlikely. Conversely, greater representativeness from this group is advantageous as they *are* the targeted facilitators and designers of skill-based healthy eating programs in schools.

Likewise, the use of a largely local and convenience sample of food expert participants may not be representative of food experts elsewhere. While many potential participants in each group were sought for their opinion and invited to participate to increase the sample size, not all invitees agreed to participate. Saturation tended to offset this limitation. To the candidate's knowledge, this study was unique and there have been no similar studies with which to compare the results.

### **3.8 Summary and Conclusion**

The main aim of this study, to identify the essential 'need to know' food skills required by young people in order to meet their dietary needs and live independently, was achieved.

Twelve essential skills to enable young people to take control of their food shopping, preparation and cooking were identified by the participants. These essential skills were positioned in a proposed model and classified as declarative or pre-cursory decision making and consumer skills required to plan healthy meals or procedural skills required to shop, prepare and cook meals and to manage the tasks of cleaning and managing the kitchen.

The skills were contextualised as the 'micro components' or content of a program. The articulation of these skills will enable their use as the 'tools of reference'. Teachers and other program designers can use and embed them into any skill-based healthy eating programs that purport to develop food skills in young people.

In addition to the twelve essential food skills, the participants made three recommendations to program designers to incorporate into their programs. Their suggestions included how to teach, ideas on how to motivate young people and involve parents and community agencies in the school's skill-based program.

Hitherto, no skill-based program has explicitly listed these essential skills *and* the recommendations. Therefore, the findings from this study can be usefully incorporated into the design of skill-based school programs and possibly extended to skill-based community programs, in the future.



## **4.0 CHAPTER 4 STUDY 2**

### **4.1 Introduction**

The results of Study 1 revealed that twelve essential skills were considered by food experts to help young people shop, prepare and cook healthy meals for themselves and to live healthy independent lives. Three recommendations were made by this same group of experts to improve food skills programs and included, ‘motivate young people to cook’, ‘involve parents’ and ‘involve the community’ in the program.

As outlined in the literature review, essential food skills are not well articulated in existing skill-based programs. Such articulation was the purpose of Study 1. The purpose of Study 2 was to examine if teachers’ views matched those of food experts, in terms of the teachers’ perceptions of the importance of these skills.

Home economics teachers were selected to participate in the questionnaire as they work in secondary schools with students and teach them food skills. An understanding of what food skills they consider to be important would be valuable to assist program designers in the profession to develop a relevant curriculum that incorporated these skills.

Since home economics teachers’ views of essential food skills are unknown due to a dearth of research in this specialist area, the aim of this study was to determine the importance home economics teachers’ place on these skills and what they believe should be taught and what they actually teach in their food skills programs. A comprehensive survey of home economics teachers’ across Australia provided a unique opportunity to gather data on a range of issues significant to the profession in addition to their views on the food skills.

This chapter outlines the quantitative research procedures undertaken in Study 2.

The design, pre-test and piloting of the questionnaire, recruitment procedure, description of the sample and statistical analyses are reported in this chapter.

## **4.2 Aims of Study 2**

The first aim of this study was to investigate how the essential skills identified by the food experts were incorporated by teachers into their food skills programs, if at all. A second aim of the study was to examine likely predictors of teachers' perceived importance of these skills. Teachers' demographic and professional backgrounds which included factors such as age, length of teaching experience, type of training, location and type of school were considered as likely predictors that might influence their views of the importance of particular food skills and their use of resources. It was proposed that teachers' personal beliefs about food and cooking, nutrition, consumerism and environmental issues, described as 'orientations', might influence their views of these food skills.

A third aim of the study was to investigate home economics teachers' views about several issues of interest to the profession and included:

- the level of autonomy and responsibility they had when they planned their food skills program;
- their pedagogical practices such as whether or not they used state or Territory curricula when they planned and evaluated their programs;
- the amount of time in hours over a school year that they considered to be sufficient to teach their programs;
- the constraints that affected their ability to effectively teach their programs;
- the goals that they wanted to achieve in their food skills programs.

### **4.2.1 Survey Hypotheses**

1. Teachers' views of the importance of essential food skills will match those of food experts interviewed in Study 1.

#### **Rationale**

To identify whether the views of home economics teacher respondents in Study 2 confirm the findings of Study 1 in which the views of home economics teacher respondents were shared by other food experts.

2. Teachers' use written and media (material) and personnel (human) resources to supplement their food skills program and to motivate their students.

### Rationale

To identify whether home economics teacher respondents in Study 2 follow the recommendations made by the food experts in Study 1 about the use of resources to support their programs.

3. There is a positive relationship between the teachers' perceived importance of food skills and their demographic characteristics including age, sex, employment status and length of teaching experience, type and location of school and their professional background. For example, teachers who are older or have more food skills experience or come from a hospitality background are more likely to respond to the food and cooking 'orientation'.

### Rationale

To identify and explain any correlation between the teachers' perceived importance of particular food skills and their demographic characteristics.

4. There is a positive relationship between the teachers' perceived importance of the food skills and their personal beliefs about food and cooking, consumerism and the environment and nutrition; (their 'orientation').

### Rationale

To identify and explain any correlation between the teachers' perceived importance of particular food skills and their orientation.

Specifically, teachers who respond to:

- food and cooking are more likely to incorporate traditional food skills into their food skills program;
  - consumerism and the environment are more likely to incorporate issues such as ethical farming practices, organic food, shopping around for quality seasonal or organic produce, budgeting and getting good value for money into their food skills program;
  - nutrition are more likely to incorporate nutrition and healthy eating concepts into their food skills program.
5. There is a positive relationship between the teachers' level of agreement with the amount of time that they considered to be essential and the amount of time allocated to teaching food skills.

#### Rationale

Anecdotally, teachers' nominate that short-term programming is the most significant barrier to their ability to teach their food skills programs. This hypothesis seeks evidence to confirm the anecdotal reporting of teachers' nomination of short-term programming as the most significant barrier to their ability to teach their food skills programs.

6. Teachers' have the autonomy and responsibility to plan and evaluate their food skills programs in schools.

#### Rationale

Anecdotally, teachers' use State or Territory curriculum guidelines to design and evaluate their programs and they are more likely to use written assessment tasks to assess their students' food skills. This hypothesis seeks evidence to confirm teachers' anecdotal use of the guidelines to design and evaluate their programs and written assessment tasks to measure their students' food skills.

### **4.3 Methodology**

#### **4.3.1 Questionnaire Design**

The conceptual model (Predictors of Teacher Practices **Figure 2.5** renumbered in this chapter as **Figure 4.1** Predictors of Teacher Practices) was used to inform the components to be included in the questionnaire; namely, the teacher beliefs, the declarative and procedural skills, student food exposure and nutritional knowledge and resources, including student motivation and practices, and the role of parents and the community.

These components were matched with the statements made by the food experts in Study 1. They were verified by four of the home economics teacher experts interviewed in Study 1, who undertook content analysis of the statements in an exploratory workshop. The purpose of the workshop was to match the interview statements with the twelve themes of the declarative and procedural skills and the three recommendations identified as resources ('motivate young people to cook', 'involve parents' and 'involve the community') deemed essential, by the food experts, to include in any skill-based program. Each statement was scrutinised by the panel of four food experts to identify and retain the variation that most clearly expressed the essential food skill.

The workshop proceedings followed best practice recommendations (Gabel MJ & Shipan CR, 2004; Scott EA & Black N, 1991). These included the importance of choosing panel members from a diverse range of backgrounds and with a high level of expertise to increase the likelihood of informative voting on statement items (Gabel MJ & Shipan CR, 2004, p. 554). In the current setting, a representative panel of experienced experts from the home economics teaching profession was considered appropriate to generate an accurate evaluation of the food skills items.

A nominal group technique was used in which the panel was led towards consensus through successive rounds of listing and refining ideas through debate and discussion. This technique enabled the panel to contribute their ideas while a pooled judgement was facilitated (Rolls K & Elliot D, 2008).

A series of steps was undertaken by the panel which involved them in the completion of a pre-workshop questionnaire, designed by the candidate, to foster some preliminary thinking about the skills required (**Appendix G**). During the workshop, the panel then reviewed and classified the interview statements from Study 1 under the twelve themes and three recommendations and then finally ranked the statements from the most to the least important.

In the review process by the expert panel, a new category emerged from the statements categorised under 'Motivation'. These statements specifically related to the teacher's role in motivating young people to cook. This new category was named by the expert panel as 'Provide opportunities for learning' and consequently became the fourth recommendation extracted from the original theme of 'Motivation'. This concluded the panel's input into the questionnaire design.

Additional questionnaire items, based on the teacher predictors in **Figure 4.1**, were included to provide data on the respondents' beliefs and their demographic and professional background. These data later proved to be critical for obtaining the evidence required to depict the interrelationship between the predictors in Study 2.

All the items were then refined into plain English statements which were designed to be read and responded to quickly and easily. At this point various sources were consulted to ensure

that methodological procedures related to constructing internet questionnaires were followed, particularly those of Dillman (Dillman DA, 2007).

Items were placed from the most to least relevant to maintain respondent focus and interest and therefore increase the response rate (Dillman DA, 2007). The food skill items were placed at the beginning of the questionnaire to reflect the content in the cover letter.

Open ended questions that required more thought and time to respond were placed towards the end of the questionnaire. Respondents are more likely to respond to these items if they already had a sense of engagement with, and commitment to the earlier items in the questionnaire (Dillman DA, 2007).

At this point, each questionnaire item was revised and simplified to one single idea per statement to prevent respondents having to cope with two ideas in the one statement (known as multi-barrelled statements) (Dillman DA, 2007).

Placement of five response categories of strongly disagree, disagree, neutral, agree and strongly agree was considered to allow respondents to report their strength of opinion (or lack of it) of each statement (Dillman DA, 2007). To reduce respondent burden, these categories were used consistently throughout the questionnaire.

### **Pre-testing of the Questionnaire**

At this stage, draft questionnaires were completed by ten respondents drawn from the home economics teaching profession. They included a home economics leader who was expert in education and journal writing. The aim of this pre-test was to test the comprehensibility and face validity of the questionnaire prior to its use in the study.

The ten volunteers vetted its length (30-40 minutes duration) and readability and identified whether all the essential food skills identified by the food experts (in Study 1) and the workshop panel were included. The initial drafts were considered to be too long; some pre-test respondents took up to 85 minutes to complete it. Therefore, some items were discarded or simplified to their core meaning and the stem variations removed. The volunteers noted

that there were intrinsic differences in the statements which created respondent momentum and enabled them to respond mindfully.

Once the questionnaire had been vetted by the pre-test respondents, it was re-edited and uploaded onto an online survey platform (SurveyMonkey Inc) in October 2009.

Before the questionnaire was distributed to respondents, the survey link was trialled twice by two sets of test respondents (initially nine of the ten ‘pre-testers’ and then seven respondents who had not been exposed previously to the questionnaire) so that any technical difficulties were identified. These volunteers were asked to comment on the logical structure and length of the questionnaire and the clarity of the items.

The questionnaire was refined further so that lengthy questions were shortened, grouped under similar themes and presented in a matrix or as a series of tick the boxes. The questionnaire was then sent out for a second time to a new set of seven pre-test respondents to ensure that it was able to be completed successfully. These respondents were able to complete the updated and shortened questionnaire within twenty to thirty minutes without technical or comprehension problems. At the conclusion of the pilot workshop and pre-testing, the questionnaire contained 139 items.

### **4.3.2 Questionnaire Content**

#### **Overview**

The food skills questionnaire was constructed in four sections (Section A-D).

#### **Section A**

Section A items included all the nominated essential food skills (‘consumer knowledge, information and skills’, ‘hygiene and safety knowledge and skills’, ‘meal knowledge and skills’, ‘nutritional health knowledge’, ‘cookery methods knowledge and skills’, ‘equipment knowledge and skills’, ‘food exposure knowledge’, seasonal produce knowledge’, ‘troubleshooting knowledge’, ‘sources information’, ‘terminology information’ and ‘skills acquisition’) and the three recommendations (‘student motivation’, ‘parent involvement’ and

‘community involvement’) derived from the opinion statements made by the food experts interviewed in Study 1. The fourth recommendation, ‘opportunities for learning’, made by the expert panel in Study 2 was added to the Section A questionnaire items. The items were deconstructed by the candidate and her panel of food experts (above) into simple one clause statements. Five of the original seventy-four food skill items were made redundant and collapsed into the remaining sixty-nine food skill items. These sixty-nine items were classified under broad themes based on the twelve essential skills identified in the first study: consumer knowledge and information (16 items in Question 1); cookery methods skills (22 items in Question 2); equipment and appliance operational skills (8 items in Question 3); prepare and cook food safely and hygienically (5 items in Question 6); meal planning skills (4 items in Question 7); nutritional health knowledge (5 items in Question 8), shop for seasonal produce and value for money (5 items in Question 10), trouble shooting skills (2 items in Question 11) and use sources of information (2 items on the use of literacy skills to source and evaluate recipes using the Internet in Question 12). These sixty-nine items were used in the data and factor analysis to compare teachers’ views of the importance of the food skills with those of the food experts in Study 1 and therefore to test the first hypothesis.

Section A of the questionnaire also included seventy-three items based on the four recommendations made by the food experts in Study 1, the expert panel in Study 2 and the findings in the literature review; that is how ‘student motivation’, ‘parent involvement’, ‘community involvement’ and ‘opportunities for learning’ may operate as resources to support teachers in their programs. Respondents were asked questions about their own beliefs on how young people’s food skills could be developed through learning opportunities which used the following sets of resources: food exposure (17 items in Question 4), nutritional health knowledge (5 items in Question 8), nutritional practices (11 items in Question. 9), sources of information (10 items in Question 12), skills acquisition (11 items in Question 13), motivating students (15 items in Question 14) and community involvement linked with food skills programs in schools (4 items in Question15). These seventy-three items helped to identify the resources that teachers’ used in the classroom and to test the second hypothesis.

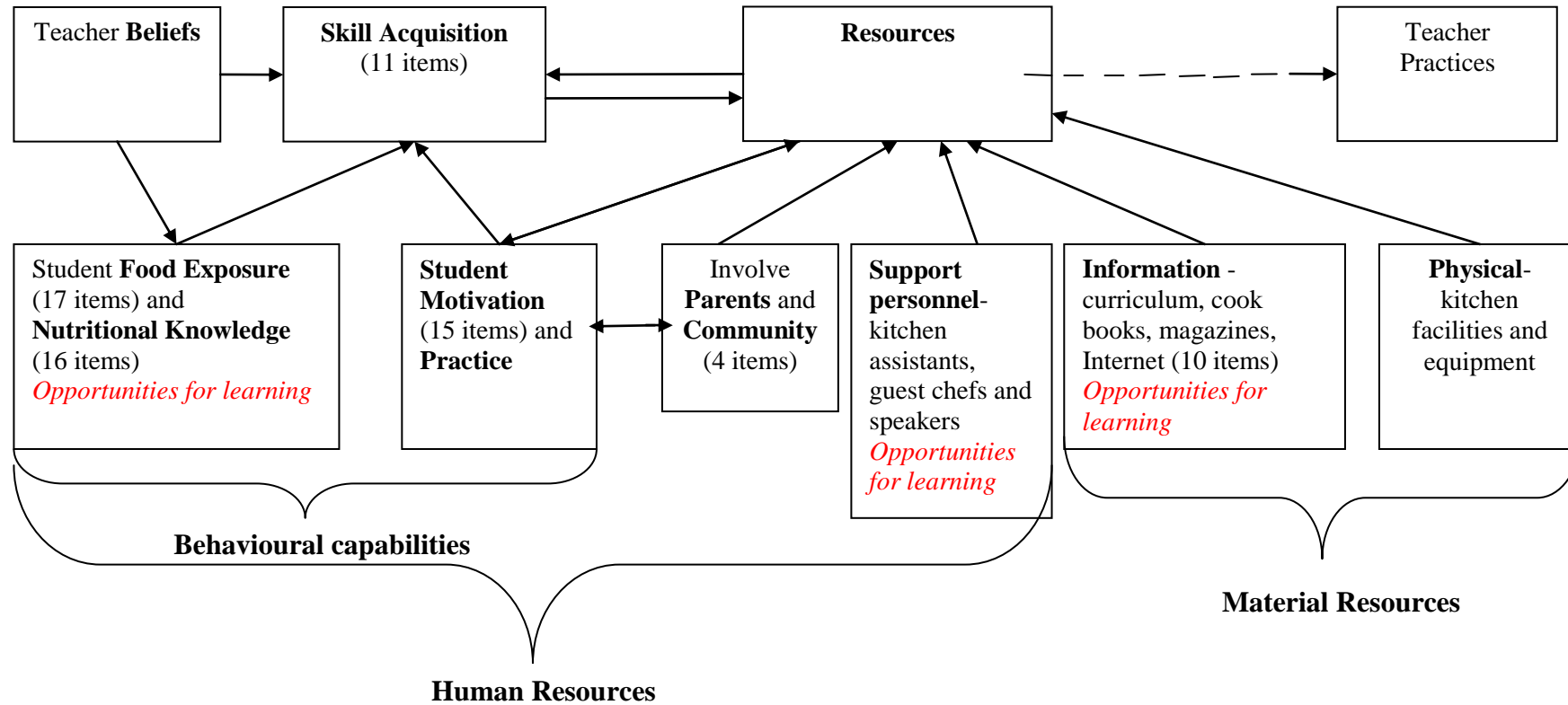
The respondents in Study 2 were asked to respond to all the food skill items (Questions 1, 2, 3, 6, 7, 8, 10, 11 and the 2 items in Question 12) and the resources items (Questions 4, 8, 9,



12, 13, 14 and 15) and rate their responses in one of the five categories of strongly disagree, disagree, neutral, agree and strongly agree. At the end of each question section, respondents had the opportunity to add comments or justify their ratings. The questions that were asked of the respondents and the rating categories are included in the Teacher Questionnaire (**Appendix I**).

The recommendations have been nominated in successful skill-based programs (**Table 2.1** Summary of recommendations and rationale for program design based on WHO guidelines and reviews) and are positioned in an updated conceptual model (**Figure 4.1** Predictors of Teacher Practices).

**Figure 4.1 Predictors of Teacher Practices** (includes fourth recommendation *Opportunities for learning*)



## **Section B**

Section B included items on the respondents' demographic characteristics, their work, teaching philosophy and practice and the goals they wanted to achieve for their students. The respondents were asked for details of their age in years, sex and professional background selected from the following categories: home economics education; hospitality trade; education (other than in home economics); or 'other'. If respondents nominated 'other', they were asked to specify their professional background. They were also asked to nominate their length of teaching experience in the following categories: 1-3 years, 4-10 years, 11-15 years, 16-20 years, 21 years + or pre-service. Respondents were asked in a fifth and open question to nominate up to three goals that they wanted to achieve in their work as a food skills teacher. The responses made here provided the data to test the third hypothesis.

Section B also included statements about the work of home economics teachers. These statements were designed to elicit opinions which would reflect a respondent's beliefs about what they considered to be important and wanted to achieve for their students in their food skills classes. The question items asked respondents' what they believed to be right, even though they may not have (or had) the opportunity to apply these beliefs in their food skills classes. They were asked for the extent that they agreed or disagreed with the statements in one of the five categories of strongly disagree, disagree, neutral, agree and strongly agree. These 18 items (Question 21) were included to identify whether teachers' goals were consistent with the recommendations made in the literature review about students' motivation and food skills acquisition.

Finally, twenty-two items (Question 22) consisting of the philosophical and teaching practice statements were included in Section B. The question items asked respondents' about their practices and what they actually do (or did) in their food skills classes. They were asked for the extent that they agreed or disagreed with the statements in one of the five categories of strongly disagree, disagree, neutral, agree and strongly agree. These items were designed to assess the respondents' personal beliefs and practices about food and cooking, nutrition, consumerism and environmental issues, the themes identified from the literature review. They were used, later, to form the three teacher 'orientations'. The responses made here provided the data to test the fourth hypothesis.

## **Section C**

This section focused on the respondents' workplace situation and practices and included their views on external and internal factors that supported or prevented them from achieving their teaching goals. The respondents' were asked questions about the types of school they worked in (single sex or co-educational government, independent or Catholic) and the location (metropolitan, regional or rural and including which state or Territory) in which they taught. They were asked about their current employment status (full or part time, casual, pre-service or retired, family leave, seeking work).

The teachers who were no longer in the paid workforce (retired) or currently in unpaid work (family leave or pre-service teachers) were included in the survey to identify their responses to the importance of food skills and to enable the testing of the second and third hypotheses. Their responses to these questions were considered to be valid; however, once they completed Section A and Section B, they were directed to the end of the questionnaire and bypassed Sections C and D about their work in schools.

To test the fifth hypothesis, the respondents were asked at what secondary school year levels they were currently teaching (or have taught) and their views on the amount of time (in hours) they considered to be essential for their students to learn the food skills at each year level of secondary school. Consequently, they were asked to identify any barriers which accounted for any time reduction in their program delivery. Finally, they were asked to nominate the degree of responsibility they had when they planned their program.

## **Section D**

This section focused on the respondents' teaching program rationale, planning and evaluation of their food skills programs.

To test the sixth and last hypothesis, the respondents were asked to select in a tick-the-box the Key Learning Area (Health and Physical Education, Technology or a combination of the two) they used to plan their food skill program, including the aims, content, assessment,

outcomes and evaluation (Question 31). In the next tick-the-box question they were asked to justify their selection from one or more of the following:

mandated by the educational body of the State/Territory in which I teach;

mandated by the school in which I teach;

my faculty thinks that this KLA (Key Learning Area) best fits the content of a food skills program;

I think that this KLA (Key Learning Area) best fits the content of a food skills program;

Other (please specify).

In the next tick-the-box question (Question 33) the respondents were then asked to select from a single or combination of Key Learning Area/s they thought best supported the achievement of food skills competencies. In another tick-the-box question in this section (Question 36), respondents were asked to nominate their use of one or more measures to assess their students' food skills, including the use of formal student questionnaires, practical food skills tests, written assessment tasks (tests, assignments, projects, written reports, data analysis), informal student feedback, assessment of students' retention of food skills from one year to the next, students' assessment of cooking practices at home and students' written evaluation of their own work. The respondents were given the opportunity to specify any other measures used to assess their students' food skills. The results from these questions would help to inform the design of a valid and reliable evaluation tool which could be used by teachers to measure the food skills acquisition of their students, which is the aim of Study 3.

The respondents were invited to nominate their top six food skills in a checkbox from the list of the twelve broad themes and explain why they considered them to be important (Questions 34 and 35). The purpose of these questions was to compare the teachers' responses to those of the food skills experts in Study 1. Finally they were asked to rate the success of their current food skills programs from a seven-point rating continuum ranging from 'Not at all successfully' to 'Very successfully'. At the end of all four sections, respondents had the opportunity to add comments and justifications to their responses.

**Table 4.1 Summary of the Sections A-D and their relationship with the hypotheses**

<b>Section</b>	<b>Section Content</b>	<b>Hypothesis</b>
<b>A</b> (69 items)	Twelve broad themes representing the essential food skills	1. Teachers views of food skills match with food experts
<b>A</b> (73 items)	Four recommendations ‘student motivation’, ‘parent involvement’, ‘community involvement’ and ‘opportunities for learning’	2. Teachers use resources to supplement their food skills program to motivate their students
<b>B</b> (5 items)	Items covered respondents’ demographic characteristics, professional background, and length of teaching experience and nomination of three teaching goals.	3. Relationship exists between food skills importance and teacher demographics
<b>B</b> (18 items)	Respondents’ work and personal beliefs in relation to their teaching goals	4. Relationship exists between food skills importance and teacher personal beliefs
<b>B</b> (22 items)	Respondents’ philosophical and teaching practice	4. Relationship exists between food skills importance and teacher personal beliefs
<b>C</b> (8 items)	Respondents’ school location and sector, employment status, year levels taught, responsibility in program planning and views on time allocation requirements for delivery of food skills program.	5. Relationship exists between teacher level of agreement with time allocated to teaching food skills
<b>D</b> (7 items)	Respondents’ program planning and evaluation, nomination of top six food skills and rating of success of their program.	6. Teachers have autonomy to plan and evaluate food skills programs

### 4.3.3 Sampling of Respondents

The purpose of this study was to recruit as many teachers as possible from a diverse range of age groups, teaching experience, professional backgrounds, schools and locations. The diversity of teacher respondents was designed to collect a representative sample of opinions that were able to be compared with the opinions of the food experts.

The invitation to complete the questionnaire was circulated to members of the Victorian home economics teachers’ professional association (Home Economics Victoria) by email; the responses were drawn from a convenience sample of home economics teachers who volunteered tacitly to complete the survey.

### Sample Size Estimation

The sample size was difficult to estimate as, to the best of the candidate’s knowledge; this survey of home economics teachers was unique. Therefore, it was decided to recruit a

convenience sample of as many home economics teachers as possible through the state and national home economics professional associations.

#### **4.3.4 Ethics Approval**

The University of Wollongong Human Resource Ethics Committee provided ethics approval for this study on 30 September 2009 (HE091290).

#### **4.3.5 Recruitment Procedure**

Teachers of home economics were sought through the professional teachers' association of Victoria, Home Economics Victoria (HEV). A letter of request was sent to the Board of Directors to invite their members to participate in an online questionnaire (**Appendix H**).

The Board of Directors agreed to send out an email on behalf of the candidate to all their members (**Appendix I**) that explained the purpose of the questionnaire, and included an electronic link to the instrument. The complete survey is recorded in **Appendix I**. The members were advised in the cover letter that their participation was voluntary. No incentives were offered to encourage them to participate. An invitation to participate in the questionnaire also was extended to members of the national professional association, the Home Economics Institute of Australia, as part of an interstate professional development activity.

#### **4.3.6 Response Rate**

The questionnaire was administered via a group email to 658 members by Home Economics Victoria in November 2009. This directed them to a link on the Survey Monkey (SurveyMonkey Inc) platform where the survey could be assessed. By early December, 109 responses had been received, representing 13.6 per cent of the membership. A reminder email was re-sent in early December 2009. By mid-December, 112 respondents had completed the questionnaire. A third and final reminder was sent out in the first week of February, 2010 to coincide with the new school year. This email generated a further 149 responses making a total of 271 responses, a response of 41 per cent.

This sample population included 61 interstate respondents from the national professional association, the Home Economics Institute of Australia. Subsequent data analysis found no statistically significant differences between the two groups, so the data were pooled and analysed as one data set.

Several factors were identified as possible reasons why members did not respond to the questionnaire and included:

- faulty email addresses (this accounted for 20 per cent or 84 email ‘bounce backs’ returned as an error message and represented 12.8per cent of the total membership of 658 members);
- members not reading their emails; and
- the invitation was sent out at a busy time of the year when teachers were completing semester student reports.

Since participation in the survey was voluntary for members, it was not possible to collect data on the non-respondents. Due to the length of the survey, there was some attrition in the number of respondents who started the survey (n=271) and those who went on to complete it (n=208), which represented 76 per cent of the original sample.

#### **4.4 Data Analysis**

The questionnaire data were downloaded from a Survey Monkey platform as a SPSS file (SPSS, 2009). A series of frequency and correlation analyses were performed. Data were analysed using cross-tab correlations to analyse food items and demographic variables, including age categories of respondents. Simple frequency analyses were conducted on these categorised food skills responses, and on, respondents’ professional backgrounds, age and years of food skills teaching experience. The cross-tab correlations revealed missing cells so the ‘disagree’ and ‘strongly disagree’, ‘neutral’ and ‘agree’ and ‘strongly agree’ categories used in Sections A and B of the questionnaire were aggregated into three categories of ‘agree’, ‘neutral’ and ‘disagree’ respectively to avoid missing cells in the subsequent chi square analyses and thus increase the reliability of this test.



Exploratory factor analyses (principal components with varimax rotation (Hair JF, Black WC, Babin BJ, & Anderson RE, 2010)) were performed on the non-recoded data, the 5 point scales in Section A and B, to examine the interrelationships between the food skills and resource items. Confirmatory factor analysis was not employed partly because the relatively small sample size precluded adequate cross-validation of factors. Reliability analysis was performed to test the internal consistency of the derived factor scores (via Cronbach's alpha). The respondents' personal beliefs, based on their strength of agreement with a series of statements, were also factor analysed to reveal factors corresponding to the teachers' orientations.

Stepwise multiple linear regression analyses (Hair JF et al., 2010) were performed on each of the food skill and resource factors (the dependent variables) to ascertain the linear relationships with the nominated independent variables which included the demographic and professional background variables and the three teaching orientations which are described in the Results (**Table 4.5**).

## **4.5 Results**

### **4.5.1 Demographic and professional characteristics of the respondents**

The majority of the 221 respondents had a background in home economics education (n=195, 88.2 per cent of the total number of respondents). The remaining respondents typically had a hospitality trade background (n=35, 15.8 per cent), sometimes in conjunction with home economics education, or in education, but not in home economics (n=13, 5.9 per cent) and in other areas (n=14, 6.3 per cent). Other areas included health science, real estate, food management, food technology and dietetics. These professional and background characteristics closely matched those of home economics teachers in schools (Corstorphan B et al., 2005), which suggests the sample is representative of the home economics teaching profession.

Almost all of the respondents were female (n=215, 97.3 per cent); only 2.7 per cent (n=6) were male. The majority were over 35 years of age and over half had taught for more than 21 years. More of the teachers worked full time (63.5 per cent), in government schools (71.2 per

cent) and schools in metropolitan (54.2 per cent) compared with regional (18.9 per cent) areas.

**Table 4.2** outlines the demographic and professional characteristics of the sample.

**Table 4.2 Demographic and professional characteristics of the respondents**

Professional Background (n=221 <sup>1</sup> )  (Percentage)		Teaching Experience (n=221) Number of years (Percentage)		Age of Respondents (n=220 <sup>1</sup> ) Age in years (Percentage)		Employment Status (n=211 <sup>1</sup> )  (Percentage)		Type of School (n=212 <sup>1</sup> )  (Percentage)		School Location (n=212 <sup>1</sup> )  (Percentage)	
Home Economics (n=173)	78.3	Pre-service (n=4)	1.8	Less than 35 (n=30)	13.6	Full time (n=134)	63.5	Government secondary or Primary to Year 12 (n=151)	71.2	Metropolitan capital city (n= 115)	54.2
Home Economics /Hospitality (n=22)	10.0	1-3 (n=17)	7.7	36-50 n= 102	46.4	Part time (n=60)	28.4	Independent co-educational (n=17.0)	36.0	Regional area (major town) (n=40)	18.9
Hospitality (n=13)	5.9	4-10 (n=43)	19.5	51 years plus (n=88)	40.0	Not currently in paid work <sup>2</sup> (n=17)	8.1	Independent single- sex (female) (n=12)	5.7	Rural area (small country town) (n= 54)	25.5
Education, but not in Home Economics (n=8)	3.6	11-15 (n=19)	8.6					Independent single sex (male) (n=1)	0.5	Other (unspecified) (n=3)	1.4
Other (Food Technology, Dietetics, Food Science) (n=5)	2.3	16-20 (n=26)	11.8					Catholic co-educational (n=30)	14.2		
		21 years plus (n=112)	50.7					Catholic single sex (female) (n=13)	6.1		
								Catholic single sex (male) (n= 3)	1.4		
								Other <sup>3</sup> (n=10)	4.7		

1. Respondent numbers varied

2. Due to retirement, seeking work, pre-service teacher, long service leave, casual work status

3. Remaining participants worked in TAFE (Technical and Further Education) institutions or special schools (for intellectually or physically disabled students)

#### 4.5.2 The perceived importance of food skills

**Table 4.3** presents the respondents' ratings of the importance of the sixty-nine food skill items (top 10 skills **bolded**) and depicts the rankings of the perceived importance of the items along with the loadings of the items on the five factors that were derived from factor analysis.

Forty-five skills were ranked as “very important” by 90 per cent of the respondents. These skills included the declarative and procedural skills that equip young people to make healthy meals, for example, safe and hygienic preparation of food, the use and storage of knives and the cleaning up of dishes and equipment after the meal is prepared.

Equipment knowledge and skills included those items which would support young people in being able to use small and large appliances when they made these healthy meals. Respondents noted how important it was to develop students' technical dexterity in using the appliances as well as being able to safely operate the appliance itself. In response to the question on Equipment knowledge and skills, one respondent summed it up like this:

*Correct use of equipment and tools is vital. Students have poor hand skills compared with past generations of students (eg. poor scissor skills etc.). Technology (skill-based) subjects are the only areas where students have the opportunity to hold and use tools with safe instruction and guidance. By not teaching these basics of life we are not helping our students or our OH & S (Occupational Health and Safety) knowledge base.*

**Respondent, 02 Feb 2010, 11-00am**

‘How to make a healthy snack’ was ranked as the third most important food skill. Stir frying was nominated as an exceptional cookery method and was included among the highly ranked basic procedural skills. As a cooking method, ‘stir frying’ encompasses many of the attributes considered by respondents in their comments, to be essential in a contemporary food skills program. Additionally the ingredients can be adapted to suit diners with food allergies or those who choose a vegetarian diet. Compared with deep frying, stir frying is a healthier alternative and provides opportunities for individuals to make use of seasonal vegetables and to create many recipe variations.

Included in the higher ranked items were the declarative skills required before preparation of food takes place. These items included the ability for young people to make informed judgements about selecting and buying seasonal fruits and vegetables and understanding the health benefits of eating a wide variety of food. The items included reading and following and adjusting recipes to create meal variations or to make them more nutritious and exchanging cookery methods to lower fat content and sequencing the cooking components of a recipe. One respondent summed this up in their comment:

*Students need to make wise food choices and have the nutritional knowledge and skills in how to apply this knowledge. They need to know how to safely prepare food, and the skills to independently follow recipes and adapt these recipes to suit dietary needs.*

**Respondent, 10 Feb 2010, 11-09am**

Items of middle ranked importance included skills such as the ability to troubleshoot and to rectify mistakes, select and buy quality food, adjust serving sizes, create vegetarian meals by adapting meat-based recipes and to know when a canned, dried, frozen fruit or vegetable could be successfully substituted for the fresh variety in a recipe. The ability to substitute fresh for the convenient fruit and vegetable alternative is relevant to the recommendation made in the literature review for the *judicious* use of convenience food in place of cooking meals ‘from scratch’ to save families’ time. Two respondents endorsed the recommendation:

*Commercial preparations of pastry, stocks, jams, breads are so good these days that students should be encouraged to prepare basic food items and use convenience foods that are appropriate to save time.*

**Respondent, 12 Oct 2009, 8-46am**

*With so many readymade products available and limited time to start food from scratch, we need to teach kids how to make healthy choices (or adapt) in convenience foods.*

**Respondent, 12 Sept 2009, 10-34am**

Items of lower ranked importance pertained to traditional cookery methods and included skills such as creaming butter and sugar (as part of the process of, for example, baking cakes and biscuits). The skills required to make pasta, pastry, gravy, meat and fish stocks and bread

and yeast products were ranked lower. The ability to make a white sauce with its broad application to a variety of standard dishes in the domestic culinary repertoire was ranked higher than the ability to make a series of classic sauces. Finally, the skills to be able to shop without planning and the computer technology skills of being able to shop for food products on-line were ranked lowest of all the food skills. Teachers were less emphatic about buying food on-line and preferred to teach their students the hands-on experiences of personal shopping for food.

*In reference to buying food online I believe, although it is an information/technological age, that people are better off shopping for food personally and taking advantage of places like markets and so on - not only is there better value for money but you have the added bonus of interaction with various people and a greater choice of products and prices.*

**Respondent, 06 Mar 2010, 4-17pm**

#### **4.5.3 The food skills classified as five factors**

The exploratory factor analysis of the sixty-nine food skills derived five factors. Three home economics teachers were invited to inspect these five factors and were asked to suggest suitable names for them according to their interpretation. The factors were provisionally named as '*Procedures for domestic settings*', '*Procedures for vocational settings*' (advanced food skills), '*Cookery methods*', '*Food economy*' and '*Use of microwave ovens*'. The factor loading of each of the food skills is indicated under each factor in **Table 4.3**.

Factor 1 '*Procedures for domestic settings*' included the basic skills required to plan and make meals from start to finish in a family-type situation and included those items with the highest factor loadings. Specifically, they included the ability to select, buy and store food, make healthy snacks and prepare cheap and nutritious meals. The ability to read food labels, follow and adjust recipes and exchange cookery methods to make meals more nutritious were all nominated as adjuncts to meal construction.

The supplementary skills that required the operator to adapt the recipe repertoire (how to sequence the cooking components in a recipe), know what appliances and equipment could

be substituted and know the basic items to have in the pantry and refrigerator had slightly lower factor loadings.

Barbequing and more particularly, stir frying with its high factor loading, were perceived to be most relevant to domestic settings, while most other cookery methods were relegated to a separate factor. This set of items may be useful for those teachers who want to focus on, and train their students to make basic, healthy and tasty meals for themselves and their families.

Factor 2 *'Procedures for vocational settings'* included more advanced food skills or those more applicable to the hospitality industry (Crowley L & Schultz J, 1989). They included how to adapt a recipe and create meal variations or to suit diners with food allergies. Safety and hygiene skill items specific to the hospitality industry figured prominently here but had moderate factor loadings and included operational procedures such as how to prepare for food preparation and cooking, safely freeze left over meals, correctly wash dishes and safely use and clean equipment.

The use of creativity was a feature in this factor; for example, how to season food and to adapt recipes to create meal variations. There was an incremental decrease in the factor loadings of those items which required the operator to adapt recipes to suit a range of diners' dietary needs that might be applicable in the hospitality industry, including food allergies, vegetarianism or body weight.

Other skills that would help to implement these demands were accommodated in this factor, including the operator's ability to research and evaluate recipes on the Internet and use food models such as the Australian Guide to Healthy Eating to plan meals. Likewise, troubleshooting and the ability to rectify culinary mistakes were linked here and factored highly.

Factor 3 *'Cookery methods'* included all the cookery methods with the exception of 'stir frying' and 'barbequing'. The high scoring and close range (Making classic sauces with a factor loading of 0.783 descending to a factor loading of 0.582 for Casseroling and stewing) of the items indicate a strong communality between these items.

Factor 4 *'Food economy'* included those items relevant to buying to save money. The respondents' agreed that it was more important for consumers to know 'how to select and buy quality and value-for-money' in person but not on-line, compared with 'how to select and buy quality and value-for-money food online' and 'how to buy food online' which were two of the lowest ranked items overall. Generally, with the exception of the personal shopping item and 'when a canned, dried, frozen fruit or vegetable can be successfully substituted for the fresh variety in a recipe', the remaining items were ranked lower by respondents.

Factor 5 *'Use of microwave ovens'* featured items exclusively associated with microwave cooking and how to reheat and cook food. These items had high factor loadings but were not rated as particularly important by respondents. Microwaves ovens were mostly used to reheat rather than to cook food and the high importance percentages may be misleading as some respondents reported that teaching students how to use this appliance to cook food was secondary to teaching them how to use it safely.

**Table 4.3 Summary of the factor analysis of the respondents' rankings of the importance of 69 food skills represented in five dimensions (n=269)<sup>1</sup>.**

Factor	Item	Item Rank -ing	Factor Loading	Agree (%)	Strongly Agree (%)	Total (%)
<b>Factor 1</b> <b>Procedures for domestic Settings</b> <sup>2</sup>	Making healthy snacks	3	0.734	20.6	<b>78.6</b>	99.2
	Follow recipe instructions	19	0.730	19.0	<b>77.3</b>	96.3
	How to read food labels	15	0.705	21.6	<b>75.8</b>	97.4
	Buy ingredients to make a cheap and nutritious meal	23	0.690	25.3	<b>70.6</b>	95.9
	How to safely use and store knives	14	0.683	26.1	<b>71.6</b>	97.7
	How to correctly store perishable food	16	0.669	22.7	<b>74.7</b>	97.4
	Stir frying	11	0.650	38.9	<b>59.2</b>	98.1
	Adjusting recipes to make them more nutritious	12	0.641	19.8	<b>78.2</b>	98.0
	How to exchange cookery methods such as deep frying for healthier cooking methods such as stir frying	8	0.639	26.3	<b>72.5</b>	98.8
	How to use an electric cooker	17	0.639	35.6	<b>61.3</b>	96.9



	How to sequence the cooking of components in a recipe	26	0.620	33.2	<b>61.8</b>	95.0
	How to use a gas cooker	25	0.614	33.0	<b>62.5</b>	95.5
	How to correctly use small tools (vegetable peelers, apple corers, melon ballers, graters)	27	0.560	31.4	<b>63.2</b>	94.6
	Know what appliances and equipment could be substituted when the most appropriate item is not available	22	0.554	37.9	<b>58.2</b>	96.1
	How to create meal variations from standard recipes such as a meat sauce	30	0.552	<b>47.7</b>	44.7	92.4
	Use food labelling information to make meals for people with allergies	29	0.551	32.0	<b>61.7</b>	93.7
	How to exchange ingredients for low fat alternatives	13	0.539	32.8	<b>64.5</b>	97.7
	Make a shopping list	39	0.535	39.0	<b>51.3</b>	90.3
	How cookery method selection will affect preparation and cooking time is important	28	0.524	45.4	<b>48.5</b>	93.9
	How to use small appliances (stick blenders, cake mixers, food processors, portable grills)	21	0.510	<b>49.4</b>	46.7	96.1
	Know the basic food items to have in the pantry and refrigerator	42	0.451	38.7	<b>50.6</b>	89.3
	How to adjust serving sizes	38	0.409	<b>46.5</b>	43.9	90.4
	Where food originates (paddock to plate)	44	0.400	<b>53.5</b>	33.1	86.6
	Barbequing	52	0.351	<b>50.8</b>	31.3	82.1
<b>Factor 2 Procedures for vocational settings<sup>3</sup></b>	How to anticipate and rectify culinary mistakes	31	0.683	<b>48.9</b>	43.5	92.4
	Troubleshooting is useful as it explains why something does not work out	35	0.679	<b>49.8</b>	41.8	91.6
	How to adapt a recipe and create meal variations	<b>9</b>	0.661	40.7	<b>58.1</b>	98.8
	How to adapt a recipe to suit diners with food allergies	18	0.650	34.4	<b>62.1</b>	96.5
	How to use the whole fresh vegetable instead of pre-prepared and packaged fresh vegetables	24	0.619	43.5	<b>52.3</b>	95.8
	How to season food to make it tastier	41	0.612	<b>57.3</b>	32.8	90.1
	Correctly wash dishes	<b>5</b>	0.597	18.6	<b>80.6</b>	99.2
	Know how seasonal produce can help inform recipe selection	20	0.596	<b>53.2</b>	43.0	96.2

	Correctly clean equipment	<b>6</b>	0.594	17.4	<b>81.8</b>	99.2
	How eating a wide variety of foods benefits health	<b>2</b>	0.574	27.1	<b>72.4</b>	99.6
	Use cooking equipment to prevent injuries	<b>4</b>	0.573	18.6	<b>80.6</b>	99.2
	How to cook healthy meals	<b>7</b>	0.567	29.6	<b>69.5</b>	99.1
	Prepare for food preparation and cooking tasks	<b>1</b>	0.551	14.6	<b>85.0</b>	99.6
	How to select and buy seasonal fresh fruits and vegetables	<b>10</b>	0.542	40.9	<b>57.8</b>	98.7
	How to create vegetarian meals by adapting meat-based recipes	37	0.519	<b>46.2</b>	45.1	91.3
	Know the best time of the year to purchase fresh fruits and vegetables	32	0.505	<b>51.1</b>	40.9	92.0
	How substituted ingredients affect the nutritional value of meals	34	0.488	<b>62.1</b>	29.6	91.7
	Safely freeze left over meals	40	0.484	33.2	<b>56.9</b>	90.1
	How the Australian Guide to Healthy Eating is used to plan meals	33	0.453	44.9	<b>46.9</b>	91.8
	ICT literacy skills to evaluate suitable recipes on the Internet.	49	0.445	<b>46.6</b>	38.5	85.1
	ICT literacy skills to find suitable recipes on the Internet.	45	0.431	<b>52.6</b>	33.8	86.4
	How to cook healthy meals that will help achieve optimum body weight	47	0.425	<b>48.1</b>	37.9	86.0
	When to purchase the more expensive ready prepared fruit or vegetable alternative when making meals	61	0.389	<b>45.6</b>	15.6	61.2
<b>Factor 3 Cookery Methods</b> <sup>4</sup>	Making classic sauces (béchamel, mayonnaise, mornay, demi-glace)	65	0.783	<b>39.3</b>	16.4	55.7
	Making pastry	64	0.773	<b>45.8</b>	13.4	59.2
	Creaming butter and sugar	53	0.754	<b>51.9</b>	29.8	81.7
	Making bread and yeast products	59	0.753	<b>51.9</b>	17.2	69.1
	Making meat and fish stocks	68	0.709	<b>35.1</b>	8.4	43.5
	Making pasta	63	0.703	<b>47.3</b>	12.6	59.9
	Baking cakes and biscuits	51	0.674	<b>61.1</b>	22.9	84.0
	Making gravy	62	0.672	<b>49.2</b>	11.5	60.7
	Making white sauce	46	0.658	<b>53.8</b>	32.4	86.2
	Roasting meat and poultry	54	0.618	<b>56.1</b>	23.7	79.8
Casseroles and stewing	50	0.582	<b>56.1</b>	28.6	84.7	

<b>Factor 4</b> <b>Food economy</b> <sup>5</sup>	How to select quality and value-for-money food on-line	66	0.684	<b>31.6</b>	16.4	48.0
	How the Healthy Living Pyramid can be used as a guide to allocate weekly food dollars ( \$60 allocated to foods in the ‘eat most’ section, \$30 allocated to food in the ‘eat moderately’ section and \$10 allocated to foods in the ‘eat least’ section = \$100 total food dollars)	60	0.572	<b>37.5</b>	27.1	64.6
	How to buy food on-line	69	0.565	<b>27.1</b>	5.6	32.7
	How to select and buy quality and value-for-money food	36	0.524	36.8	<b>54.6</b>	91.4
	How to safely freeze fruits and vegetables to extend their seasonal qualities	58	0.508	<b>42.8</b>	28.6	71.4
	Choosing cookery methods to lower gas and electricity costs	55	0.475	<b>46.9</b>	27.9	74.8
	When a canned, dried, frozen fruit or vegetable can be successfully substituted for the fresh variety in a recipe	43 <sup>7</sup>	0.444	<b>53.5</b>	35.7	89.2
	How to shop without planning ahead	67	0.319	<b>33.1</b>	14.9	48.0
<b>Factor 5</b> <b>Use of microwave ovens</b> <sup>6</sup>	How to use a microwave oven to reheat food	48	0.637	<b>49.4</b>	36.0	85.4
	Micro-wave cooking	57	0.550	<b>51.1</b>	23.3	74.4
	How to use a microwave oven to cook food	56	0.505	<b>49.0</b>	25.7	74.7

1. 237 respondents completed this section of the questionnaire

2. Cronbach’s  $\alpha$  value was calculated on 23 items with factor loadings > 0.400 Procedures for domestic settings 0.945

3. Cronbach’s  $\alpha$  value was calculated on 22 items with factor loadings > 0.400 Procedures for vocational settings 0.923

4. Cronbach’s  $\alpha$  value was calculated on 11 items with factor loadings > 0.400 Cookery methods 0.921

5. Cronbach’s  $\alpha$  value was calculated on 7 items with factor loadings > 0.400 Food economy 0.779

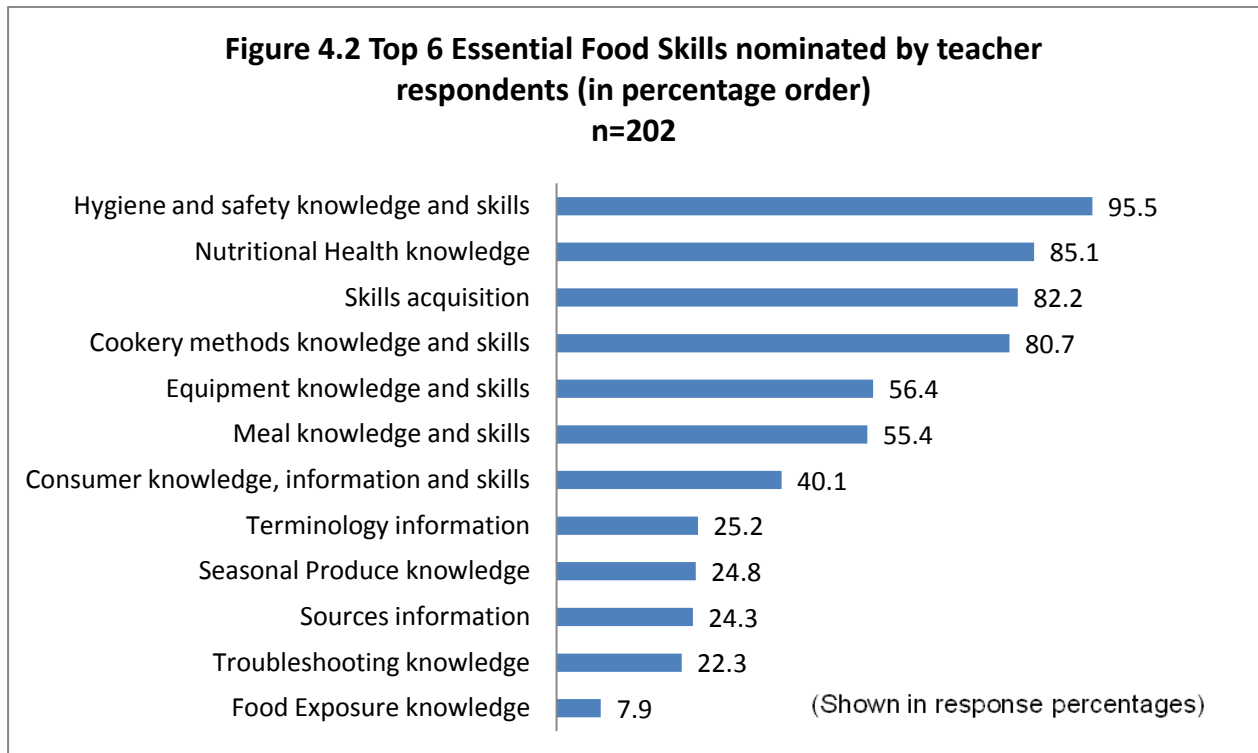
6. Cronbach’s  $\alpha$  value was calculated on 3 items with factor loadings > 0.400 Use of microwave ovens 0.859

7. This duplicated item was retained to check respondent acquiescence but was excluded in the factor analysis - ‘When frozen vegetables can be used as alternatives to fresh’ ranked as 43.

#### 4.5.4 Teachers’ nominations of their Top 6 Essential Food Skills

The respondents were asked to nominate (from the list of twelve essential skills identified by the food experts in Study 1) the top six skills which they considered to be essential and required for young people to be able to select and purchase food, store food pre- and post cooking, prepare, cook and serve food to individuals and family members. From the list of twelve essential skills, the Top 6 skills (in percentage order) were Hygiene and safety

knowledge and skills, Nutritional Health knowledge, Skills acquisition, Cookery methods knowledge and skills, Equipment knowledge and skills and Meal knowledge and skills. They are presented in **Figure 4.2**.



#### 4.5.5 Teachers' nominations of their Top 3 Goals they wanted to achieve in their food skills program

The respondents were asked to nominate their top three goals that they tried to achieve in their work as a food skills teacher (**Figure 4.3**). Many responded to this open question and outlined several sub-goals within their statements for each goal. When this occurred, a respondent's statement was content analysed and each goal was included in one of the eight classifications listed below, resulting in more responses than the original number of respondents who answered this question. The bar chart displays the percentage of respondents' nomination of the top three goals represented as Goal 1 (shown in blue), Goal 2 (shown in red) and Goal 2 (shown in green). For example, nominated with the largest percentage by 31.2 per cent of respondents, *Motivate students to cook* was Goal 1 followed by the next ranking primary goal *Prepare and cook food* nominated by 20.8 per cent of respondents. For Goal 2, *Engage and Connect with students* was nominated by 27 per cent of

respondents followed by the next ranking goal *Teach Life Skills* with 25 per cent of respondents and so forth.

Thirty-three per cent of teachers nominated that the most important goal for them was to *Motivate students to cook* and enjoy food. Respondents in this study described how the preparation and cooking of ‘occasional’ foods such as cakes and biscuits added ‘fun’ and ‘enjoyment’ to their teaching program. They felt it was important to give young people the autonomy to select their own favourite food recipes and then provide them with the skills to execute those meals and the opportunities to share experiences and knowledge with each other. One respondent summed it up like this:

*Baking biscuits, cakes, slices and treats are enjoyed by students, so there is still a place for this in our Home Economics classes. This is balanced with the idea of eating these foods in moderation and learning these baking skills so that these foods can be made at home or school and enjoyed and shared with family and friends. We also discuss the cost of making these products at home versus buying these products in the shops.*

**Respondent, 05 Feb 2010, 9-40pm**

Their second *and* third goals were to *Engage and Connect* with students through food enjoyment, group work and building confidence. The emphasis on student motivation and encouragement were identified as common themes and aligned with each other as the top three goals.

Many respondents enjoyed teaching their students not only the basic skills required to put together a tasty meal but to see their students develop confidence in the process of making food and eating it with their friends. This socialisation aspect of teaching food skills to young people emerged as a significant theme. This response expressed the views of many:

*I think it is important to teach all basic methods of cooking, stressing safety and hygienic methods; allow the student to become skilled in timing and organisational skills. The feeling of competence should build their self confidence with a feeling of ‘know how’ in the kitchen. This should result in an improved willingness to learn about nutrition, taste, textures, economy as well as simply loving the eating.*

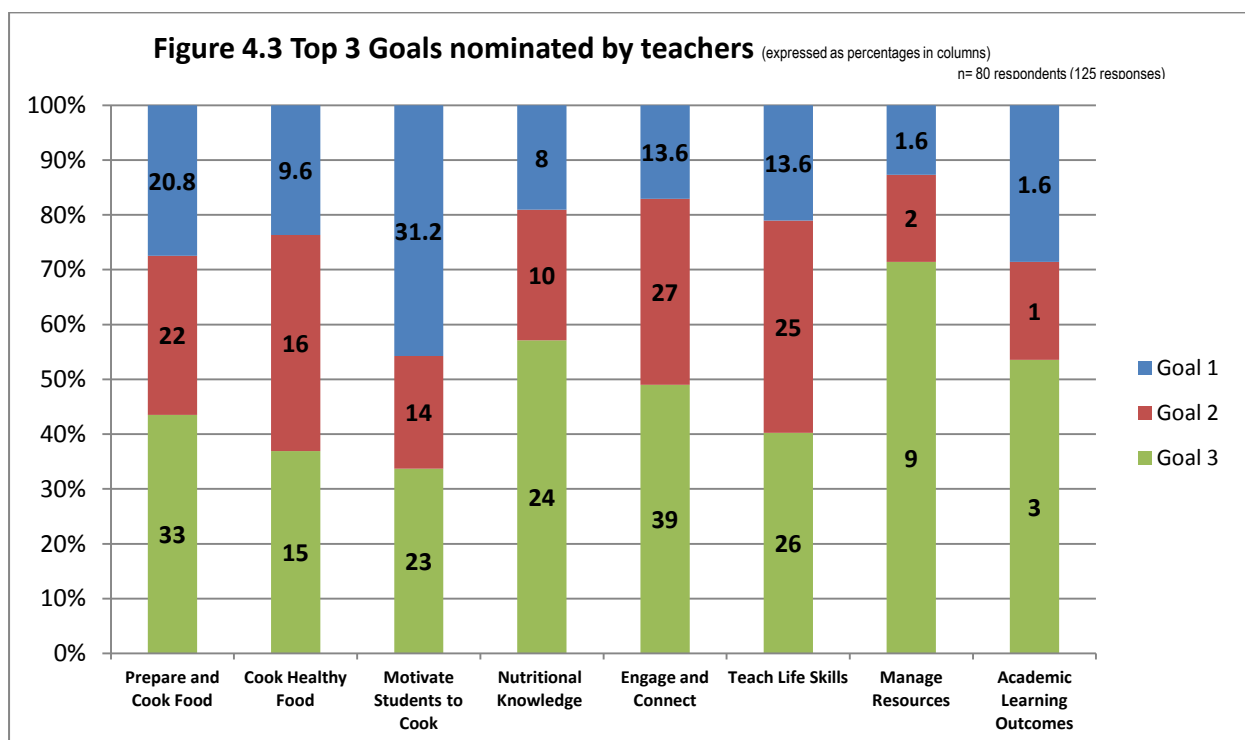
**Respondent, 19 Nov 2009, 9-38am**

Likewise, the goal of *Teach Life Skills*, which included themes such as sustainability for later life, food exposure and culture, was a recurring theme in all three levels of goals but more often appeared as a second or third priority goal.

The goal to teach students’ how to *Prepare and Cook food* was nominated for all three levels of goals. Implicit within this goal was teaching hygiene and safety skills, which was nominated as the most important essential food skill in the previous section.

The goal to teach students to *Cook Healthy Food* was considered more as a secondary goal and aligned with the classified factor of teaching *Nutritional knowledge* since the percentages for these factors appeared to interchange between Goal 2 and Goal 3. In the earlier section, however, when respondents were asked to rank the essential food skills, they nominated that ‘teach nutritional health knowledge’ was their second top priority after teaching hygiene and safety skills.

Finally, the classified factors of *Resource Management* which included teaching students environmental energy, consumer resourcefulness and money saving measures and *Academic Learning Outcomes* were nominated by a small percentage of teachers as important goals of their food skills programs.



#### 4.5.6 Respondents' perceived importance of Personal Belief and Practice items – derivation of Teacher Orientations

Twenty-four items from the personal beliefs and practices section related to food and cooking, nutrition, consumerism and environmental issues. These items were used to test the hypothesis that there is a relationship between the teachers' responses to the food skills items and the importance that they place on them and their personal beliefs and practices.

Factor analysis (principal components analysis with varimax rotation and pairwise inclusion) of these personal orientation items derived three components (**Table 4.4**). These three components were scrutinised for common themes and were allocated provisional names.

Component 1 (13 items), named as '*Food Aesthete*', focused on food: the product and the process involved in making and perfecting it; Component 2 '*Consumer-Environmentalist*' (5 items) related to food economy and moral decisions that people might make as consumers when they select food to buy and eat. Component 3 '*Nutritionist*' (6 items) focused on skills such as how to budget, use of dietary analysis software programs to analyse diets, use of microwave ovens and products including fresh herbs and vegetables to produce healthy food outcomes.

The items that were ranked as important by two-thirds (> 70 per cent) of the respondents were all included in the *Food Aesthete* component and related to the respondents' perceptions of their own food practices (cooking as a personal hobby, trying out recipes, teaching healthy tips and going to restaurants) and what they considered important to teach to their students (how to use a cook's knife, present food attractively and expose students to new food experiences).

The remaining items in all three categories of orientations were recorded as not particularly important based on strength of agreement. The purpose of the factor analysis was to determine the three teacher 'orientations' and the process achieved this purpose. Of lesser priority was the level of importance that the teacher respondents attached to the belief and practice items themselves.

The Cronbach's alpha values revealed that the first two sets of items for the *Food Aesthete* ( $\alpha$  0.778) and the *Consumer-Environmentalism* ( $\alpha$  0.797) were more reliable scales than the *Nutritionist* orientation scale ( $\alpha$  0.549).



**Table 4.4 Factor analysis for respondents' perceived importance of Personal Belief and Practice items and allocation of Teacher Orientations**

'Food Aesthete' <sup>1</sup>	Factor Loading	Agree (%)	Strongly Agree (%)	Total (%)	'Consumer Environmentalist' <sup>2</sup>	Factor Loading	Agree (%)	Strongly Agree (%)	Total (%)	'Nutritionist' <sup>3</sup>	Factor Loading	Agree (%)	Strongly Agree (%)	Total (%)
It's important for students to know how to cook sponge cakes and biscuits	0.672	32.7	6.8	39.5	If I had more money in my food skills budget I would choose to purchase organic food	0.810	29.5	18.9	48.4	I teach my students how to use dietary analysis software programs	0.562	35.5	11.5	47.0
Knowing how to use a cooks knife (20 cm blade) is essential	0.613	45.0	27.7	72.7										
Cooking is my personal hobby (P)	0.591	33.6	43.3	76.9	If I had more money in my food skills budget I would choose to purchase food that reflects ethical farming practices	0.724	35.0	28.6	63.6	I teach my students how to budget their food dollars	0.559	41.9	11.5	53.4
It is important that students know how to present food attractively	0.560	56.8	31.8	88.6										
I love trying new recipes and using them in my own food skills classes	0.524	47.5	36.4	83.9	I choose to use free-range eggs not caged eggs in my food skills program	0.644	13.4	8.3	21.7	All my recipe selections used in my food skills program are nutritious	0.518	27.2	10.6	37.8

Tapping into new ideas shown on television cooking shows is the best way of motivating students	0.520	40.9	12.7	53.6										
Product outcome is an important criteria for recipe success	0.502	54.5	23.6	78.1	I use organic foods as much as I can in my food skills program	0.619	7.8	4.1	11.9	Students need to know how to use a microwave oven as a cooking not just as a re-heating appliance	0.506	44.1	12.7	56.8
Taking students to markets and restaurants is a good way of exposing them to new food experiences	0.496	53.2	28.6	81.8										
Students can be motivated to enjoy cooking if they cook non-nutritious food	0.488	24.1	6.4	30.5	I allocate funds in my home economics budget to purchase food that reflect my ethics	0.590	23.5	5.1	28.6	I use fresh seasonal vegetables and fruit in my food skills program	0.401	58.5	30.4	88.9

I assess students on their food product outcome in my food skills classes	0.451	49.8	12.4	62.2										
I try and include healthy eating tips in my food skills program	0.431	46.1	52.1	98.2						Our food skills program uses fresh herbs and vegetables sourced from our own school's vegetable garden	0.395	27.6	12.0	39.6
I enjoy eating out at restaurants	0.374	32.7	61.8	94.5										
I use the recipe ideas shown on television cooking shows in my food skills program	0.373	46.1	18.0	64.1										

1 Cronbach's  $\alpha$  value was calculated on 13 items with factor loadings > 0.400 Food Aesthete 0.778

2 Cronbach's  $\alpha$  value was calculated on 5 items with factor loadings > 0.400 Consumer-Environmentalism 0.797

3 Cronbach's  $\alpha$  value was calculated on 6 items with factor loadings > 0.400 Nutritionist 0.549

#### 4.5.7 Predictors of Food Skills

The multiple regression analyses of the food skills component scores (**Table 4.5**) indicated that the *Food Aesthete* orientation positively predicted each of the first three skill importance factors and was a particularly strong predictor of Factor 2 '*Procedures for vocational settings*' ( $\beta$  0.439,  $R^2$  0.289) and Factor 3 '*Cookery methods*' ( $\beta$  0.417,  $R^2$  0.204). In other words, '*Procedures for domestic Settings*', '*Procedures for vocational settings*' and '*Cookery methods*' were the most important sets of skills for *Food Aesthetes* compared with the other two orientations.

The *Consumer-Environmental* orientation was predictive of three of the skills factors. The teachers who followed this orientation valued Factor 2 '*Procedures for vocational settings*' ( $\beta$  0.118,  $R^2$  0.289) but were less likely to endorse Factor 5 '*Using microwave ovens*', as indicated by the negative standardised beta value ( $\beta$  -0.231,  $R^2$  0.098), as part of their teaching. Factor 4 '*Food economy*' ( $\beta$  0.164,  $R^2$  0.094) was valued by the *Consumer-Environmental* respondents.

The *Nutritionist* orientation was predictive of three of the skills factors, particularly Factor 4 '*Food economy*' ( $\beta$  0.275,  $R^2$  0.094) and Factor 2 '*Procedures for Vocational Settings*' ( $\beta$  0.305,  $R^2$  0.289). These teachers with a *Nutritionist* orientation were more likely to endorse the use of microwave ovens ( $\beta$  0.229,  $R^2$  0.098) in their teaching.

Teachers' demographic and professional characteristics were weaker predictors of the perceived importance of food skills than the three personal orientations '*Food Aesthete*', '*Consumer-Environmental*' and '*Nutritionist*'. For example, teachers' food skills experience ( $\beta$  0.302,  $R^2$  0.092) was a stronger predictor for Factor 1 '*Procedures for domestic settings*' than their professional background ( $\beta$  0.150,  $R^2$  0.092) in Factor 1 '*Procedures for domestic settings*', which was the only other demographic predictor for all five factors.

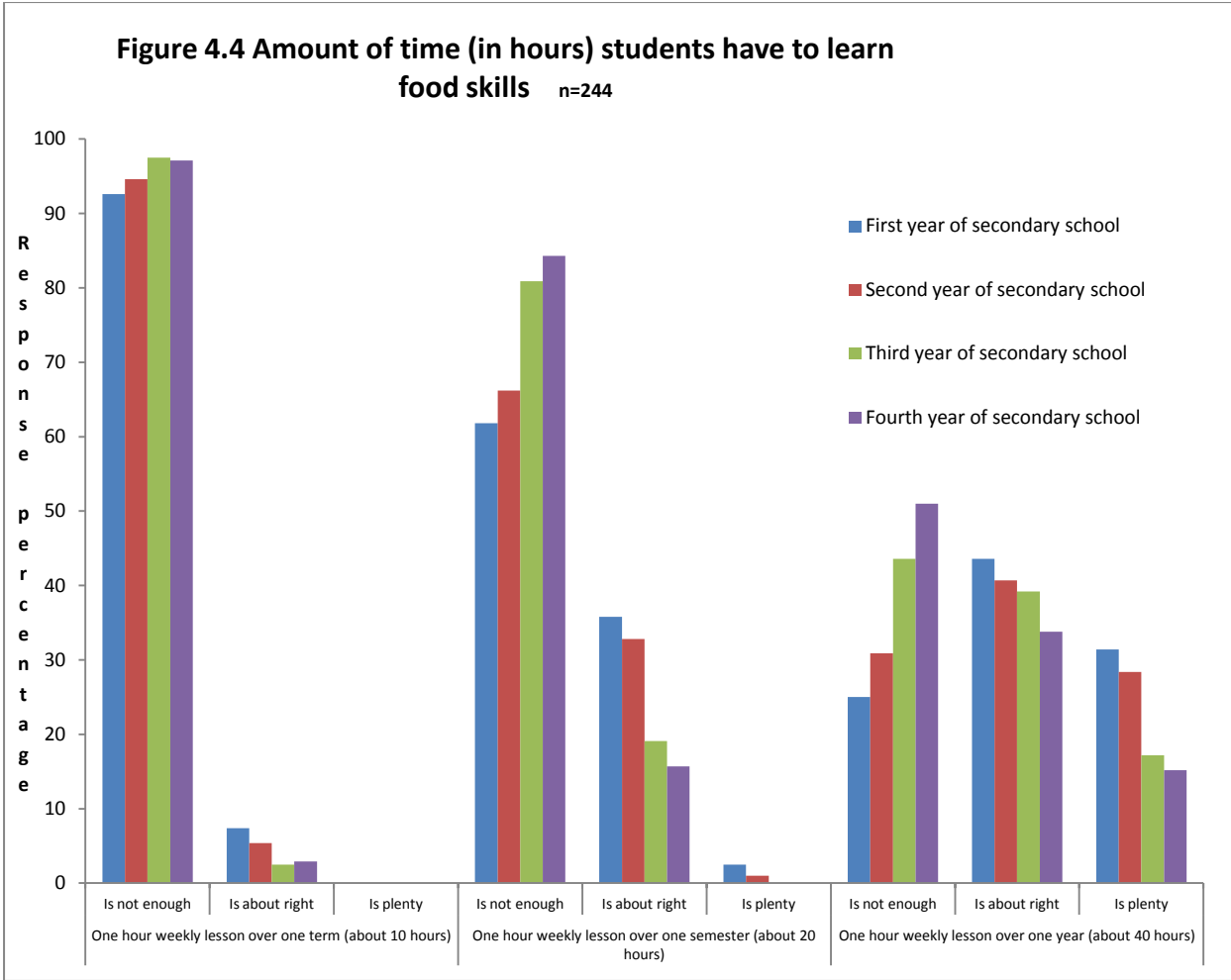
**Table 4.5 Demographic, professional background and Orientation predictors of the perceived importance of food skills represented in five dimensions**

<b>Factor</b>	<b>Predictor Variable</b>	<b><i>p</i>-value</b>	<b>R<sup>2</sup></b>	<b>Std β</b>
Factor 1 Procedures for domestic settings	Food Skills Experience	0.001 <sup>1</sup>	0.092	0.302
	Food Aesthete	0.004		0.186
	Professional Background	0.041		0.150
Factor 2 Procedures for vocational settings	Food Aesthete	0.001 <sup>1</sup>	0.289	0.439
	Nutritionist	0.001 <sup>1</sup>		0.305
	Consumer-Environmentalism	0.041		0.118
Factor 3 Cookery methods	Food Aesthete	0.001 <sup>1</sup>	0.204	0.417
	Food Skills Experience	0.002		-0.191
Factor 4 Food economy	Nutritionist	0.001 <sup>1</sup>	0.094	0.275
	Consumer-Environmentalism	0.012		0.164
Factor 5 Using microwave ovens	Consumer-Environmentalism	0.001 <sup>1</sup>	0.098	-0.231
	Nutritionist	0.001 <sup>1</sup>		0.229

1. Denotes a statistically significant difference ( $p < 0.005$ )

#### **4.5.8 Teachers' views of adequacy of time allocated to teaching food skills in the curriculum**

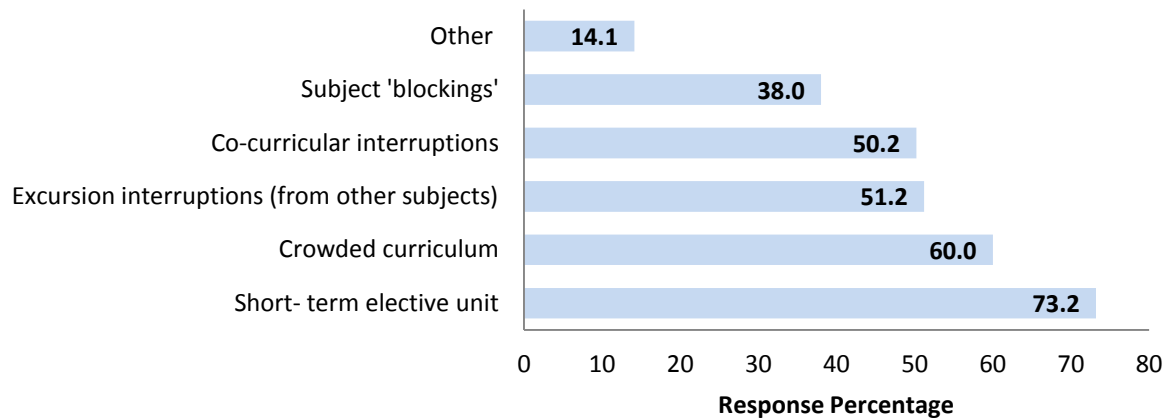
The teachers were asked to nominate the amount of time that they considered to be sufficient for students to learn the food skills included in the curriculum. **Figure 4.4** depicts this relationship and shows that as the amount of time students had to learn the food skills increased from one weekly lesson over one term (10 hours) to one weekly lesson over one year (40 hours) so too did teachers' level of agreement that there was sufficient time allocated to the program. However, teachers' level of agreement for the sufficiency of time allocated for the program decreased as students moved from the first to the fourth year of secondary school.



Furthermore, the teachers’ nominated short-term programming, that is, short program duration of a ten week term compared with a one year program, as the most significant barrier to account for insufficient time to teach their food skills programs (73.2 per cent). Apart from those barriers already listed in the survey, which included Subject ‘blockings’ (clashes with other subjects given priority by students or school managers) and ‘Crowded curriculum (too many subjects or co-curricular activities that compete for time in the school day), ‘Other’ barriers identified by respondents (14.1 per cent ) included, ‘only teacher in the school to teach the subject’, ‘limited parent and school funding’, ‘school not supporting food skills program’ and ‘limited kitchen facilities’ (Figure 4.5).

**Figure 4.5 Barriers accounting for insufficient time to teach food skills**

(Shown as response percentages n=205)



#### **4.5.9 Teachers' level of responsibility for designing food skills programs**

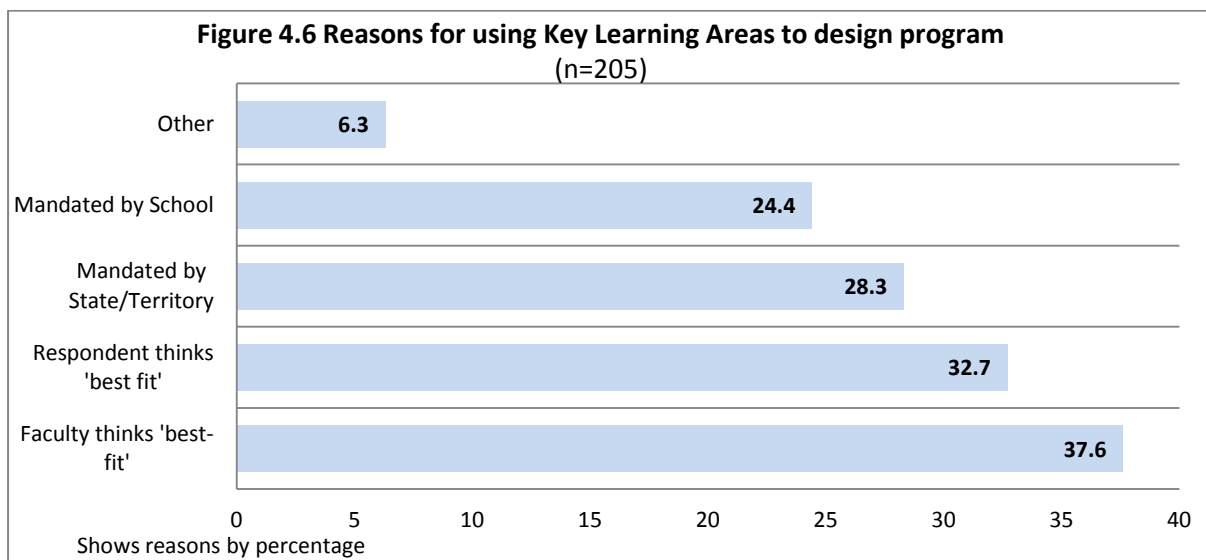
Of the 187 teachers who responded to this question, 92.3 per cent reported they had some or full responsibility for deciding which food skills were taught in their classes over the first four years of secondary school. In the final two years of secondary school, teachers are mandated to follow the curriculum prescribed by the state curriculum authority. In some cases, respondents were the only home economics teacher in the school and therefore had full responsibility to design and implement their own programs whilst others mentioned that they worked collaboratively with their colleagues to share ideas to create a better program. These findings supported the hypothesis that teachers' had autonomy and responsibility when they planned and evaluated their own programs.

#### **4.5.10 Design of food skills programs based on the Australian curriculum**

When the teachers' planned their food skills programs, many respondents (52.7 per cent) used a combination of the Technology and the Health and Physical Education Key Learning Areas to design their programs (Victorian Curriculum Assessment Authority, 2008). A little over a third of them (32.7 per cent) based the design of their curriculum exclusively on the Technology Key Learning Area of their State/Territory curriculum while 7.8 per cent based their program design exclusively on the Health and Physical Education Key Learning Area of their State/Territory curriculum. Those who cited 'Other' (6.8 per cent) specified that their programs were integrated into more than two key learning areas (such as 'Personal

Learning’) or were based on competency based or vocational training programs, such as Hospitality.

Many teachers reported they had autonomy in selecting which Key Learning Area they used to plan their programs. When they were asked to specify the reason/s for their selection, 32.7 per cent nominated that they thought it was the ‘best fit’ while another 37.6 per cent nominated that their faculty thought it was the ‘best fit’. Respondents could respond to more than one selection, but less than one third specified that their selection was mandated by the State or Territory (28.3 per cent) or the school (24.4 per cent) in which they taught. The ‘Other’ 6.3per cent was mostly used by respondents to justify or more fully explain their selection (**Figure 4.6**).



Finally, respondents were asked to nominate which Key Learning Area best supported the achievement of food skills competencies (**Figure 4.7**). Over two-thirds (72.0 per cent) nominated a combination of the two Key Learning Areas of Technology and Health and Physical Education to combine the health and nutritional knowledge and practical food skills that they wanted their students to learn. Some respondents (n=12) used this question to express their grievances that neither of the Key Learning Areas covered all the skills and knowledge that they wanted to impart. The statements from two respondents summed up the views of many:

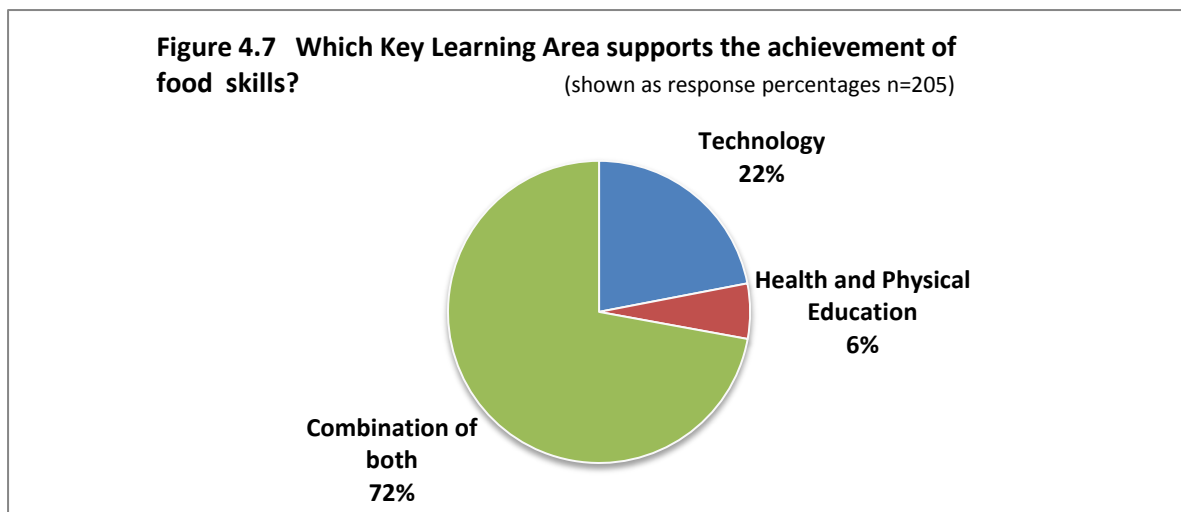


*You must have both. There are components in each that complement each other and I feel I can give the students the best teaching from including both.*

**Respondent, 03 Feb 2010, 9-37am**

*I think Home Economics as a broad subject (including Food, Textiles, Consumer Education) needs to be together, (and as a subject) has been weakened by being divided and placed in best fit KLAs (Key Learning Areas).*

**Respondent, 10 Dec 2009, 12-05am**

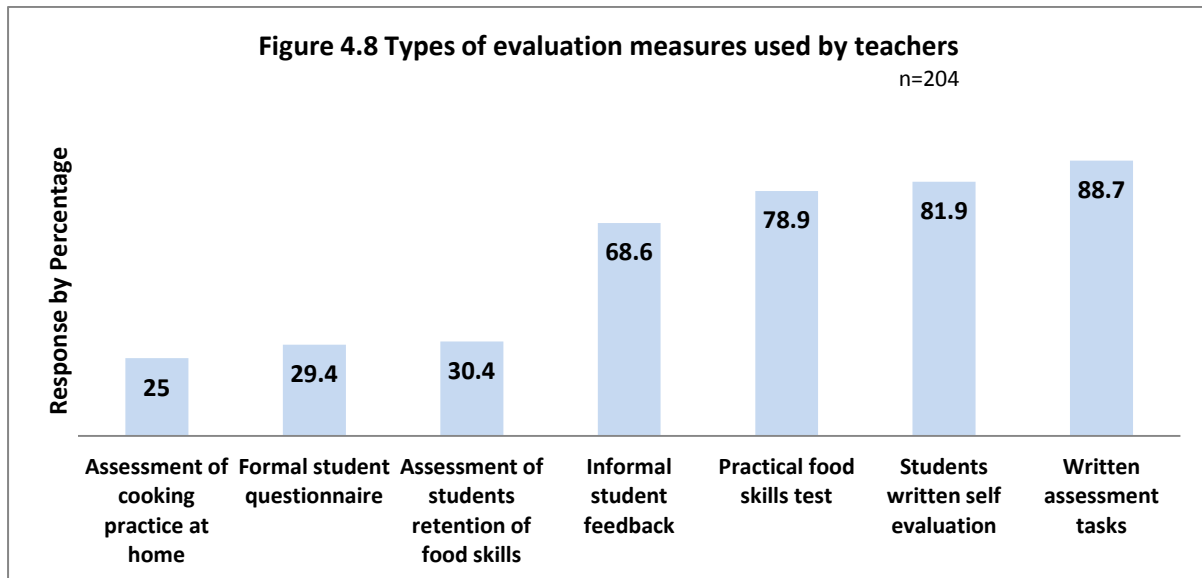


No respondent specified that they did *not* use some form of State- or Territory based curriculum to design their programs, which supported the hypothesis that teachers' used State or Territory curriculum to design or evaluate their programs.

#### **4.5.11 Evaluation measures used by teachers to assess students' food skills**

Teachers' reported using a variety of evaluation measures, including written assessment tasks, assessment of students' retention of food skills from one year to the next as well as self- and/or peer assessment of the students' themselves, to assess their students' food skills (**Figure 4.8**). Eleven respondents specified that they used other measures including on-going or formative assessment such as teacher observation of students' practical work or students' self-evaluation of their food products. These data related to the final hypothesis of the teacher survey regarding the evaluation measures used by teachers to assess their students' food skills.

The collective responses to this question have particular significance as they help to inform the design and development of a valid and reliable evaluation tool for teachers and a peer- or self-evaluation tool for students, which is relevant to Study 3 of the thesis.



#### 4.5.12 Resources needed for teaching food skills

In the Study 2 survey, teachers were asked to rate the importance of the resources they might use to support their food skills programs. The list of resources was derived from the four recommendations made by the food experts in Study 1 and the expert panel in Study 2. It included: ‘motivation (of students)’, ‘parental involvement’, ‘community (friends, peers, community and government) involvement’ and ‘opportunities for learning’. The list of 91 items, described in Section A of the Methodology (4.3.2) was derived from Section A (73 items) and Section B (18 items) of the questionnaire under the following question headings:

- **Food exposure** to a variety of foods from different cultures through an ‘International Foods’ themed school food program, information provided by guest speakers and student visits to restaurants, ‘food’ streets and markets. These items encompass ‘opportunities for learning’ and ‘community involvement’ recommendations made by Study 1 and 2 food experts in **Figure 4.1** Predictors of Teacher Practices (17 items);

- **Nutritional Health Knowledge** and what constitutes a healthy meal in relation to meeting daily activity requirements, why it is important to enjoy and consume a wide variety of nutrient dense food and how to select nutrient dense food in relation to vegetarian foods, healthier alternatives and portion sizes. These items encompass the ‘student motivation’ recommendation made by Study 1 and 2 food experts in **Figure 4.1** Predictors of Teacher Practices (16 items);
- **Information sources** and how they are used to assist students with produce selection and stimulate them to trial new produce, recipes and subsequently broaden their culinary repertoire. These items encompassed the recommendation of ‘opportunities for learning’ made by Study 2 experts in **Figure 4.1** Predictors of Teacher Practices (10 items);
- **Skills acquisition** and how hands-on and thinking skills are used to assist students to develop independence and confidence. These items encompassed the recommendations of ‘opportunities for learning’, ‘parental involvement’ and ‘motivation’ made by Study 1 and 2 food experts in **Figure 4.1** Predictors of Teacher Practices (11 items);
- **Motivating students** so that they are encouraged to change eating behaviour by learning and practising food skills. These items encompassed the recommendations of ‘parental involvement’ and ‘motivation’ recommendation made by Study 1 and 2 food experts in **Figure 4.1** Predictors of Teacher Practices (15 items);
- **Community involvement** and how these agencies can make food skills programs successful. Community resources include resources outside family and skill-based eating programs (food skills classes) in schools: friends, peers, community cookery classes or ‘clubs’, sporting agencies (gyms, sports clubs, community health centres and doctors’ surgeries, commercial agencies (markets, retail food outlets, restaurants), non-Government (Dairy Board, Meat and Livestock Association, Nutrition Australia) and local (libraries, neighbourhood houses, youth groups and councils) and federal government agencies. ‘Community involvement’ was a recommendation made by Study 1 and 2 food experts in **Figure 4.1** Predictors of Teacher Practices (4 items).

The remaining 18 items were derived from the Beliefs and Practices section of the Teacher Survey and related to respondents' views on curriculum (6 items), teaching vocational food skills (2 items), cookbooks and ICT (2 items), reinforcing food skills through practice at home (6 items) and using other resources including teachers from other subject areas (1 item) and cooking programs on television (1 item) to motivate and provide students with further learning opportunities.

Four exploratory factor analyses (principal components with varimax rotation) were performed to examine the interrelationships between items and to finally derive the ten factors. The factors were provisionally named as '*Practice at home*', '*Multi-cultural and community food exposure*', '*Community agencies - beyond the classroom*', '*Use of Cookbooks*', '*Healthy meal planning*', '*Motivate students to cook healthily*', '*Teach students vocational food skills*', '*Curriculum as a resource*', '*Use of Information Communication and Technology (ICT) as a resource*', and '*Foster independence*'. The agreement of the factor loadings and Cronbach's alpha values (for items loading > 0.400) of each of the resources are shown in **Table 4.6**.

Factor 1 '*Practice at home*' included extended learning opportunities for students to practise the food skills acquired at school in their homes and with their parents. The high factor scores together with the importance that the respondents placed on these items showed that this was a critical factor in food skills acquisition. '*Practice at home*' necessarily relies upon the teachers and parents to work together and ensure that the child is encouraged to cook 'every day' food that they would enjoy eating together as a family. The factor scores showed the integral link made by teacher respondents' between children's enjoyment of food through cooking and eating and their motivation to cooking healthily at home, by linking it with 'their world' and 'with fun and enjoyment'.

The teachers recognised the importance of parents as positive role models who shaped their children's current and future eating patterns. Almost all (99 per cent) of them agreed that it was important to encourage parents to support their children's food skills practice at home. They encouraged their students to share food preparation and cooking tasks at home, to practise and hone their food skills and incidentally develop their organisational skills. The

teachers agreed that setting homework tasks was a good way of getting parents involved and for young people to practise the food skills learnt at school.

Factor 2 '*Multi-cultural and community food exposure*' was considered to be an important resource, based on the high percentages and factor scores, used by teachers to expose their students to new and unfamiliar foods and new and enjoyable tasting experiences. These items encompassed the fourth recommendation of 'opportunities for learning'.

*I use a large amount of multicultural techniques, ingredients, cooking methods in my classes to broaden knowledge about what is available in the market place so that students can identify and use these products. This also gives the opportunity for the student to share experiences and knowledge which can take away the doubts which some students may have about trying new foods.*

**Respondent, 20 Nov 2009, 9-41am**

The respondents agreed that teaching about food from around the world in an 'International Foods' themed program was a popular topic with their students. Supplemented with visits to markets with foods from different cultures, most respondents' agreed that an International Foods themed program helped to increase their students' cultural acceptance of food and opened up cultural pathways. For these reasons, the teachers rated 'World Food' as important, and not for the food skills learnt within this themed program since fewer than half (41.8 per cent) of the respondents agreed that an international themed program was the 'best way to teach food skills'. The respondents' were less emphatic that an 'International Foods' themed program was healthier or cheaper, especially if they taught in a rural school.

*Teaching country kids about international foods is so rewarding - they have such limited exposure to other cultures. But access to appropriate ingredients is expensive and extremely difficult in small rural schools.*

**Respondent, 09 Dec 2009, 10-37am**

*Our school is fairly mono cultural and we now offer an eight lesson unit in year nine called 'World in your Kitchen' which has some Social Studies components as well with the spice routes taking in Geography and history of foods. We would like to do more excursions to Melbourne and visit the markets but buses are too expensive to do as often as we would like.*

**Respondent, 09 Dec, 2009, 12-08am**

Factor 3 '*Community agencies - beyond the classroom*' were those resources which teachers used to supplement and enrich their program (and to provide further opportunities for learning) and to make it more enjoyable for their students. These resources were used as wider sources of information. They included involving guest chefs and speakers and teachers from other subject areas and visits to markets and restaurants where students would learn about food production and different cultures.

Most respondents' (93.3 per cent) agreed that it was important to involve their students in the program design and to motivate them to cook healthily by matching new learning experiences with enjoyment. The novel ideas that respondents thought were important to include in their food skills program to make it more enjoyable for their students included cooking show contests, story-telling about food, environmentally themed projects or growing herbs and vegetables to learn about environmentally sustainable food production and cooking techniques such as barbequing that would appeal to male students. They were less emphatic about rewarding students with prizes and involving parents in their food skills program.

Factor 4 '*Use of cook books*' was used as the major source of recipes by the majority (97.1 per cent) of teachers. Teachers were in agreement that the cook books needed to have the following features: step-by-step instructions, a glossary of culinary terms, coloured photographs, troubleshooting tips and no-fail and basic recipes that would help to build students' confidence.

Factor 5 '*Healthy meal planning*' as a resource provided guidelines for teachers to teach their students how to plan and cook healthy and nutritious meals. The teachers' agreed unanimously (99.1 per cent) that this was an important set of resources to include in a contemporary food skills program. The process of meal planning incorporated practical ways that students could apply nutritional concepts and included how to use the Australian Guide to Healthy Eating and substitute ingredients to change the nutritional value of meals and analyse their own diet. The respondents agreed that it was important to teach students the link between diet and nutritional outcomes such as the consumption of a wide variety of food to benefit health and optimum body weight.

Factor 6 '*Motivate students to cook healthily*' as a resource provided guidelines for teachers to teach nutrition to their students as a theoretical concept and in practical ways such as how to cook healthy meals. They promoted its appeal by positioning healthy cooking as 'cool' or linked with 'looking good' (64.2 per cent), 'sporting performance' (66.5 per cent) or most importantly, to student wellbeing (97.1 per cent).

Factor 7 '*Teach students vocational food skills*' is used as a resource by teachers to prepare their students for work in the hospitality or food industry. Eighty per cent of respondents agreed that they have a role in preparing their students for food skills job training. The cooking of non-nutritious food is linked with this factor and therefore may justify their inclusion as part of a food skills program.

*I believe these are life skills which they could take with them where ever they go and can cater for basic food preparation through to kitchen basics for the hospitality industry and the kids learn heaps as they progress.*

**Respondent, 10 Dec 2009, 9-08am**

Factor 8 The '*Curriculum attitudes*' factor relates to the professional body which should be responsible for developing the food skills curricula within, or separate to, a home economics curriculum in Australia. Close to eighty per cent of teachers agreed that a national food skills or home economics curriculum was important for strengthening home economics as a subject in schools. Two-thirds (71.8 per cent) of respondents agreed that it was the role of the home economics professional associations to develop a food skills or home economics curricula and not the ACARA (Australian Curriculum, Assessment and Reporting Authority 2013) (34.6 per cent); however, as two respondents stated:

*Professional associations need to advocate for national curriculum and be clear in their position to best influence ACARA who hold the responsibility for development.*

**Respondent, 4 Nov 2009, 3-56pm**

*I would assume that Home Economics professional associations (representing home economics teacher members) would work with ACARA to develop a national home economics (including food skills) curriculum.*

**Respondent, 26 Oct 2009, 9-32pm**

Factor 9 ‘*Use of ICT (Information Communication and Technology)*’ was a supplementary resource to Factor 4 ‘*Cook books*’ for teachers to use as a source of recipe ideas and to teach their students to develop ICT literacy skills in order to find and evaluate suitable recipes as suggested by this comment:

*There is no such thing as a no fail recipe in a classroom. How to make judgements about Internet recipes is an excellent skill development area.*

**Respondent, 02 Feb 2010, 11-05am**

Factor 10 ‘*Foster independence*’ included miscellaneous resources that teachers use to supplement their food skills programs and include the use of supermarket magazines and products and television cooking shows to motivate students and provide them with further learning opportunities. The ability for students to design their own activities was linked to this factor and was considered to be important by 79.6 per cent of teachers.

**Table 4.6 Summary of the factor analysis of the respondents’ rankings of the importance of resources used to support their food skills program represented in 10 dimensions (n=256) <sup>1</sup>.**

1. Decreased to 217 respondents by the end of the questionnaire

<b>Factor</b>	<b>Items</b>	<b>Factor Loading</b>	<b>Agree (%)</b>	<b>Strongly Agree (%)</b>	<b>Total (%)</b>
<b>Factor 1 Practice at home</b>  Cronbach’s $\alpha$ 0.917 (14 items)	Encouraging parents to support their children’s food skills practice at home	0.768	25.9	73.2	99.1
	To acquire skills, students need practice	0.737	22.4	75.9	98.3
	Practice is important for students to properly learn food skills	0.721	29.4	68.9	98.3
	Sharing food preparation and cooking tasks at home helps students learn organisational skills	0.712	27.2	67.1	94.3
	Encouraging students to share food preparation and cooking tasks at home helps them to learn food skills	0.706	27.6	70.6	98.2
	Encouraging parents to be positive role models who influence the current and	0.696	28.5	66.7	95.2



	future eating patterns of their children				
	Setting practical food homework tasks reinforces food skills learnt at school	0.666	35.5	45.6	81.1
	Students need to cook food in class that they will enjoy and cook for themselves	0.553	38.6	55.7	94.3
	Setting practical homework tasks is a good way of getting parents involved in reinforcing food skills learnt at school	0.534	47.7	30.9	78.6
	Setting practical homework tasks is a good way of reinforcing food skills learnt at school	0.530	45.5	31.4	76.9
	Young people remember how to use the food skills they learnt at school	0.488	42.5	49.6	92.1
	Introducing young people to cooking at school teaches correct food skills	0.433	37.3	53.5	90.8
	Practice is the best way of increasing student confidence in cooking	0.419	37.7	59.5	97.2
	My food skills program is based on every day recipes that students can cook at home	0.406	37.8	56.2	94.0
	Motivate students to healthy cook by linking it with their world	0.390	44.6	48.2	92.8
	Motivate students to healthy cook by linking it with fun and enjoyment	0.356	39.7	54.5	94.2
<b>Factor 2</b> <b>Multi-cultural and community food exposure</b>  Cronbach's $\alpha$ 0.921 (13 items)	Cooking world food opens up cultural pathways	0.746	48.4	39.8	88.2
	Cooking world food increases cultural acceptance of food	0.744	52.7	41.4	94.1
	Cooking world food is my students' favourite topic	0.717	35.9	12.9	48.8
	Cooking world food exposes students to new tasting experiences	0.716	44.1	53.5	97.6
	Cooking world food is the best way to teach food skills	0.715	32.4	9.4	41.8
	Cooking world food is the best way of exposing students to new food	0.708	44.9	34.0	78.9

	Cooking world food exposes students to enjoyable tasting experiences	0.702	48.8	40.2	89.0
	Cooking world food exposes students to unfamiliar foods	0.702	44.9	51.6	96.5
	Cooking world food is always used in my program	0.673	49.2	32.8	82.0
	Cooking world food is popular with my students	0.632	42.2	45.3	87.5
	Cooking world food show healthier eating options	0.599	36.3	18.8	55.1
	Cooking food from around the world in an 'International Foods' themed program	0.569	49.6	29.3	78.9
	Cooking world food shows cheaper food options	0.560	26.6	15.6	42.2
	Visits to markets with foods from different cultures	0.390	48.4	24.2	72.6
<b>Factor 3</b> <b>Community agencies - beyond the classroom</b>  Cronbach's $\alpha$ 0.887 (16 items)	Motivate students to healthy cook by entering cooking competitions	0.633	31.3	11.2	45.2
	Community agencies extend, enrich and endorse food skills programs in schools	0.631	50.7	19.7	70.4
	Involve community agencies to provide information to support food skills programs	0.627	49.8	22.4	72.2
	Guest speakers and chefs from different cultures	0.626	52.3	16.8	69.1
	Excursions help students learn about ethical farming practices	0.611	38.6	22.0	60.6
	Excursions help students learn about food production	0.573	49.8	36.8	86.6
	Visits to different culturally themed restaurants	0.562	42.2	9.4	51.6
	Motivate students to healthy cook by using barbeques (cooking techniques) that appeal to male students	0.544	42.0	16.5	58.5

	Motivate students to healthy cook by story-telling about food	0.510	38.4	20.5	58.9
	Motivate students to healthy cook by rewarding students with prizes for cooking	0.504	28.6	9.4	38.0
	Motivate students to healthy cook by linking it with environmental projects	0.503	45.5	11.6	57.1
	Growing herbs and vegetables helps students learn about environmentally sustainable food production	0.485	46.1	32.8	78.9
	Motivate students to healthy cook by linking it with 'food science' curriculum themes	0.470	42.9	13.4	56.3
	Motivate students to healthy cook by involving them in program design	0.454	54.9	27.2	82.1
	Motivate students to healthy cook by simulating 'cooking show' contests in class	0.452	51.8	25.0	76.8
	Motivate students to healthy cook by linking it as something new	0.422	44.6	13.8	58.4
	Motivate students to healthy cook by matching new food experiences with enjoyable social experiences	0.389	48.7	44.6	93.3
	I involve parents in my food skills program	0.387	29.5	3.2	32.7
	I involve teachers from other subject areas in my food skills program	0.380	47.0	8.3	55.3
	From primary school age, it is desirable if young people cook a family meal at least once a week	0.292	32.0	31.1	63.1
<b>Factor 4 Use of cook books</b>	Cook books with step-by-step instructions	0.697	43.6	49.1	92.7
	Cook books with a glossary of culinary terms	0.658	49.1	39.7	88.8
	Cook books with coloured photographs	0.600	41.0	47.0	88.0

Cronbach's $\alpha$ 0.831 (8 items)	Cook books with troubleshooting tips	0.573	56.4	29.9	86.3
	I use cook books as a source of recipe ideas	0.511	59.0	38.2	97.2
	Motivate students to healthy cook by starting with recipes that build their confidence	0.477	40.2	58.5	98.7
	Cook books with no-fail recipes	0.467	40.6	29.1	69.7
	Cook books or magazines with cooking basics	0.425	56.0	35.0	91.0
<b>Factor 5</b> <b>Healthy meal planning</b>  Cronbach's $\alpha$ 0.845 (9 items)	How the Australian Guide to Healthy Eating is used to plan meals	0.653	44.9	46.9	91.8
	Teaching nutrition in terms of short or long dietary health outcomes	0.557	56.8	32.1	88.9
	How to cook healthy meals that will help achieve optimum body weight	0.538	48.1	37.9	86.0
	Students cooking nutritious foods	0.522	45.7	51.0	96.7
	How to cook healthy meals	0.519	29.6	69.5	99.1
	How eating a wide variety of foods benefits health	0.495	27.2	72.4	99.6
	Students analysing case study diets	0.487	52.3	27.6	79.9
	Students analysing their own diet	0.465	45.3	47.7	93.0
	How substituted ingredients affect the nutritional value of meals	0.411	62.1	29.6	91.7
<b>Factor 6</b> <b>Motivate students to cook healthily</b>  Cronbach's $\alpha$ 0.633	Linking cooking of healthy meals with 'looking good'	0.595	42.8	21.4	64.2
	The best way to teach nutrition is students cooking healthy meals	0.566	42.4	38.7	81.1
	Motivate students to cook healthily by linking it as something 'cool to do'	0.503	46.0	21.0	67.0
	Technical skills (hands-on) skills are more important than nutrition in a food skills program	0.435	23.0	11.5	34.5

(6 items)	Linking student wellbeing to cooking healthy meals is a good way of teaching healthy eating	0.424	49.0	48.1	97.1
	Food tasting experiences in class have to be nutritious	0.422	25.5	8.2	33.4
	Motivate students to healthy cook by linking it to sporting performance	0.346	53.1	13.4	66.5
<b>Factor 7</b> <b>Teach students vocational food skills</b>  Cronbach's $\alpha$ 0.715 (5 items)	Demonstrating cooking of non-nutritious foods	0.699	40.7	5.8	46.5
	Students cooking non-nutritious foods	0.679	45.3	7.4	52.7
	Students can be motivated to enjoy cooking if they cook non-nutritious food	0.560	24.1	6.4	30.5
	Preparing my students for jobs in the food and hospitality industry	0.544	39.2	19.4	58.6
	Teachers have a role in preparing their students for food skills job training	0.480	51.8	28.2	80.0
	Teacher-directed activities ensure that essential food skills are taught	0.378	55.9	31.4	87.3
<b>Factor 8</b> <b>Curriculum attitudes</b>  Cronbach's $\alpha$ 0.798 (4 items)	A national food skills curriculum is essential for strengthening home economics as a subject in schools.	0.827	32.3	46.4	78.7
	A national home economics curriculum is essential for strengthening home economics as a subject in schools	0.825	30.5	49.1	79.6
	ACARA (Australian Curriculum, Assessment and Reporting Authority) is responsible for developing a national home economics or food skills curriculum	0.560	18.2	16.4	34.6
	Home Economics professional associations are responsible for developing a national home economics or food skills curriculum	0.481	29.5	42.3	71.8
<b>Factor 9</b> <b>Use of ICT</b>	ICT literacy skills to find suitable recipes on the Internet.	0.691	52.6	33.8	86.4

Cronbach's $\alpha$ 0.742 (3 items)	ICT literacy skills to evaluate suitable recipes on the Internet.	0.657	46.6	38.5	85.1
	I use the Internet as a source of recipe ideas	0.461	50.2	29.5	79.7
<b>Factor 10</b> <b>Foster independence</b>  Cronbach's $\alpha$ 0.903 (2 items)	Supermarket magazines as the recipes are easy	0.666	39.3	18.8	58.1
	Supermarket magazines as the food products are readily available	0.633	44.4	19.7	64.1
	Student-directed activities using a design brief approach is important for developing food skills	0.394	52.3	27.3	79.6
	Tapping into new ideas shown on television cooking shows is the best way of motivating students	0.377	40.9	12.7	53.6

#### 4.5.13 Predictors of Teachers' Use of Resources

**Table 4.7** shows the use of resources represented as ten factors and their predictors which included teacher demographic (age, professional background, type of school) and orientation characteristics (*Food Aesthete*, *Consumer-Environmental* and *Nutritionist*) and the five sets of food skills (*Procedures for domestic settings*, *Procedures for vocational settings*, *Cookery methods*, *Food economy* and *Use of microwave ovens as an appliance*). The multiple regression analyses of the resource use component scores (**Table 4.7**) indicated that the three personal orientations were stronger predictors for eight of the ten factors than the demographic and professional characteristics of the teachers.

The age of respondents was positively linked with Factor 6 (*Motivate students to healthy cook*) and with the use of the food skills, *Procedures for vocational settings*, *Cookery methods* and *Food economy*. This demographic characteristic was linked with Factor 9 (*Use of ICT*): the negative beta value suggests that older teachers may be less likely to use ICT as a teacher resource. However, age was positively related to Factor 10 and may indicate that older teachers may be more likely to foster independence in their students, particularly if they are *Food Aesthetes*, which was the strongest predictor for this resource.

The professional background of teachers was a weak predictor for only one resource, the *Use of community agencies* (Factor 3). All three of the orientation characteristics of teachers were linked with, and were stronger predictors for this factor, based on higher beta values.

The *Food Aesthete* orientation was predictive of five of the ten resource factors, particularly Factor 7 *Vocational food skills*, where they were the *only* teacher orientation and a strong predictor for this factor (as shown by a high  $\beta$  value of 0.552 and  $R^2$  0.344). Teachers with this orientation were most likely to use Factor 3 *Community agencies* ( $\beta$  0.336) and Factor 10 *Foster independence* ( $\beta$  0.438) compared with the other two orientations. The *Food Aesthetes* were linked with Factor 5 *Healthy meal planning* ( $\beta$  0.138) but less so than the *Nutritionist* orientation ( $\beta$  0.257).

The *Consumer-Environmentalism* orientation was a positive predictor of six of the ten resource factors, particularly Factor 1 *Practice at home and school* where they were the *only* teacher orientation strongly linked with this factor ( $R^2$  0.337). Although teachers with this orientation were the only ones linked with Factor 4 *Use of cookbooks* and Factor 9 *Use of ICT* (Information, Communication and Technology), the negative regression coefficients may indicate that they were resistant to the use of cookbooks ( $\beta$  - 0.177) and the Internet ( $\beta$  - 0.260) for use in the classroom or as a source of recipe ideas.

The *Nutritionist* orientation was a positive predictor of four of the ten resource factors. Teachers with this orientation were slightly more likely than the *Food Aesthete* and the *Consumer-Environmentalism* teachers to use Factor 2 *Multicultural and community food exposure* ( $p$ -value 0.023;  $\beta$  0.166) as a resource. The *Nutritionist* orientation was the strongest predictor ( $p$ -value < 0.0001,  $\beta$  0.257) of Factor 5 *Healthy meal planning* as a resource.

All three orientations were predictors of three factors to a lesser or greater degree and included the use of the following resources; *Multi-cultural and community food exposure* (Factor 2), *Community agencies* (Factor 3) and *Foster independence* (Factor 10).

As for the sets of food skills, each featured in one or other of the Resource Use categories.

Factor 1 (*Practice at home*) was strongly linked ( $R^2$  0.337) with the *Consumer-Environmental* orientation and the *Procedures for domestic settings* and *Procedures for vocational settings*. These sets of food skills encompassed the basic and advanced food skills, many of which have been deemed essential by the food experts and by teachers.

Factor 2 *Multi-cultural and community food exposure* was the most important of all the resources as it was linked with, and used by all three teacher orientations to teach all sets of food skills, with the exception of the *Use of the microwave oven*. The high Cronbach's alpha value ( $\alpha$  0.921) shows the scale has high internal reliability; however, only ten percent ( $R^2$  0.101) of the variability in this factor was related to the independent variables.

Factor 3 *Community agencies* was linked with the professional background of teachers ( $p$  0.023,  $\beta$  0.139) but the three orientations of teachers were all better predictors for the use of this resource based on the regression coefficients (beta values). The food skill, *Procedures for domestic settings* was linked with this resource but the negative regression coefficient ( $\beta$  -0.291) suggested that teachers were less likely to use this skill. Instead all three orientations of teachers used *Community agencies*, which included market and restaurant visits and use of guest speakers, to teach their students the skill of *Food economy*; how to select and buy value-for-money and quality food. The use of the skill *Food economy*, however, was a weaker predictor ( $p$  0.034,  $\beta$  0.133) compared with the skill, *Procedures for domestic settings*.

Factor 4 *Use of cookbooks* was less likely to be used by teachers with the *Consumer-Environmental* orientation, as has already been indicated. The links with food skills *Procedures for domestic settings* and particularly, *Procedures for vocational settings*, (with its lower  $p$ -value 0.003 and higher regression coefficient  $\beta$ 0.251), suggest that teachers might use this resource to teach their students basic and advanced food skills.

Factor 5 *Healthy meal planning* was linked with, and a predictor for the two teacher orientations of the *Food Aesthete* and *Nutritionist* (with its lower  $p$ -value <0.0001 and higher regression coefficient  $\beta$ 0.257). The use of this resource was linked with three food skills as predictors, particularly *Procedures for vocational settings* (with its lower  $p$ -value <0.0001 and significantly higher regression coefficient  $\beta$  0.432) and compared with *Use of microwave*



*ovens* and *Procedures for domestic settings*. The ability to plan healthy meals was crucial in the vocational setting when customers have particular health and nutritional concerns.

Factor 6 *Motivate students to cook healthily* was linked as a weak predictor with the age of the teacher. This resource was more strongly linked with the three food skills, *Procedures for vocational settings*, *Cookery methods* and *Food economy*. The skill *Cookery methods* was the strongest predictor of the three food skills linked with this resource and this may indicate that teachers might use of a variety of cookery methods to stimulate and motivate their students to cook healthily.

Factor 7 *Vocational food skills* as a resource was not strongly linked with the *Food Aesthete* teacher orientation. The food skill *Procedures for vocational settings* as an expected link did not appear; instead *Procedures for domestic settings* were linked but the negative regression coefficient ( $\beta$  -0.165) suggested that the teachers did not use the basic skills to teach vocational food skills. The food skill *Cookery methods* was linked, but only as a weak predictor, and may have indicated that a variety of cookery methods were used to teach the more advanced vocational skills.

Factor 8 *Curriculum Attitudes* displayed how teacher respondents viewed the changes in the food skills curriculum with the move towards a national curriculum in Australia. The food skills *Food economy* was the only, albeit a strong predictor for this factor and may indicate a tenuous link with items within this food skills factor.

Factor 9 *Use of ICT* was linked with the age and the *Consumer-Environmentalism* orientation of the teacher. The negative regression coefficient values for both the age ( $\beta$  -0.186) and orientation ( $\beta$  -0.260) of these teachers indicated that they may be more resistant to the use of ICT in their teaching. This resource was linked with three of the five food skills; *Procedures for vocational skills*, *Food economy* and the *Use of microwave ovens*. Whilst the *Use of microwave ovens* was the strongest predictor ( $p < 0.0001$ ), the negative regression coefficient ( $\beta$  -0.312) indicated that the use of ICT was not used to teach the use of this food skill but may be instead used to teach *Procedures for vocational skills* ( $\beta$  0.264) and to a lesser extent, *Food economy* ( $\beta$  0.180).

Factor 10 *Foster independence* was represented by items that students might use to direct their own skill development and included the design of their own food activities and use of supermarket magazines and cooking shows on television to help inspire them. This might explain the negative regression coefficients for the two food skills as predictors, *Procedures for vocational settings* ( $\beta$  -0.241) and particularly, *Cookery methods* ( $\beta$  -0.324), which were unlikely to be used for this resource.

All three teacher orientations, particularly the *Food Aesthete*, used this resource as indicated by the high regression coefficient ( $\beta$  0.438) and  $p$ -value ( $<0.0001$ ).

**Table 4.7 Demographic and orientation characteristics of teachers and the perceived importance of food skills as predictors of resource use**

Resource Use	Adj R sq p< 0.05	Std Beta	<i>p</i>	Resource Use	Adj R sq p< 0.05	Std Beta	<i>p</i>	Resource Use	Adj R sq p<0.05	Std Beta	<i>p</i>
<b>Factor 1 Practice at home and school</b>				<b>Factor 2 Multi-cultural and community food exposure</b>				<b>Factor 3 Community agencies</b>			
<b>Demographics</b>				<b>Demographics</b>				<b>Demographics</b>			
								Professional Background	0.304	0.139	0.023
<b>Orientation</b>				<b>Orientation</b>				<b>Orientation</b>			
Consumer- Environmentalists	0.337	0.166	0.004	Food Aesthete	0.101	0.135	0.049	Food Aesthete	0.304	0.336	0.0001
				Consumer- Environmentalists		0.143	0.039	Consumer- Environmentalists		0.228	0.0001
				Nutritionist		0.166	0.023	Nutritionist		0.208	0.003
<b>Food Skills</b>				<b>Food Skills</b>				<b>Food Skills</b>			
Procedures for domestic settings	0.337	0.319	0.0001	Procedures for domestic settings	0.101	0.154	0.028	Procedures for domestic settings	0.304	-0.291	0.0001
Procedures for vocational settings		0.428	0.0001	Procedures for vocational settings		0.178	0.035	Food Economy		0.133	0.034
				Cookery Methods		0.240	0.002				
				Food Economy		0.131	0.064				
<b>Cronbach's <math>\alpha</math> 0.917 (14 items)</b>				<b>Cronbach's <math>\alpha</math> 0.921 (13 items)</b>				<b>Cronbach's <math>\alpha</math> 0.887 (16 items)</b>			

Resource Use	Adj R sq p<0.05	Std Beta	<i>p</i>	Resource Use	Adj R sq p<0.05	Std Beta	<i>p</i>	Resource Use	Adj R sq p<0.05	Std Beta	<i>p</i>
<b>Factor 4 Use of Cookbooks</b>				<b>Factor 5 Healthy meal planning</b>				<b>Factor 6 Motivate students to healthy cook</b>			
<b>Demographics</b>				<b>Demographics</b>				<b>Demographics</b>			
								Age	0.060	0.121	0.086
<b>Orientation</b>				<b>Orientation</b>				<b>Orientation</b>			
Consumer- Environmentalists	0.124	-0.177	0.012	Food Aesthete	0.216	0.138	0.036				
				Nutritionist		0.257	0.0001				
<b>Food Skills</b>				<b>Food Skills</b>				<b>Food Skills</b>			
Procedures for domestic settings	0.124	0.193	0.006	Procedures for domestic settings	0.216	0.159	0.009	Procedures for vocational settings	0.060	0.171	0.047
Procedures for vocational settings		0.251	0.003	Procedures for vocational settings		0.432	0.0001	Cookery methods		0.194	0.014
				Use of microwave ovens		0.282	0.0001	Food economy		0.152	0.036
<b>Cronbach's <math>\alpha</math> 0.831 (8 items)</b>				<b>Cronbach's <math>\alpha</math> 0.845 (9 items)</b>				<b>Cronbach's <math>\alpha</math> 0.633 (6 items)</b>			
Resource Use	Adj R sq p<0.05	Std Beta	<i>p</i>	Resource Use	Adj R sq p<0.05	Std Beta	<i>p</i>	Resource Use	Adj R sq p<0.05	Std Beta	<i>P</i>
<b>Factor 7 Vocational Food Skills</b>				<b>Factor 8 Curriculum Attitudes</b>				<b>Factor 9 Use of ICT (Information Communication Technology)</b>			
<b>Demographics</b>				<b>Demographics</b>				<b>Demographics</b>			
								Age	0.185	-0.186	0.007

<b>Orientation</b>				<b>Orientation</b>				<b>Orientation</b>			
Food Aesthete	0.344	0.552	0.0001					Consumer- Environmentalism	0.185	-0.260	0.0001
<b>Food Skills</b>				<b>Food Skills</b>				<b>Food Skills</b>			
Procedures for domestic settings	0.344	-0.165	0.006	Food Economy	0.072	0.294	0.0001	Procedures for vocational settings	0.185	0.264	0.001
Cookery methods		0.133	0.043					Food economy		0.180	0.008
								Use of microwave ovens			-0.312
<b>Cronbach's <math>\alpha</math> 0.715 (5 items)</b>				<b>Cronbach's <math>\alpha</math> 0.798 (4 items)</b>				<b>Cronbach's <math>\alpha</math> 0.742 (3 items)</b>			
<b>Resource Use</b>	Adj R sq p<0.05	Std Beta	<i>p</i>								
<b>Factor 10 Foster independence</b>											
<b>Demographics</b>											
Age	0.136	0.118	0.096								
<b>Orientation</b>											
Food Aesthete	0.136	0.438	0.0001								
Consumer- Environmentalism		0.118	0.089								
Nutritionist		0.168	0.029								
<b>Food Skills</b>											
Procedures for vocational settings	0.136	-0.241	0.004								
Cookery methods		-0.324	0.0001								
<b>Cronbach's <math>\alpha</math> 0.903 (2 items)</b>											

#### **4.5.14 Summary of results and key findings of teachers' views of the importance of food skills and resource use**

Based on the aims and hypotheses stated in the Methodology section of Study 2, the following summary statements are made.

The first key finding identified that the food skills teachers selected as important matched those identified as important by the food skills experts interviewed in Study 1. The results in Study 2 found that teachers considered the most important skills to teach students were the declarative and procedural processes students required to plan, shop, prepare and cook healthy meals and to clean up dishes and equipment after the meal was prepared. This finding supported the first hypothesis of Study 2.

The second key finding identified that the teachers' goals of what they wanted to achieve in their food skills programs were aligned closely with those of the Study 1 food experts; particularly chefs, homemakers and home economics teachers. The *most* important goal nominated by teachers in Study 2 was to teach their students how to cook healthy meals but they wanted to achieve this goal in a way that motivated and stimulated them to enjoy the process of making good food. This finding supported the second hypothesis of Study 2.

The third and a significant key finding was that teachers' personal beliefs or 'orientations' were stronger predictors than their demographic characteristics of the food skills that they considered to be important. This finding was unexpected and only partly supported the third hypothesis that teachers' demographic characteristics, with the exception of their experience, age and professional background were less significant predictors than proposed. In contrast, the three teacher orientations were the main determinants of what food skills are taught and what resources are used by teachers in their food skills programs. This finding supported the fourth hypothesis.

Other findings were based on hypotheses which pertained to the teaching of food skills within a school curriculum. As postulated, teachers' agreed that more time was required at each year level to teach food skills and that short-term program planning was the most significant barrier to them being able to teach their food skills programs. These findings supported the

fifth hypothesis. While these time constraints existed, most teachers (93 per cent) enjoyed the autonomy and had some or full responsibility for the design and evaluation of their food skills programs.

As for the curriculum content, over half of the respondents (52.7 per cent) reported that they used a combination of the Technology and Health and Physical Education Key Learning Areas of the State or Territory curricula to design their food skills program. Furthermore, up to two-thirds of respondents (72 per cent) agreed that a combination of content drawn from the two learning areas was the best way to teach food skills. The report of these data informs the home economics teaching profession of their collective opinions on curriculum issues and may serve as evidence to government bodies responsible for developing curricula (such as the Australian Curriculum and Assessment Authority).

The majority of respondents' (88.7 per cent) used a variety of evaluation tools to assess their students' food skills which included tests, assignments, projects, written reports and data analysis. These collective findings supported the sixth hypothesis.

The remaining findings pertained to the resources used by teachers to supplement their food skills program. Beyond the initial four recommendations made by the food skills experts in Study 1 and the expert panel members in Study 2, teachers' used many different resources to enrich their students' learning and make the learning process more enjoyable. This primary goal nominated by the teacher respondents in Study 2 and verified by the findings in the Literature Review (Satter E, 2007a, 2007b; Satter EM, 2008), was to connect with their students and provide opportunities for them to enjoy and make food in a positive and supportive learning environment.

## **4.6 Discussion**

### **4.6.1 Significance of key findings**

This study was unique in finding that teachers endorsed the essential food skills required by young people to be able to prepare healthy meals for themselves and their families. In Study

1 the essential skills were identified in a process of semi-structured interviews of fifty-one food experts. In Study 2 the importance of food skills *and* the resources used by teachers was estimated.

The main theme which emerged from the participants in Studies 1 and 2 was that they thought it was important to provide young people with the opportunity to practise these skills and to build their confidence so that they are able to put together a healthy and tasty meal for themselves and their families.

What makes these studies so important, especially for home economics teachers in schools, was that for the first time the essential food skills *and* resources have been articulated and verified by the same professionals who use them to teach young people in schools.

Hitherto, the food skills and resources have not been well articulated in skill-based programs or in the health education literature (Fordyce-Voorham S, 2009a; Lichtenstein AH & Ludwig DS, 2010; Vidgen H & Gallegos D, 2011) although there have been recent reports published on food literacy skills in Australian community settings (Cullerton K, Vidgen HA, & Gallegos D, 2012; Vidgen H & Gallegos, 2012).

In some instances, designers of food skills programs have tacitly included the identified food skills but have seldom articulated them (Davies LT, 2008; Larson NI, Perry CL, et al., 2006; Larson NI, Story M, et al., 2006). The identification of resources which operate as a supplement to the teaching of the food skills was a new finding and worthy of consideration to include in the design of any new program.

The finding that the teacher orientations were stronger predictors than their demographic or professional characteristics in relation to food skills taught was significant. The stereotyped beliefs postulated in the third hypothesis; that older or more experienced teachers might favour teaching traditional food skills or teachers with a hospitality background teaching more advanced food skills, were refuted in this study. Instead, teachers' selection and use of food skills in their programs have been based on a set of values and personal beliefs defined as 'orientations'. This finding has repercussions for teaching training institutions and for the profession itself and will be discussed further below.



While the majority of teachers agreed that there was inadequate time to teach their food skills program, they had autonomy to select the food skills from a designated State and Territory curriculum and incorporate them into their own designed and evaluated program. This was a significant (and reassuring) finding for the profession that teachers were largely responsible for the choice of food skills they taught their students. Combined with an understanding and articulation of what their own teacher orientation represents, this finding opens up potential collaborative opportunities for program planning with teacher colleagues within and outside the school.

#### **4.6.2 Implications for Home Economics Education**

These findings have important implications for home economics teachers and nutrition educators, who deliver food courses in community settings, and indeed for their training institutions. The survey identified the food skills teachers considered to be important and then showed how different teacher ‘orientations’ determined the importance teachers place on these food skills.

Teachers recognised the need to expose their students to a wide variety of food as a way to broaden young people’s diet. In support of the current findings, a review of eleven demographic and health surveys found evidence of the link between dietary diversity and improved diet quality (Arimond M & Ruel MT, 2004) in young children. The same review found a correlation between consumption of a wider range of foods in those children of wealthier families. While the subjects in the review were younger than the targeted subjects for this thesis, these findings may have relevance since exposure to a wide variety of foods in their food skills class would mean that young people from lower socio-economic backgrounds would have an opportunity to broaden their diet through food skills programs at school, even when they have a narrower diet at home.

The ways in which teachers facilitate healthy eating practices amongst their students has implications. In the literature review it was found that eating healthily was not appealing to, nor was it a priority for young people (Chapman G & Mac Lean J, 1993). Instead, young people were motivated to eat well to boost their body shape, stamina, sports performance and overall wellness (Contento IR et al., 1995).

Only 66.5 per cent of teachers in the current study agreed or strongly agreed that links to sporting performance was a good way to motivate young people to prepare healthy meals. Instead, teachers agreed with the recommendations made in literature review that they could stimulate their students' interest in nutrition if they included recipes that appealed to young people's taste (Backman et al., 2002; Neumark-Sztainer D et al., 1999) and matched them with their motivational goals (Contento IR et al., 2002).

For this reason, items which examined the strategies that teachers' might use to encourage their students to produce healthy meals and eat healthily, and without mentioning the word 'nutrition', were included in the questionnaire. Whilst teachers were evenly divided over whether technical skills were more important to teach than nutrition, the majority agreed (81.1 per cent) that the best way to teach nutrition was students cooking healthy meals. And while the majority (97.1 per cent) felt that linking student wellbeing to cooking healthy meals was a good way of teaching healthy eating (and accommodating technical proficiency), they were less certain (64.2 per cent) about linking the cooking of healthy meals with 'looking good'.

Teachers' reticence to link cooking healthy meals with appearance is understandable and conforms with the findings of a large study of 8355 primary and secondary school-aged boys and girls in schools across Australia (O'Dea JA, 2007). In this 2006 study of children, it was found that a focus on body weight coupled with inappropriate nutritional messages may exacerbate fears in those young women already concerned about weight gain.

Other factors that were considered important by teachers to help motivate students included involving them in program design (82.1 per cent). Other researchers (Contento IR, 2011; Klepp KI & Wilhelmsen BU, 1993) have supported student involvement in program design as a useful way for teachers to determine the influences on young people's eating behaviours. For example, with the recent interest in television cooking competition programs, teachers were asked whether they re-enacted or used cooking competitions for new ideas to motivate their students' interest in cooking. While 76.8 per cent of teachers agreed or strongly agreed that they supported this idea or used cooking shows for new ideas to motivate their students (53.6 per cent), they were less certain of the merits of rewarding their students with prizes (only 38.0 per cent agreed or strongly agreed) or entering their students into cooking

competitions (45.2 per cent). These findings agree with those from a qualitative study of 38 pre-adolescents in Perth, Australia which found that there was no association between children watching junior cooking competition shows on television and their subsequent interest in cooking at home or food involvement (Goodchild R, 2012).

In addition to the food skill-related findings, the identification of teacher orientations is new and has implications for the profession and teacher training organisations. The three orientations suggest that teachers (and other practitioners, including nutrition educators), might focus more on food and nutrition or health or environmental sustainability in their curriculum or community programs. Explicit focus on these orientations during teacher or nutrition educator training or in professional development workshops may be helpful for trainee and experienced teachers and nutrition educators to identify their own personal orientation. This could enable them to incorporate particular food skills that match with their orientation, into the design of their own skill-based program in schools and the community.

In a subject area where there are opportunities for home economics teachers to teach both health, as part of the Health and Physical Education Key Learning Domain, or food skills as part of the Technology Learning Domain, these findings may help to explain their preferred teaching direction. This is particularly important in a subject such as home economics as its cross-curriculum structure (Home Economics Institute of Australia, 2010, 2012) can sometimes make it challenging for teachers to adopt a particular identity and to find their preferred strength of subject direction.

Furthermore, in an environment where there is a current and an anticipated future shortage of home economics teachers (Corstorphan B et al., 2005; Pendergast D, Reynolds J, & Crane J, 2000), the promotion of these teacher orientations might help to attract new teachers and keep existing teachers working happily in the profession. This might be used as ways to attract potential teachers to the profession by promoting teacher training courses that utilise and feature these orientations.

## **4.7 Limitations**

### **4.7.1 Sampling, recruitment and participation**

The convenience sample of a relatively small number of 269 respondents was confined largely to teacher members of the Victorian teachers' professional association (Home Economics Victoria, 71 per cent). However, almost one-third of respondents were drawn from Australia (26.4 per cent) or from overseas (2.4 per cent). The national teachers' professional association (Home Economics Institute of Australia) refused the candidate's request to recruit their members from their membership list. This was a significant limitation which prevented the survey from being circulated nationwide. Nevertheless, one-third of respondents were recruited by direct contact, word of mouth and invitation at several professional development workshops and conferences. The findings, however, may not be representative of other teachers beyond the sample although the lack of differences between the Victorian and other respondents suggests that was unlikely to be a major bias.

Other limitations related to the respondents themselves. Fifty per cent of respondents had over twenty years teaching experience (and therefore older) which may impact on the type of food skills they considered to be important, such as the ability to 'buy food online'. The results may have been somewhat influenced by retired, pre-service or casual teacher respondents (8.1 per cent) whose perception of the importance of the food skills and resources may be different from practising teachers as they did not have the currency of a situational context.

Other factors which may have influenced the food skills taught by teachers and their perceptions of which food skills they considered to be important for their students to learn included the resources available to them such as food budget allowance and equipment available and the variation in the kitchen facilities in the different types of schools and locations.

The cross-sectional nature of the study prevented any assumption that the relationships between food skills, resource use and the predictor variables were causal. Ideally, a

longitudinal survey could be conducted in future to confirm and extend the associations observed in the current study.

#### **4.7.2 Strengths and limitations of the survey**

There was a fairly high attrition rate from 269 at the start of the survey to 204 respondents by the end of the survey. The length of the survey, with 139 items, was long. Several respondents dropped out of the survey as it progressed because they indicated in their comments that they felt that their opinions were not relevant to some items as they were retired or pre-service or casual relief teachers.

Nevertheless, there was a high response rate given the length and time required to complete the survey. The subject topic was of interest to the respondents based on the length of, and level of detail in the comments section. Despite the length of the survey, many respondents took the time to respond to the items and used the comments section to expand, support or justify their ratings in the survey. The survey provided many respondents with the opportunity to record their thoughts freely and anonymously.

#### **4.7.3 Limitations of the methodology**

While the survey was comprehensive and provided detailed and rich data, itemisation of the food skills under two sections as ‘declarative’ and ‘procedural’ skills, may have reduced the total number of items and made the task of rating the items faster for the respondents and more expeditious to analyse. The factor analysis of the food skills and the resource use items and the ensuing number and names of the categories may have been different had a greater or lesser number of variables been used. Despite key common themes observed, interpretation may have been different had an additional researcher described and named the themes. For this reason, several home economics teachers were invited to inspect the themes to help identify commonality between the themes.

The orientation variables used to predict the importance of food skills and the resources used in the classroom were quite crudely measured and would need to be defined in more detail in

future studies. Likewise, the belief and practice questions used to determine the teacher predictors would need further refinement and re-testing before they are applied in the future.

The internal reliability analyses showed that the number of items used to test the reliability of the 'Food Aesthete' ( $\alpha$  0.775) and the 'Consumer-Environmentalism' ( $\alpha$  0.797) was sufficient. However, more or different items need to be included to identify the 'Nutritionist' orientation as the Cronbach's alpha value ( $\alpha$  0.549) on the six items was too low. In future studies, a focus or Delphi group of teachers could be used to refine these questions and a series of exploratory factor analyses undertaken to determine the best questions to match each teacher orientation.

#### **4.8 Recommendations**

In future studies the questionnaire could be shortened to include items relating to specific declarative and procedural food skills and resources.

The belief and actual practices questions could be extended, particularly for the 'Nutritionist' orientation so that they more distinctly represent the three teacher orientations.

Further research to measure these relationships in a longitudinal study is required.

Future studies could consider the use of a comprehensive nationwide sample of teachers to examine differences between teachers and their food skills preferences from other States and Territories.

#### **4.9 Conclusions**

This study confirmed the food skills which are important for any skill-based program that is taught in secondary schools, at least in Australasia. The identification of the declarative and procedural food skills provides designers with the content that they need to include in any skill-based program. The identification of a wide range of human and material resources helps designers to harness the support they need to ensure the success of their programs. The identification of the teacher orientations as the best predictors of teacher practice has the most

significant influence on the type of food skills taught and resources used by teachers. Future studies could be designed to confirm and extend the findings to other States and Territories in Australia and to other countries.

Next, as the development of the procedural food skills has been the focus of many skill-based programs, they have been selected as the set of skills on which to develop an evaluation tool for use by teachers in secondary schools. In the following chapter the development of a Food Skills Rating Checklist will be described. Specifically, the purpose of the third and last study is to develop and test the use by teachers of a Food Skills Rating Checklist that would help teachers to measure the procedural skills of their students.

## **5.0 CHAPTER 5 STUDY 3**

### **5.1 Introduction**

This chapter outlines the research procedures undertaken in Study 3. The chapter commences with the rationale for the selection of the evaluation tool, a Food Skills Rating Checklist (the ‘Checklist’). The design and pre-testing of the tool are reported, followed by the procedure to recruit professionals to use the materials and respond to a survey reflecting on their experiences, and the results of the survey.

In Study 2, it was found that teachers used a variety of tools to measure the development of their students’ food skills. These included written assessment tasks, practical food tests and assessment of students’ retention of food skills. Of all the measures, practical food skills tests were used by up to eighty per cent of teachers to assess their students’ food skills acquisition. The teachers’ also used students’ self-evaluations, formal questionnaires and informal feedback from the students’ to assess the success of their programs.

### **5.2 Aim of Study 3**

A literature search found no reports of the reliability and validity of instruments designed to test food skills. An initial Internet search of ‘food skill checklists’ or variations of the key words (including using the prefix of the word plus the asterisk such as food checklists\* and food skills\*) yielded no evidence-based research.

Facilitators of food skills programs were reported to typically use participants’ ‘confidence’ to measure program success (Caraher M et al., 2013; Children's Food Trust, 2013; Contento IR et al., 2010; Larson NI, Story M, et al., 2006; Rocha Leal FM et al., 2011; Vrhovnik L, 2012). Whilst cooking confidence measures have been developed and applied in a cooking skills program involving primary school- aged children, the results have been inconsistent for some skill indicators (Caraher M et al., 2013).

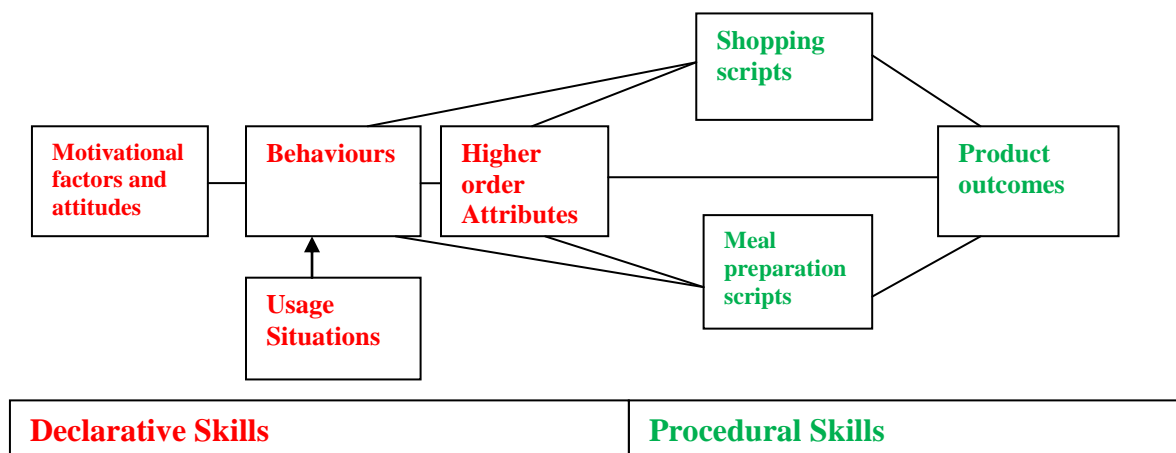
A cooking skill scale was developed to measure cooking skills and tested using 4436 adults in a Swiss study, and showed a relationship between cooking ability and increased frequency



of vegetable consumption (Hartmann C et al., 2013). Cooking enjoyment was identified as the most significant predictor of people’s cooking ability. Arguably, people become proficient cooks with practice. As with any task, with regular practice people’s level of confidence and enjoyment of making the food increases and alongside the amount of time spent in meal preparation, their cooking ability improves. This explains why women, who were mostly responsible for daily meal preparation, reported having higher cooking ability in their thirties than women in their twenties and higher cooking ability than men (Hartmann C et al., 2013).

The aim of this study, then, was to design an objective, valid and reliable tool that teachers could use in schools to assess the food skills acquisition of their students. The instrument should be sufficiently generic to cover the meal preparation scripts of the procedural skills (featured in the model **Figure 2.4** reproduced below as **Figure 5.1**) required from the meal pre-preparation to meal service and post-meal cleaning-up.

**Figure 5.1 A proposed model depicting declarative and procedural food skills in context**



### 5.3 Methodology

#### 5.3.1 Design and test of the evaluation tool

The decision was made to select procedural skills based on the results of Study 2. The respondents in Study 2 almost always described procedural skills when they referred to the use of ‘food skills’ to assess their students’ skills acquisition. The selection of skills used in

the Checklist was informed by the results of Study 1, which had identified the essential skills required by young people to produce healthy meals.

The final selection of eighteen procedural skills was based on the analysis of typical meal and snack recipes in cook books used in Australian schools and the generic skill requirements documented in the Design, Creativity and Technology standards of the Victorian school curriculum (Victorian Curriculum Assessment Authority, 2008), the State in which the study was conducted.

The skills were divided into five skill-sets in the Checklist, including Beginning (Steps 1 to 4), During Food Preparation (Items 5 to 7), During Cooking Procedure (Items 8 to 11), Presentation of Food (Items 12 to 15) and Cleaning Up (Items 16 to 18) tasks (**Table 5.1**). An Asian-style stir fry meal was selected as the test recipe to pilot the Checklist. This recipe (**Figure 5.2**) was sufficiently generic and complex to cover the eighteen procedural skills. Moreover, based on the findings in Study 2, this recipe was typically taught to students in contemporary food skills programs in Australian secondary schools.

To test the use of the Checklist by participants, three hypothetical situations of a person with low (poor) skills, some (good) skills and with expert (excellent) skills making the selected recipe were demonstrated in separate videos. The candidate was the demonstrator to circumvent the ethical and privacy issues associated with using students to demonstrate the skills on the videos.

The aim of each video was to demonstrate the three levels of skills. The demonstrator aimed to achieve consistency and to control the procedures as much as possible and to ensure that all the procedural skills listed as eighteen tasks in the Checklist were covered. A summary of the Food Skills Rating Checklist and the description of the three levels of the skills are displayed in the five skill-sets in the Checklist (**Table 5.1**).

**Figure 5.2 Test Recipe: Asian-style Stir Fry (for TWO people)**

**Ingredients**

Select at least **THREE** vegetables

100g broccoli, *washed* and *trimmed* into flowerets

½ red capsicum, *washed* and *sliced*

½ green capsicum, *washed* and *sliced*

80g snow peas, *washed* and *trimmed* of strings

4 champignons, *wiped clean* (with a clean tea towel) and *diced* into 0.5cm pieces

4 baby corn, *washed*

4 spring onions, *washed* and *sliced* into 0.5cm sections up to the green section

*ENVIRONMENTAL TIP: Wash* all vegetables in a large bowl filled with cold water and then *pour* the water onto your vegetable garden! *Compost* the vegetable trimmings.

Select **ONE** Meat or Meat Equivalent

200g beef strips (rump steak, *sliced* thinly) *OR*

200g chicken strips (1 chicken breast or thigh fillet, *sliced* thinly)

2 cups rice, cooked

1 Tb vegetable oil (NOT peanut oil if diner has nut allergy)

1 clove garlic, *crushed*

½ tsp ginger, *grated* finely

1 Tb soy sauce

1 Tb oyster sauce (check food label for potential allergens)

1 tsp sesame oil

**Method**

1. *Prepare* the selected meat and vegetables.

*TIP: Use* the **red** coloured chopping board to slice meat and the **green** coloured chopping board to prepare vegetables. If you are using the one chopping board, *wash* (in hot soapy water) and *dry* (using a clean dry tea towel) your chopping board between the meat and vegetable preparation.

2. *Heat* the vegetable oil in a wok. *Brown* small quantities of the meat or poultry at a time, *stirring* continuously. *Remove* meat on to a clean dry plate.

3. *Add* the ginger, garlic, broccoli, capsicum, spring onion, snow peas, champignons, baby corn and *stir fry* for 2-3 minutes.

4. *Return* meat to the wok. *Stir* in the sesame oil, soy and oyster sauce and *heat* through and *combine* all ingredients.

**Table 5.1 Summary of the skill-sets and description of the skills demonstrated in the videos**

Skill- sets and Item number	Skill	Level of skills demonstrated in Video ‘X’ no skills (duration 8:34 mins)	Level of skills demonstrated in Video ‘Y’ good skills (duration 7:46 mins)	Level of skills demonstrated in Video ‘Z’ excellent skills (duration 10:42 mins)
Beginning 1	<i>Wash hands</i>	No hand washing	<i>Rinses hands – uses no soap</i>	<i>Washes hands thoroughly with hot water and soap Rinses hands</i>
2	<i>Rinse and dry hands</i>	<i>No rinsing and drying of hands</i>	<i>Dries hands on tea towel</i>	<i>Dries hands on hand towel</i>
3	<i>Protect clothing and hair</i>	No apron <i>Wears dangly necklace Hair worn over face</i>	<i>Wears grimy apron Wears long shirt sleeves –cuffs Wears rings</i>	<i>Wears clean apron Wears rolled up shirt sleeves Wears no jewellery or watch</i>
4	<i>Read recipe</i>	<i>Picks up and glances at recipe</i>	<i>Briefly scans recipe throughout cooking process</i>	<i>Reads recipe carefully and checks each step throughout the cooking process</i>
During Food Preparation 5	<i>Organise work – collect ingredients, clean work space</i>	<i>Assembles ingredients on plates Allows scraps of food to remain on bench Collects ingredients in several steps Guesses ingredient quantities.</i>	<i>Assembles ingredients on plate Organises some procedures – chopping boards, collects ingredients, roughly measures ingredients</i>	<i>Assembles ingredients in sequential order of use on plates Collects ingredients in order of use Measures ingredients accurately with correct measuring equipment – jugs, tablespoons and teaspoons</i>
6	<i>Use correct knife</i>	<i>Uses bread and butter knife (blade faces up) ‘Tears’ not ‘cuts’ ingredients.</i>	<i>Uses correct (Chef’s) knife and shows some skill in cutting up meat Uses charn and fork inconsistently to</i>	<i>Uses correct (Chef’s) knife and shows skill in cutting up meat Uses charn throughout the cooking</i>

		Uses knife to stir food in wok	<i>stir</i> food in wok	
7	<i>Prepare</i> ingredients – correct, safe and hygienic <i>use</i> of chopping boards, tools and equipment	Uses green chopping board to chop meat Uses same board to chop vegetables without washing it in between Does not <i>use</i> appropriate tools – a grater to <i>grate</i> ginger and garlic which is added whole	Uses correctly colour coded boards – <i>uses</i> red board to cut up meat and green board for vegetables but with no under cloth to prevent board slippage Uses appropriate tools inconsistently – grater to <i>grate</i> ginger and garlic, charrn to <i>remove</i> larger pieces of food from wok	Uses correctly colour coded boards – <i>uses</i> red board to cut up meat and green board for vegetables Uses under cloth to prevent board slippage Uses appropriate tools – grater to <i>grate</i> ginger and garlic, tongs to <i>remove</i> larger pieces of food from wok
During Cooking Procedure 8	<i>Perform</i> correct operation of cooking equipment	Turns wok handle outwards Wok handle projects beyond cook top Does not <i>hold</i> onto wok handle when stir frying food	<i>Positions</i> wok handle inconsistently – <i>projects</i> outwards and inwards when wok is used <i>Holds</i> onto wok handle on some occasions	<i>Positions</i> wok handle so that it projects inwards at all times <i>Holds</i> onto wok handle at all times when food is stirred
9	<i>Control</i> temperature	<i>Ignites</i> gas but does not <i>check</i> the size of gas flame at this point nor throughout cooking	<i>Matches</i> wok base with gas burner <i>Ignites</i> gas but does not <i>check</i> size of flame	<i>Matches</i> wok base with gas burner <i>Ignites</i> gas and <i>checks</i> size of flame throughout cooking
10	<i>Use</i> protective mitts	Uses no mitts during cooking	Uses no mitts during cooking	Uses oven mitts to remove hot pan
11	<i>Supervise</i> appliances	Does not <i>check</i> food throughout cooking Makes no adjustment to size of gas flame	<i>Checks</i> food occasionally throughout the cooking process. Makes no adjustment to size of gas flame	<i>Checks</i> food regularly and is attentive throughout the cooking process. Makes adjustments to size of gas flame

Presentation of food 12	<i>Prepare</i> service of food	<i>Plates</i> food carelessly in a bowl previously used to collect raw vegetable ingredients <i>Uses</i> dessert spoon to plate food	<i>Plates</i> food with some care <i>Uses</i> a serving spoon to plate food onto clean plate <i>Drops</i> portion of food onto bench and then returns it to plate with fingers	<i>Plates</i> food with care <i>Uses</i> a serving spoon to plate food onto clean plate
13	Season and garnish food	<i>Uses</i> no seasoning or garnishing of food	<i>Positions</i> food onto plate and <i>uses</i> remainder of cooked vegetables as a garnish	<i>Uses</i> a fork to check the food is cooked <i>Adjusts</i> seasoning of food with a clean tasting spoon prior to serving <i>Positions</i> food onto plate <i>Uses</i> remainder of cooked vegetable as a garnish
14	Present food	<i>Serves</i> food carelessly- disproportional sized- serving of rice to meat and vegetables. Meat and vegetable pieces are uneven.	<i>Serves</i> evenly-sized and chunks of food with some attention. <i>Balances</i> portion of rice to meat and vegetables	<i>Serves</i> evenly-sized and thinly sliced food with care <i>Balances</i> portion of rice with meat and vegetables
15	Serve food	<i>Serves</i> food on a dirty plate which has been previously used to collect ingredients	<i>Serves</i> food on a clean plate <i>Uses</i> washing up sponge to wipe off fingerprints	<i>Serves</i> food on a clean plate <i>Uses</i> kitchen paper towel to thoroughly wipe down food smears
Cleaning up 16	<i>Clean</i> throughout preparation and service	Does not <i>clean</i> up during food preparation and service	<i>Stacks</i> and <i>cleans</i> away unused utensils and ingredients away from work space <i>Cleans</i> up occasionally throughout the cooking process	<i>Stacks</i> and <i>cleans</i> away unused utensils and ingredients away from work space <i>Cleans</i> up and <i>wipes</i> down benches throughout preparation and service

17	Wash up	<p><i>Places</i> all utensils, crockery and cutlery in sink – not <i>scraped</i> clean, <i>rinsed</i> or <i>stacked</i></p> <p>No hot water or detergent <i>used</i></p> <p>No rinsing</p> <p>Does not <i>wipe down</i> benches</p> <p><i>Places</i> wet dishes onto unclean bench</p>	<p><i>Stacks up</i> and <i>washes</i> dishes and preparation utensils haphazardly</p> <p><i>Uses</i> hot water but no detergent</p> <p>No rinsing</p> <p><i>Wipes down</i> bench quickly with sponge</p>	<p><i>Scrapes</i> and <i>rinses</i> dishes and utensils</p> <p><i>Stacks up</i> dishes and utensils systematically and in order of cleanest dishes first</p> <p><i>Uses</i> hot water and detergent</p> <p><i>Rinses</i> dishes</p> <p><i>Stacks up</i> dishes onto clean draining towel</p>
18	Dry up	<p><i>Uses</i> hands to wash dishes and equipment</p> <p><i>Wipes down</i> bench with wet cloth</p> <p><i>Uses</i> same wet cloth to dry dishes</p>	<p><i>Uses</i> same sponge to wash dishes and equipment</p> <p><i>Wipes down</i> bench with hand towel</p> <p><i>Uses</i> same hand towel to dry dishes</p>	<p><i>Washes</i> cleanest dishes first with a washing up sponge</p> <p><i>Wipes down</i> bench and sink draining board with a separate sponge</p> <p><i>Uses</i> clean dry tea towel to dry dishes.</p>

## **Pre-testing of the Checklist**

Prior to the distribution of the Checklist, the tool was pre-tested twice for practical use by the same two home economics teachers on the same sample of ten students in two lessons. The students were observed making a batch of cup cakes in the first lesson and the test recipe of the Asian-style stir fry meal in the second lesson. The Checklist was used to assess the students' food skills.

After the first pilot testing and consultation with the two teachers, the Checklist was modified to provide a clearer understanding of the skill descriptors. For example, the descriptor 'wash hands' in the Checklist stated in the first pre-test was more fully defined in the second pre-test as 'Uses soap and hot water to thoroughly wash hands between fingers in hand washing sink'.

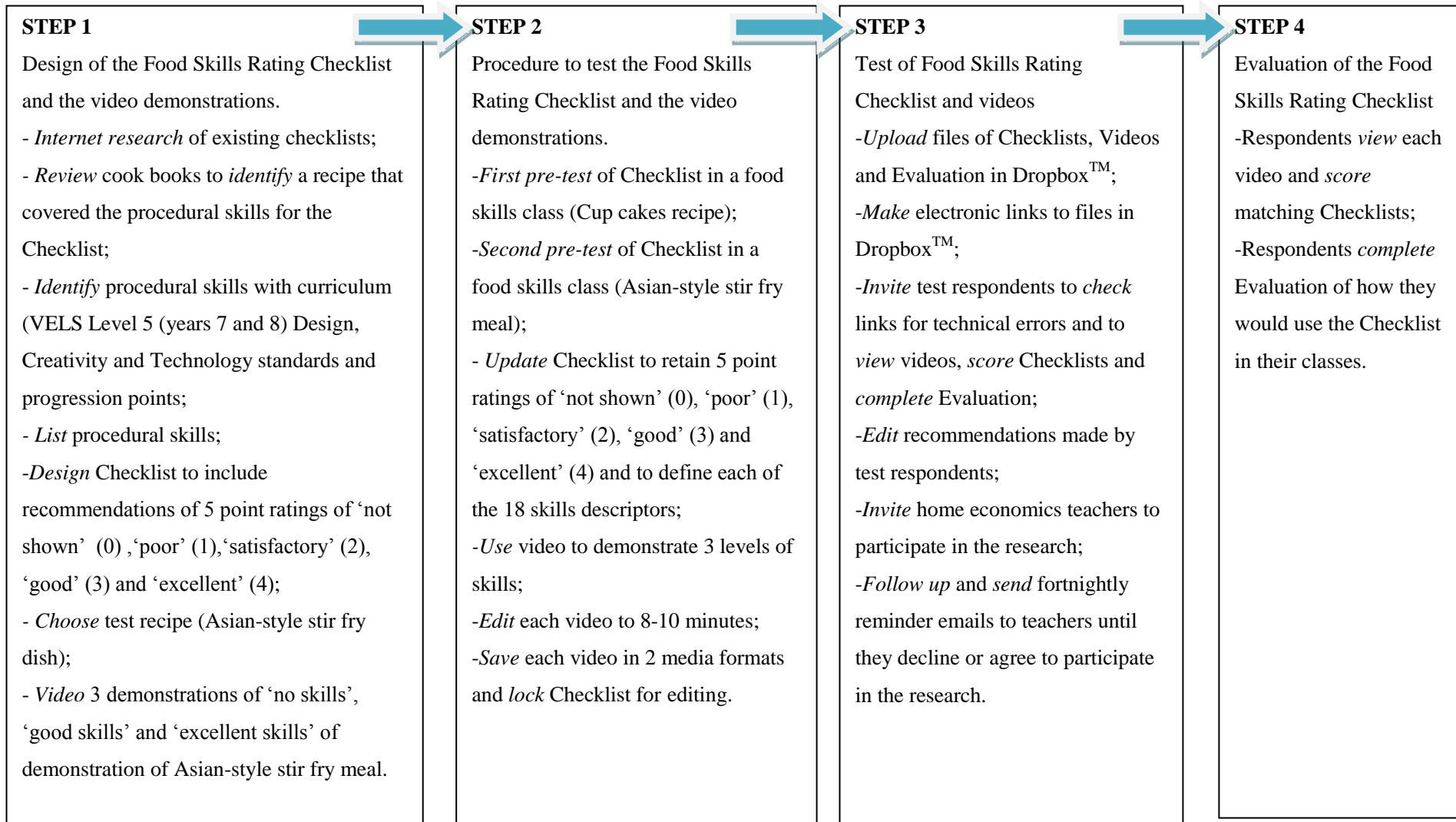
In the second pre-test, the test recipe of the Asian-style stir fry meal and the five-point rating of skills were retained to provide teachers with a broad enough range of skill levels to accommodate nuances between the different skill levels for different students or for the same student but for different tasks. Each task was rated on the five-point rating scale of skills: 'Not Shown' (0), 'Poor' (1), 'Satisfactory' (2), 'Good' (3) through to 'Excellent' (4).

After the second pre-test, in consultation with the two teachers, the test recipe and the Checklist (**Appendix J**) were deemed to be ready for testing by the respondents. The Checklist document was locked for editing to ensure that no modification could be done and only one checkbox could be selected for each skill once it was uploaded into Dropbox<sup>TM</sup>, an Internet storage facility.

Before the administration of the Checklist a final pre-test was undertaken to test the Checklist, the three videos and the evaluation for face validity, acceptability and feasibility of administration. Four more teachers were invited to complete an evaluation as if they were respondents. The teachers' provided feedback on the ease of understanding the descriptors for each of the eighteen tasks as five skill-sets, the suitability of the five-point range of skill levels and the questions in the evaluation, how clearly each video depicted the skill levels, the length of time required to complete the pre-test and to indicate any technical difficulties encountered with accessing the documents via Dropbox<sup>TM</sup>. The design of, and the procedures used to test the administration of the Checklist are outlined in a flow chart (**Figure 5.3**).



**Figure 5.3 Flow Chart of procedures for the design and testing of the procedural skills of the Food Skills Rating Checklist**



### **5.3.2 Administration of Study 3**

#### **Recruitment and selection of participants**

An email invitation was sent to teachers in Study 2 who had expressed an interest in participating in follow-up research. Other teachers known to the candidate through professional and personal associations were also invited to participate in the research. The objective was to recruit as many home economics teachers as possible from a diverse range of cultural backgrounds, types and locations of schools to determine the universality of application of the tool.

The teachers were informed by email about the procedure for the evaluation of the Checklist in a Letter of Invitation and Information to Participants (**Appendix K**). They were advised in the invitation that their participation would be voluntary. No incentives were offered to encourage them to participate, other than the opportunity for them to use the Checklist as a tool in their classrooms.

#### **Sample Size Estimation**

Any research project which involves the collection of data should be designed so that it is capable of providing information that can be analysed to achieve the aims of the project.

The G\* power software program was used to estimate the minimum sample size (Faul F, Erdfelder E, Buchner A, & Lang A, 2009). An ANOVA repeated measure approach was used to determine that an effect size of 0.25, an alpha of 0.05 and a total sample size of 27 would achieve a power of 95 per cent. Based on this calculation, the aim was to recruit a minimum of thirty participants to test the validity of the Checklist across the three cooking skills conditions.

### **5.3.4 Ethics Approval**

The University of Wollongong Human Research Ethics Committee approved the ethics protocols for this study on 12 October, 2011 (HE11/399).

### **5.3.5 Data collection**

Once the pre-test was completed and the electronic links to the files in Dropbox™ tested, invitations were sent by email to teachers in December 2011 (**Appendix K**). The teachers who agreed to participate in the research were required to view the videos and to complete the Checklist for each of the three conditions and to complete an Evaluation of the Checklist (**Appendix L**). The aim of the Evaluation was to determine respondents' opinions of the value of using this Checklist as a tool to objectively assess their students' food skills. The data, which included the three scored Checklists and the Evaluation for each respondent, was printed off as a Word document and then tallied manually into a SPSS file (SPSS, 2009).

### **5.3.6 Response Rate**

A total of 122 teachers from Australia and overseas were contacted by email between December 2011 and February 2012. By the end of May 2012, forty-five teachers had agreed to participate in the study and between January and May; forty respondents had completed and returned (by email) the three Checklists and their evaluations of the Checklist. This represented a response rate of 30.5 per cent.

Participation in the research was voluntary for teachers, thus it was not possible to collect data on the non-respondents. The seven teachers, who responded to the email and declined the invitation to participate, cited the length of time required to complete the research task as the main reason for their non-participation.

### **5.3.7 Data Analysis**

The five categories of 'Excellent', 'Good', 'Satisfactory', 'Poor' and 'Not Shown' were aggregated into three categories of 'Not Shown' (0), 'Poor' (1) and 'Good' (2) to summarise the multiple observations into three manageable subsets and to simplify the process of data analysis.

Means and standard deviations were calculated for each of the eighteen skills and the three skills levels ('No Skills', 'Good Skills', 'Excellent Skills') using SPSS Version 18 (SPSS,

2009). To verify the validity and reliability of the Checklist, pair-wise non-parametric analyses (Wilcoxon-signed rank test) were performed to compare the means of the three samples (Checklist 'X' with 'Y', Checklist 'X' with 'Z' and Checklist 'Y' with 'Z'). In addition a repeated measure analysis of variance (ANOVA) was conducted to compare differences between the three test conditions over the eighteen skills.

## **5.4 Results**

### **5.4.1 Demographic and professional characteristics of the respondents**

The majority of the respondents worked as home economics teachers in Melbourne metropolitan or Victorian schools (**Table 5.2**). The remainder of the respondents were from interstate or overseas. Over half of the respondents worked as teachers in government or independent schools with the remainder working as research students or lecturers of home economics education or health sciences in universities or technical colleges. Ten per cent of the respondents were retired teachers of home economics.

All but one of the respondents were female. There were no respondents represented in the under 30 years age group. The majority (87.2 per cent) were evenly distributed between the age groups of 31-60 years of age with the remainder (12.5 per cent) more than 61 years of age and in the retired category (**Table 5.2**).

**Table 5.2 Demographic and professional characteristics of respondents (n=40)**

Age of respondents (in year groupings) (%)		Location (%)		Workplace (%)	
31-40 (n=10)	25	Melbourne metropolitan (n=16)	40	Government school (n=16)	40
41-50 (n=12)	30	Victoria regional (n=10)	25	Independent or Catholic school (n=6)	15
51-60 (n=13)	32.5	Interstate (n=7)	17.5	University-research student (n=8)	20
60+ (n=5)	12.5	Overseas (n=7)	17.5	University, Technical College-Lecturer (n=6)	15
				Retired teachers – not in work (n=4)	10

#### 5.4.2 Comparison of the skills ratings across the three levels of skills

The group of forty respondents were asked to rate the three test conditions on the eighteen skills, using five point scales from 0 ('no skills') through to 4 ('excellent skills'). There was some variation in the respondents' ratings of the skills for all of the items for Video X (no skills) and Video Y (good skills). For Video Z (excellent skills), there was almost unanimous for all forty respondents' scoring of excellent skills for the Checklist, with the exception of Item 10 (use of protective mitts).

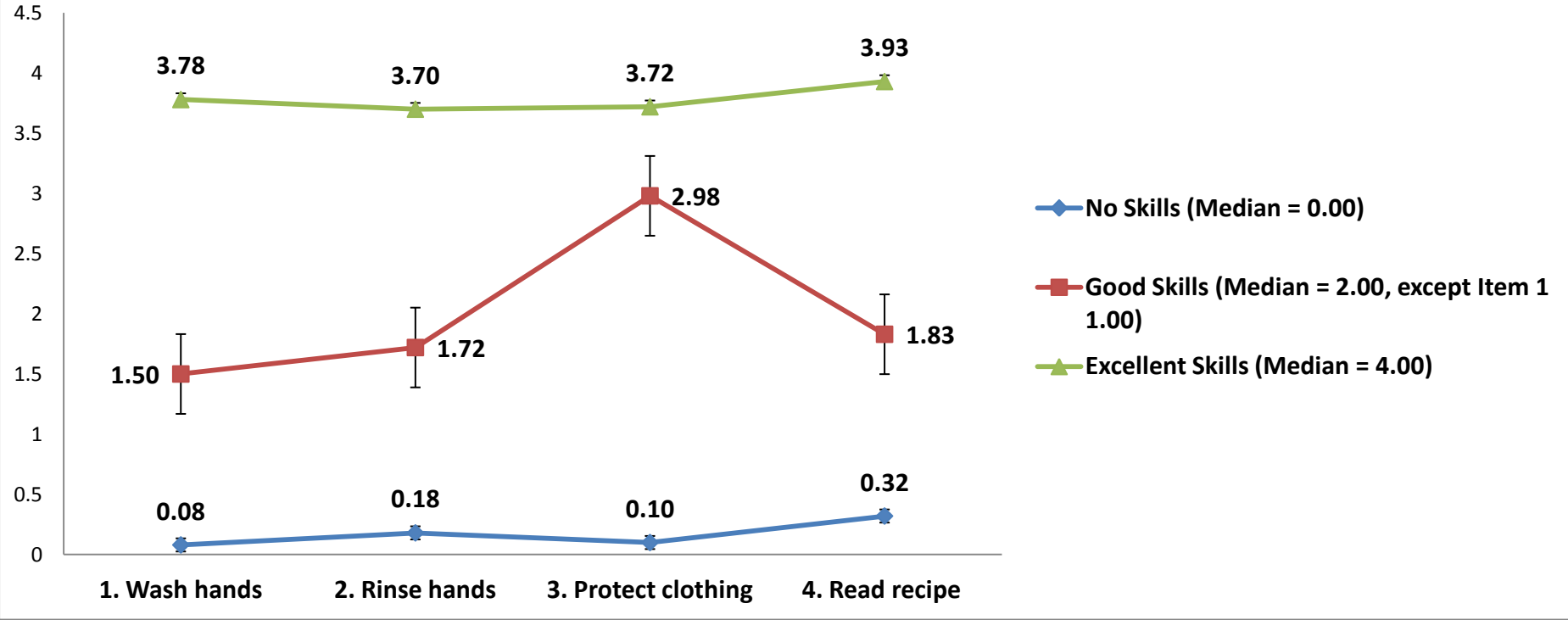
The means and standard deviations for each of the eighteen tasks in each of the three skills levels ('No Skills', 'Good Skills', 'Excellent Skills') are depicted in the five skill-set line graphs (**Figures 5.4 - 5.8**). Inspection of the means for the skills suggested that the Checklist was sufficiently reliable for respondents to discern between the three skill levels; that is, the respondents scored mostly '0' ('No skills') for the video depicting no skills, mostly '2' ('good') for the video depicting good skills and mostly '4' ('excellent') for the video depicting excellent skills. (**Table 5.3**).

A series of ANOVA tests was performed to check the non-parametric means analyses. The repeated measures analysis of variance (ANOVA) showed all the mean comparisons across the three skill levels of each skill-set were significant ( $p$ -values  $<0.000$ ).

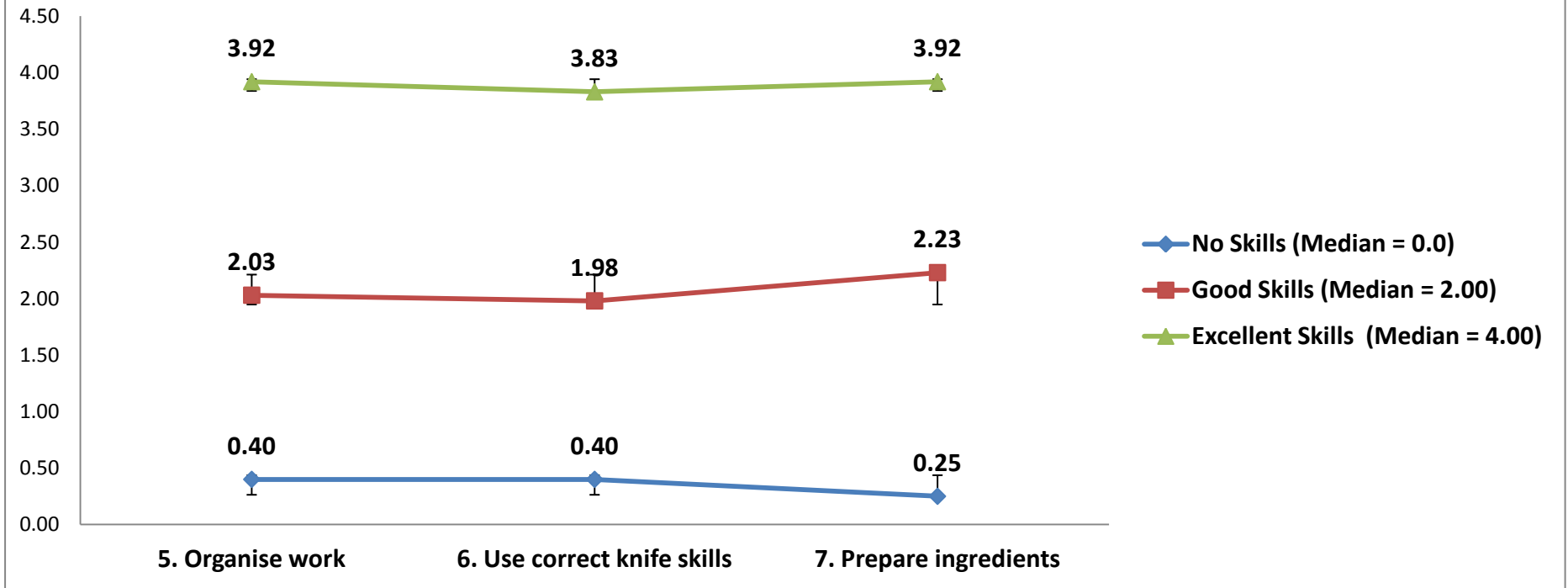
The Intraclass Correlation Co-efficients (ICC) provide an index of the consistency of ratings between the respondents. The inter-rater reliability revealed that the Checklist was reliable across the three conditions; that is, the respondents used the rating scales to evaluate the three different scenarios: Video 'X' with 'Y' (0.833), Video 'X' with 'Z' (0.923) and Video 'Y' with 'Z' (0.810). The values were above the lower limit of the 95 per cent Confidence Interval of 0.750 (Lee J, Koh D, & Ong CN, 1989).

The majority of the items in the Checklist had high Partial  $\text{Eta}^2$  coefficients ( $>0.8$ ) which indicated that the Checklist was robust based on the measures of effect size. Items 3, 8, 9, 11 and 16 in the Checklist, which required careful viewing of the demonstrated tasks, had low Partial  $\text{Eta}^2$  coefficients ( $<0.5$ ). Partial  $\text{Eta}^2$  can be defined as the ratio of variance accounted for by an effect (the three test conditions) and that effect plus its associated error variance within an ANOVA study (Brown JD, 2008).

Figure 5.4 Means for Skill-set "Beginning" Items 1 - 4



**Figure 5.5 Mean for Skill-set "During Food Preparation" Items 5 -7**





**Figure 5.6 Means for Skill-set "During Cooking Procedure" Items 8 - 11**

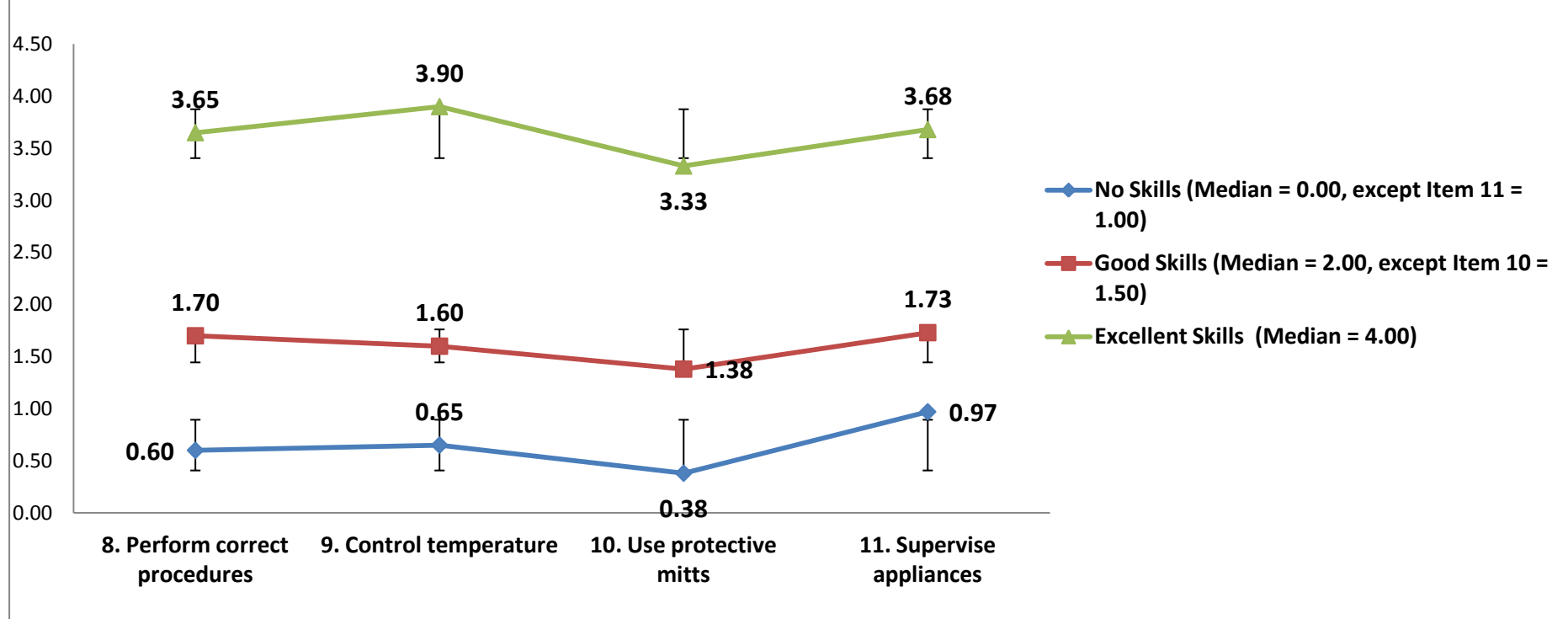


Figure 5.7 Means for Skill-set "Present Food" Items 12 - 15

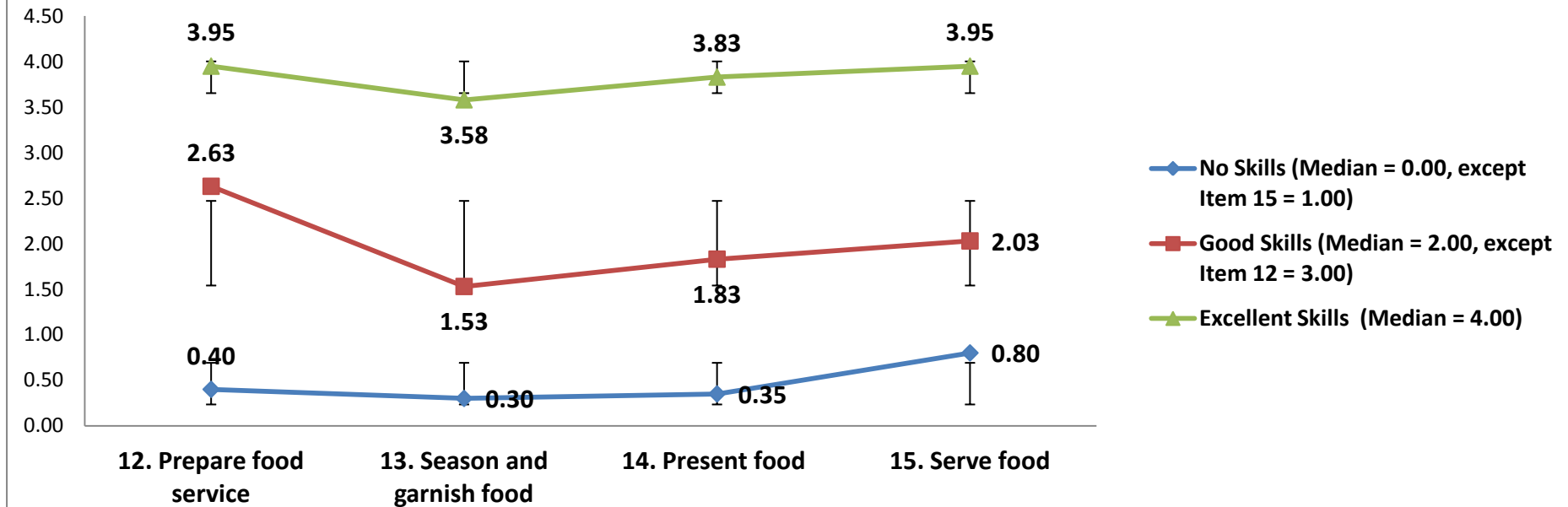
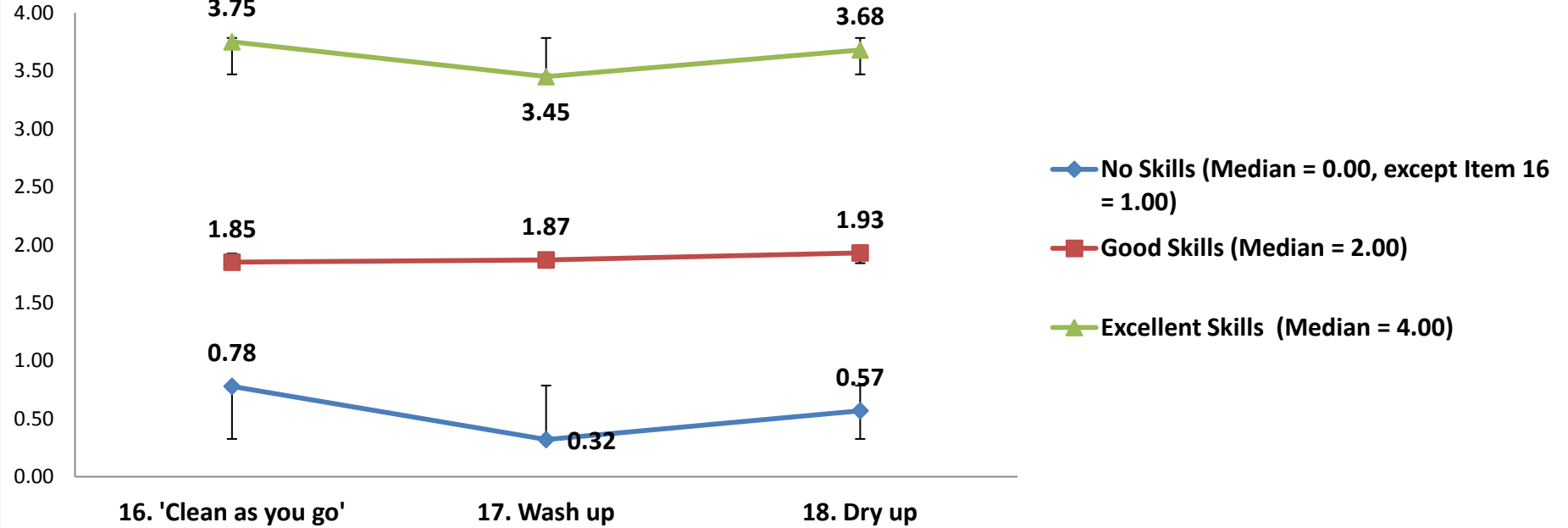


Figure 5.8 Means for Skill-set "Cleaning Up" Items 16 - 18



**Table 5.3 Comparisons between the ratings of skills descriptors and the three levels of food skills <sup>1</sup>.**

Skill Descriptors	No Skills (X) versus Good Skills (Y) <sup>2, 4</sup> .				No Skills (X) versus Excellent Skills (Z) <sup>2, 5</sup> .				Good Skills (Y) versus Excellent Skills (Z) <sup>2, 6</sup> .			
	Mean	Std . Deviation	F	Partial Eta <sup>2 3</sup> .	Mean	Std . Deviation	F	Partial Eta <sup>2 3</sup> .	Mean	Std . Deviation	F	Partial Eta <sup>2 3</sup> .
1.Wash hands	0.08	0.267	269.025	0.873	1.50	0.555	2053.500	0.981	3.78	0.423	674.236	0.945
2.Rinse hands	0.18	0.501.	171.137	0.814	1.72	0.554	808.508	0.954	3.70	0.516	320.684	0.892
3.Protect clothing	0.10	0.304	529.000	0.931	2.98	0.698	1532.664	0.975	3.72	0.452	<b>37.340</b>	<b>0.489</b>
4.Read recipe	0.32	0.572	135.000	0.776	1.83	0.501	1296.000	0.971	3.93	0.267	716.625	0.948
5.Organise work	0.40	0.778	131.295	0.771	2.03	0.660	746.255	0.950	3.92	0.267	319.977	0.891
6.Use correct knife skills	0.40	0.591	280.927	0.878	1.98	0.577	925.399	0.960	3.83	0.385	312.228	0.889
7.Prepare ingredients	0.25	0.494	264.852	0.872	2.23	0.620	1649.219	0.977	3.92	0.267	115.600	0.876
8.Perform correct procedures	0.60	0.810	<b>36.581</b>	<b>0.484</b>	1.70	0.687	290.820	0.882	3.65	0.622	198.391	0.836
9.Control temperature	0.65	0.864	<b>22.033</b>	<b>0.361</b>	1.60	0.928	523.095	0.931	3.90	0.304	239.895	0.860
10.Use protective mitts	0.38	0.628	45.882	0.541	1.38	0.774	234.472	0.857	3.33	0.917	165.234	0.809
11.Supervise appliances	0.97	0.800	<b>20.172</b>	<b>0.341</b>	1.73	0.816	245.095	0.863	3.68	0.526	212.613	0.845
12.Prepare food	0.40	0.632	222.814	0.850	2.63	0.838	1236.472	0.969	3.95	0.221	95.179	0.709

service												
13.Season and garnish food	0.30	0.608	63.312	0.619	1.53	0.847	598.105	0.939	3.58	0.594	234.978	0.858
14.Present food	0.35	0.483	169.911	0.813	1.83	0.675	1048.010	0.964	3.83	0.385	283.636	0.879
15.Serve food	0.80	0.853	66.933	0.632	2.03	0.733	531.928	0.932	3.95	0.316	200.896	0.837
16.‘Clean as you go’	0.78	0.800	<b>38.541</b>	<b>0.497</b>	1.85	0.700	354.252	0.901	3.75	0.543	319.977	0.891
17.Wash up	0.32	0.616	209.380	0.843	1.87	0.607	443.182	0.919	3.45	0.749	139.326	0.781
18.Dry up	0.57	0.675	123.078	0.759	1.93	0.572	543.174	0.933	3.68	0.526	245.000	0.863

1. Tests of within subjects
2. p-values <0.000 for all comparisons were significant at this level
3. Higher percentage indicates greater measure of effect size for group mean difference (0.99 signifies 99 per cent difference between the three sets of means)  
**Bolded** figures depict Item exceptions <0.500
4. Reliability measure X-Y 0.833 Cronbach’s Alpha 0.866
5. Reliability measure X-Z 0.923 Cronbach’s Alpha 0.941

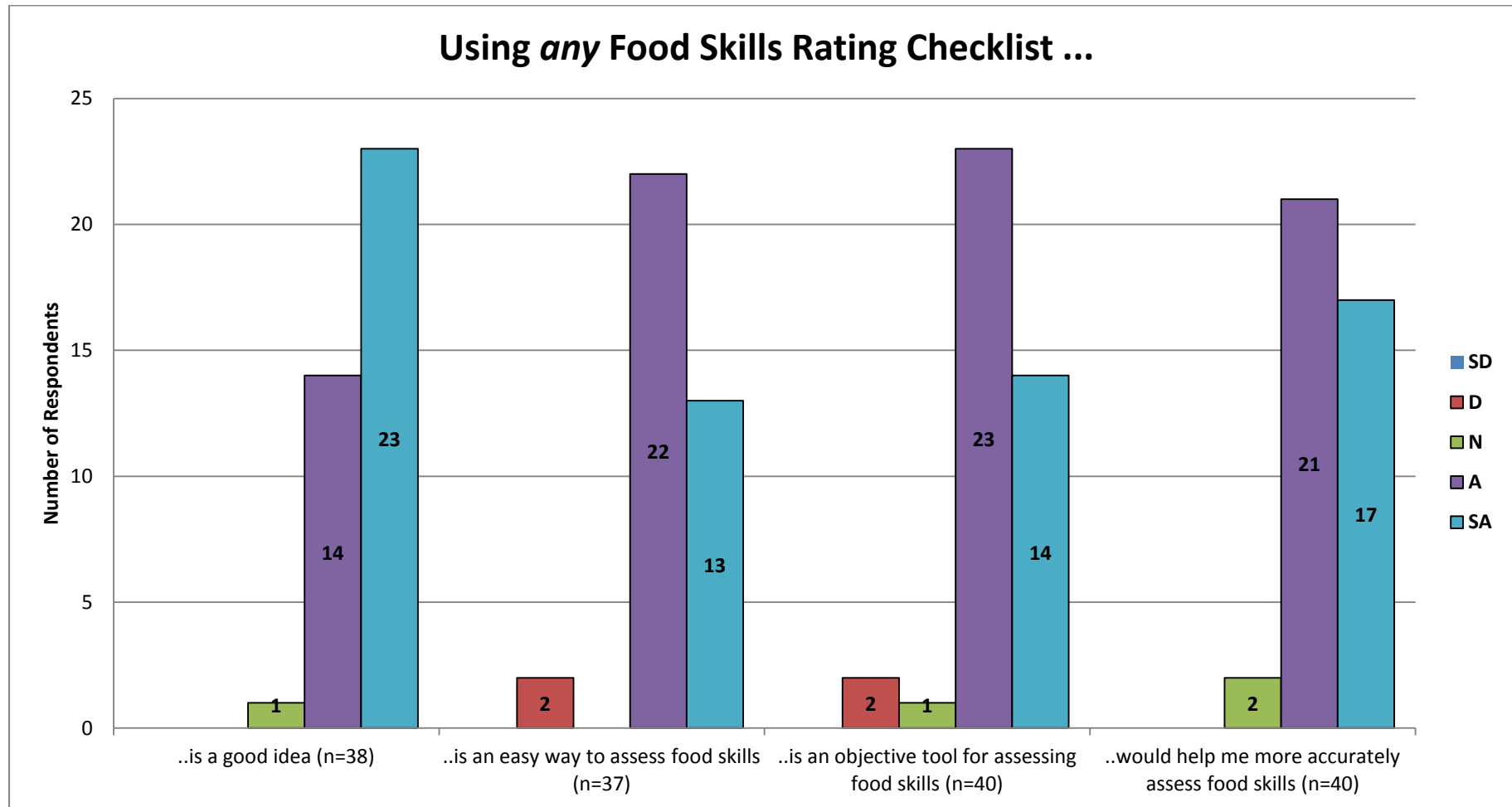
### **5.4.3 Respondents' views of the use of any food skills rating checklist as an evaluation tool**

Thirty-nine respondents agreed or strongly agreed that the use of any food skills rating checklist was a good idea and would help teachers, particularly new or less experienced teachers, to more accurately assess their students' food skills (**Figure 5.9**).

Thirty-five respondents thought that the use of such a checklist would be an easy and thorough way to assess food skills. However, two respondents felt that the level of detail on a paper-based evaluation sheet of three pages would be time consuming, cumbersome and impractical to complete in a class of up to twenty-five students.

More than four out of five respondents thought that a checklist was an objective tool but several premised this with the need for teachers to have a shared understanding of the descriptors and the scoring. Two respondents suggested that teachers and students could discuss the descriptors and the scoring and then derive their own shared understanding of the criteria. Once the criteria had been negotiated, students could view the videos as a training tool and score the Checklist prior to their practical lesson.

Figure 5.9 Respondents' views of the use of *any* checklist as an evaluation tool



#### 5.4.4 Respondents' views of the application of *any* food skills rating checklist

In the second set of questions, respondents were asked how they might use any food skills rating checklist (**Figure 5.10**). All but one of the respondents would use such a checklist in principle and as evidence to report on their students' food skills and as a part of a range of assessment tools. One respondent noted that a checklist would have merit when reporting their students' skill acquisition in relation to the Victorian state curriculum.

*While the reporting system does not require the amount of depth a checklist provides, I could see that it would be very easy to convert teacher notes from a checklist into a Victorian Essential Learnings (VELs) progression point.*

**Respondent no. 16 DS**

Thirty-one of teachers reported they would use a checklist to assess their students' food skills and thirty-three teachers identified they would use a checklist to assess the development of their students' food skills, particularly the progression of skills over time. However, the teachers also identified that the use of a checklist would be one of several tools they would use to assess food skills. Two respondents summed this up as follows:

*I think that a checklist provides excellent 'pre and post' test data that would definitely show a progression (or not) of practical skills, thereby providing evidence on which to plan follow up lessons. This would be just one tool to assist in the assessment of students skills.*

**Respondent no. 16 DS**

*This would be an invaluable tool to assess a student's progress as the teacher would be able to show evidence of where the student has improved or requires improvement. It would not leave this to the teacher's memory.*

**Respondent no. 19 JB**

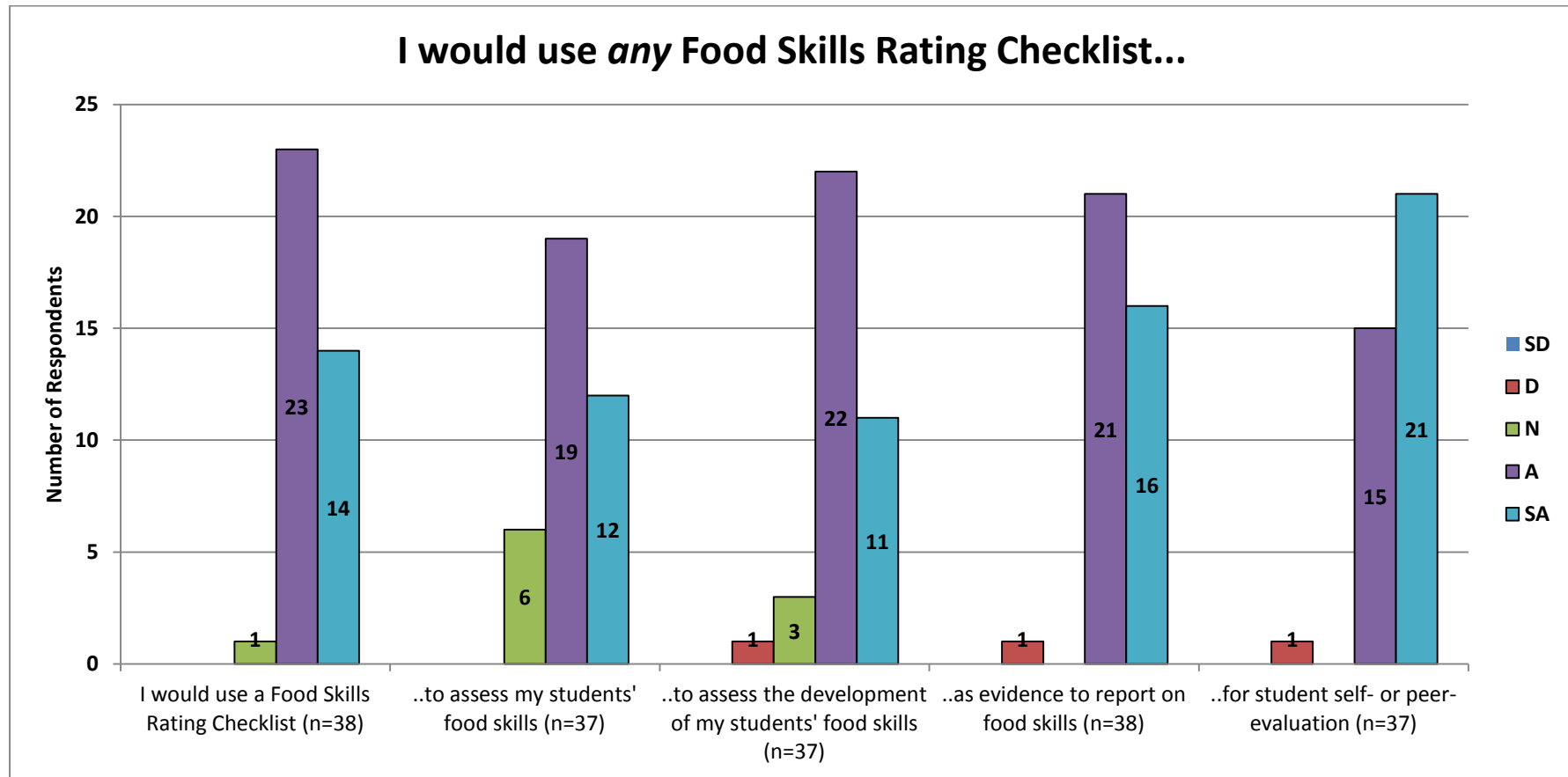
Thirty-six respondents were emphatic about the possibility of students using any checklist for students as a self-evaluation or peer-evaluation tool. Several respondents reported they had used *the* Checklist and the videos as a learning tool in their classes.



*The Checklist provides students with clear expectations when undertaking practical work. It can also assist with target setting and as students' self-assess they are able to determine when they have achieved set goals during practical work.*

**Respondent no.10 BC**

Figure 5.10 Respondents' views of the application of *any* food skills rating checklist



#### 5.4.5 Respondents' views of the use of *this* Food Skills Rating Checklist

Respondents were asked to comment on how they would use the Checklist in their lessons (**Figure 5.11**). Thirty respondents agreed or strongly agreed that they would use *this* Checklist and use it to report on, and to assess the development of their students' food skills, often in conjunction with using the set of videos as a training tool for their students.

*I would like to use the Food Skills Rating Checklist in conjunction with the videos as an entertaining and challenging tool for teaching and reinforcing food health and safety in Years 8 and 9.*

**Respondent no. 11 BB**

The respondents made suggestions on how to improve the Checklist and the videos as training tools to use in their own lessons (**Table 5.4**).

Respondents were ambivalent about the use of any checklist to compare their students' food skills with those of colleagues. Only fifteen respondents agreed or strongly agreed that they would use the Checklist for this purpose. The remaining respondents were equally divided between the neutral (n=11), disagree and strongly disagree (n=11) categories.

*I think students might find comparisons with other classes stressful towards a streaming or ranking of classes, which is not relevant. The progress of the student should be looked at from the criteria given in this test in his or her class.*

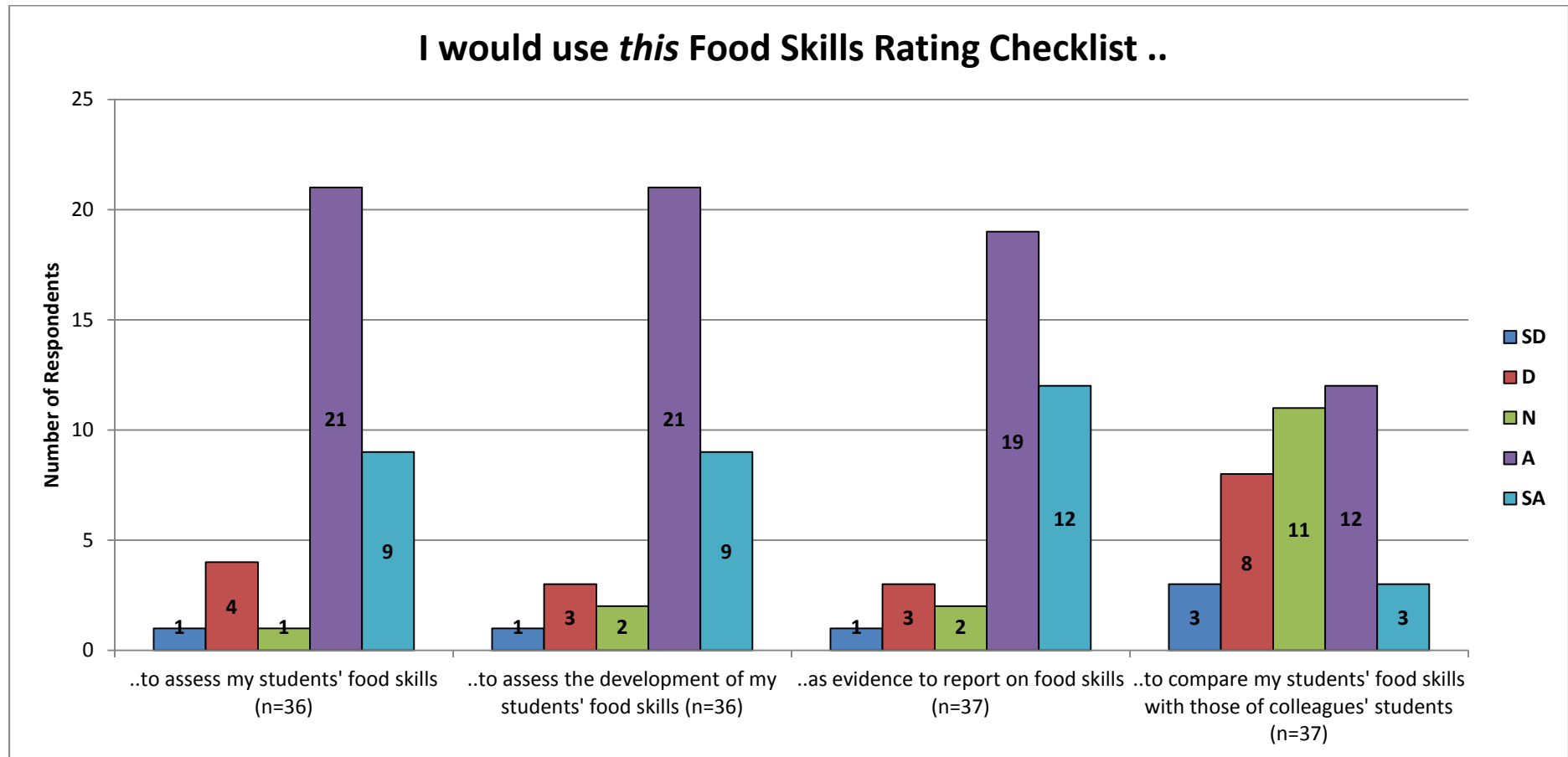
**Respondent no.10 BC**

One respondent who did advocate the use of a checklist as a moderation tool commented:

*This tool is very useful in helping students understand what the expectations are when being assessed. It would also be useful in moderation across different classrooms of students. It can also help to develop student-led learning, as areas which need attention and this could be highlighted across classes of students by the Checklist.*

**Respondent no.37 RB**

Figure 5.11 Respondents' views of the use of *this* Food Skills Rating Checklist



#### **5.4.6 Respondents' suggestions for inclusions on *this* Food Skill Rating Checklist**

Thirteen respondents wanted additional food skills or more detailed descriptors specifically related to the learning or training needs of their students in senior food skills classes (**Figure 5.12**).

*Originally I did think that there was no way that I would use this Checklist due to the amount of steps involved in relation to assessing 23 students; however, if used discriminately – 1 or 2 times a term, I can see where it would be very useful. Also the more often it is used, the quicker the process would be. Definitely useful for the senior years, where I can actually carry out assessment in the kitchen, rather than crowd control or safety watch.*

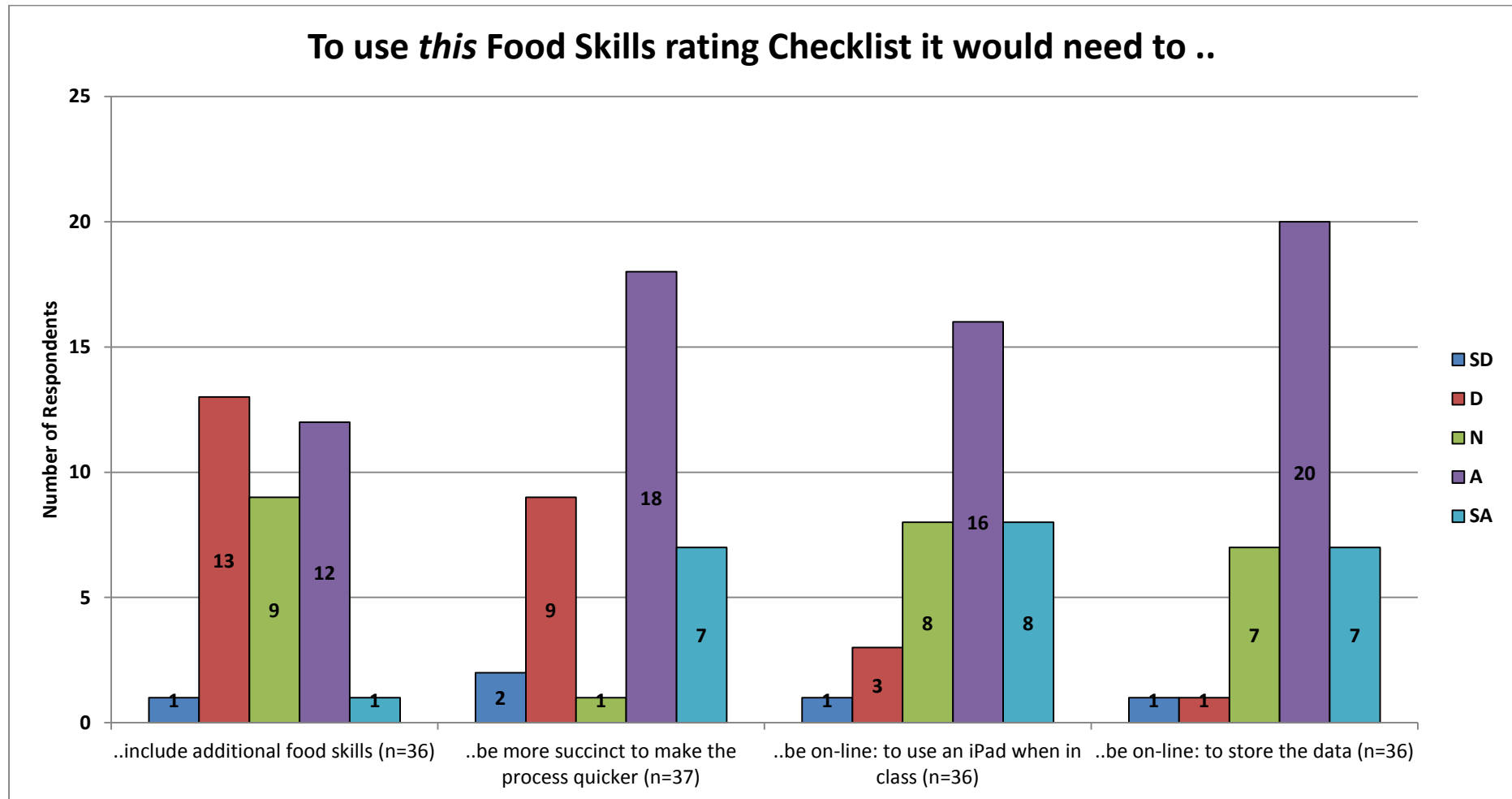
**Respondent no.16 DS**

Those who wanted fewer skill items (n=14) or remained neutral (n=9) on the amount of food skill items commented that the Checklist was just too long as a practical tool. They considered it would potentially reduce the teacher's supervision of students in the classroom, especially in junior food skills classes.

Twenty-five respondents agreed or strongly agreed that the Checklist would need to be made more succinct to make the process faster. These respondents suggested the use of other strategies such as rubrics or abridged versions of different skill sub-sets as a specific lesson focus.

With the increased use and popularity of portable digital tablets as a learning tool in schools, two-thirds of respondents who agreed or strongly agreed could see the potential and ease of use in having on-line or electronic versions made available. Twenty-seven respondents agreed or strongly agreed that an online version would be useful to store the data collected. One out of five respondents remained neutral for these technology-based questions, whilst the remaining one or two respondents who disagreed or strongly disagreed suggested that they did so because they had no access to digital tablets in their schools or would not use the technology if it were available for use in their schools.

Figure 5.12 Respondents' suggestions for inclusions on *this* Food Skills Rating Checklist



### 5.4.7 Suggested modifications of the Checklist and videos for future use in the classroom

The respondents made many suggestions to modify the Checklist as an evaluation tool and the videos as training tools for future use in their classes (Table 5.4).

**Table 5.4 Suggested modifications of the Checklist and videos for future use in the classroom**

Suggested modification of the content of the Checklist as an evaluation tool	Suggested modification of the Checklist as an evaluation tool	Suggested modification of the videos as training tools
<ol style="list-style-type: none"> <li>1. Balance and delineate the safety and hygiene skills and the production skills.</li> <li>2. Include environmentally sustainable food waste skills such as composting food waste or recycling food packaging such as cans and plastic packages.</li> <li>3. Focus on the preparation of food to maximise its nutritional content. For example, cooking time and mediums, handling of the ingredient and addition of other accompaniments.</li> <li>4. Include time management and work co-operation skills.</li> <li>5. Define the term ‘not shown’ as ‘not completed at all’ and ‘poor’ skills to mean ‘skill performed poorly’.</li> <li>6. Include a food skills ‘confidence measure’<sup>1</sup> which would allow students to self-evaluate their confidence to complete a range of food skills from food shopping</li> </ol>	<ol style="list-style-type: none"> <li>1. Include a glossary of skill descriptors to provide teachers with have a common understanding. For example, <i>use of knife skills</i> needs to be defined or explained fully as the use of a chef’s knife to prepare food.</li> <li>2. Use step-by-step coloured photographs or a training video to accompany the Checklist and to provide teachers with a visual standard on which to score the Checklist and to gain the shared understanding of the skill descriptors.</li> <li>3. Have a basic and an advanced version to accommodate the skills level of junior and senior school students or to suit physically or intellectually disabled students’ needs and abilities.</li> <li>4. Have an abridged version of each of the five skills-sets to allow teachers to focus on one skill-set in a lesson appropriate to that task.</li> <li>5. Have abridged versions from a five</li> </ol>	<ol style="list-style-type: none"> <li>1. Include a combination of high and low level skills into one video instead of three videos to shorten the viewing time and ameliorate respondent fatigue.</li> <li>2. Increase the duration of the demonstrations so that they are long enough to show each skill clearly and obviously in the videos, particularly for temperature control, supervision of appliances and presentation skills.</li> <li>3. Include close-ups of these ‘micro-skills’ which require closer inspection to be able to be scored accurately.</li> <li>4. Match each task so that it is aligned with the level of skill represented on the video, particularly in the demonstration of ‘poor’</li> </ol>

<p>to food preparation and cooking.</p> <p>7. Include one skill per check box to make it easy for teachers to observe the skill and then tick one box.</p> <p>8. Include a comment box attached to each skill-set to enable the teacher to supplement or justify their scoring.</p>	<p>point to a three point rating to save time and expedite scoring in those situations when teachers require a general overview of students' skill acquisition.</p> <p>6. A declarative skill versions which includes menu planning to suit family members, making shopping lists and shopping and storing fresh food and pantry food.</p> <p>7. An online version to use in class, to store data or as an adjunct to photographic or video evidence of the students' food skills.</p>	<p>and 'not shown' skills.</p> <p>5. Have clear text segments advertising each skill covered in the video segment.</p> <p>6. Randomise the order of the three videos when they are used as a training tool in a group situation to overcome anticipated guessing.</p>
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The 'confidence measure' builds on the findings reported in the *Chefs Adopt a School* evaluation that determined the confidence levels amongst primary school-aged children to request, make and eat food items new to them (Caraher M et al., 2013).

#### 5.4.8 Summary of Results

The aim of Study 3, to design a reliable and valid evaluation tool that teachers could use to measure the development and progress of their students' procedural skills, was achieved. Both the ANOVA analyses of the data in **Table 5.3** and the non-parametric analyses (**Figures 5.4 – 5.8**) suggest that the Checklist is a reliable and valid evaluation tool. This is a preliminary finding, and as the teachers' comments suggest, further development and validation will be required.

Four out of the five respondents indicated they would use this Checklist to assess their students' food skills, the development of their students' food skills and as evidence to report on their students' food skills. The majority thought that the Checklist, even in this current version, was suitable for use in their classes. Several respondents had already made their own modifications and arrived at a shared understanding with their students by reviewing the Checklist as a preliminary step to peer, self or teacher evaluation of students' food skills.



## **5.5 Discussion**

The statistical analyses showed that the respondents were able to use the Checklist to distinguish between the three levels of skills demonstrated in the videos. That is, the analyses demonstrated the reliability and the validity of the instrument.

The exceptions to this occurred when it was likely that respondents overlooked the skill or were less able to discern how well the skill was performed in the videos. This may have explained the low Partial Eta<sup>2</sup> scores (<0.500) indicated for Item 8 (Perform correct procedures), Item 9 (Control temperature), Item 11 (Supervise appliances) and Item 16 ('Clean as you go') for the variations between 'No Skills' versus 'Good Skills' and Item 3 (Protect clothing) for the 'Good Skills' versus 'Excellent Skills'.

Four out of the five respondents indicated that they would use the Checklist to assess their students' food skills acquisition. They would use the Checklist to assess the progression of their students' food skills and then use this information to report on their students' food skills.

This Checklist, to the candidate's knowledge, is the first to be tested and evaluated by practising teachers. The tool was original in its design and matched with the procedural food skills identified in meal recipes and the essential food skills identified by the food skills experts in Study 1.

## **5.6 Strengths and limitations of the study**

Further research needs to be done to develop test items that would accurately measure the internal and test-retest reliability and the discriminative validity of the Checklist.

Any updated versions of the tool would need to be in-field trialled and tested by teachers. The convenience sample of a relatively small number of forty participants was confined largely to those who lived in metropolitan Melbourne or regional Victoria.

While there was a range of experienced teachers from each of the school sectors and pre-service teachers and lecturers from universities, more early experience teachers may have

provided different information. Therefore, any future testing of the Checklist should include more of the early experience teachers.

To establish the applicability of use of this Checklist for teachers in other countries or for facilitators of non-school food skills programs, more participants would need to be included in future trials.

The use of, and access to digital technologies and Internet data storage facilities were significant methodological strengths of this study. The ability of the respondents to download the videos and documents from Dropbox<sup>TM</sup>, an Internet storage facility, expedited the process of data storage and retrieval.

The use of the video demonstrations to simulate the meal making was another methodological strength that ensured the preparation and cooking procedures involved in the meal production were controlled and the ethical procedures of using students were circumvented.

### **5.7 Future research directions**

Each of the recommendations suggested by the respondents (**Table 5.4**) could be considered for inclusion or modified in any future design and development of the Checklist. For example, the *content* of the Checklist could include additional or particular skills such as time management, work co-operation or skills pertaining to environmental sustainability.

The use of confidence measures which have been used elsewhere by facilitators of food skills programs (Caraher M et al., 2013), could be embedded into the Checklist. For each skill or a particular skill-set, the students (or other participants) could rate their level of confidence of demonstrating a skill, such as using a cook's knife to chop an onion.

The use of cooking enjoyment as a significant predictor of cooking ability, especially in males (Hartmann C et al., 2013), could also be embedded into the Checklist as a subjective measure of meal or food product success.

The *design* of the Checklist could be modified to suit individual teacher requirements and include comment boxes, abridged versions of particular skill sub-sets or declarative skills versions. Particular skill-sets could be used as a focus for introducing or refining food skills. For example, Tasks 16 to 18 ('Clean as you go', Washing and Drying up) could be used to introduce 'hands-on' safety and hygiene lessons.

Teachers could use the Checklist to develop the relevant strategies required to improve these and other skill sub-sets in their students. For example, teachers might allocate more time to demonstrate particular skills or for their students' to practise the skills.

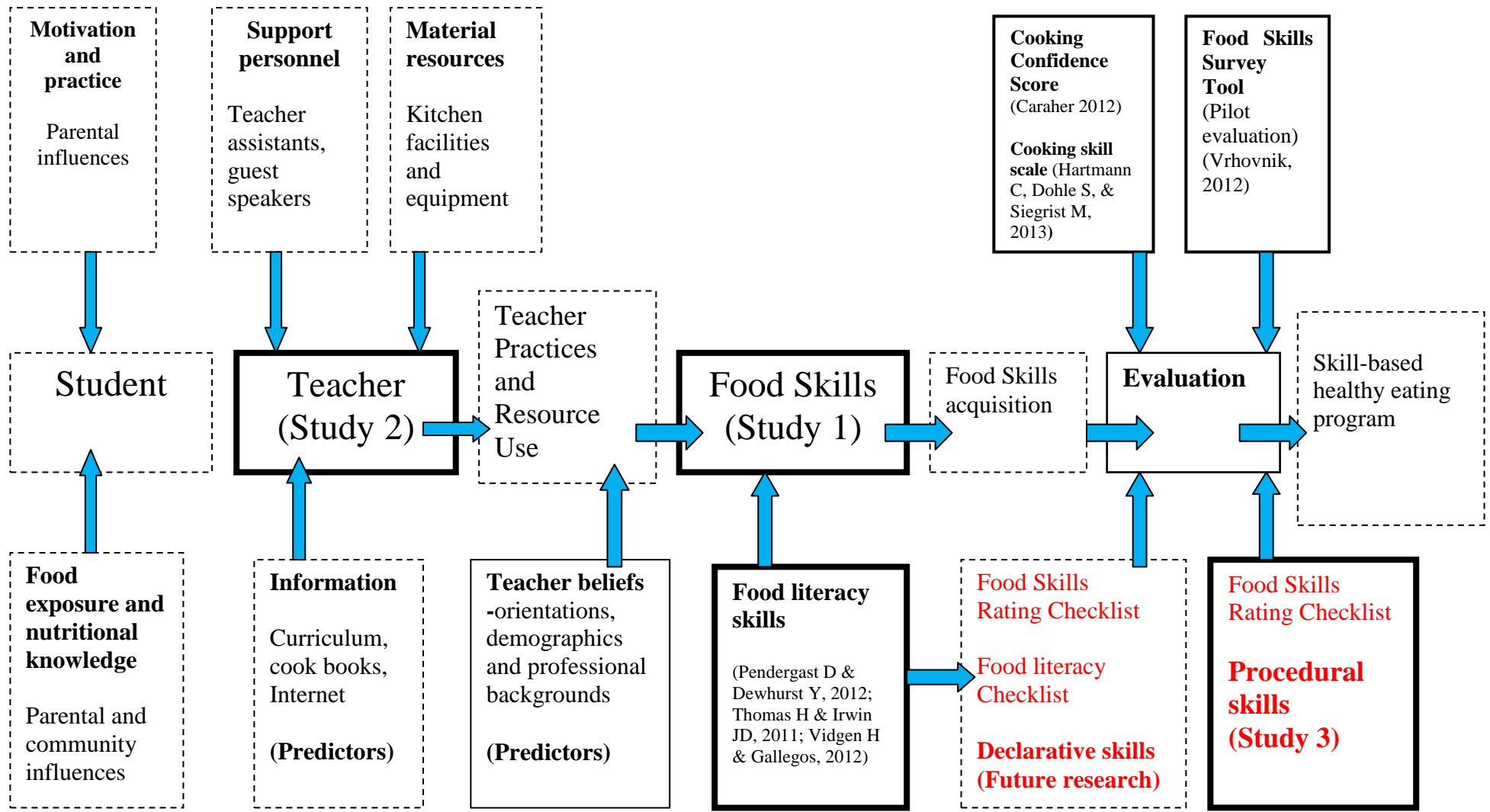
More skill-sets that included meal planning, making shopping lists and shopping for food would be included in declarative skill versions of the current Checklist. The declarative skills version of the Checklist, for example, could be used for those recipes that required pre-planning, shopping for, or pre-preparing specialty foods (such as marinating game meats or fish).

Confidence measures could be accommodated in this version when students in senior food classes were required to shop for food from a specialty food supplier. For example, an *objective* confidence measure of a shopping skill could be exemplified (in *italics*) by a student having the confidence to *correctly identify* the species, *recognise the freshness* of the whole fish and *verify the provenance* of the fish with the fishmonger.

With the recent progression of the research into, and definition of 'food literacy' (Pendergast D & Dewhurst Y, 2012; Thomas H & Irwin JD, 2011; Vidgen H & Gallegos D, 2011), new opportunities have been created for the development of food literacy measures to be used in food skills acquisition and evaluation. The development of a 'Food literacy checklist' could be embedded into declarative versions of the Checklist. Based on the definition "the ability of consumers to understand and act upon the food labelling and nutritional information they need to prepare tasty and nutritious meals for themselves and their families" (Fordyce-Voorham S, 2010), a 'Food literacy checklist' would require a participant to correctly match the labelling components with appropriate action. For example, a consumer purchasing a locally made food product to support values of environmental sustainability and 'food miles'.

The new components of a ‘Food literacy checklist’ in a declarative skills version of the Checklist and the ‘Cooking confidence measure’ and ‘Cooking skill scale’ in an updated procedural skills version and the Food Skills Rating Checklist are positioned in an extension of **Figure 2.5** Predictors of Teacher Practices titled **Figure 5.13** Positioning of the Food Skills Rating Checklist in an extension to Model (Figure 2.5 Predictors of Teacher Practices). The line density of the boxes indicates the level of evidence –based research invested in each box’s contents. Areas where future research is required are contained in boxes with broken lines.

**Figure 5.13 Positioning of the Food Skills Rating Checklist in an extension to Model (Figure 2.5 Predictors of Teacher Practices)**



In the future, training videos could be developed for the entire range of skills or particular skill-sets. The video demonstrations in this study were made as a tool to make it possible for respondents to evaluate the Checklist. However, the teachers saw potential in the videos as a separate training tool, as an adjunct to the Checklist that *they* could use in the classroom. This was an unexpected finding.

The videos could be used as a training tool by teachers on those occasions when they are absent from the class or do not have the resources available. These situations may occur when the teacher may not have the time or skill expertise to demonstrate a particular skill-set or does not have the available cooking or equipment facilities in their school to demonstrate them.

Finally, the videos and the Checklist not only potentially serve as training tools, they also enable teachers to acquire the evidence they need to determine student outcomes in their bi-annual reports and in their appraisal of their own performance.

The tool has merit for use by teachers, both locally and abroad, but could be extended for use by facilitators of cooking programs in a variety of community or commercial settings to assess participants' skills acquisition.

Further, the Checklist could be trialled as a quality control tool for practising teachers to use as part of their own professional development and self-evaluation. For example, teachers could track student outcomes from one year's program to the next or between classes in the same year to identify consistently low scoring skill sub-sets across students' range of capabilities.

## **5.8 Summary and conclusions**

The main findings of this Study suggest that the Food Skills Rating Checklist is a valid and reliable evaluation tool for teachers to use to assess their students' food skills acquisition. The videos, used to demonstrate the skills and to make it possible for the respondents to evaluate the Checklist, have hitherto unrealised potential as a separate training tool. Teachers have already used the videos as training tools and these could be developed as training

packages in conjunction with the Checklist in the future. Finally, more extensive research should be conducted to develop the instruments for use among a broader set of teaching contexts and teachers in Australia and overseas.

## **6.0 CHAPTER 6 GENERAL DISCUSSION AND CONCLUSION**

### **6.1 Introduction**

This thesis aimed to address three research questions:

1. What are the essential food skills that young people need to plan and shop for food and then prepare and cook healthy meals? (Study 1)
2. What are the food skills taught and the resources used by teachers? (Study 2)
3. How do teachers measure their students' food skills? (Study 3)

This chapter summarises the findings of the three studies and discusses their implications for home economics teacher training and practice. While the focus has been on Australian teachers, these novel findings have significance and applicability to food educators in schools and communities worldwide as they inform curriculum and program developers of the essential food skills that need to be included in any skill-based program purporting to foster healthy eating behaviours among young people. The thesis also identifies, for the first time, the resources that teachers' need to be able to deliver these programs successfully to their students. However, while the programs focus on students as the end users, the research does not extend to determining their views on the food skills they believe should be taught in schools, due to time and research constraints. Future research based on a needs assessment of the students and related key stakeholders, such as parents and school management personnel, is recommended to extend the current findings (Hawe P, Degeling D, & Hall T, 1990).

### **6.2 Key findings**

The next section outlines the four key findings and their implications for food skills curricula used by the home economics teaching profession and teacher training organisations. Further research directions to augment the identified findings are then explored, along with their significance for designers and practitioners of food skills programs in schools, vocational training organisations and communities.



## **1. The range of food skills that experts and home economics teachers' think young people need to learn**

The range of skills identified by the fifty-one experts (Study 1) included key informants such as independent young people who provided a retrospective student view of the food skills they believed should be taught in schools, and community food educators who provided input into the food skills requirements of people in the community. The skills verified by 271 teachers (Study 2) included the planning (declarative) and hands-on (procedural) tasks required by young people to cook a healthy meal. Specifically, the teachers nominated the twelve essential skills identified by the food experts that covered the pre-planning menu design and the shopping, preparation and cooking of food followed by the post-meal cleaning-up. They included tasks such as the safe and hygienic preparation of food, the use and storage of knives and the cleaning up of dishes and equipment after the meal was prepared. For the first time, the essential skills to cook a healthy meal were identified and listed in Study 1. They provide curriculum developers, teachers, trainers in vocational training organisations and community facilitators with the 'micro components'; that is, the content they need to develop relevant curricula for existing or new skill-based food programs.

## **2. Food skills taught and resources used by teachers**

In Study 2 the teachers endorsed the skills that were identified by the food experts in Study 1. The sixty-nine skills were reduced by exploratory factor analysis into five skill-sets: (*domestic settings, vocational settings, cookery methods in a contemporary food skills program, food economy and use of microwave ovens*).

The data indicated that the importance the teachers' placed on these skill-sets was influenced more by their attitudes and beliefs about food, nutrition, consumerism and the environment (their personal 'orientations') than their teaching experience and professional background. The implications of these influences are discussed below in the section on teacher predictors.

The teachers' goals for their programs influenced their teaching practice. Their main priority was to give their students the learning and practice opportunities to make healthy meals skilfully and in a fun way that developed their confidence. These goals aligned with the enjoyment of food integral to Satter's model (Satter E, 2007b) and the use of confidence as a

measure of food skills acquisition in skill-based programs in both school and community settings (Caraher M et al., 2013; Children's Food Trust, 2013; Contento IR et al., 2010; Engler-Stringer R, 2010; Larson NI, Story M, et al., 2006; Rocha Leal FM et al., 2011).

The teachers recognised the importance of motivating young people to eat well with easy to prepare recipes that they enjoyed eating and making with their friends. Highlighting the recommendations made by nutrition educators (Contento IR, 2008; Contento IR et al., 2010; Contento IR et al., 2002; Veuglers PJ & Fitzgerald AL, 2005), teachers knew how to engage their students by allowing them to work in groups but providing opportunities for them to work independently to practise time management and task scheduling skills in simulated home settings. These strategies exemplify the teachers' implicit understanding of their students and the many ways they connect with them and their world.

To help them achieve their program goals, teachers used human and material resources to teach food skills to engage their students and to enrich their programs. Consistent with the views of the food experts in Study 1 and the nutrition education guidelines made by the World Health Organisation (Dixey R et al., 1999), the teachers recognised the importance of parents as resources, and were strategic in enlisting their help when they invited them into their classrooms to share multi-cultural culinary experiences or encouraging them to allow their children to practise the skills learnt at school at home.

Teachers were strategic in enlisting community expertise such as guest chefs and taking students on market and restaurant visits to extend their culinary experiences. Even when they taught in remote schools with limited finances or access to these facilities, teachers were strategic and resourceful. For example, they used the Internet as a source of information to expose their own students to new foods or culinary experiences.

### **3. Predictors of selection of skills and resources by teachers**

Study 2 identified several predictors that might operate as influences on the skills and resources teachers select and use with their students. Pendergast's (Pendergast, 2001) construct of teacher 'personas' was the genesis for the development of the three teacher 'orientations' described as the *Food Aesthete*, *Consumer-Environmentalist* and *Nutritionist*.

These ‘orientations’ were *more* important predictors of the food skills they selected to teach in their programs than the respondents demographic characteristics, training or duration of teaching experience. Unsurprisingly, as a food focused profession, the *Food Aesthete* orientation figured highly, with more than two-thirds of the respondents’ valuing food exposure and ‘hands-on’ skill development in their students.

The teacher orientations were also stronger predictors for the use of the different educational resources. The *Nutritionists* focused on healthy meal planning and dietary analysis skills. With their emphasis on making and eating good food, *Food Aesthetes* were more likely to instil ‘hands-on’ advanced or vocational skills and encourage their students to work independently. By contrast, the *Consumer-Environmentalists* were more likely to emphasise home practice to build on their students’ food skills and to tackle moral and ethical dilemmas associated with their food choices as civic-minded consumers with a global outlook (Caraher M, 2013). No matter their orientation, all teachers used multi-cultural and community food exposure as resources, for example, by taking their students to restaurants and markets.

These novel but preliminary findings on the teacher orientations are important as they provide professionals with an understanding of ‘who they are’ and why they might choose particular skills and resources in their program. For example, with the imminent introduction of a national Technologies curriculum (Australian Curriculum Assessment & Reporting Authority, 2013), teachers may well update accordingly but given that more than two-thirds of the respondents have enough autonomy to develop a food skills program that ‘best-fitted’ their own school or faculty, they are more than likely to continue to develop their own curricula to match with their own orientations and resources available to them. The implications of this situation for teaching healthy eating and home economics education are discussed below.

Whilst more than half of the teachers used a combination of the two Key Learning Areas of Health and Physical Education or Technology curricula (of their State or Territory) they appeared to use them merely as a starting point to guide their food skills programming. In Study 2, two-thirds of the teachers’ looked toward their professional associations such as the Home Economics Institute of Australia and Home Economics Victoria as more relevant sources for the development of a food skills curriculum and *not* to the Australian Curriculum,

Assessment and Reporting Authority. This situation has possible ramifications for the profession as teachers' need to ensure that their programs comply with guidelines authorised by the national curriculum body.

#### **4. Preliminary evaluation tool of food skills acquisition**

Designers and facilitators of food skills programs have typically used participants' self-reports of confidence in completing particular food tasks as a measure of program success (Caraher M et al., 2013; Children's Food Trust, 2013; Contento IR et al., 2010; Larson NI, Story M, et al., 2006; Rocha Leal FM et al., 2011). However, such measures are subject to bias (Auld GW et al., 1998) and error (Contento IR, 2008) and may not assess levels of food skills. Instead, most teachers in Study 2 reported using practical food tests to measure their students' food skills but they indicated that they seldom reported these outcomes as measures of program success.

Several researchers indicated that many facilitators (nutrition educators and teachers) fail to evaluate their programs either because they lack the time or the need to do so (Gussow & Contento, 1984; Worsley T & Crawford D, 2005) or crucially, the absence of adequate evaluation tools (Barton KL et al., 2011). Since these tools could contribute to the evidence facilitators need to evaluate the success of their programs, an easy-to-use evaluation tool to *objectively* measure food skills was developed and tested by teachers in Study 3.

The Food Skills Rating Checklist was designed to cover the procedural food skills required by students to prepare, cook, serve and clean up after a meal. The Checklist was tested among forty participants in an on-line experiment that involved them viewing three skill scenario video demonstrations and rating the skills on the instrument. The Food Skills Rating Checklist was found to be a valid and reliable evaluation tool to measure procedural food skills. Even in its current rudimentary form some respondents reported using it as a training tool.

The Checklist could be used by teachers in several ways. For example, it could be used either as a formative tool throughout the skills education program or as a more formal summative tool to test students' acquisition of procedural food skills before and after program delivery. At a school level, it could be used to provide evidence for teachers'

reporting of their students' food skills acquisition to parents each semester, and as part of program evaluation for management. In vocational skills programs operating in TAFE (Technical and Further Education) settings, the tool could be used to measure basic competency skills used in the hospitality industry.

The Checklist could also be used as a quality control tool for teachers' own professional development and appraisal. They could, for example, track student outcomes from one year's program to the next or between classes in the same year, to identify and address consistently low scoring skill sub-sets across the students' range of capabilities.

The Checklist could be used in conjunction with the Essential Skills List identified in Study 1 to serve as the framework to design and evaluate a food skills curriculum. The respondents made many suggestions about the ways the tool could be applied in a school setting and extended or developed to match with the curriculum as students advance through levels of their schooling or, more broadly as a program evaluation tool. The implications that the Checklist may have for the promotion of healthy eating and home economics education are discussed in the next section.

### **6.3 Towards a new conceptual model**

Two conceptual models were used to inform Studies 1 and 2. The first model (**Figure 2.4**) was based on the Food-related Lifestyle Model (Grunert KG et al., 1993) and components of the Eating Competence Model (Satter E, 2007a). It positioned the declarative and procedural skills in relation to product outcomes and was used to inform the categorisation of the twelve essential skills in Study 1. The procedural skills component of **Figure 2.4** was selected for pilot testing in the Checklist in Study 3.

The second model (**Figure 2.5**) was used to inform Study 2. It incorporated components of **Figure 2.4** and showed how teacher beliefs worked as predictors that might influence the food skills taught to students. The model was based on the earlier findings reported in the literature review and took into account the factors that may influence young people's behavioural capabilities to acquire the declarative and procedural skills.

#### **6.4 Implications for healthy eating and home economics education**

Although further refinement and testing of the teacher orientations are required, the preliminary findings are nevertheless important. For home economics professional associations and under-graduate teacher course designers, the findings could be used to tailor and market teacher training programs to attract new people to a profession that is experiencing a current and anticipated shortage in Australia (Corstorphan B et al., 2005) and elsewhere (Slater J, 2013).

Further, the promotion of specialist streams based on the three teacher orientations would attract potential trainees to an under-graduate teacher training program that articulates and accommodates their interest and utilises their 'best-fit' attributes. For school principals, the articulated specialisations provide forecasts of the likely vocational skills of teachers in their schools and their likely matching with their school's culture and student clientele.

In a multi-disciplinary field such as home economics (Home Economics Victoria, 2009), an understanding of the teacher orientations would provide pre-service teachers with a training direction which would then support them when they graduate, move into schools and start designing and teaching programs of their own. For teachers in schools, an understanding of their orientation coupled with knowledge of the essential skills would assist them to tailor a program according to their own interests and attributes, and to those of their students.

Within a school or a network of schools, colleagues with different orientations could collaborate to develop a multi-faceted program that complements the attributes of each practitioner and accommodates the learning styles of their students who might favour a particular food skill interest.

With the articulation of the essential skills and the resources used by teachers and their positioning within the proposed conceptual model (**Figure 2.5**), curriculum and program designers have a framework to build a skill-based healthy eating program. In the current transition of Australia moving towards a national curriculum, the research provides curriculum designers with content on which to build a relevant and evidence-based national

food skills curriculum that has already been informed by the teachers who will use it in schools.

With further development and testing of the Food Skills Rating Checklist, home economics teachers will have an easy-to-use and reliable evaluation tool on which to report their students' food skills acquisition and more broadly, the success of their programs. For a time-poor profession, the Checklist serves as a crucial tool that would help teachers gather the consistent evidence they need to promote their work in schools, and more importantly, to the broader community. For a profession that has hitherto relied upon anecdotal reporting of their students' food skills acquisition, and by default their program success, the Food Skills Rating Checklist represents a significant move forward.

## **6.5 Broad limitations and new research directions**

### **Program design**

This research has identified and described the content of what a successful skill-based program might look like. Specifically, the essential skills list and the Food Skills Rating Checklist would serve as the evidence-based package used by curriculum designers to incorporate into program design and program facilitators to track participants' food skills acquisition pre- and post-program delivery.

Future research needs to determine likely causal relationships between skill-based programs which employ the package and sustainable improvements in young people's healthy eating behaviours. Whilst teachers have been the focus of this thesis, the perspectives of other key stakeholders including young people (students), parents, school management personnel and curriculum bodies need to be represented as their needs may well be different. While this study investigated normative needs, future studies would benefit from an exploration of other types of needs, especially those represented by young people. Therefore, a needs assessment could be used to guide the process of developing a successful program which would entail accommodating, for example, the students' requirements as the end users of such skill-based programs (Hawe P et al., 1990). Due to time constraints, the study of young people as key

informants was restricted to those young adult independents who helped to inform the identification of essential food skills in Study 1.

A needs assessment would help to determine and factor in the testing of any secondary effects of the motivational, parental and community influences on students' food skills acquisition and their eating behaviours. Furthermore, any future study involving students could also include their parents to determine their needs and identify any causal links between the two groups and their selection of the food skills deemed essential to be taught in these programs.

### **Teacher predictors**

Further research should be conducted on the identified home economics teacher orientations. The orientation variables were quite crudely measured in this study and could be defined in more detail in future studies. For example, more items, particularly for the 'Nutritionist' orientation, should be developed and then re-tested along with the original items to verify the observed relationship between this orientation and teachers' selection of skills and resources.

The cross-sectional nature of the study prevented attribution of causal relationships between food skills, use of resources and the predictor variables. Further research to measure these relationships in a longitudinal study is required in order to determine whether the teacher orientations influence the food skills and the resources selected and used by teachers, and sustainable food skill practices among their students.

While the use of relatively small samples, drawn mainly from Victoria, Australia limits the generalisability of the findings of Study 2 and 3 at this time, future studies could be conducted in other states and countries to validate the findings. For example, preliminary testing of the Food Skills Rating Checklist by seven teacher participants from countries where English was not their first language, suggested that the Checklist has application beyond Victorian secondary schools. Given sufficient funding, future studies might use a comprehensive nationwide and international sample of teachers.



## **Evaluation tools**

The preliminary findings showed that the Food Skills Rating Checklist was a reliable and valid evaluation tool. However, any updated versions would need to be tested and re-tested in realistic classroom settings.

Since some teachers have already reported using the trial version of the Checklist there may be merit in developing a standardised tool that all teachers would be willing to use in their classes. They could report the outcomes as evidence of their students' food skills acquisition and by default, the success of their skill-based programs. Potentially, data could be collected by teachers' professional associations and then pooled as part of the collective evidence used to evaluate all skill-based programs in secondary schools. For this to happen, teachers would need to be convinced that the tool would not add to their workload but instead be a useful adjunct to the tools they might already use.

The participants made many suggestions about how they might use variations of the Checklist that would meet their requirements. Future research would require a needs analysis of the Checklist variations. This could involve focus groups of teachers, for example, articulating their priorities and specifications for their programs and then identifying Checklist variations which would provide strong evidence for the evaluation of their teaching program.

In summary, as the essential food skills have never before been articulated or explicitly documented, this thesis has for the first time provided a list of the twelve essential skills required to be taught in school and community food skills programs. This was the purpose and achievement of Study 1. Next, as home economics teachers deliver these programs in schools, their views were sought on the food skills they deemed important to include in their programs. Along with the verification of the skills deemed important to teach by teachers, the resources they used to deliver their programs were also determined. This was the purpose and achievement of Study 2. Finally, as the tools by which teachers used to measure their students' skill acquisition was hitherto unknown, a Food Skills Rating Checklist was developed and tested successfully for use as an evaluation tool by participants. This was the purpose and achievement of Study 3.

## 6.6 Conclusions

In addressing the eating behaviours of young people, this thesis has filled a gap in the food education literature by articulating the essential skills that should be taught to young people to enable them to plan and cook healthy meals for themselves and others. A conceptual model has been proposed which outlines the relationships between the components which need to be taken into consideration by teachers when they design their skill-based programs.

These components include the essential food skills that provide teachers and program designers with the content on which to build a skill-based program. These significant findings drawn from Study 1 were verified by the teachers in Study 2 along with new findings relating to the teachers' beliefs about food and cooking, nutrition, consumerism and environmental issues on their teaching practices. The Study 2 findings showed that these beliefs described as 'orientations' were significant in teachers' selection of particular food skills and resources that they incorporated into their teaching practices.

Although in its preliminary form, the Food Skills Rating Checklist findings contribute significantly toward the development of a standardised instrument that could be used to evaluate skill-based programs in schools and elsewhere. Used in conjunction with existing tools such as confidence measures, the Checklist would strengthen the evaluation of skill-based programs for facilitators.

While this thesis has contributed significantly to the understanding of the components of skill-based program design, future challenges would require research that establishes the links between successful skill-acquisition programs and long term improvements in young people's eating behaviours.

## REFERENCES

- Abbott RA, Macdonald D, Mackinnin L, Stubbs CO, Lee AJ, & Harper C. (2007). 2006 Healthy Kids Queensland Survey Summary Report. Brisbane: Queensland Health.
- Ajzen I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, 50, 179-211.
- Allen H. (2005). Family meal patterns. An undergraduate research report. *Journal of the Home Economics Institute of Australia* 12(2), 34-44.
- Archuleta M, VanLeeuwen D, Halderson K, Wells L, & Bock MA. (2012). Diabetes Cooking Schools Improve Knowledge and Skills in Making Healthful Food Choices. *Journal of Extension*, 50(2).
- Arimond M, & Ruel MT. (2004). Dietary Diversity Is Associated with Child Nutritional Status: Evidence from 11 Demographic and Health Surveys. *Journal of Nutrition*, 134, 2579-2585.
- Auld GW, Romaniello C, Heimendinger J, Hambidge C, & Hambidge M. (1998). Outcomes from a School-based Nutrition Education Program Using Resource Teachers and Cross-disciplinary Models. *Journal of Nutrition Education*, 30, 268-280.
- Australian Bureau of Statistics. (1998). National Nutrition Survey: Nutrient Intakes and Physical Measurements Australia 1995 *Australian National Nutrition Survey*. Canberra, Australia: Australian Bureau of Statistics.
- Australian Bureau of Statistics. (2005). *Information Paper. Field of Children and Youth Statistics Australia*. (Document 4910.0).
- Australian Bureau of Statistics. (2008). *How Australians Use Their Time, 2006*. (4153.0). Canberra: Australian Bureau of Statistics.
- Australian Bureau of Statistics. (2009). *National Health Survey: Summary of results 2007-2008*. (4364.0). Canberra
- Australian Curriculum Assessment & Reporting Authority. (2013). The Draft Australian Curriculum: Technologies. Retrieved 28 August, 2013, from <http://www.acara.edu.au/technologies.html>
- Australian Institute of Health and Welfare. (2007). Australia's Young People: Their health and wellbeing. Canberra Australia: AIHW.
- Australian Institute of Health and Welfare. (2008). *Australia's health 2008*. Canberra: AIHW.
- Australian Institute of Health and Welfare. (2012). *Australia's food and nutrition 2012: in brief*. Canberra: AIHW.
- Backman, DR, Haddad, EH, Lee, JW, Johnston, PK, & Hodgkin, GE. (2002). Psychosocial Predictors of Healthful Dietary Behaviour in Adolescents. *Journal of Nutrition Education and Behaviour*, 34, 184-193.
- Baderoon G. (2002). *Everybody's mother was a good cook: Meanings of food in Muslim cooking*. [www.agenda.org.za.Gabeba](http://www.agenda.org.za/Gabeba)
- Bai L. (2010). *Nutritional Status of Adolescents: an overview*. University of Wollongong. Wollongong, NSW.
- Bandura A. (2002). Social Cognitive Theory in Cultural Context. *Applied Psychology: An International Review*, 51(269).
- Baranowski T, Cullen KW, & Baranowski J. (1999). Psychosocial correlates of dietary intake: advancing dietary intervention. *Annual Review of Nutrition*, 19, 17-40.
- Barlow SE, & Dietz WH. (1998). Obesity evaluation and treatment: Expert Committee recommendations. The Maternal and Child Health Bureau, Health Resources and Services Administration and the Department of Health and Human Services. *Pediatrics*, 102(E29).

- Barton KL, Wrieden WL, & Anderson AS. (2011). Validity and reliability of a short questionnaire for assessing the impact of cooking skills interventions. *Journal of Human Nutrition and Dietetics*, 24, 588-595.
- Bauer, KW, Yang, YW, & Bryn, Austin S. (2004). "How Can We Stay Healthy When You're Throwing All of This in Front of Us?" Findings From Focus Groups and interviews in Middle Schools on Environmental Influences on Nutrition and Physical Activity. *Health Education Behaviour*, 31(1), 34-46.
- Bell AC, Kremer PJ, Magaey AM, & Swinburn BA. (2005). Contribution of 'noncore' foods and beverages to the energy intake and weight status of Australian children. *European Journal of Clinical Nutrition*, 59, 639-645.
- Bell, AC , & Swinburn, BA. (2004). What are the key food groups to target for preventing obesity and improving nutrition in schools? *European Journal of Clinical Nutrition*, 58, 258-263.
- Birch LL, & Fisher JO. (1998). Development of eating behaviours among children and adolescents *Pediatrics*, 101, 539-549.
- Block K, & Johnson B. (October 2009). Evaluation of the Stephanie Alexander Kitchen Garden Program (pp. p.7). Melbourne: Deakin University, University of Melbourne.
- Bonzo G, Kitson N, & Wardrop J. (2000). Talking food: A conversation about Zimbabwe, cooking, eating and social living. *Mots Pluriels*, 15, [www.arts.uwa.au/MotsPluriels](http://www.arts.uwa.au/MotsPluriels).
- Booth M, Okely D, Denney-Wilson E, Hardy L, Yang B, & Dobbins T. (2006). *NSW Schools Physical Activity and Nutrition Survey (SPANS) 2004 Summary Report*,. Sydney.
- Booth ML, Chey T, Wake M, & al, et. (2002). Change in prevalence of overweight and obesity among young Australians 1969-1997. *Am J Clin Nutr*, 77, 29-36.
- Booth ML, Dobbins T, Okely AD, Denney-Wilson E, & Hardy LL. (2007). Trends in the Prevalence of Overweight and Obesity among Young Australians, 1985,1997, and 2004. *Obesity*, 15(5), 1089-1095.
- Booth ML, Wake M, Armstrong T, & et al, . (2001). The epidemiology of overweight and obesity among Australian children and adolescents, 1995-1997. *Aust N Z J Public Health*, 25, 162-169.
- Britten N, Jones R, & al, et. (1995). Qualitative research methods in general practice and primary care. *Family Practice*, 12, 104-114.
- Bronfenbrenner, U. (1979). *The Ecology of Human Development:Experiments by Nature and Design*. Cambridge, MA: Harvard University Press.
- Brown JD. (2008). Effect size and eta squared. *Shiken: JALT Testing & Evaluation SIG Newsletter*, 12, 38-43.
- Brunso K, Scholderer J, & Grunert KG. (2004). Testing relationships between values and food-related lifestyle:results from two European countries. *Appetite*, 43, 195-205.
- Caraher M. (2006). *Cooking Skills and Young People (unpublished work sent by the author to the Candidate)*.
- Caraher M. (2013). *Global food bowls: An era of new abundance-for some!* Paper presented at the Home Economics Institute of Australia (Qld) 2013 State Conference: Food! Nutrition! Futures! An education perspective Brisbane, Australia.
- Caraher M, Dixon P, Lang T, & Carr-Hill R. (1999). The state of cooking in England:the relationship of cooking skills to food choice. *British Food Journal*, 101(8), 590-609.
- Caraher M, Seeley A, Wu M, & Llyod S. (2013). When chefs adopt a school?: an evaluation of a cooking intevention in English primary schools. *Appetite*, 62, 50-59.
- Caraher, M, & Coveney, J. (2004). Public health nutrition and food policy. *Public Health Nutrition*, 7(5), 591-598.

- Carleton, RA, Sennett, L, Gans, KM, Levin, S, Lefebre, C, & Lasater, TM. (1991). The Pawtucket Heart Health Program. Influencing adolescent eating patterns. *Am NY Acad Sci*, 623, 322-326.
- Carter OBJ. (2006). The weighty issue of Australian television food advertising and childhood obesity. *Health Promotion Journal of Australia*, 17(1), 5-11.
- Catford JC, & Caterson ID. (2003). Snowballing Obesity: Australians will get run over if they just sit there. *Medical Journal of Australia*, 179(15), 577-579.
- Centers for Disease Control and Prevention. (2000). Promoting Lifelong Healthy Eating: An Overview. CDC's Guidelines for School Health Programs (pp. 1-33). Atlanta, GA: CDC.
- Centers for Disease Control and Prevention. (2008). Youth Risk Behavior Surveillance *Morbidity and Mortality Weekly Report 2007* (Vol. 57 (SS-4), pp. 1-131). US.
- Chapman G, & Mac Lean J. (1993). "Junk Food" and "Healthy Food": Meanings of food in adolescent women's culture. *Journal of Nutrition Education*, 25, 108-113.
- Chenhall C. (2010). *Improving Cooking and Food Preparation Skills: A Synthesis of the Evidence to Inform Program and Policy Development*. Government of Canada, Canada.
- Children's Food Trust. (2013). Let's Get Cooking". Retrieved from <http://www.letsgetcooking.org.uk/>
- Clancy, K. (1999). *Reclaiming the Social and Environmental Roots of Nutrition Education*. Paper presented at the Society for Nutrition Education, Albuquerque, New Mexico.
- Cole TJ, Bellizzi MC, Flegal KM, & Dietz WH. (2000). Establishing a standard definition for child overweight and obesity worldwide: international survey. *British Medical Journal*, 320, 1240-1243.
- Commonwealth of Australia. (2008). *2007 Australian National Children's Nutrition and Physical Activity Survey - Main Findings*. Canberra: Commonwealth Government.
- Contento IR. (2008). Nutrition education: linking research, theory, and practice. *Asia Pacific Journal of Clinical Nutrition*, 17(1), 176-179.
- Contento IR. (2011). *Nutrition Education: Linking Research, Theory and Practice* (Second Edition ed.). Sudbury MA: Jones and Bartlett Publishers.
- Contento IR, Cichela JL, & Goldberg CJ. (1988). Food choice among adolescents: Population segmentation by motivations. *Journal of Nutrition Education*, 20, 289-298.
- Contento IR, Koch PA, Lee H, & Calabrese-Barton A. (2010). Adolescents Demonstrate Improvement in Obesity Risk Behaviours after Completion of Choice, Control and Change, a Curriculum Addressing Personal Agency and Autonomous Motivation. *Journal of the American Dietetic Association*, 110, 1830-1839.
- Contento IR, Michela JL, & Williams SS. (1995). Adolescent food choice criteria: role of weight and dieting status. *Appetite*, 25, 51-76.
- Contento IR, Randell JS, & Basch CE. (2002). Review and analysis of evaluation measures used in nutrition education intervention research. *Journal of Nutrition Education and Behaviour*, 34(1), 2-25.
- Contento L, Balch G, & Bronner Y. (1995). The effectiveness of nutrition education and implications for nutrition education policy, programs and research: a review of research. *Journal of Nutrition Education*, 27, 284-418.
- Corstorphan B, Fordyce-Voorham S, & Warren C. (2005). Where have all the home economics teachers gone? *Journal of the Victorian Home Economics and Textiles Teachers' Association*, 44(2), 2-8.
- Crawford D, & Worsley T. (2005). *Promoting Healthy Eating in Children - A Planning Guide for Practitioners*. Melbourne.

- Crawford, D, & Worsley, A. (2004). Review of Children's Healthy Eating Interventions (pp. 1-148): Deakin University.
- Croll JK, Nemark-Sztainer D, & Story M. (2001). Healthy Eating: What does it mean to adolescents? *Journal of Nutrition Education*, 33, 193-198.
- Crowley L, & Schultz J. (1989). Incorporating Work and Family Concepts in Vocational Home Economics: A Survey of Iowa Educators. *Journal of Home Economics Vocational Education*, 7(2), 54-67.
- CSIRO. (2009). *2007 Australian National Children's Nutrition and Physical Activity Survey: Main Findings* Canberra: Department of Health and Ageing.
- Cullen KW, Watson KB, Zakeri I, Baranowski T, & Baranowski JH. (2007). Achieving fruit, juice, and vegetable recipe preparation goals influences consumption by 4th grade students. *International Journal of Behavioral Nutrition and Physical Activity*, 4(28).
- Cullerton K, Vidgen HA, & Gallegos D. (2012). *A review of food literacy interventions targeting disadvantaged young people*. Queensland University of Technology. Brisbane, Queensland.
- Cusatis CM, & Shannon BM. (1996). Influences on Adolescent Eating Behaviour. *Journal of Adolescent Health*, 18(1), 27-34.
- Cyr CA. (2013). *Cooking up a Course: Food Education at Pomona College*. (Bachelor of Arts Degree in Environmental Analysis), Pomona Senior Theses Paper 86 [http://scholarship.claremont.edu/pomona\\_theses/86](http://scholarship.claremont.edu/pomona_theses/86).
- Davies LT. (2008). *Licence to Cook Licence to Cook Monitoring Report*. London: Design and Technology Association.
- Demas A. (2001). *Food is Elementary*. Trumansburg NY: Food Studies Institute.
- Department of Health and Ageing. (2008). *2007 Australian National Children's Nutrition and Physical Activity Survey- Main Findings*. Canberra: Commonwealth of Australia.
- Department of Human Services. (2005). *Victorian Burden of Disease Study 2001*. Melbourne, Victoria: State Government of Victoria,.
- Department of Human Services. (2008). *Future prevalence of overweight and obesity in Australian children and adolescents 2005-2025*. Melbourne: Victorian Government.
- Dillman DA. (2007). *Mail and Internet Surveys- The Total Design Method*: John Wiley and Sons.
- Dixey R. (1996). Gender perspectives on food and cooking skills. *British Food Journal*, 98(10).
- Dixey R, Heindl I, Laureiro I, Perez-Rodrigo C, Snel J, & Warnking P. (1999). *Healthy Eating Guide for Young People in Europe- A school-based nutrition education guide*. Copenhagen, Denmark: WHO.
- Dorn LD, Dahl RE, Woodward HR, & Biro F. (2006). Defining the Boundaries of Early Adolescence: A User's Guide to Assessing Pubertal Status and Pubertal Timing in Research With Adolescents. *Applied Developmental Science*, 10(1), 30-56.
- Easthorpe G, & White R. (2006). Health & Wellbeing How do young people see these concepts? *Youth Studies Australia*, 25(1), 42-49.
- Engler-Stringer R. (2010). Food, Cooking Skills and Health: A Literature Review. *Canadian Journal of Dietetic Practice and Research*, 71(3), 141-145.
- Evans A, & Sawyer-Morse MK. (2002). The Right Bite Program: A theory-based nutrition intervention at a minority college campus. *Journal of the American Dietetic Association*, 90(3), 102-103.
- Faul F, Erdfelder E, Buchner A, & Lang A. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behaviour Research Methods*, 41, 1149-1160.



- Food Standards Agency. (2005). *Dietary Change: The Evidence Base and Future Research Needs*.
- Foodshare. (2002). [www.foodshare.net](http://www.foodshare.net).
- Fordyce-Voorham S. (2009a). *Essential food skills required in a skill-based healthy eating program*. Paper presented at the Daring to Dream: Preferred futures through home economics, Darwin, Australia.
- Fordyce-Voorham S. (2009b). National Curriculum: Food skills covered in home economics across Australia. *Journal of Home Economics Victoria.*, 48(2), 20-24.
- Fordyce-Voorham S. (2010). Identification of food skills for healthful eating programs in secondary schools. *Journal of Nutr Educ Behav.*, 10.1016/j.neb2009.12.002.
- Furst T, Connors M, Bisogni C, Sobal J, & Falk L. (1996). Food Choice: A Conceptual Model of the Process. *Appetite*, 26, 247-266.
- Gabel MJ, & Shipan CR. (2004). A social choice approach to expert consensus panels. *Journal of Health Economics*, 23(3), 543-564.
- Gans KM, Levin S, Lasater TM, Sennett LL, Maroni A, Ronan A, & Carleton RM. (1990). Heart Healthy Cook-Offs in Home economics classes: an evaluation with junior high school students. *J. Sch. Health*, Mar:60(3), 99-102.
- Gibbs L, Kealy M, Willis K, Green J, Welch N, & Daly J. (2007). What have sampling and data collection got to do with good qualitative research? *Australian and New Zealand Journal of Public Health*, 31(6), 540-544.
- Gibson RS, Heath A-L M, & Ferguson EL. (2002). Risk of suboptimal iron and zinc nutriture among adolescent girls in Australia and New Zealand:causes, consequences, and solutions. *Asia Pacific J Clin Nutr*, 11, S543-S552.
- Gillman M, Rifas-Shiman S, Frazier L, Rockett H, Camargo C, Field A, . . . Colditz C. (2000). Family dinner and diet quality among older children and adolescents. *Arch Fam Med*, 9, 235-240.
- Giskes K, Turrell G, Patterson C, & Newman B. (2002). Socio-economic differences in fruit and vegetable consumption among Australian adolescents and adults. *Public Health Nutrition*, 5(5), 663-669.
- Glaser B, & Strauss A. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine.
- Glass TA, & McAtee MJ. (2006). Behavioural science at the crossroads in public health:Extending horizons, envisioning the future. *Social Science and Medicine*, 62, 1650-1671.
- Glasson C, Read H, Hands B, Parker H, Brinkman S, & Miller M. (2004). Food and Nutrient Intakes in Western Australian Children and Adolescents: Report.
- Goodchild R. (2012). *The 'reality' of the Australian 'Junior Masterchef' television series for preadolescents and their parents* (Bachelor of Psychology (Honours in Psychology) ), Murdoch University, Perth.
- Green J, Willis K, Hughes E, Small R, Welch N, Gibbs L, & Daly J. (2007). Generating best evidence from qualitative research:the role of data analysis. *Australian and New Zealand Journal of Public Health*, 31(6), 545-550.
- Green LW, & Kreuter M. (1991). *Health promotion planning:an educational and environmental approach* (Second ed.). Toronto: McGraw Hill.
- Grunert KG, Brunso K, & Bisp S. (1993). Food-related Lifestyle:development of a cross-culturally valid instrument for market surveillance: MAPP Working Paper, no.12, Aarhus Business School, Denmark.
- Gussow JD. (1999). Dietary Guidelines for Sustainability: Twelve Years Later. *Journal of Nutr Educ Behav.*, 31(4), 194-200.

- Gussow, JD, & Contento, I. (1984). Nutrition Education in a Changing World. *Wld Rev. Nutr. Diet*, 44, 1-56.
- Hair JF, Black WC, Babin BJ, & Anderson RE. (2010). *Multivariate Data Analysis 7th Edition*: Prentice Hall.
- Hands B, Parker H, Glasson C, Brinkman S, & Read H. (2004). Physical activity and nutrition levels in Western Australian children and adolescents: report. Perth: Western Australian Government.
- Hartmann C, Dohle S, & Siegrist M. (2013). Importance of cooking skills for balanced food choices. *Appetite*, 65, 125-131.
- Hawe P, Degeling D, & Hall T. (1990). *Evaluating Health Promotion: A Health Workers' Guide*. New South Wales: McLennan Petty.
- Heaney, R.P. (2000). Calcium, Dairy Products and Osteoporosis. *J. Am Coll Nutr*, Apr(19 (2 Suppl)), 83S-99S.
- Home Economics Institute of Australia. (1997). Home Economics Education in Australia- Understanding Home Economics Education.
- Home Economics Institute of Australia. (2010). Position Paper: Home Economics and the Australian Curriculum. *Journal of the Home Economics Institute of Australia*, 17(3), 2-13.
- Home Economics Institute of Australia. (2012). HEIA News, 19 (2).
- Home Economics Victoria. (2009). Home Economics Victoria submission to the board of the Australian Curriculum, Assessment and Reporting Authority (ACARA), September 2009. In Warren C & Pendergast D (Eds.). Melbourne, Victoria: Home Economics Victoria.
- Hsieh H-F, & Shannon SE. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative Health Research*, 15(9), 1277-1288.
- Ironmonger DS, & Aitken CK. (1996). Impacts of the Microwave Oven. *Prometheus*, 14(2), 168-178.
- Jabs J, Devine CM, & Sobal J. (1998). Model of the Process of Adopting Vegetarian Diets:Health Vegetarians and Ethical Vegetarians. *Journal of Nutrition Education*, 30, 196-202.
- Jones SC, & Fabrianesi B. (2007). *Children and the Internet: What are "safe" websites telling our kids about food?* Paper presented at the Social entrepreneurship, social change and sustainability: International Nonprofit and Social Marketing Conference, Brisbane. <http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1071&context=hbspapers>
- Jonsson M, Ekstrom MP, & Gustafsson IB. (2005). Appetising learning in Swedish comprehensive schools:an attempt to employ food and tasting in a new form of experimental education. *International Journal of Consumer Studies*, 29(1), 78-85.
- Kalenkoski CM, & Hamrick KS. (2013). How Does Time Poverty Affect Behaviour? A Look at Eating and Physical Activity. *Applied Economics Perspectives and Policy*, 35(1), 89-105.
- Kearney JM, & McElhone S. (1999). Perceived barriers in trying to eat healthier - results of a pan-EU consumer attitudinal survey *British Journal of Nutrition*, 81(s2), 133-137.
- Klepp KI, & Wilhelmsen BU. (1993). Nutrition education in junior high schools:incorporating behaviour change strategies in home economics classes. *Health Education Research*, 8(4), 547-554.
- Krebs-Smith SM, & Scott-Kantor L. (2001). Choose a variety of fruits and vegetables daily:understanding the complexities. *The Journal of Nutrition*, 131(487S-501S).
- Kremers SPJ, Brug J, de Vries H, & Engels RCME. (2003). Parenting style and adolescent fruit consumption. *Appetite*, 41, 43-50.



- Lang T, & Caraher M. (2001). Is there a culinary skills transition? Data and debate from the UK about changes in cooking culture. *Journal of the Home Economics Institute of Australia*, 8(2), 2-14.
- Larson NI, Perry CL, Story M, & Neumark-Sztainer D. (2006). Food preparation by young adults is associated with better diet quality. *J Am Diet Assoc*, 106, 2001-2007.
- Larson NI, Story M, Eisenberg ME, & Neumark-Sztainer D. (2006). Food Preparation and Purchasing Roles among Adolescents: Associations with Sociodemographic Characteristics and Diet Quality. *Journal of the American Dietetic Association*, 106, 211-218.
- Lea E, & Worsley A. (2002). Benefits and barriers to the consumption of a vegetarian diet in Australia. *Public Health Nutrition*, 6(5), 505-511.
- Lee J, Koh D, & Ong CN. (1989). Statistical evaluation of agreement between two methods for measuring a quantitative variable. *Comput. Biol. Med.*, 19(1), 61-70.
- Levy J, & Auld G. (2004). Cooking Classes outperform Cooking Demonstrations for College Semophores. *Journal of Nutr Educ Behav.*, 36, 197-203.
- Li M, Eastman CJ, Waite KV, Ma G, Zacharin MR, Topliss DJ, . . . Doyle Z. (2006). Are Australian children iodine deficient? Results of the Australian National Iodine Nutrition Study. *Med J Aust*, 184(4), 165-169.
- Li M, Ma G, Boyages SC, & Eastman CJ. (2001). Re-emergence of iodine deficiency in Australia. *Asia Pacific J Clin Nutr*, 10(3), 200-203.
- Lichtenstein AH, & Ludwig DS. (2010). Bring back home economics education. *Journal of American Medical Association*, 303(18), 1857-1858.
- Lincoln YS, & Guba EG. (1985). *Naturalistic Inquiry*. Newbury Park CA: Sage
- Liquori T, Koch PD, Contento IR, & Castle J. (1998). The Cookshop Program: Outcome Evaluation of a Nutrition Education Program Linking Lunchroom Food Experiences with Classroom Cooking Experiences. *Journal of Nutrition Education*, 30, 302-313.
- Lobstein T, Baur L, & Uauy R. (2004). Obesity in children and young people: a crisis in public health. *Obesity Reviews* (5), 4-104.
- Lyle L, & Achterberg C. (1995). Changing the diet of America's children: What works and why? *Journal of Nutrition Education*, 27(5), 250-257.
- Lytle LA, & Kubic, MY. (2003). Nutritional Issues for adolescents. *Best Practice & Research Endocrinology and Metabolism*, 17(2), 177-189.
- Macfarlane A, Crawford D, Ball K, Savige G, & Worsley A. (2007). Adolescent home food environments and socio-economic position. *Asia Pacific J Clin Nutr*, 16(4), 748-756.
- Macfarlane A, Crawford D, & Worsley A. (2010). *Associations between parental concern for adolescent weight and the home food environment and dietary intake* Research Article. Deakin University. Melbourne, Australia.
- Magarey A, Daniels LA, & Smith A. (2001). Fruit and vegetable intakes of Australians aged 2-18 years: an evaluation of the 1995 National Nutrition Survey data. [online]. *Australian and New Zealand Journal of Public Health*, 25(2), 155-161.
- Magarey AM, Daniels LA, & Boulton TJ. (2001). Prevalence of overweight and obesity in Australian children and adolescents: reassessment of 1985 and 1995 against new standard international definitions. *Medical Journal of Australia*, 174, 561-565.
- Malterud K. (2001). Qualitative research: standards, challenges and guidelines. *Lancet*, 358, 483-488.
- Matthews L, Green C, Avraam A, Duviani J, & Menger D. (2007). Fifteen Minutes of Food. *Victorian Home Economics and Textiles' Teachers Association*, 47(3), 2-4.
- Mayring P. (2000). Qualitative content analysis. Forum: Qualitative Social Research [Online Journal] Art. 20. <http://www.qualitative-research.net/index.php/fqs/article/view/1089/2385>. Accessed April 22, 2010.

- McCullough FSW, Yoo S, & Ainsworth P. (2004). Food choice, nutrition education and parental influence on British and Korean primary school children. *International Journal of Consumer Studies*, 28(3), 235-244.
- McDonnell CM, Harris M, & Zacharin MR. (2003). Iodine deficiency and goitre in schoolchildren in Melbourne, 2001. *Med J Aust*, 178(4), 159-162.
- McLaren K. (2002). *Building Strength: A review of research on how to achieve good outcomes for young people in their families, peer groups, schools, careers and communities*. Wellington.
- Mintz S. (1996). *Tasting food, tasting freedom: Excursions into eating, culture and the past*. Boston, USA: Beacon.
- National Health and Medical Research Council. (2003). *Food for health: dietary guidelines for children and adolescents in Australia*. Canberra: National Health and Medical Research Council.  
[http://www.nhmrc.gov.au/files/nhmrc/file/publications/synopses/n30\\_pamphlet.pdf](http://www.nhmrc.gov.au/files/nhmrc/file/publications/synopses/n30_pamphlet.pdf) viewed January 12, 2010.
- National Health and Medical Research Council. (2013). *Australian Dietary Guidelines*. Canberra: National Health and Medical Research Council.
- Neumark-Sztainer D, Story M, Perry C, & Casey MA. (1999). Factors influencing food choices of adolescents: findings from focus group discussions with adolescents. *Journal of American Dietetic Association*, 1999(19), 17-40.
- Nijmeijer M, Worsley T, & Astill B. (2004). An exploration of the relationships between food lifestyle and vegetable consumption. *British Food Journal*, 106(7).
- Nowak M, & Buttner P. (2002). Adolescents food-related beliefs and behaviours: a cross-sectional study. *Nutrition and Dietetics*, 59(4), 244-252.
- O'Dea J. (2003). School-based activities to improve body image and prevent eating problems in children and adolescents: a self-esteem approach. In O'dea J (Ed.), *Issues in Society: Healthy Body Image* (Vol. 182, pp. 38-40). Sydney, NSW: Spinney Press.
- O'Dea J. (2005). Improving adolescent eating habits and prevention of child obesity: Are we neglecting the crucial role of parents? *Nutrition and Dietetics*, 62(2/3), 66-68.
- O'Dea J, & Wilson R. (2006). Socio-cognitive and nutritional factors associated with body mass index in children and adolescents: possibilities for childhood obesity prevention. *Health Education Research Theory and Practice*.
- O'Dea JA. (2007). Are we OK or are we not? *Journal of the Home Economics Institute of Australia*, 14(3), 6-14.
- Oogarah-Pratap B, Bholah R, Cypersade M, & Mathoor K. (2004). Influence of home economics on the nutrition knowledge and food skills of Mauritian school adolescents. *Nutrition and Food Science*, 34(6), 264-267.
- Patton MQ. (2001). *Qualitative Research and Evaluation Methods (2nd Edition)*. Thousand oaks CA: Sage Publications.
- Peat J, Mellis C, Williams K, & Xuan W. (2002). *Health Science Research: A Handbook of Quantitative Methods*. London: Sage.
- Pendergast, D. (2001). *Virginal Mothers, Groovy Chicks and Blokey Blokes* Brisbane: Australian Academic Press.
- Pendergast D, & Dewhurst Y. (2012). Home Economics and food literacy: An international investigation. *International Journal of Home Economics*, 5(2), 245-263.
- Pendergast D, Reynolds J, & Crane J. (2000). Home economics teacher supply and demand to 2003- projections, implications and issues. *Journal of the Home Economics Institute of Australia*, 7(3), 1-40.
- Perez-Rodrigo C, & Aranceta J. (1997). Nutrition Education for Schoolchildren Living in a Low-Income Urban Area in Spain. *Journal of Nutrition Education* 29(5), 267-273.

- Perinau L. (2002). Dining with the doom generation. *In Gastronomica. The Journal of Food and Culture* [www.ucpress.edu/gastro](http://www.ucpress.edu/gastro), 2(4).
- Potapchuk, WR. (1998). Collaborative Approach to Nutrition Education in Schools and Communities: Exploring the Lessons. *Journal of Nutrition Education*, 30, 332-339.
- QSR International Pty Ltd. (2006). NVivo qualitative data analysis software Version 7.
- Reid M, Li E, Bruwer J, & Grunert KG. (2001). Food-related lifestyles in a cross-cultural context: comparing Australia with Singapore, Britain, France and Denmark. *Journal of Food Products Marketing*, 7(4), 57-75.
- Rescinow K, Lazarus A, Davis MS, Wang DT, Lyn R, Kotler H, & Hall M. (1999). Go Girls!: Development of a Community-Based Nutrition and Physical Activity Program for Overweight African-American Adolescent Females. *J Nutr Ed*, 31(283C).
- Reynolds J. (2000). The construction of food-related behaviour and implications for school-based, adolescent, food and nutrition education. *Journal of the Home Economics Institute of Australia*, 7(1), 2-13.
- Reynolds J. (2005). Nutrition Education in Schools-the good, the bad and the ugly. *Food Chain*. Issue 16, February 2005. Retrieved 31 March, 2008, 2008
- Reynolds J. (2006). School-based Nutrition Education-Making it work. *Journal of the Home Economics Institute of Australia*, 13(1), 12 -18.
- Ripe C. (1993). *Goodbye culinary cringe*. Sydney, Australia: Allen & Unwin.
- Ritzer G. (1996). *The McDonaldization of society*. California, USA: Pine Forge Press.
- Rocha Leal FM, Oliveira BM, & Rodrigues Pereira SS. (2011). Relationship between cooking habits and skills and Mediterranean diet in a sample of Portuguese adolescents. *Perspectives in Public Health*, 131(6), 283-287.
- Rodrigues SSP, & de Almeida MDV. (1996). Food habits: Concepts and practices of two different age groups. In Edwards JSA (Ed.), *Culinary arts and sciences Global and national perspectives* (pp. 387-397). Southampton UK: Computational Mechanics.
- Roe L, Hunt H, Bradshaw H, & Rayner M. (1997). Health Promotion and Effectiveness Reviews: Health promotion interventions to promote healthy eating in the general population. London, UK: Health Education Authority.
- Rolfe G. (2006). Validity, trustworthiness and rigour: quality and the idea of qualitative research. *Journal of Advanced Nursing*(53), 304-310.
- Rolls K, & Elliot D. (2008). Using consensus methods to develop clinical practice guidelines for intensive care: The Intensive Care Collaborative Project. *Australian Critical Care*, 21(4), 200-215.
- Sanigorski AM, Bell AC, Kremer PJ, & Swinburn BA. (2005). Lunchbox contents of Australian school children: room for improvement. *European Journal of Clinical Nutrition*, 59, 1310-1316.
- Satter E. (2007a). Eating Competence: Nutrition Education with the Satter Eating Competence Model. *J Nutr Educ Behav*, 2007(39), S189-S194.
- Satter E. (2007b). Eating Competence: Definition and Evidence for the Satter Eating Competence Model. *Journal of Nutr Educ Behav.*, 39 (S142-S153).
- Satter EM. (2008). Nutrition Education in Schools (Appendix H) *Secrets of Feeding a Healthy Family*. Madison, WI: Kelcy Press.
- Savidge G, Ball K, Worsley A, & Crawford D. (2007). Food intake patterns among Australian adolescents. *Asia Pacific J Clin Nutr*, 16(4), 738-747.
- Savidge G, Macfarlane A, Ball K, Worsley T, & Crawford D. (2007). Snacking behaviours and their association with skipping meals. *International Journal of Behavioral Nutrition and Physical Activity* 4(36).
- School Meals Review Panel. (2005). Turning the Tables.

- Scott EA, & Black N. (1991). When does consensus exist in expert panels? *Journal of Public Health, 13*(1), 35-39.
- Shapiro L. (2004). *Something from the oven*. New York: Penguin.
- Shepanski P, & Diamond M. (2007). An Unexpected Tragedy: Evidence for the connection between working hours and family breakdown in Australia: Relationships Forum Australia.
- Short F. (2003). Domestic Skills-what are they? *Journal of the Home Economics Institute of Australia, 10*(3), 14-22.
- Short F. (2007). *Cooking, convenience and disconnection*. Paper presented at the Food and Foodways - Connecting people and places Conference, Norkopping, Sweden.
- Short, F. (2007, 11-13 June, 2007). *Food and foodways - connecting people and places*. Paper presented at the A European Cultural Studies Conference Norrkoping, Sweden
- Singleton WT. (1978). *The study of real skills* (Vol. 1). Lancaster, UK: MTP Press.
- Slater J. (2013). Is cooking dead? The state of Home Economics Food and Nutrition education in a Canadian province. *International Journal of Consumer Studies*. doi: DOI: 10.1111/ijcs.12042
- SPSS. (2009). PASW Statistics Grad Pack 18. Chicago, USA.
- Stead M, Caraher M, Wrieden W, Longbottom P, Valentine K, & Anderson A. (2004). Confident, fearful and hopeless cooks. *British Food Journal, 106*(4), 274-287.
- Stephoe A, & Pollard TM. (1995). Development of a Measure of the Motives Underlying the Selection of Food:the Food Choice Questionnaire. *Appetite, 25*, 267-284.
- Stinson E. (2010). *Eating the World: Food Literacy and its place in Secondary School Classrooms*. (Master of Education), University of Victoria, Melbourne, Australia.
- Story M, & French S. (2004). Food Advertising and Marketing Directed at Children and Adolescents in the US. *International Journal of Behavioral Nutrition and Physical Activity, 1*(3).
- Story M, Lytle LA, Birnbaum AS, & Perry CL. (2002). Peer-led, school-based nutrition education for young adolescents: Feasibility and process evaluation of the TEENS study. *The Journal of School Health, 72*(3), 121-128.
- Story M, Neumark-Sztainer D, & French S. (2002). Individual and environmental influences on adolescent eating behaviours. *Journal of the American Dietetic Association, 102*(3).
- Stotts JL, & Lohse B. (2007). Reliability of the ecSatter Inventory as a Tool to Measure Eating Competence. *J Nutr Educ Behav, 39*, S167-S170.
- SurveyMonkey Inc. Palo Alto California, USA.
- Swinburn B, & Bell C. (2003). Results of a weight survey of primary school aged children in the Sentinel Site for Obesity Prevention. Melbourne: Deakin University.
- Tasmanian Community Fund. (July 2008). Wicked Vegies Project 2006-2007. Hobart, Tasmania: The Cancer Council Tasmania.
- Ternier S. (2010). Understanding and measuring cooking skills and knowledge as factors influencing convenience food purchases and consumption. *Guelph, 3*(2).
- Thomas H, & Irwin JD. (2011). Cook It Up! A community-based cooking program for at-risk youth: overview of a food literacy intervention. *BMC Research Notes, 4*(495).
- Thoney PF, & Bisogni CA. (2006). Cooking Up Fun: A Youth Development Strategy *Journal of Nutrition Education and Behaviour, 38*(5), 321-323.
- Townsend MS, Johns M, Shilts MK, & Farfan-Ramirez L. (2006). Evaluation of a USDA Nutrition Education Program for Low-income Youth. *J Nutr Educ Behav, 38*, 30-41.
- Verplanken B, Herabadi AG, Perry JA, & Silvera DH. (2005). Consumer style and health:The role of impulsive buying in unhealthy eating. *Psychology and Health, 20*(4), 429-441.

- Veuglers PJ, & Fitzgerald AL. (2005). Effectiveness of school programs in preventing childhood obesity: a multilevel comparison. *Am J Public Health*, 95(3), 432-435.
- VicHealth. (2008). Key Influences on health inequalities: Report summary. Retrieved 7th February, 2010, from [www.vichealth.vic.gov.au/inequalities](http://www.vichealth.vic.gov.au/inequalities)
- Victorian Curriculum Assessment Authority. (2008). *Victoria Essential Learnings and Standards Framework*.
- Videon TM, & Manning CK. (2003). Influences on Adolescent Eating Habits: The Importance of Family Meals. *Journal of Adolescent Health*, 32, 365-363.
- Vidgen H, & Gallegos, D. (2012). Defining food literacy, its components, development and relationship to food intake: A case study of young people and disadvantage. Brisbane, Queensland: Queensland University of Technology.
- Vidgen H, & Gallegos D. (2010). Food literacy: Time for a new term or just another buzz word? *Journal of the Home Economics Institute of Australia*, 17(2), 1-7.
- Vidgen H, & Gallegos D. (2011). What is food literacy and how does it influence what we eat: a study of Australian food experts. Brisbane, Queensland: Queensland Institute of Technology.
- Vrhovnik L. (2012). *A pilot study for the development of a food skills survey tool*. (Masters of Science), Queen's University, Kingston, Ontario, Canada.
- Wang Z, Byrne NM, Kennardy JA, & Hills AP. (2005). Influences of Ethnicity and Socioeconomic Status on the Body Dissatisfaction and Eating Behaviour of Australian Children and Adolescents. *Journal of Eating Behaviours*, 6(1), 23-33.
- Warash BG, Fitch C, & Bodnovich K. (2003). Snack Choices: helping young children make decisions. *Journal of Family and Consumer Sciences*, 95(2), 60-64.
- Waters EB, & Baur LA. (2003). Childhood Obesity: modernity's scourge. *Medical Journal of Australia*, 178(9), 422-423.
- Webster B, & Hayman J. (2006). *Prevalence of diet-related among Tasmanian secondary school students in 2005 and trends over time*. Melbourne: The Cancer Council Tasmania.
- White JM, & Klein DM. (2002). *Family Theories* (Second ed.). Thousand Oaks: Sage Publications.
- WHO. (2004). Global strategy on diet, physical activity and health *Fifty-Seventh World Health Assembly*. Geneva: World Health Organisation.
- WHO. (2009). A Snapshot of the Health of Young People in Europe. Brussels: European Commission.
- Willet W, & Lenart E. (1998). Reproducibility and validity of food-frequency questionnaires. In Willet W (Ed.), *Nutritional Epidemiology*. New York/Oxford: Oxford University Press.
- Worsley A. (2002). Nutrition knowledge and food consumption: can nutrition knowledge change food behaviour? *Asia Pacific J Clin Nutr*, 11 (Suppl), S579-S585.
- Worsley A, & Skrzypiec G. (1998). Teenage Vegetarianism: Prevalence, Social and Cognitive Contexts. *Appetite*, 30(2), 151-170.
- Worsley T, & Crawford D. (2005). *Promoting Healthy Eating for Children- A Planning Guide for Practitioners*. Melbourne: Victorian Government Department of Human Services.
- Wrieden WL, Anderson AS, Longbottom PJ, Valentine K, Stead M, Caraher M, . . . Dowler E. (2002). Assisting dietary change in low-income communities: assessing the impact of a community-based practical food skills intervention (CookWell) (pp. 40). London: Food Standards Agency.
- Wrieden WL, Anderson AS, Longbottom PJ, Valentine K, Stead M, Caraher M, . . . Dowler E. (2007). The impact of a community based food skills intervention on cooking

- confidence, food preparation methods and dietary choices- an exploratory trial. *Public Health Nutrition*, 10(2), 203-211.
- Wu M, Seeley A, & Caraher M. (2008). A Movable Feast (pp. 1-25). London: Centre for Food Policy, City University.
- Zubiada S, & Tapper R. (2001). *Culinary cultures of the Middle East*. London: I.B. Tauris.



## APPENDIX A. PERCENTAGE OVERWEIGHT/OBESITY PREVALENCE IN AUSTRALIAN YOUNG PEOPLE

Survey	Age (in years)	Percentage healthy weight	Percentage over-weight	Percentage obese	Sample
National Health Survey ABS 2009	13-17	68.5 (males) 74.3 (females)	18.5 (males) 20 (females)	1.3 (males) 5.7 (females)	Based on self-reported Body Mass Index. National Health Survey conducted by ABS from a sample of 28,000 Australians from all States and Territories
Children's Nutrition Survey 2007	9-13	69 (males) 65 (females)	18 (males) 23 (females)	7 (males) 7 (females)	2007 Commonwealth of Australia Survey of 4,487 children aged 2-19 across Australia
	14-16	71 (males) 72 (females)	19 (males) 16 (females)	6 (males) 7 (females)	
Booth et al 2007	13-15 <sup>1</sup>	Not indicated	19.4 (males) 16.2 (females)	6.7 (males) 3.6 (females)	2004 NSW SPAN (Schools Physical Activity and Nutrition) Survey of 5402 children aged 7-15 years.
Booth and Armstrong 2001 (Booth ML et al., 2001)	6-16 <sup>2</sup>	79-81 (males) 76-79 (females)	14-16 (males) 16-18 (females)	5 (males) 5-6 (females)	Based on compilation of 3 surveys, National Nutrition Survey 1995, NSW Schools Fitness and Physical Activity Survey 1997, Health of Young Victorians Study 1996 –total numbers not indicated
Magarey et al (2001)	7-15		9.3 (males) 10.6 (females)	1.4 (males) 1.2 (females)	Reassessment of 1985 and 1995 data against new standard international definitions based on the findings of 8492 schoolchildren aged 7-15 years (Australian Health and Fitness Survey, 1985) and 2962 children aged 2-18 years (National Nutrition Survey, 1995).
	2-18		15.0 (males) <sup>2</sup> 15.8 (females) <sup>2</sup>	4.5 (males) <sup>2</sup> 5.3 (females) <sup>2</sup>	

1. 7, 9 and 11 year old children were also sampled but not included for the purposes of this research

2. 6-16 years based on a compilation of data taken from students in years 2,4, 6, 8 and 10

3 Overweight and obesity peaked at 12-15 years for boys and 7-11 years for girls

## **APPENDIX B. THE NUTRIENT AND DIETARY INTAKE OF YOUNG AUSTRALIANS**

The information on nutrient intake is derived from the 2007 Children's National Nutrition and Physical Activity Survey (CSIRO, 2009). For brevity, the term 'Children's Survey' is used in this Appendix.

Macro-nutrients derived from carbohydrates, protein and fat in food and drinks provide the individual with the necessary energy (measured in kilojoules) for their body to carry out metabolic functions and meet growth needs (CSIRO, 2009). Energy requirements vary with an individual's age, sex, body size and physical activity (CSIRO, 2009). Generally energy requirements increase with age in order to meet growth needs until adulthood (CSIRO, 2009). In the Children's Survey (CSIRO, 2009) energy intake (measured in kilojoules) was compared with the Estimated Energy Requirements (EER) and included percentages of survey participants outside the upper and lower ranges of these figures.

In the Children's Survey (CSIRO, 2009), young men aged 14-16 years had the highest energy intake and were more likely to meet their energy requirements than young women of the same age. Half of the young women did not meet their energy needs at 16 years which is most likely related to their weight and body image concerns (Savidge G, Macfarlane A, et al., 2007; Wang Z, Byrne NM, Kennardy JA, & Hills AP, 2005). The majority of young people in the selected age groups between 12-16 years met the EAR (Estimated Average Requirements) for all of the assessed micro-nutrients. However, calcium, folate, magnesium and potentially zinc and iodine were identified as micronutrients of concern as they were below the EAR for some boys and girls (see **Table 1**).



**Table 1 Proportion of children meeting EAR for selected micro-nutrients (Department of Health and Ageing, 2008)**

	PROPORTION (Percentage)			
	Girls (9-13 years)	Girls (14–16 years)	Boys (9-13 years)	Boys (14-16 years)
Vitamin A Retinol Equivalent	91	86	96	79
Folate (dietary folate equivalents)	89	71	99	86
Vitamin C	89	71	99	86
Calcium	45	18	65	56
Phosphorus	81	86	95	99
Magnesium	90	44	99	66
Iron	98	89	100	99
Zinc	100	98	100	87
Iodine	91	74	96	95

Young women aged 14-16 years appeared to be at risk of not meeting calcium requirements and twenty per cent of this age group of both sexes did not meet their EAR for Vitamin A Retinol equivalent. Under-consumption of dairy products, as excellent sources of calcium and Vitamin A Retinol, can lead to an individual's increased long-term risk of developing osteoporosis (Heaney, 2000; Videon TM & Manning CK, 2003). Magnesium, iron and zinc are required for growth and the development of red blood cells and have been identified as micro-nutrients of concern in young people, particularly young women, in earlier studies (Gibson RS, Heath A-L M, & Ferguson EL, 2002; Magarey A et al., 2001). Low intakes of these nutrients by this age group have been attributed to lower rates of consumption of red meat and leafy green vegetables which are valuable food sources of these nutrients (Gibson RS et al., 2002; Magarey A et al., 2001).

Other studies indicated that almost all young people do meet their iron and zinc requirements (CSIRO, 2009) which is consistent with young people meeting their meat serving requirements, as the best source of dietary iron and zinc, based on the Australian Guide to

Healthy Eating (**Table 3**). While dietary iron consumption levels are met in the majority of young men and women, up to 30 per cent of young people do not meet their EAR for folate in recent and earlier surveys (Australian Bureau of Statistics, 1998; CSIRO, 2009). This is consistent with Australian young people's low fruit and vegetable consumption identified elsewhere in the Children's Survey (CSIRO, 2009) and in other studies (Giskes K et al., 2002; Savage G, Ball K, et al., 2007). Folate, which is essential for the metabolism and division of all body cells particularly during times of growth, is found in a wide variety of foods including green vegetables and some varieties of fruit (Glasson C et al., 2004).

Iodine, which has an important role in the normal functioning of the thyroid gland and is particularly important for energy metabolism (Li M et al., 2006), was measured for the first time in the 2007 Children's Survey (CSIRO, 2009). Recently, there has been renewed interest in iodine deficiency in Australians with the reduction of iodine content of dairy products and as people respond to health recommendations by reducing their dietary salt intake (Li M, Ma G, Boyages SC, & Eastman CJ, 2001). The prevalence of iodine deficiency in Australian young people is relevant to the demographic group for this thesis. Up to 96 per cent of young men (9-16 years) and 74 per cent of young women (aged 14-16 years) met their EAR for iodine compared with up to 25 to 60 per cent of children and adolescents in earlier studies (Li M et al., 2006; McDonnell CM, Harris M, & Zacharin MR, 2003). In two recent cross-sectional studies of Australian children (Li M et al., 2006; McDonnell CM et al., 2003) mild iodine deficiencies were found in up to 76 per cent of children aged 11-18 years. For young women, in particular, these findings have potential consequences for the cognitive development of their offspring if they enter pregnancy with depleted levels of iodine (Caraher M et al., 2013).

### **The dietary intake in young Australians**

The dietary intakes of the participants in the Children's Survey (CSIRO, 2009) were compared against a combination of food and nutrient guidelines and recommended intakes.

The Dietary Guidelines for Children and Adolescents in Australia (National Health and Medical Research Council, 2003) recommended young people to eat plenty of vegetables, legumes, fruit and cereals; to include lean meat, fish, poultry, milk, yoghurt, cheese and/or alternatives in their diet; and to drink plenty of water. A healthy diet should also be low in saturated fat and salt, and contain only moderate amounts of sugar. The Dietary Guidelines

for Children and Adolescents recommend the following serves of each food group for 12-18 year old adolescents; the age groups relevant to this thesis (see Table 2).

**Table 2 Recommended servings of food groups for 12-18 year old adolescents**

Age Group (in years)	Fruits and Vegetables (no. of serves)	Cereal and cereal products (no. of serves)	Milk and milk products (no. of serves)	Meat and meat alternatives (no. of serves)	Extras (no. of serves)
12-18	Fruit 3 Veg 4	5 -11	3	1	1-3

Source: [http://www.nhmrc.gov.au/files/nhmrc/file/publications/synopses/n30\\_pamphlet.pdf](http://www.nhmrc.gov.au/files/nhmrc/file/publications/synopses/n30_pamphlet.pdf)

Viewed 01 September, 2013

**Percentages of young Australians who meet serve recommendations based on the Australian Dietary Guidelines**

Based on the recommendations in Table 2, Table 3 shows the proportion of young people who meet the serve recommendations of the Australian Guide to Healthy Eating based on the Australian Dietary Guidelines (National Health and Medical Research Council, 2003). The percentages shown refer to children and adolescents in the 9-13 and 14-16 year age categories, the age groups of young people relevant to this thesis.

Whilst the Children’s Survey is recent and is a useful foundation on which to determine young people’s food intake, the findings need to be viewed with caution as reliance on food recall data may not always be accurate and representative of an individual’s typical food intake (Willet W & Lenart E, 1998). Likewise, the use of nutritional indices such as the Nutrient Reference Values (Bai L, 2010) and the Australian Dietary Guidelines for the assessment of adequate intake and variety of fruit and vegetable consumption (Krebs-Smith SM & Scott-Kantor L, 2001) for example, to accurately assess an individual’s food intake, has limitations. Therefore, in order to obtain further evidence of young people’s food and

nutritional intake, the Children's Survey results are compared with the National Health Survey taken around that time.

**Table 3 Proportion of young people who meet the serve recommendations of the Australian Guide to Healthy Eating based on the Australian Dietary Guidelines**

		Boys (%) -		Girls (%) -	
		Age shown in years		Age shown in years	
Dietary Guideline	Parameter	9-13	14-16	9-13	14-16
Eat plenty of fruits	≥1-3 serves/day excluding juice	50	2	52	1
	≥1-3 serves/day including juice	89	25	91	19
Eat plenty of vegetables	≥2-4 serves/day excluding potatoes	2	2	2	0
	≥2-4 serves/day including potatoes	17	11	11	1
Eat plenty of cereals	≥3-4 serves/day	20	50	3	2
Include lean meat, fish, poultry and/or other alternatives	%>EAR for protein, iron and zinc	100	87-100	98-100	89-100
Include milks, yoghurts, cheese and/or alternatives	%>Calcium EAR	65,50 <sup>1</sup>	56	45,11 <sup>1</sup>	18
Choose water as a drink	%>fluid AI	56	44	57	47
Limit saturated fat and moderate total fat intake	<10% energy from saturated fat	19	20	19	25
Choose foods low in salt	>sodium AI	100	100	100	100
Consume only moderate amount of sugars	%<20% energy from total sugars	35	41	33	39

1. EARs exist for 9-11 years and for 12-13 years. 65per cent and 45per cent for boys and girls respectively represents proportion of children who meet the EAR for 9-11 years, 50per cent boys and 11per cent girls met the EAR for the 12-13 year olds.

Many adolescents, particularly adolescent females, do not meet the serving size recommendations for fruit (especially if fruit juice was excluded), vegetables (especially if potatoes were excluded), cereals and milk. Generally, children's intake of both fruit and

vegetables decreased as they moved towards adolescence (Australian Bureau of Statistics, 2009; CSIRO, 2009). In effect, up to eighty per cent of young Australians (9-16 years) do not eat enough fruit and vegetables (CSIRO, 2009). This poses a future health risk to young people as fruit and vegetables are known to have a protective effect on the development of heart disease, diabetes and some cancers and the decrease in energy density of the diet (Krebs-Smith SM & Scott-Kantor L, 2001; Magarey AM et al., 2001; WHO, 2009).

As children move into adolescence they appear to eat more cereals (breads, grains, pastas, breakfast cereals) and cereal-based products (cakes, biscuits and pastries) (CSIRO, 2009), much of which was consumed as fast food, and energy-dense foods such as cakes and biscuits (Bell & Swinburn, 2004; Sanigorski AM, Bell AC, Kremer PJ, & Swinburn BA, 2005). The consumption of milk and milk products (a significant dietary source of calcium) appears to decrease as children move into adolescence and exchange milk for sweetened beverages (CSIRO, 2009). Calcium has remained an ongoing micro-nutrient of concern for both sexes over the last decade since these figures were last reported (ABS 1998). Young women especially, appear less likely to drink milk compared with any other age group and gender (Australian Bureau of Statistics, 1998). This has been identified as a health concern for this group (Centers for Disease Control and Prevention, 2008; Croll JK et al., 2001; Lytle LA & Kubic, 2003) as it places them at an increased risk of low bone mineral density and possible osteoporosis later in life (Heaney, 2000). Added to the health risks, a compelling reason for all individuals to consume the recommended serves of dairy products are the protective effects they provide against the development of strokes, hypertension and cardio-vascular disease (National Health and Medical Research Council, 2013).

Meat and their alternatives, measured as the EAR (Estimated Average Requirements) for protein, zinc and iron were met by the majority of young people in both age groups (CSIRO, 2009). These nationwide findings are similar to those reported in state wide surveys, although iron deficiency appears to be more common in young women than young men (Abbott RA et al., 2007; Hands B, Parker H, Glasson C, Brinkman S, & Read H, 2004). This contrasts with earlier findings (Australian Bureau of Statistics, 1998; Gibson RS et al., 2002) that reported zinc and iron requirements were not met, particularly in young women.

**APPENDIX C. SUMMARY OF THEORETICAL MODELS FOR SKILL-BASED HEALTHY EATING PROGRAMS IN SECONDARY SCHOOLS**

Title of Model	Merits of Model	Deficits of model	Corresponding educational approaches and strategies	Evidence-based outcomes	Relevance to Skill-based healthy eating programs in secondary schools
Theory of Planned Behaviour (Ajzen I, 1991)	<p>Single layered model makes it simple to apply. Focuses on the individual's attitudes towards their behaviour.</p> <p>Recognises the importance of an individual's social environment (peers, school).</p> <p>Understands self-efficacy as fundamental to empowerment in making choices.</p>	<p>Assumes that individuals are aware of their attitudes that affect their behaviour</p> <p>Does not consider that behaviour might be linked with unconscious decisions such as habit and physiological needs and desires for particular food</p>	<p>Assumes if attitudes can be changed, then so too can the behaviour – implies that if schools are change agents and can enlist the support of an individual's peers, then behaviours change.</p>	<p>A 1997 study designed to identify predictors of healthful eating behaviour in 780 American adolescents in 4 Californian high schools (Backman et al., 2002) found that intention to eat a healthy diet was a predictor of actually consuming a healthy diet. Intention was influenced by participants' positive attitude towards healthy eating behaviours including feeling good about themselves.</p>	<p>Acknowledges the role of the social environment (schools and peers) and the importance of self-efficacy in influencing behavioural change.</p> <p>This theory might have merit as it has been applied to the same age group as young people in this study; however the ethnic background needs to be taken into account as this study incorporated young people from white, black and Hispanic, Asian/Pacific Islander and Indigenous American young peoples.</p>

				enjoying eating and liking the taste of healthy foods.	
Social Cognitive Theory (Bandura A, 2002)	<p>One of the most widely used models in health promotion interventions in schools</p> <p>Recognises the importance of reinforcers (such as the peer group) in the environment</p> <p>Recognises the link between the individual and environmental influences</p> <p>Uses observational learning that is relevant and appealing to young people</p> <p>Emphasises self-efficacy</p>		<p>Acknowledges the importance of the peer group in influencing behaviour.</p> <p>Demonstrates healthy behaviour through observational and participatory learning (“learning by doing”)</p> <p>Uses feedback and goal setting mechanisms to enable the individual to plan to change their behaviour.</p>	<p>An Australian study of 4441 schoolchildren aged 6-18 years, based on Social Cognitive Theory and Theory of Planned Behaviour, found a correlation between children’s BMI, low nutritional quality of breakfast and parental socio-economic status (O’Dea J &amp; Wilson R, 2006)</p> <p>A study of 242 American adolescents in high schools designed to identify correlations between high fat and sugar scores (measured as diet diversity using a Food Frequency Questionnaire) and eating behaviours</p>	<p>Participatory or ‘learning by doing’ learning is fundamental in any skill-based program. It allows individuals to work alongside peers in a supportive setting, observe and model healthy behaviour (preparation, cooking and eating healthy food) and practice skills that develops self-efficacy.</p>

				<p>(Cusatis CM &amp; Shannon BM, 1996) found that there was a positive correlation between high fat, sugar scores and high snack consumption and a low self-efficacy for making healthy food choices.</p> <p>Results from these two studies supported Bandura's Theory and the value of focusing on self-efficacy in nutrition strategies aimed at adolescents,</p>	
<p>Precede-Proceed Model (Green LW &amp; Kreuter M, 1991)</p>	<p>Accounts for environmental influences on behaviour. Three sets of influence are relevant to young people: Predisposing factors (attitudes, values and beliefs) Enabling factors (skill development, availability)</p>	<p>Planning needs to occur through a series of directive stages. This lineal approach may restrict flexibility and opportunities to return to earlier stages. Model has been not</p>		<p>Little evidence-based application in young people's interventions.</p>	<p>Not tested in healthy eating interventions in schools so little evidence to support the use of this theoretical model. Checklist outlining the ordering of procedures in interventions may be useful.</p>



	<p>and accessibility of food)  Reinforcing factors (support from parents, schools, health care workers)  Provides a useful checklist of items recommended for inclusion in any intervention.</p>	<p>really been well used and applied to young people's health behaviours.</p>			
<p>Social Ecological Model (Bronfenbrenner, 1979)</p>	<p>Focuses on the individual in relation to their environment.  Relevant to home economics with its base in human ecology and the focus on family and home. Through the chronosystem, acknowledges that time affects events and individual development</p>	<p>Limited predictive value of ecological theory  Does not account for which level (individual, group or organisation) causes the change in health behaviour (White JM &amp; Klein DM, 2002)</p>	<p>Acknowledges an individual's development over time that matches with sequential and 'just in time' learning</p>		<p>Acknowledges the importance of the influence of family and community on the individual's health behaviour. This supports the value of adopting a 'whole school approach' (WHO, 2004) and the importance of collaborating with key personnel (Potapchuk, 1998)</p>
<p>Society Behaviour Nexus Model (Glass 2006)</p>	<p>Organises influences into levels and acknowledges relevance of socio-economic, social and cultural factors.  Places 'schools' in context with other societal institutions (workplaces, healthcare and community)</p>	<p>Level of effect of some factors unknown and make it difficult to measure 'risk regulators' and its association with health behaviours. Complexity makes analysis of testing cross-level effects</p>	<p>Outlines how 'risk regulators' influences health behaviours. Uses example of obesity to show how food availability at home and school has influence on of eating and physical activity.</p>	<p>Recent model that has not been applied or tested to the candidate's knowledge.</p>	<p>Risk regulators focus on the population level. Has possible application in school nutrition policy development rather than at the curriculum level and what happens with individuals in the classroom.</p>

		within the model difficult.			
Furst Model (Furst T et al., 1996)	Shows how individuals make food choices based on family and socialisation experiences and individual factors including ideals, resources, value priorities, sensory perceptions and current family situation. Includes the importance of expectations and value priorities and managing relationships	Has not been applied to young people, only adults.	Motivational influences likely to be the same for young people as adults.	Qualitative research interview with 29 American participants of varying demographic characteristics to identify food choices based on the factors leading to selection of a particular food item (Furst T et al., 1996)	Not tested in healthy eating interventions in schools so little evidence.
Food Related Lifestyle Model (Grunert KG et al., 1993)	Specific to food-related health behaviour and outcomes. Shows how values, perceptions, shopping and meal preparation knowledge or 'scripts' fit together in the model Provides a checklist of influences	Assumes individual has declarative and procedural knowledge to make food choices Influences, perception and usage situations vary and may not be applicable to individual. Has not been applied to young people, only adults Qualitative studies on adults are not conclusive	Education can develop shopping and meal script components.	Qualitative studies conducted in several European countries (Brunso K, Scholderer J, & Grunert KG, 2004) and Australia (Reid M, Li E, Bruwer J, & Grunert KG, 2001) on adults values and relation with shopping and meal preparation behaviours. Qualitative study of 276 Australian adults to show link	Not tested in healthy eating interventions in schools so little evidence. Model's basic components fit in with influences on young people's behaviour

				between values held and vegetable consumption – findings inconclusive as other influences might apply (Nijmeijer M, Worsley T, & Astill B, 2004)	
Integrated Model showing relationship between consumer purchasing style and snacking habits (Verplanken B et al., 2005)	Focuses on the relationship between consumer style, particularly impulse buying and snacking has relevance to young people. Model showed evidence of a positive correlation between these variables.	Causal links between low self-esteem, eating disturbance propensity and snacking behaviour have been acknowledged by the authors as limitations. Snacking behaviour was not measured for example, through diary, record keeping or recall so unable to assess motivating factors including self-efficacy, attitudes, values and beliefs. Convenience sample of 214 participants surveyed in transit at an airport may not constitute a	The focus on disordered eating used in this model conflicts with this thesis and its focus on motivating young people to change eating behaviours through positive food exposure experiences.	Positive correlation shown between impulse buying and snacking behaviour based on a convenience sample of 214 Norwegian adults surveyed in transit at a domestic airport.	The investigative link shown between consumer purchase style and snacking behaviour provides interesting background information and findings but little recommendation for use as a theoretical model in skill-based healthy eating programs in schools.

		representative sample of adults that can be extrapolated to young people in this thesis.			
Eating Competence Model (Satter E, 2007b)	Model aims to create ‘competent eaters’ Has relevance and potential application to young people in a school setting as it: focuses on creating positive attitudes towards enjoying and eating food. focuses on increasing awareness of appetite and satiety demand to inform food selection and guide energy balance. focuses on fostering positive attitudes towards trying and accepting a wide variety of foods focuses on developing food skills and competencies.	Dietary and eating guidelines have an important role in directing eating and planning meals so needs to be included in skill-based healthy eating programs in schools as an adjunct to the Model. Helping young people identify internal cues for guiding appetite is complex and dependent on other influences such as cultural, religious and peer influences. These aspects were partly addressed in a follow up article that addressed nutrition recommending information for those interested and including messages to assist individuals	Matches well to the school setting and the goals of achieving healthy eating behaviours in young people by focusing on the positive aspects including enjoyment of eating a wide variety of food and being able to prepare healthy tasty meals. Makes recommendations for age and stage learners participating in school-based nutrition education programs.	Validity of model tested using the ecSatter Inventory (ecSI) questionnaire on an analysed sample of 259 adults (18 – 65 years) in the USA and found to be a reliable measure for assessing the impact of eating competence-focused interventions (Stotts JL & Lohse B, 2007)	The aim of the ec Satter Model is to encourage the enjoyment of eating by making it a positive, joyful and intrinsically rewarding experience (Satter E, 2007a). Teachers surveyed in Study 2 of this thesis nominated this as their primary goal in developing and delivering their own skill-based healthy eating program in schools, therefore endorsing the relevance of the ecSatter model for use in an educational setting.

		determine their internal regulation (Satter E, 2007a)			
Procedural model for designing theory based nutrition education programs (Contento 2011)	Six-step procedural model makes it easy for designers to plan the inputs (people and resources required), outputs (motivation, action and environmental (community) personnel) and outcomes (program focus)	Intervention of control (n=574) test group of (n=562) 12 years old students in middle schools, New York. Program trained in intervention schools delivered 24 <i>Choice, Control and Change</i> lessons as part of science curriculum to target behaviours related to obesity risk.	Incorporates key components identified in the literature and informs the design of a conceptual model developed by the candidate. The Model based on several behavioural theories was used to inform an inquiry-based program as the intervention in participating schools.	Statistically significant differences reported (Contento IR et al., 2010). Intervention groups showed a significant decrease in less healthy behaviours and higher degree of 'personal agency' (self-efficacy, confidence and autonomy) compared with control groups.	Positions food skills acquisition as one small component in the procedural model that could be adapted for use in school skill-based healthy eating programs. Program intervention outcomes could be used to inform the 'knowledge' base and the motivational components of a skill-based program. The 'personal agency' or behavioural capabilities part of the Social Cognitive Theory would also be useful to inform the confidence-base measures explored recently by Caraher (Caraher M et al., 2013)

## **APPENDIX D. REVIEWS OF SKILL-BASED HEALTHY EATING PROGRAMS**

The reviews mostly used the word ‘intervention’ when describing ‘programs’. For the purpose of this thesis and to ensure consistency of terminology, the word ‘program’ and not ‘intervention’ is used.

### **The English Review**

The review titled *A moveable feast: Evidence of school-based cooking interventions to improve children’s food behaviours and diets* (Wu M et al., 2008), provided extensive and relevant data into the existing skill-based programs throughout the world. Of the original 799 articles the reviewers had located through databases such as MEDLINE, ERIC, SSCI, the British Education Index and the Australian Education Index, they deemed thirty-seven articles were relevant. Only four studies provided sufficient methodological quality to be included in the review. The four studies were *The Cookshop Program* (Liquori T et al., 1998), *Evaluation of a USDA Nutrition Education Program for Low-Income Youth* (Townsend MS, Johns M, Shilts MK, & Farfan-Ramirez L, 2006), *Nutrition Education for Schoolchildren Living in a Low-Income Urban Area in Spain* (Perez-Rodrigo C & Aranceta J, 1997) and *Achieving fruit, juice, and vegetable recipe preparation goals influences consumption by 4th grade students* (Cullen KW, Watson KB, Zakeri I, Baranowski T, & Baranowski JH, 2007).

Other skill-based programs identified in this review were considered to lack methodological rigour and specific details regarding the skill-based (cooking) component in the reporting. Even the four included were considered to lack conceptual detail and more importantly in relation to this thesis, showed no evidence of any theoretical base used to underpin the program design. One feature of the Moveable Feast Review was the use of five different level classifications to evaluate the quality of the evidence reported in the skill-based programs viz:-

Level 1: A well-designed study, survey, or systematic review, often using randomised, controlled, quasi-experimental, intervention versus a control and comparison group or a pre- and post- test design including historical studies with academic rigour;

Level 2: A study, survey or review of one of the four relevant policy areas - improving nutrition knowledge, changing food selection and preferences, increasing children's confidence in cooking ability, changing children's eating habits;

Level 3: A study that is descriptive, anecdotal, well presented and provides relevant qualitative information. The number of programs classified as Level 3 was not specified in the Review;

Level 4: A study that includes very general information, little data but with subject relevance. The number of programs classified as Level 4 was not specified in this Review.

For the purposes of this thesis, the above four classifications were used to classify and present the programs identified and shown in this Appendix. Since many skill-based programs operating in schools are seldom reported and evaluated on, a fifth level classification that may be described as 'grey literature' was included viz:-

Level 5: A study that has not been widely used, been formally reviewed or evaluated or in the process of being evaluated. Some of these studies had targeted primary-school aged children (The *Tootie Fruity* Vegetable Project and The Kitchen Garden Foundation). The studies also may have figured prominently in the Australian media and lay publications. They were considered to have potential merit in future application to secondary school skill-based programs.

### **The United Kingdom Review**

A general review of 85 programs undertaken in UK schools, colleges and universities by the British Nutrition Foundation (Food Standards Agency, 2005) provided clear practical recommendations to help guide researchers but provided no outline or evaluation of the programs. The report, however, acknowledged that few studies used validated measurement tools or operated for long enough to be effective or to allow for proper evaluation of sustainability.

### **The United States Review**

A comprehensive review of 265 healthy eating programs (mostly American-based) from 1980 to 1999 was conducted by Contento et al (Contento IR et al., 2002) in 2002. Of the programs targeting school-aged children, it was found that 50 per cent evaluated skills and/or knowledge and 90 per cent measured psycho-social mediators and/or behavioural changes such as self-efficacy. More than 50 to 90 per cent of these programs reported on criteria and content validity of instruments measuring mediating variables. Evaluation based on behavioural change measures reported in this review included physiological parameters and nutrient and/or food intakes and rudimentary healthy eating behaviours (such as removing skin from chicken and increasing fruit and vegetable intake) but did not include change measures such as shopping, food preparation or cooking skills, of relevance to this thesis. Nevertheless, the evaluation measures themselves reported in this review still have applicability and relevance to this project.

Contento (Contento IR, 2008) referred to knowledge and skills combined as ‘behavioural capabilities’; the term that is used throughout this thesis to describe this combination. Of the programs that targeted school-aged children, 95 per cent were knowledge-based only. Most of these were general in nature and focused on food attitudes, variety and groupings, nutrient sources and nutrient functions in the body. Secondary school programs were slightly less rudimentary and focused more on consumer decision making, weight control, fitness and nutritional requirements over the lifespan. Of these, only one study The Cookshop Program (Liquori T et al., 1998), also identified in the review by the British Nutrition Foundation, was designed to increase vegetable and wholegrain consumption. It had a focus on young people’s perception of their cooking skills or cooking self-efficacy.

In a separate review of the literature, several food skills programs specifically targeting American college-aged students (Evans A & Sawyer-Morse MK, 2002 ; Larson NI, Perry CL, et al., 2006; Levy J & Auld G, 2004) were identified but not included in the Tables as they did not fit the targeted age-group. These ‘hands-on’ cooking programs were purposely designed to improve eating behaviours (Evans A & Sawyer-Morse MK, 2002 ; Larson NI, Perry CL, et al., 2006) and food preparation and cooking skills (Larson NI, Perry CL, et al., 2006; Levy J & Auld G, 2004) in students who had not been exposed to food skills classes at secondary school (Evans A & Sawyer-Morse MK, 2002 ; Levy J & Auld G, 2004). This



suggests that *had* these participants been exposed to food skills programs at school, eating behaviours amongst this age group may have been healthier. Longitudinal studies of secondary school-aged participants who were exposed to food skills classes and tracked later into college would be required to validate this assumption. While the short-term evaluation shown in each of the studies (Evans A & Sawyer-Morse MK, 2002 ; Larson NI, Perry CL, et al., 2006; Levy J & Auld G, 2004) appeared to be promising, longer term impact evaluations would have substantiated the positive effects of these programs as per the recommendations made by the program designers.

### **The Australian Review**

An Australian-based Review of Children's Healthy Eating Interventions (Crawford & Worsley, 2004) focused on a range of healthy eating programs for children aged 0-15 years old and found that most of the programs focused on infants, pre-schoolers and primary school-aged children. The Review identified nineteen skill-based programs that operated in secondary schools and focused on secondary school-aged children, the targeted age group for this thesis, but these had not been evaluated by the program designers, certainly not over the long term. These programs, which featured on non-Government organisation web sites, may be considered as 'grey literature' (Level 5) since limited or no evaluation of the outcomes has been recorded.

Each of the relevant skill-based programs is outlined in the Tables below.

## APPENDIX D. REVIEW OF SKILL-BASED HEALTHY EATING PROGRAMS

**Table 1 Skill-based healthy eating programs in Australia**

Title or name of nutrition education program and Author	Description and aims of nutrition education program	Intervention period and sample	Measurable Outcomes
<p><i>Wicked Vegies Project</i> A collaborative project developed by the Home Economics Institute of Australia (Tas), Eat Well Tasmania, Dept. Of Education, Dept of Human Services, The Heart Foundation (Tas)</p> <p>Source: The Cancer Council Australia</p>	<p><b>Level 3 – mainly secondary school program</b> Aim to increase awareness of healthy eating behaviours to decrease diet-related problems (increase fruit and vegetable intake).</p> <p>Student-centred project designed to complement the curriculum involved students investigating, designing and producing easy-to-prepare snacks using local fruit and vegetables and visiting local supermarkets</p> <p>Involved key stakeholders – parents, teachers, parents/families, health professionals, local councils, community groups and F and V growers.</p> <p>Environmental approach – using local fruits and vegetables and involving local suppliers.</p>	<p>Two year project conducted over two years. Piloted in 5 secondary schools in 2006 and launched in 2007 in another 11 schools. Limitations acknowledged by the program designers: Short term implementation of the project (over one school term), constant encouragement of teachers required to implement the project (perceived to be ‘extra’ work).</p> <p>Total student participants not specified. 2006 Student focus groups with a follow up in 2007 of 3 focus groups of students in 3 different schools (n=24). 2007 Survey of principals (n=5), canteen managers (n=2) , community partners (n=3)</p>	<p>Limited and anecdotal reporting from each group. Students: reported that eating habits had changed marginally and mostly due to increased confidence and knowledge on how to identify and prepare tasty healthy vegetable-based recipes; identified enablers and barriers supporting that healthy food needs to be tasty, affordable and accessible.</p> <p>Teachers: worked more with canteen managers to align food prepared in class with that served in school canteen.</p> <p>Community groups (growers and supermarkets) were positive with their involvement with schools.</p> <p>Main benefits of program identified included: monitoring of knowledge and skills in students (not detailed in actual consumption), increased awareness of local produce and contact with local suppliers (fostering community partnerships) Summary: whilst this program did not specify actual increased vegetable consumption amongst students, it had merit as it reported increased</p>

			<p>knowledge and skills in students, involved all key stakeholders in the project and had an environment (using local food produce) and community focus (supermarkets and food growers)</p> <p>Included recommendations to improve evaluation measures and to broaden number of schools and community partnerships for ongoing viability of the program.</p>
<p><i>Fifteen Minutes of Food</i> (Matthews L, Green C, Avraam A, Duviani J, &amp; Menger D, 2007)</p> <p>Source: Journal of the Home Economics Victoria (Issue 47:3,2007)</p>	<p><b>Level 5 – secondary school program</b> Cooking Program developed for Year level 8 and 9 students in schools in Geelong participating in the <i>It's Your Move</i> program. The aim of the program is to encourage participants to be able to produce nutritious meals in fifteen minutes. The sessions involved participants making salads, baked items such as muffins and meals such as stews, pasta dishes and casseroles.</p>	<p>Unknown – Candidate currently seeking information from program facilitators</p>	<p>The Program has not yet been evaluated to assess long term sustainability and success of the program once the participants are no longer exposed to the program. Anecdotal benefits of the Program reported by students and teachers.</p>
<p>Jamie's Home Cooking Skills</p>	<p><b>Level 3 – secondary school program</b> This food skills program is taught in schools by teachers and aims to increase basic cooking skills in young people aged 14-16 years. The program is organised under</p>	<p>The program based on the English version was launched into Australia in 2012.</p>	<p>No evaluation at this time. Jamie's Home Cooking Skills collaborates with Pearson Education to provide a comprehensive list of basic and advanced recipes. Supported by print-out fact sheets and videos of 'how-to' prepare and cook food. Relevant to the aims of this thesis.</p>

	recipe sections as 2 levels (basic 'how-to' or procedural skills) and (advanced – planning or declarative skills). Enrolment in and completion of the program qualifies British participants with an 'internationally recognised 'food skills' (Home Cooking Skills' Level 1 and 2) qualification.		<a href="http://www.jamieshomecookingskills.com.au/">www.jamieshomecookingskills.com.au/</a> Viewed 3 September 2013
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**Table 2 Skill-based healthy eating programs in the United States**

Title or name of nutrition education program and Author	Description and aims of nutrition education program	Intervention period and sample	Measurable Outcomes
<i>Go Girls:</i> Development of a community based nutrition and physical activity program for overweight African American females  Resnicow, K et al (2000)	<b>Level 2- secondary school aged children, Community-based program</b> The <i>Go Girls</i> healthy eating and physical activity intervention pilot program was designed to address the increased prevalence of overweight and lower physical activity amongst African American compared with European American females, aged 11 to 17 years. The aim of the program was to enhance efficacy amongst participants and help them lose weight, increase activity and increase their fruit and vegetable intake (outcome expectations). In addition to building nutritional knowledge and cooking skills (shopping for ingredients and	The program was delivered to groups of 8 to 14 adolescents in community space or apartments at the four public housing developments. Program staff included a PhD candidate in nutrition science, a master's-level exercise physiologist, and several public health Masters students who assisted in the assessment and intervention. The program was conducted in four 6-month cycles over 2	Outcome evaluation was measured on feasibility and relevance rather than efficacy so that whilst the program achieved statistical significance for nutrition knowledge, low-fat practices, perceived changes in low-fat practices, and social support it was not made clear whether attendees cooking skills had increased. In lieu of a Control group, outcomes were tested on low and high attendees (minimum 50 per cent). High attendees (n = 26) showed more favourable 6-month post-test values for most

	<p>preparation and tasting of low fat meals) and developing an exercise program, communication skills were also built into the program so that participants could inform their parents about how they could make healthier food choices. The program addressed, and highlighted the importance of, cultural sensitivity of the targeted group. The design practices were based on Bandura's Social Cognitive Theory of using self-efficacy as a means of developing an individual's control over eating habits and exercise.</p>	<p>years. For the first 4 months, sessions were conducted twice per week, generally after school for 2 hours. Some field trips were conducted on weekends and school holidays. For the final 2 months of each cycle, sessions were conducted weekly. Fifty-seven females in the targeted group were tested over six months. Each session comprised three components: (1) an educational/behavioural activity, (2) 30 to 60 minutes of physical activity, and (3) preparation and tasting of low-fat meals.</p>	<p>outcomes compared with low attendees (n = 31).</p>
<p><i>Pawtucket Heart Health Program</i> Carleton (1990) Source: manual search by candidate</p>	<p><b>Level 2- Secondary school program.</b> The Heart Healthy Cook-Off was part of a comprehensive nutrition education program involving junior and high school aged students in 23 schools in Rhode Island. The School Cook-Off was only one part of an extensive community based program known as the Pawtucket Heart Health Program. The aim of the Heart Healthy Cook-Off program was to educate young people about the risk factors of heart disease through a knowledge and skill-based program incorporating recipe selection, low-fat</p>	<p>105 junior high school students participated in the Cook-off/SCORE program. Forty percent had elevated blood cholesterol levels of 170 mg/dl or above.</p>	<p>Measurable outcomes were based on physiological changes such as reducing cholesterol levels in participants. In 1988-1989. A statistically significant decrease in blood cholesterol levels was observed during a 12-week time period. In one junior high school class, cholesterol measure before and after the cook-off decreased by 10.7per cent among those with elevated cholesterol. Whilst the aims of this program were different – decreased cholesterol levels</p>

	substitute ingredient decision-making using a microcomputer and nutrient analysis software program, food purchasing, and preparation and cooking as part of a comprehensive nutrition education program. A panel of judges assessed presentation, taste, and health-promoting characteristics.		versus developing shopping, preparation and cooking skills in this project, the PPHP demonstrated how a skill-based program improved young people's eating behaviour and health. Facilitators distributed recipe guidelines.
<p><i>Cooking Up Fun!</i></p> <p>Thonney and Bisogni (2006)</p> <p>Source: manual search by candidate</p>	<p><b>Level 3- secondary school program</b></p> <p>This youth development strategy promoted independent food skills through an after school cooking program facilitated by the Expanded Food and Nutrition Program, Food Stamp Nutrition Education and 4-H Youth Development educators and volunteers. It was aimed at 9-15 year old students. Adult facilitators worked with small groups of 6-8 students in the planning and decision making process, choosing "youth-tested" recipes designed to increase skills such as reading recipes and food labels, kitchen and food safety, ingredient science and nutritional choices. To achieve the goal of independent food skills, the program was structured to provide the time, space, and encouragement for each child to master skills. Although CUF was designed with flexibility for a variety of informal settings, sessions were at least 90 minutes in length to allow youth to be fully engaged in all tasks from set-up to clean-up. A series of 6 sessions increased the opportunity for mastery, and multiple series of sessions allow youth to progress to more challenging levels.</p>	<p>The program involved six, progressively challenging sessions with each session totalling 90 minutes. A 2002 pilot project was conducted and involved 128 young people (aged 9-15 years old from mostly low socio-economic groups) in 18 cooking "clubs" in 7 New York counties.</p>	<p>Based on assessments conducted before, during and after the program, it was found that there was an increase of selected skills, knowledge and behaviour related to food preparation and cooking; however, it was not made clear how these skills were measured. Suggestions were made about improving evaluation tools and exploring the interactions with the family environment.</p>

<p>Food is Elementary  <a href="http://www.foodstudies.org">www.foodstudies.org</a>  Viewed 3  September 2013  (Demas A, 1999)  Source: manual search by candidate</p>	<p>Level 5- primary school program (is included in this Table as program may be adapted as multi-aged according to program designers)  Based on the research of Demas’ 1995 thesis, this skill-based program used a multi-component approach that focused on school, home and community to improve eating behaviour of young people. Aim was to teach young people about food, nutrition, culture, and healthy living. Lesson plans were presented with suggestions for age appropriate activities for students in grades K through 6. The curriculum was intended to be adapted by individual teachers for different student populations. Participants were taught knife and basic cooking skills and prepared food from different cultures. They kept a journal and recorded observations and ‘nutritional measurements’. Consumer, hygiene and safety, nutritional information was included.  The program involved families and community in classroom teaching, school meals, gardens and collaborative projects. Program was adapted for use in different age groups, including adults</p>	<p>Program implemented in 450 schools across US. Varied according to school and community setting.  Primary school intervention based on 28 lessons over 2 semesters- first 14 lessons covered fundamentals of preparing foods, safety and hygiene issues, the categories of different foods in the USDA Food Pyramid, and the taste, aesthetics, and nutritive value of plant-based foods from around the world, second 14 lessons covered ‘legumes from around the world’. Classroom teachers and parent volunteers trained and provided with tips.</p>	<p>Documented results recorded on web site were based on several studies conducted by the program designers and reported to have included “increased preference for fruits, vegetables and whole foods over processed junk foods, reduced Body Mass Index and improved general health in school children within weeks of educational intervention, introduction of plant-based entrees into the school lunch programs, parents choosing healthier foods due to the influence of their children and dramatic improvement in behaviour, mind set and academic performance of troubled teens.”  Candidate currently seeking program evaluation of secondary schools (reported in literature) and whether home economics teachers deliver these programs – no response to date from program designers.</p>
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**TABLE 3 SKILL-BASED HEALTHY EATING PROGRAMS IN SCHOOLS IN THE UNITED KINGDOM**

Title or name of nutrition education program and Author	Description and aims of nutrition education program	Intervention period and sample	Measurable Outcomes
<p><i>The Cook-It Club</i> and <i>Cooking Bus</i> (withdrawn)</p> <p>Project developed by the Food Standard Agency.</p> <p>Source: manual search by candidate</p>	<p><b>Level 4- secondary school aged children, community-based program</b></p> <p>The <i>Cook-It Club</i> was a skill-based out-of-school hours cooking program targeting 11-14 year olds.</p> <p>Allowed non-trained teachers opportunities to target this age group in school and community settings in order to improve healthy eating by developing cooking skills and practical food preparation and nutritional knowledge.</p> <p>The <i>Cooking Bus</i> program targeted children in schools. Teacher facilitators visited schools and taught food education via interactive sessions.</p>	<p>Based on the core competencies for 14-16 year olds developed by the FSA's document <i>Getting to grips with grub</i>. <a href="http://www.food.gov.uk/multimedia/pdfs/grubgrips.pdf">http://www.food.gov.uk/multimedia/pdfs/grubgrips.pdf</a> viewed 3 September 2013</p> <p>Neither the <i>Cook-It Club</i> nor the <i>Cooking Bus</i> has been evaluated.</p> <p>The <i>Cook-It Club</i> project, however, was based on initial findings of a pilot study and included tips for encompassing a whole-school approach and ways of identifying program success through rudimentary evaluation.</p>	<p>Possibly developed in response to the demise of formal skill-based programs in UK schools as non-trained teachers could facilitate these programs.</p>
<p><i>Food in Schools</i> <a href="http://www.foodinschools.org/">www.foodinschools.org/</a> Viewed 3 September 2013</p> <p>Source: Roy Ballam 2011 British Nutrition Foundation</p>	<p><b>Level 4 – primary school-aged children, school based program</b></p> <p>The food in schools program is a primary school-based program facilitated by primary school teachers.</p> <p>Teachers undertake a 1 or 2 day training program facilitated by qualified food skills (home economics) teachers.</p> <p>The aim of the program is to increase food education, including practical competencies in primary school-aged children as they transition into secondary school.</p>	<p>Trained teacher facilitates a variety of specified food activities which cover 4 sections: diet and health, food safety, cooking and shopping</p> <p>Children use a 'food passport' to record their food experiences.</p> <p>Secondary school teacher uses each child's food passport to assess their level of food and nutrition skills, knowledge and understanding.</p>	<p>Relies on child's self-reported assessment of food skills based on records made in the food passport.</p> <p>The training program has been qualitatively and quantitatively evaluated by 1,136 participating primary school teachers. (O'Dea J, 2003)</p>



	Is a prelude to the secondary-school <i>Licence to Cook</i> program.		
<p><i>A Licence to cook</i> (withdrawn)</p> <p>Source: Report of preliminary findings sent directly to candidate on 10<sup>th</sup> August 2008 by Louise Davies, Deputy Chief Executive, Design and Technology Association.</p> <p>Information supplied by Roy Ballam (2008)</p>	<p><b>Level 2 – secondary school program</b></p> <p>This national program was developed by the British Nutrition Foundation, The Design and Technology Association and the Specialist Schools and Academies Trust in 2006.</p> <p>It was designed to address the standards, skills and knowledge to support food education, ensuring that teachers have the skills to deliver sustainable programs in schools.</p> <p>Training programs took place from 2008 for all schools and providers taking part.</p>	<p>The program’s content is linked to the Design and Technology curriculum in England and is designed to enhance and/or supplement existing curriculum. Delivered by home economics teachers (further 800 to be trained in the UK).</p> <p>Average class sizes 19.</p> <p>The program recommends a minimum of 16x 1 hour lessons covering Diet and nutrition, Food safety and hygiene, Consumer Awareness and Basic Cooking skills.</p> <p>Evaluators visited 29 mixed representative (different regions, urban, regional, single-sex, co-ed) schools (n=4,000 students) of the 50 schools involved in the program.</p> <p>Teacher interview of planning and observation of delivery.</p> <p>Online questionnaires used to assess participants knowledge and monitoring of program.</p>	<p>A program that is in the early stages of evaluation. Evaluation of the resources and the pilot programs took place from September 2007 and February 2008 involving 50 food teachers and their students.</p> <p>Preliminary findings at end of intervention - Year 7, 8,9 student participants (n=1077) from 37 schools - reported improvement of shopping (44per cent) and cooking skills (90per cent), knowledge of hygiene and safety(72per cent) and nutrition and health (68per cent)</p>
<p>Let’s Get Cooking <a href="http://www.letsgetcooking.org.uk">www.letsgetcooking.org.uk</a> viewed 3 September, 2013</p> <p>School Food Trust <a href="http://www.schoolfoodtrust.org.uk">www.schoolfoodtrust.org.uk</a></p>	<p>Funded by the Big Lottery Funds grant Aims to provide children (5 -18 years) and their families with practical skills to combat obesity. Five thousand cooking clubs operate in schools and facilitated by a local co-ordinator and higher level teaching assistants.</p> <p>A two day training of co-ordinators covers</p>	<p>Three hundred clubs (10 per cent) selected to take part in evaluation that measures the number of participants who use their skills at home and increase their intake of healthy food.</p> <p>Self-reported questionnaires completed by participants at the beginning and end of the 6 week training program.</p>	<p>Charts illustrate and clearly describe the procedural skills.</p> <p>Designed to be used by the Program co-ordinators to assess the skills of participants.</p> <p>In the 2009-2010 Annual</p>

viewed 3 September, 2013	basic cooking and food hygiene. A range and level of procedural food skills required to produce a meal are taught.	Data will be collected over a five year period.	Review, it was reported that nine out of ten club members use the skills they have developed and 58per cent have reported that they eat a healthier diet. No long term evaluation has been provided.
Food – a fact of life <a href="http://www.foodafactoflife.org.uk/">http://www.foodafactoflife.org.uk/</a> Viewed 3 September 2013	<b>Level 5</b> This food skills programs are grouped in 4 age groups. The 8-11 years and 11-16 year programs are appropriate to this thesis. For 8-11 year olds: focuses on healthy eating and food origin knowledge and includes recipe ideas. For 11-16 year olds: focuses on energy and nutrients, diet and health, food ingredients, production and processing. Cooking skills are only one part of a broad range of topics covered.	Mentioned pilot projects success.	No specific measures recorded
Jamie’s Home Cooking Skills	<b>Level 3 – secondary school program</b> This food skills program is taught in schools by teachers and aims to increase basic cooking skills in young people aged 14-16 years. The program is organised under recipe sections as 2 levels (basic ‘how-to’ or procedural skills) and (advanced – planning or declarative skills). Enrolment in and completion of the program qualifies British participants with an ‘internationally	The program was developed in 2010. Currently 200 schools (n=5,000). English government has made it compulsory for every 11-14 year old student to receive one hour cooking in schools for at least one term (10 weeks). Participant numbers are expected to increase.	No evaluation at this time. Provides a comprehensive list of basic and advanced recipes. Supported by print-out fact sheets and videos of ‘how-to’ prepare and cook. Relevant to the aims of this thesis.

	recognised ‘food skills’ (Home Cooking Skills’ Level 1 and 2) qualification.		
Chefs Adopt a School <a href="http://www.academyofculinaryarts.org.uk/">http://www.academyofculinaryarts.org.uk/</a> Viewed 3 September 2013	<b>Level 2 – primary school program</b> This food skills program is taught by chefs mostly in primary schools in England. The aim of this three session program is to teach children about food, its origins, healthy eating and food preparation.	Four schools participated (n=169 primary school-aged children aged between 9 to 11 years old, n=86 intervention group and n=83 control (delayed intervention) group. A ‘confidence measure’ questionnaire of the participants one week before and two to four weeks after program delivery was used to obtain the pre- and post-test data.	Questions were asked to measure the participants’ confidence levels to prepare food, ask for a favourite vegetable and eat a range of vegetables. Statistically significant increases in confidence levels were found amongst participants in the intervention group. These findings are relevant to this thesis and contribute to the development of another practical tool used to evaluate food skills programs.

**TABLE 4 SKILL-BASED HEALTHY EATING PROGRAMS IN OTHER COUNTRIES**

Title or name of nutrition education program and Author	Description and aims of nutrition education program	Intervention period and sample	Measurable outcomes
Skill-based healthy eating intervention program conducted in Bergen, Norway  (Klepp and Wilhelmsen, 1993)	<b>Level 1 –secondary school program</b> Skill-based program successfully using a multi-component approach that focused on school, home and community to improve eating behaviour of young people. Participants prepared healthy recipes	Four schools (n= 447 young people) participated in the program intervention and a baseline survey was conducted in January 1989 of the two control schools and two intervention schools, where the home	At baseline , immediately after the intervention and 8 months after the intervention students completed food-frequency questionnaire was used to assess knowledge of healthy eating habits and behaviour and a correlation between knowledge and behaviour established

<p>Source: manual search by the candidate</p>	<p>using their favourite foods in class and also planned and prepared dinners for their families. Participants reported and made recommendations based on their findings of food surveys of supermarkets and fast food outlets. Participants were selected as peer leaders to implement smaller group activities aimed at increasing student knowledge and changing attitudes towards healthy eating practices.</p>	<p>economics staff participated in the design of a new curriculum for seventh grade home economics students.</p>	<p>There was a 94per cent to 87per cent participation rate between baseline and 12 month later follow-up. Female participants in the intervention group reported significantly healthier eating behaviour compared with those in the control group at post-immediate and after 8 month follow-up. Males in the intervention group reported significantly healthier eating behaviour compared to males in the control group at post-immediate evaluation; however, there was no difference in the control and intervention male participant groups in the follow-up evaluation.</p>
<p>Nutrition education and food skills in Mauritius  (Oogarah-Pratap B, Bholah R, Cypersade M, &amp; Mathoor K, 2004)</p>	<p><b>Level 4- secondary school program</b> An assessment of current programs taught in Mauritius rather than an evaluation of a specific intervention. This report aimed to compare the knowledge and skills between two groups of students (those who had studied home economics in years 7-10 and those who had not studied the subject)</p>	<p>Male (113) and female (202) students, average age 14.9 years (n=315) from 12 schools in 4 rural and urban areas of Mauritius. A self-administered student questionnaire (covering nutrition knowledge and food skills) was distributed to a test and control group to assess their knowledge of nutrition and food skills. The participants in the test group had studied home economics in years 7-10 and participants in the control group had not studied the subject at all.</p>	<p>Inconclusive and unreliable data. Negligible differences were noted in participants' nutrition knowledge – test group showed a better understanding of desirable weight loss practices whilst the control group showed a better understanding of micro-nutrients. Report showed that participants in the test group had better food skills, especially amongst boys. However, food skills were assessed by determining the percentage of students who helped their parents in food preparation and who regularly prepared food at home. The results did not indicate whether it was due to food skills learnt in home economics classes or developed at home with parents. Recommendations made included the need</p>

			<p>for hands-on program for teaching food skills.</p> <p>The didactic teaching style accounted for student disengagement and reporting of 70 per cent of students from both groups failing to understand what constitutes a balanced meal.</p>
<p>Nutrition education for school children living in a low income urban area of Spain</p> <p>Perez, C and Aranceta J (1997)</p> <p>Source: manual search by candidate and the English Review</p>	<p><b>Level 2- secondary school program</b></p> <p>The program aimed to improve children's attitudes towards food and nutrition and promote healthy eating and to develop skills and self-empowerment using a three-tiered strategy of classroom, the school environment and home.</p> <p>Program focused on knowledge, attitude and skills related to food and nutrition, hygiene, cookery, consumer issues and social behaviour that is relevant to this thesis; however, only <i>five</i> practical food workshops were conducted.</p> <p>Program also included changes to school lunches and involved food service and parents.</p>	<p>A pilot study was developed that involved 9-12 year olds (n=150) in urban, low income areas of Bilbao. Teachers were trained to deliver 5 cookery sessions designed to increase participants' food preparation skills, table manners and acceptance of new dishes.</p> <p>Food preparation workshops: held in school kitchen/ lunchroom. 2-hour session/week x 5 weeks.</p> <p>Format: groups of 15 children prepared dishes supervised by cook and teacher</p> <p>Content: each session focused on a single food group. Sessions included multimedia teaching, games and crafts. Recipe preparation, with main ingredients from food group of the day formed the core of the session. At the end, children set the table, sat down together with teaching staff and ate the meal they prepared.</p>	<p>Multiple choice questions on knowledge and skills, FFQ completed during personal interviews with children. Self-perception assessed by semi-structured interview. Menu acceptance directly observed, Likert-type scales used to score</p> <p><b><i>After 2 years of programme implementation:</i></b></p> <p><b>Knowledge:</b> 95per cent had higher scores for knowledge of hygiene, foods groups, relating foods to health, food preparation, safety and reading food labels.</p> <p><b>Cooking skills:</b> showed a significant increase in post-test scores (but no detail on questions used to assess cooking skills). 60per cent of children prepared at home some of the dishes they had tried in the food preparation workshops.</p> <p><b>Eating habits:</b> FFQ showed an increase in fruit, salad, fish, and milk/dairy product consumption.</p> <p><b>Acceptance of program:</b> positive attitude towards program and activities</p> <p><b>Menu acceptance:</b> gradual acceptance observed, especially of vegetables, fruit</p>

		Qualitative evaluation based on observation was undertaken to assess acceptance and involvement in the program, team building and changes in eating habits and practices.	and fish (no data reported)
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## **APPENDIX E. FOOD-RELATED LIFESTYLE AND SATTER MODELS DESCRIBED IN CONTEXT**

The Values described in the Food-related Lifestyle Model are more broadly described here as *Motivational Factors* such as the desire for nutritional health that may prompt a particular *Behaviour* such as an individual choosing food low in fat or purchasing fresh seasonal vegetables instead of the pre-prepared variety. They also encompass the *Eating Attitudes* (EA) outlined in the Satter model that include parental influences on children's eating behaviour determined by their own attitudes and beliefs about food (Satter EM, 2008).

The *Higher order attributes* featured in the Food-related Lifestyle Model (Grunert KG et al., 1993) serve as modifying influences to the food choices made by individuals, but also incorporates components of the Eating Attitudes (EA) (Satter E, 2007a), which depend on an individual's positive attitude towards foods when it is offered in a supportive and harmonious environment. *Usage situations*, an component used in both models (Grunert KG et al., 1993; Satter E, 2007a), describe the circumstances that may influence or modify typical food selection or eating behaviours. For example, the main food preparer still values their family's nutritional health when they forgo cooking a meal from 'scratch' on those occasions when convenience overrides health: for example; when the family eats purchased hot meat pies as a quick lunchtime meal before they leave to watch a football game on a winter's day. These decisions are pre-cursors that *are* the declarative or person-centred skills, which precede the procedural or task-centred actions of shopping for, preparing and actually cooking (or re-heating) the food itself.

## APPENDIX F. INVITATION TO FOOD EXPERTS



December 2007

Dear (Name of invitee)

I am a PhD research student in the School of Exercise and Nutrition Sciences at Deakin University investigating practical food skill acquisition in relation to young people's healthy food consumption.

The aim of this project is to identify the essential practical food skills required for young people (aged 16-25 years) to be able to cook nutritionally well-balanced family-type meals.

As a food expert, I am writing to invite you to participate in a short semi-structured interview (no longer than one hour) to find out what specific skills you think are required for young people to be able to plan, prepare and cook nutritionally well-balanced family-type meals.

It is expected that the interview will take place between September to December, 2007 at a time and date convenient to you.

Your expert opinions and experience and those of other food experts would be extremely valuable to this project. It is envisaged that your contributions would be instrumental in helping to evaluate existing skill-based (ie. cooking) programs (such as those operating in Home Economics classrooms in most Victorian secondary schools) or designing a new skill-based (ie. cooking) program which accommodates the best practice based on the data obtained from this research project.

At the conclusion of this project, I would be happy to send you an outline of the outcomes of my research for your own personal and professional interest as a food expert.

Please see attached a copy of the Interview Questions, the Plain Language Statement and Consent Form for you to sign should you agree to participate in this research project.



This form outlines the purpose of the research project and includes details that protect your privacy as a voluntary participant.

If you are interested and agree to participate in this research project, please complete and tear-off the reply slip below and return to me in the reply paid envelope included with this letter.

For further information about this project, I can be contacted by email [spfo@deakin.edu.au](mailto:spfo@deakin.edu.au) or telephone at work 9581-1243.

I do hope that you will be able to participate in this project and look forward to hearing from you.

Thank you in anticipation,

Sandra Fordyce-Voorham

## APPENDIX G. PRE-WORKSHOP QUESTIONNAIRE OF FOOD EXPERTS' PANEL

Workshop Questionnaire of Food Experts' Panel

Held at 3 Oak St, Bentleigh 3204 on Tuesday 30<sup>th</sup> June 10-00am -12-00 noon

**Aim of Study 2:** to determine the question items for a Survey of Home Economics teachers designed to identify the essential food skills to be taught to students. These essential food skills will be used to develop a skill-based healthy eating program suitable for use in all Australian schools. The goal is to develop a program that will equip young people with the food skills to live independently.

**Aim of this workshop:** to use a consensus process to determine the items to be used in the Teacher Survey.

### Agenda

**10-00am - 10-20 am**

**Introduction**

**10-00am – 11-00am**

**First round**

- answer questions about food skills
- match items under 12 essential skills and 3 themes

**11-00am -11-30 am**

**Second round**

- match similar type items
- determine which items read best
- rank the items under each list from Strongly Agree to Strongly disagree

**11-30 am-12-00 noon**

**Third Round**

- determine a rank between the Strongly Agree and Agree items
- summary of ideas from Food Experts

### **Pre-workshop Questions**

1. To be skilled cooks, young people need to know...
2. To make effective consumer decisions, young people need to know...
3. To live healthy independent lives, what decision making and problem solving (thinking) skills do you think young people need to have?
4. To live healthy independent lives, what hands-on (practical) skills do you think young people need to have?
5. What behaviours do we want young people to learn to do?
6. What do we need to do as home economics teachers to teach (and instil) these behaviours?
7. What would be the ideal length of the program to teach (and instil) these behaviours?
8. Apart from the program length, what factors can you identify to ensure these behaviours are taught (instilled)?

### **Post work shop questions**

1. What 'stem' would be the best (clearest) one to use to find out from teachers these essential skills?
  - It is important for young people to know...
  - To make effective decisions...
  - To be skilled cooks...
2. What are the three most important question items on the survey?
3. Any other items that you think should be included in the survey?

## **APPENDIX H. REQUEST TO HOME ECONOMICS VICTORIA'S BOARD TO INVITE MEMBERS TO PARTICIPATE IN A TEACHER SURVEY**



University of Wollongong

(Name of CEO and President)  
Home Economics Victoria  
3 Windsor Ave  
Mt Waverley 3149

September 1st, 2009

Re: Request to invite HEV members to participate in a survey about food skills in skill-based healthy eating programs in Australian secondary schools

Dear (Name of CEO and President)

I am currently undertaking a PhD thesis evaluating skill-based healthy eating programs in Australian secondary schools at the School of Health Sciences, University of Wollongong.

As part of my research, I plan to investigate the food skills taught by home economics educators in secondary schools throughout Australia. As the peak body for home economics in Victoria, I write you as the CEO, President and the members of the Board of Home Economics Victoria to request fellow members to participate in an online survey about the essential food skills they think are taught, and should be taught, to students so that they are equipped with essential life skills to live healthy independent lives.

The results of this survey will generate vital data which will help establish what essential food skills should be taught in secondary schools throughout Australia. It has the potential to provide the home economics profession with an evaluation of existing skill-based healthy eating programs throughout Australia. This data may then assist the home economics profession in making recommendations to appropriate authorities.

A copy of the survey is attached to this letter so that you and Board members may be provided with background information in order to make an informed decision about this request. The study protocol will be reviewed and approved by the Human Research Ethics Committee of the University of Wollongong prior to commencement. Full approval to proceed will occur after confirmation from HEV that its members can be approached for this purpose.

Please contact me at the above address or via my email [sfordyce@mentonegirls.vic.edu.au](mailto:sfordyce@mentonegirls.vic.edu.au) if you have any questions about this request.

Yours sincerely,

Sandra Fordyce-Voorham

## **APPENDIX I. STUDY TWO TEACHER LETTER OF INVITATION AND QUESTIONNAIRE**



University of Wollongong

### **LETTER OF INVITATION**

#### **TITLE: Identification of food skills taught in skill-based healthy eating programs in secondary schools**

Dear Home Economics Professional,

You are invited to take part in a research survey about the food skills home economics teachers consider to be essential to be taught to students in secondary school skill-based healthy eating programs. The project is being conducted by me as part of a PhD thesis in the School of Health Sciences at the University of Wollongong. Ethics approval has been granted on 30 September 2009.

As a member of your professional association you have received an email inviting you to complete a survey online. The survey consists of a series of questions and allows space for written comments. It is designed to take approximately 20-30 minutes. As a member of the teaching profession, I understand how busy you are so the survey is designed so that you are able to enter and exit and re-enter the survey over several occasions.

By participating in this research project you will have the opportunity to express your professional opinion about the essential food skills that should be taught to secondary students to ensure that they are equipped with essential life skills to live healthy independent lives. The results of this survey will generate vital data which will help to establish what essential food skills should be taught in secondary schools throughout Australia.

The survey has the potential to provide the home economics profession with an evaluation of existing skill-based healthy eating programs throughout Australia. This data may then assist the home economics profession in making recommendations to appropriate authorities about food skills based curriculum.

Please see attached the Plain Language Statement including a list of Frequently Asked Questions for you to consider before deciding whether to proceed with this survey. Of course your participation in the survey is entirely voluntary. Please complete this survey within two weeks of receiving it. One reminder notice will be sent to you after the two weeks has lapsed.

I do hope that you will be able to participate in this project and look forward to your online responses.

The formal team of investigators for this project are

Professor Tony Worsley	Assoc.Prof. Heather Yeatman	Sandra Fordyce-Voorham
Professor of Public Health	Assoc. Prof in Public Health	PhD Candidate
University of Wollongong	University of Wollongong	University of Wollongong
+61 2 4221 5103	+61 2 4221 3153	+61 3 9557 6743
<a href="mailto:tworsley@uow.edu.au">tworsley@uow.edu.au</a>	<a href="mailto:hyeatman@uow.edu.au">hyeatman@uow.edu.au</a>	<a href="mailto:sfordyce@mentonegirls.vic.edu.au">sfordyce@mentonegirls.vic.edu.au</a>

Thank you for your interest,

Sandra Fordyce-Voorham



## **PARTICIPATION INFORMATION SHEET FOR TEACHER SURVEY**

This Participation Information Sheet contains detailed information about the research project being conducted by the University of Wollongong. Its purpose is to explain to you as openly and clearly as possible all the procedures involved in this project before you decide whether or not to take part in it. If you have any questions about the project, please ask one of the investigators.

### **Frequently Asked Questions**

#### **WHO IS INVOLVED IN THIS RESEARCH PROJECT? WHY IS IT BEING CONDUCTED?**

The primary researcher for this project is Sandra Fordyce-Voorham, a PhD student of Health Sciences at University of Wollongong. Professor Tony Worsley, Professor of Public Health is supervising the project. Associate Professor Heather Yeatman Associate Professor of Public Health is the assistant supervisor for this project.

This research project is being conducted as part of a PhD study investigating and evaluating skill-based healthy eating programs in secondary schools. This project has been approved by the University of Wollongong's Human Research Ethics Committee and by the Board of Home Economics Victoria/ Council of the Home Economics Institute of Australia.

#### **WHY HAVE YOU BEEN APPROACHED?**

You have been approached as a member of the home economics teaching profession to complete an online survey. Your professional organisation has granted the researcher permission to contact you through its current database and request your participation in this research project.

#### **WHAT IS THIS PROJECT ABOUT? WHAT ARE THE QUESTIONS BEING ADDRESSED?**

This research project aims to gather information from home economics teachers about what they consider to be the essential food skills required to be taught to students in secondary school skill-based healthy eating programs. Specifically, we are interested in how these identified food skills are linked to improving the eating behaviours of young people now and in the future. We would like to know if the skills learnt at school are practiced at home and used later when young people choose to live independently and are required to shop, prepare and cook food for themselves.

#### **IF I AGREE TO PARTICIPATE, WHAT WILL I BE REQUIRED TO DO?**

As a member of a home economics professional organisation you have received an email inviting you to complete a survey online. The survey consists of a series of questions and allows space for written comments. The survey is designed to take approximately 30-40 minutes.



## WHAT ARE THE RISKS OR DISADVANTAGES ASSOCIATED WITH PARTICIPATION?

Apart from the 30-40 minutes of your time to complete the survey, we can foresee no risks for you. Your involvement in the study is voluntary. Refusal to participate in this project will not affect your relationship with the University of Wollongong or your professional association.

## WHAT ARE THE BENEFITS ASSOCIATED WITH PARTICIPATION?

By participating in this research project you will have the opportunity to express your opinion about the essential food skills required to be taught in Australian secondary schools so that our students are equipped with essential life skills to live healthy independent lives.

The results of this survey will generate vital data which will help to establish what essential food skills should be taught in secondary schools throughout Australia. They will be combined with findings from similar surveys conducted with food experts in other studies to propose essential food skills for secondary school aged students.

The results of this survey also have the potential to provide the home economics profession with an evaluation of existing skill-based healthy eating programs throughout Australia. This data may then assist the home economics profession in making recommendations to appropriate authorities.

## WHAT WILL HAPPEN TO THE INFORMATION I PROVIDED?

Any information obtained in connection with this project and that can identify you will remain confidential (solely to the named investigator and named supervisors). It will only be disclosed with your permission, except as required by law. In any publication, information will be provided in such a way that you cannot be identified. You will be fully briefed about the survey process and may preview the survey questions in advance of undertaking the survey by contacting Sandra Fordyce-Voorham [sfordyce@mentonegirls.vic.edu.au](mailto:sfordyce@mentonegirls.vic.edu.au). Data collected will be de-identified in order to protect participants' confidentiality and will be stored securely in the researcher's password-protected computer. The results will be disseminated in a study submitted as part of the researcher's PhD thesis. The research data will be kept securely at the University of Wollongong for a period of 5 years before being destroyed.

## SECURITY OF THE WEBSITE

Users should be aware that the World Wide Web is an insecure public network that gives rise to the potential risk that a user's transactions are being viewed, intercepted or modified by third parties or that data which the user downloads may contain computer viruses or other defects. However the use of SSL encryption in this survey reduces this risk.

## SECURITY OF THE DATA

This project will use an external site to create, collect and analyse data collected in a survey format. The site being used is SurveyMonkey.com. If you agree to participate in this survey, the responses you provide to the survey will be stored on a host server that is used by SurveyMonkey.com. Terms and Privacy conditions may be found by scrolling down to the bottom of the page on [www.surveymonkey.com/monkey\\_Terms](http://www.surveymonkey.com/monkey_Terms). For extra security this site has been SSL encrypted. No personal information will be collected in the survey so none will be stored as data. Once data collection and analysis has been completed, the data collected will be imported to the University of Wollongong's server where it will be stored securely for a period of five (5) years. The data on the SurveyMonkey.com host server will then be deleted and expunged.

## ETHICS REVIEW AND COMPLAINTS

This study has been reviewed by the Human Research Ethics Committee (Social Science, Humanities and Behavioural Science) of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted, you can contact the UoW Ethics Officer on (02) 4221 4457.

## CONSENT

You are invited to save and or print the Plain Language Statement.

I have read the Plain Language Statement above and I agree to participate in this research project. Please click next to access the survey –

[http://www.surveymonkey.com/s.aspx?sm=BpCvOdqZM7ij202GFx10IA\\_3d\\_3d](http://www.surveymonkey.com/s.aspx?sm=BpCvOdqZM7ij202GFx10IA_3d_3d)

I DO NOT agree to participate in this research project (please click next to exit this website)

**Project Title-** Identification of the essential food skills that should be taught in skill-based healthy eating programs in Australian secondary schools

**This survey aims to identify the essential food skills that should be taught in skill-based healthy eating programs in secondary schools.**

The questions in this survey are about the essential food skills that you believe should be taught and are actually teaching in skill-based food classes (usually described as “Home Economics” or “Food Technology” or derivations thereof) in the first four years of secondary school. These skills are required by young people and include their ability to shop for, prepare and cook appetising and healthy meals when they leave home and live independently.

#### INSTRUCTIONS

When answering the questions, please think about food skills that include selecting and purchasing food, storing food pre- and post cooking, preparing, cooking, presenting and serving food to individuals and family members. Please complete all questions by selecting the best response in the box or filling in blank spaces and/or providing comments where possible. You are welcome to exit and return to the survey at another time but you need to start and complete the survey using the same computer.

Thank you for your participation!

Key Code

SD=Strongly Disagree

D=Disagree

Neutral= have no opinion

A=Agree

SA=Strongly Agree

## Section A

This section records your responses about the food skills that you believe should be taught to students in your food skills classes. Questions beginning with ‘how’ or ‘know’ refer to knowledge and all other questions refer to skills or pedagogical statements.

### Consumer knowledge, information and skills

*How to recognise and purchase quality and value-for-money food produce through personal or on-line shopping and what to do with food post-purchase - how to store it, how to prepare it, how to cook it.*

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
How to adjust serving sizes					
Know the basic food items to have in the pantry and refrigerator					
When a canned, dried, frozen fruit or vegetable can be successfully substituted for the fresh variety in a recipe					
How the Healthy Living Pyramid can be used as a guide to allocate weekly food dollars ( \$60 allocated to foods in the ‘eat most’ section, \$30 allocated to food in the ‘eat moderately’ section and \$10 allocated to foods in the ‘eat least’ section = \$100 total food dollars)					
How to select quality and value-for-money food <i>on-line</i>					
How to correctly store perishable food					
How to read food labels					
Know where food originates ( <i>paddock to plate</i> )					
How to safely freeze fruits and vegetables to extend their seasonal qualities					
How to buy food <i>on-line</i>					
How to select and buy quality and value-for-money food					
How to shop without planning ahead					
Use food labelling information to make meals for people with allergies					
Follow recipe instructions					
Make a shopping list					

Buy ingredients to make a cheap and nutritious meal					
<b>Add own comments here</b>					

### **Cookery Methods knowledge and skills**

*How to match food products with appropriate (traditional and modern) cookery methods to achieve best product outcome and value-for-money*

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
How to create meal variations from standard recipes such as a meat sauce					
How to exchange ingredients for low fat alternatives					
How to exchange cookery methods such as deep frying for healthier cooking methods such as stir frying					
How to sequence the cooking of components in a recipe					
How cookery method selection will affect preparation and cooking time is important					
Micro-wave cooking					
Making pastry					
Making bread and yeast products					
Making pasta					
Creaming butter and sugar					
Baking cakes and biscuits					
Roasting meat and poultry					
Casseroling and stewing					
Making white sauce					
Making classic sauces (béchamel, mayonnaise, mornay, demi-glace)					
Making meat and fish stocks					
Making gravy					
Stir frying					
Barbequing					
Making healthy snacks					

Giving students the opportunity to cook by trial and error					
Choosing cookery methods to lower gas and electricity costs					
Adjusting recipes to make them more nutritious					
<b>Add own comments here</b>					

### Equipment knowledge

*How alternative items of equipment can be used when the most appropriate item of equipment is not available. It also includes how to safely use and store sharp knives and cooking equipment (saucepans, baking trays, blenders, food processors, grillers and ovens).*

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
How to use a microwave oven to cook food					
How to use a microwave oven to reheat food					
How to use small appliances (stick blenders, cake mixers, food processors, portable grills)					
How to use a gas cooker					
How to use an electric cooker					
Know what appliances and equipment can be substituted when the most appropriate item is not available					
How to safely use and store knives					
How to correctly use small tools (vegetable peelers, apple corers, melon ballers, graters)					
<b>Add own comments here</b>					

### Food exposure

*The value of exposing students to a variety of foods from different cultures through 'International Foods' themed school food programs and restaurant, street tours, market visits and guest speakers.*

To what extent do you agree or disagree with the following statements?

	SD	D	N	A	SA
Cooking food from around the world... is popular with my students					

is my students favourite topic					
is always used in my food skills program					
is the best way of exposing students to new food					
is the best way to teach food skills					
increases cultural acceptance of food					
opens up cultural pathways toward accepting different people					
exposes students to new tasting experiences					
exposes students to enjoyable tasting experiences					
exposes students to foods unfamiliar to them					
shows healthier eating options					
shows cheaper food options					
<b>(add your own comments here)</b>					

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
Cooking food from around the world in an 'International Foods' themed program					
Visits to different culturally themed restaurants					
Visits to markets with foods from different cultures					
Growing and using the herbs and vegetables in a school garden					
Guest speakers and (professional and home) chefs from different cultures					
<b>(add your own comments here)</b>					

### **Safety and hygiene**

*Safety and hygiene skills in the kitchen are a fundamental component to include in any skill-based program. At the operational level, this means an individual's ability to safely use and store sharp knives and cooking equipment (saucepans, baking trays, blenders, food processors, grillers and ovens) to prevent cuts, scalds and burns.*

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
Safely use and store knives to prevent injuries					
Use cooking equipment to prevent injuries					
Correctly wash dishes					
Correctly clean equipment					
Prepare for food preparation and cooking tasks (wash hands, tie hair back, wear apron)					
Safely freeze left over meals					
<b>Add your own comments here</b>					

### **Meal knowledge and skills**

*How to stock a pantry and refrigerator of perishable and non-perishable items consumed on a regular basis by household members.*

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
How to season food to make it tastier					
How to adapt a recipe and create meal variations					
How to adapt a recipe to suit diners with food allergies					
How to create vegetarian meals by adapting meat-based recipes					
Reading and following a recipe.					
<b>Add your own comments here</b>					

You are one third through completing the survey. Please keep going...

Remember you are welcome to exit and return to the survey at another time but you need to start and complete the survey using the same computer.

### **Nutritional Health Knowledge**

*What constitutes a healthy meal in relation to meeting daily activity requirements, why it's important to enjoy and consume a wide variety of nutrient dense food and how to select nutrient dense food in relation to vegetarian and healthier alternatives and portion size.*

To what extent do you agree or disagree with the following statements?



	SD	D	N	A	SA
Technical (hands-on) skills are more important than nutrition in a food skills program					
The best way to teach nutrition is students cooking healthy meals					
Linking student wellbeing to cooking healthy meals is a good way of teaching healthy eating					
Linking cooking of healthy meals with 'looking good'					
Food tasting experiences in class have to be nutritious					
<b>(add your own comments here)</b>					

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
Demonstrating cooking of non-nutritious foods					
Teaching nutrition in terms of short or long dietary health outcomes					
How substituted ingredients affect the nutritional value of meals					
How eating a wide variety of foods benefits health					
How the Australian Guide to Healthy Eating is used to plan meals					
How to cook healthy meals that will help achieve optimum body weight					
How to cook healthy meals					
Students analysing their own diet					
Students analysing case study diets					
Students cooking non-nutritious foods					
Students cooking nutritious foods					
<b>Add your own comments here</b>					

### **Seasonal Produce knowledge**

*How to select fruits and vegetables in season when they are cheaper, tastier and more nutritious and readily available and to use this knowledge to help inform recipe selection*

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
When frozen vegetables can be used as alternatives to fresh					
Know how seasonal produce can help inform recipe selection					
Know the best time of the year to purchase fresh fruits and vegetables					
When to purchase the more expensive ready prepared fruit or vegetable alternative when making meals					
How to use the whole fresh vegetable instead of pre-prepared and packaged fresh vegetables					
How to select and buy seasonal fresh fruits and vegetables					
<b>(add your own comments here)</b>					

### **Troubleshooting knowledge**

*Why food product outcomes are not successful and how to rectify unsuccessful food product outcomes.*

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
How to anticipate and rectify culinary mistakes					
Troubleshooting is useful as it explains why something does not work out					
<b>(add your own comments here)</b>					

### **Sources of information**

*How information sources can be used to assist students with produce selection and stimulate them to trial new produce, recipes and subsequently broaden their culinary repertoire*

To what extent do you agree or disagree that the following are important in a contemporary food skills program?

	SD	D	N	A	SA
Cook books with no-fail recipes					
Cook books with troubleshooting tips					
Cook books with a glossary of culinary terms					

Cook books with step-by-step instructions					
Cook books with coloured photographs					
Supermarket magazines as the recipes are easy					
Supermarket magazines as the food products are readily available					
Cook books or magazines with cooking basics					
ICT (information technology) literacy skills to find suitable recipes on the Internet.					
ICT (information technology) literacy skills to evaluate suitable recipes on the Internet.					
<b>(add your own comments here)</b>					

### Skills acquisition

*How hands-on and thinking skills are used to assist students to develop independence and confidence when preparing food.*

To what extent do you agree or disagree with the following statements, if at all:

	SD	D	N	A	SA
Encouraging students to share food preparation and cooking tasks at home helps them to learn food skills					
Encouraging parents to support their children's food skills practice at home					
Encouraging parents to be positive role models who influence the current and future eating patterns of their children					
To acquire skills, students need practice					
Setting practical food homework tasks reinforces food skills learnt at school					
Students need to cook food in class that they will enjoy and cook for themselves					
Young people remember how to use the food skills they learnt at school					
Practice is important for students to properly learn food skills					
Sharing food preparation and cooking tasks at home helps students learn organisational skills					

From primary school age, it is desirable if young people cook a family meal at least once a week					
Introducing young people to cooking at school teaches correct food skills					
<b>(add your own comments here)</b>					

### **Motivating students**

*How students can be encouraged to change eating behaviour by learning and practicing food skills.*

To what extent do you agree or disagree with the following statements, if at all:

	SD	D	N	A	SA
A good way of motivating students to cook healthy meals is by...					
linking it to sporting performance					
linking it as something 'cool to do'					
linking it with environmental projects					
linking it with fun and enjoyment					
linking it with their world					
linking it with 'food science' curriculum themes					
linking it as something new					
involving them in program design					
simulating 'cooking show' contests in class					
rewarding students with prizes for cooking					
starting with recipes that build their confidence					
matching new food experiences with enjoyable social experiences					
story telling about food					
entering cooking competitions					
using cooking techniques (barbeques) that appeal to male students					
<b>(add your own comments here)</b>					

### **Community Involvement**

*How community agencies can make food skills programs successful.*

*'Community agencies' include resources outside family and skill-based healthy eating programs (home economics classes) in schools: friends, peers, community cookery classes or*

*'clubs', sporting agencies (gyms, sport clubs), community health centres and doctors' surgeries, commercial agencies (markets, retail food outlets, restaurants), non-government (Dairy Board, Meat and Livestock Association, Nutrition Australia) and local (libraries, neighbourhood houses, youth groups and councils) and federal government agencies.*

To what extent do you agree or disagree with the following statements, if at all:

	SD	D	N	A	SA
Involve community agencies to provide information to support food skills programs					
Community agencies extend, enrich and endorse food skills programs in schools					
Excursions help students learn about food production					
Excursions help students learn about ethical farming practices					
<b>(add your own comments here)</b>					

You have now completed Section A. Thank you!

The next Section is about you and your work.

Remember you are welcome to exit and return to the survey at another time but you need to start and complete the survey using the same computer.

### **Section B – Your professional background**

Please indicate the response that describes your professional background

#### **My professional background is in (tick any that are applicable)**

- ✓ home economics education
- ✓ hospitality trade
- ✓ education, but not in home economics
- ✓ other please specify

#### **I have been teaching food skills for**

- ✓ 1-3 years
- ✓ 4-10 years
- ✓ 11-15 years
- ✓ 16-20 years
- ✓ 21 years or more
- ✓ Pre-service teacher

I am (years old)

I am male female

The next set of questions explores your perception of work as teacher of food skills.  
List up to five (5) goals that you try and achieve in your work as a food skills teacher.

The next section is divided into Two (2) Parts.

**This part records your beliefs and what you believe to be right, even though you may not have the opportunity to apply these beliefs in your food skills classes.**

Indicate the extent to which you agree that the following statements are important to your work as a food skills teacher.

	SD	D	N	A	SA
Teachers have a role in preparing their students for food skills job training					
A national <b>food skills</b> curriculum is essential for strengthening home economics as a subject in schools.					
A national <b>home economics</b> curriculum is essential for strengthening home economics as a subject in schools					
ACARA (Australian Curriculum, Assessment and Reporting Authority) is responsible for developing a national home economics or food skills curriculum					
Home Economics professional associations (representing home economics teacher members) are responsible for developing a national home economics or food skills curriculum					
It is important that students know how to present food attractively					
Product outcome is an important criteria for recipe success					
Student-directed activities using a design brief approach is important for developing food skills					
Teacher-directed activities ensure that essential food skills are taught					
It's important for students to know how to cook sponge cakes and biscuits					
Taking students to markets and restaurants is a good way of exposing them to new food experiences					
Setting practical homework tasks is a good way of reinforcing food					

skills learnt at school					
Setting practical homework tasks is a good way of getting parents involved in reinforcing food skills learnt at school					
Tapping into new ideas shown on television cooking shows is the best way of motivating students					
Knowing how to use a cooks knife (20 cm blade) is essential					
Students need to know how to use a microwave oven as a cooking not just as a re-heating appliance					
Practice is the best way of increasing student confidence in cooking					
Students can be motivated to enjoy cooking if they cook non-nutritious food					

**This part records your practices and what you actually do in your food skills classes.**

Indicate the extent to which you agree that the following statements are important to your work as a food skills teacher.

	SD	D	N	A	SA
Preparing my students for jobs in the food and hospitality industry					
I choose to use free-range eggs not caged eggs in my food skills program					
I allocate funds in my home economics budget to purchase food that reflect my ethics					
I assess students on their food product outcome in my food skills classes					
I try and include healthy eating tips in my food skills program					
My food skills program is based on every day recipes that students can cook at home					
All my recipe selections used in my food skills program are nutritious					
I teach my students how to budget their food dollars					
I use fresh seasonal vegetables and fruit in my food skills program					
I use organic foods as much as I can in my food skills program					
If I had more money in my food skills budget I would choose to purchase food that reflects ethical farming practices					

If I had more money in my food skills budget I would choose to purchase organic food					
I involve parents in my food skills program					
I involve teachers from other subject areas in my food skills program					
I use cook books as a source of recipe ideas					
I use the Internet as a source of recipe ideas					
I enjoy eating out at restaurants					
I use the recipe ideas shown on television cooking shows in my food skills program					
I teach my students how to use dietary analysis software programs					
Our food skills program uses fresh herbs and vegetables sourced from our own school's vegetable garden					
I love trying new recipes and using them in my own food skills classes					
Cooking is my personal hobby					

### Section C - Your current work situation

Please indicate the response that describes you in your current work situation

I am

- ✓ Working full time
- ✓ Working part time
- ✓ Working as a casual relief teacher
- ✓ A pre-service teacher
- ✓ No longer in paid work (retired)
- ✓ Currently in unpaid work (family leave)
- ✓ Seeking work
- ✓ Other (please specify)

**I am currently working as a food skills teacher in (which state or Territory)**

- ✓ Victoria
- ✓ NSW
- ✓ Queensland
- ✓ Tasmania
- ✓ South Australia
- ✓ Western Australia
- ✓ Northern Territory
- ✓ Australian Capital Territory

**I am currently teaching in a**

- ✓ Government secondary or P-12 school



- ✓ Independent co-educational school
- ✓ Independent single-sex female school
- ✓ Independent single-sex male school
- ✓ Catholic co-educational school
- ✓ Catholic single-sex female school
- ✓ Catholic single-sex male school
- ✓ Other (please indicate)

**I am currently teaching in a school in a**

- ✓ metropolitan area (capital city)
- ✓ regional area (major town in your state/Territory)
- ✓ rural area (small country town in your state/Territory)

**I am currently teaching a food–skills program at the following year level/s (based on four compulsory years of secondary school)**

- ✓ First year of secondary school
- ✓ Second year of secondary school
- ✓ Third year of secondary school
- ✓ Fourth year of secondary school
- ✓ Other..If other, please specify

**Over one school year, the total number of hours my students learn food skills is**

- ✓ First year Number of hours is (or Not teaching at this year level)
- ✓ Second year Number of hours is (or Not teaching at this year level)
- ✓ Third year Number of hours is (or Not teaching at this year level)
- ✓ Fourth year Number of hours is (or Not teaching at this year level)

**In your opinion, is this sufficient time to teach food skills?**

	Yes	No
First year		
Second year		
Third year		
Fourth year		

**If you answered no to the above question identify the barrier(s) accounting for the insufficient time to teach your food skill program (tick any that are applicable)**

- ✓ program offered only as a short term elective unit (over one term or one semester)
- ✓ excursion interruptions from other subjects
- ✓ too many unit/ subjects to be fitted into the curriculum at each level ('crowded' curriculum)

- ✓ 'blocked' against other subjects requiring compulsory sequences (for example LOTE Languages other than English)
- ✓ co-curricular interruptions such as music and sporting events
- ✓ other

**Please indicate the response that best represents your opinion on the following statements (leave blank if you are not teaching at this level this year)  
Space is provided for your comments (optional)**

**I had input this year into deciding what food skills are taught in my classes at this year level**

	No responsibility	Some responsibility	Full responsibility	Comment
First year				
Second year				
Third year				
Fourth year				

You are almost through completing the survey.

Remember you are welcome to exit and return to the survey at another time but you need to start and complete the survey using the same computer.

## **Section D**

**This section records your comments about how you plan and evaluate your food-skills program.**

Most States and Territories generally structure food-skills based curriculum under the two Key Learning Areas of *Health and Physical Education* and *Technology*.

The following questions are designed to explore teacher practices on which Key Learning Area/s they incorporate into their planning of food-skills programs.

**When planning your food-skills based program (including aims, content, assessment, outcomes, evaluation) do you base your program on**

- ✓ Technology
- ✓ Health and Physical Education
- ✓ Combination of both

- ✓ Other If other, please specify

**Which reason(s) best explains your response to the question above (tick any that are applicable)**

- ✓ Mandated by the educational body of the State/Territory in which I teach
- ✓ Mandated by the school in which I teach
- ✓ My faculty thinks this KLA best fits the content of a food-skills program
- ✓ I think that this KLA best fits the content of a food-skills program
- ✓ Other If other, please specify

**In your opinion, which *Key Learning Area* best supports the achievement of food skills competencies?**

- ✓ Technology
- ✓ Health and Physical Education
- ✓ Combination of both

### **Comment**

This next set of questions records your comments about the food skills that you are currently teaching to your students in your courses (up to and including the end of the fourth year of secondary school) and how you evaluate your programs.

**Consider the identified food skills listed below and indicate whether you teach this food skill to your students in your food skills courses by the end of the fourth year of secondary school.**

- ✓ Consumer knowledge, information and skills
- ✓ Hygiene and Safety knowledge and skills
- ✓ Meal knowledge and skills
- ✓ Nutritional Health knowledge
- ✓ Cookery Methods knowledge and skills
- ✓ Equipment knowledge and skills (kitchen tools and small and large appliances)
- ✓ Food exposure knowledge (restaurant, market visits, guest speakers)
- ✓ Seasonal Produce knowledge (when fruits and vegetables are in season)
- ✓ Troubleshooting knowledge (how to anticipate and rectify culinary 'disasters')
- ✓ Sources information (where information obtained; cookbooks, Internet, food magazines, television, markets, supermarkets)
- ✓ Terminology information (culinary terms and techniques defined and described)
- ✓ Skills acquisition (knife skills, meal preparation and cooking competencies)

Thinking about the list of the 12 foods skills above, what would be your top 6 essential food skills that need to be taught by the time young people leave school?

These include selecting and purchasing food, storing food pre- and post cooking, preparing, cooking, presenting and serving food to individuals and family members.

If I were teaching a food skills program for the first two years of secondary school in one semester (based on one x one-hour length lesson once per week over a 16 week semester) my top 6 essential food skills would include

**I consider these food skills important because...**

**When evaluating food skills program what measures do you use to assess your students food skills?**

	Use always	Use frequently	Use some- times	Do not use at all
Formal student questionnaire				
Practical food skills tests at the end of the program delivery				
Written assessment tasks (tests, assignments, projects, written reports, data analysis)				
Informal student feedback to you				
Assessment of students retention of food skills from one year to the next				
Follow up student assessment of cooking practice at home				
Students written evaluation of their own work				
Other				

**If Other, then please indicate these**

**And finally, how would you rate your current program in teaching food skills to students?**

Not at all successful    1        2        3        4        5        6        7        Very successful

**Any other comment that you would like to make?**

Thank you for your time and participation in this survey. If you would be keen to receive the results of this survey at a later date, please email your name to Sandra Fordyce-Voorham [sfordyce@mentonegirls.vic.edu.au](mailto:sfordyce@mentonegirls.vic.edu.au). If you would be keen to participate in a follow-up survey (that would potentially include a survey of your students in your school about their food skills acquisition), please email Sandra Fordyce-Voorham [sfordyce@mentonegirls.vic.edu.au](mailto:sfordyce@mentonegirls.vic.edu.au)

## APPENDIX J. FOOD SKILLS RATING CHECKLIST

	Excellent (4)	Good (3)	Satisfactory (2)	Poor (1)	Not Shown (0)
<b>1.Beginning</b> Prepares for Cooking Food	<i>Uses</i> soap and hot water to thoroughly wash hands between fingers in hand washing sink.		<i>Insufficient soap</i> used to make lather.		<i>No hand washing</i>
Wash hands (Follow procedure – is it long enough to sing ‘Happy Birthday’?)	<i>Rinses</i> hands under running water and <i>dries</i> them thoroughly using single use paper towel or air dryer.		<i>Insufficient rinsing</i> to remove all lather. <i>Insufficient drying</i> of hands – or uses tea towel.		<i>No drying of hands</i>
Wears apron	<i>Checks</i> and <i>wears</i> clean apron free of grease and grime. Hair <i>tied</i> back, nails clean and trimmed (no nail polish)		Apron grimy or greasy. Hair strands over face and untrimmed finger nails.		<i>No apron</i> Loose long hair around face, long fingernails, nail polish
Follows instructions	<i>Reads</i> Recipe		<i>Scans</i> recipe		<i>Does not read</i> recipe
<b>2.During</b> <b>Food</b> <b>Preparation -</b>  Work Organisation  Time Management	<i>Collects</i> ingredients in one or two procedures.  <i>Measures</i> ingredients accurately (if applicable)  <i>Keeps</i> work space clean and tidy – <i>uses</i> separate scrap bowl to collect peelings, <i>wipes down</i> bench top with cloth wipe, ‘cleans up as they go’		Returns several times to collect ingredients  <i>Guesses</i> ingredients and measurements.  Cluttered bench top and food scraps remain on bench top.		<i>Does not measure</i> ingredients.   Bench top covered with peelings, <i>no</i> scrap bowl used. <i>No attempt</i> to keep bench top clean and free of food debris
Correct operation of knives appliances	<i>Uses</i> correct knife skills to prepare raw ingredients		<i>Some</i> correct knife skills used when preparing ingredients.		<i>No knife skills</i> evident

Preparing ingredients for cooking	<p><i>Consistently uses correctly coloured chopping boards</i></p> <p><i>Selects and knows how to use tools and equipment safely correctly</i></p> <p><i>Matches saucepan base to gas or electric element</i></p>		<p><i>Some correct use of colour coded chopping boards</i></p> <p>Saucepan or cooking vessel unsuited to size of gas or electric element.</p>		<p><i>Does not use correct coloured chopping at any stage of food preparation.</i></p> <p><i>Incorrect use of tools and equipment</i></p> <p><i>No indication given to choosing appropriately sized saucepan.</i></p>
<p><b>3.During Cooking Procedure</b></p> <p>Use of saucepans and cooking utensils</p>	<p><i>Consistently turns saucepan handles inwards on cook top</i></p>		<p><i>Saucepan handles may be turned inward during the procedure.</i></p>		<p><i>Saucepan handles project outwards during the procedure</i></p>
Temperature control	<p><i>Sets oven or grill temperature accurately (if applicable) and correctly.</i></p>		<p><i>Unsure about how to operate gas or electric oven or grill.</i></p>		<p><i>Asks or checks for assistance to operate oven or grill</i></p>
<p><b>3.During Cooking Procedure</b></p> <p>Use of mitts to remove hot items from oven or grill</p>	<p><i>Uses oven mitts at all times</i></p>		<p><i>Inconsistent use of oven mitts or uses tea towel</i></p>		<p><i>Uses wet tea or hand towel</i></p>
Supervision of appliances	<p><i>Constant supervision of cooking process – checks and adjusts heat for temperature control</i></p> <p><i>Remains at cooker when using wok or frying pan</i></p>		<p><i>Some supervision of cooking process – some checks and adjustments for temperature control</i></p> <p><i>Some attention at cooker when using wok or frying pan</i></p>		<p><i>No evidence of supervision of cooking process</i></p> <p><i>No checks and adjustments for temperature control</i></p> <p><i>No attention at cooker when using wok or frying pan</i></p>

<b>4.Presentation of Food</b>  Serving Temperature (hot food piping hot, cold food cold)	Food is served at correct temperature		Food is <i>allowed to stand</i> or <i>not served at peak</i> temperature.		<i>No evidence of safe food service</i> Food is <i>allowed to stand and become cold or hot</i> – cold food not refrigerated, hot food not kept ‘piping hot’
Correct use of ‘preparation for service’ chopping boards	<i>Uses</i> clean and correctly colour coded chopping board to carve or slice meat or prepare vegetables for service		<i>Uses</i> grimy or incorrect colour coded chopping board in preparation for food service		<i>Uses dirty or cross-contaminated</i> (cooked food carved or served from) chopping board on which raw food has been prepared.
Attention to Food Sensory Properties	<i>Adjusts</i> food seasoning – <i>uses</i> pepper (salt sparingly), other flavourings (herbs, spices) judiciously. <i>Appropriate use</i> of edible garnish complements meal served		<i>Some attention</i> given to food seasoning <i>No garnish or inappropriate garnish</i> (too large or inedible)		<i>Inappropriate or overuse</i> of seasoning ingredients <i>No garnish or inappropriate garnish</i> (too large or inedible)
Food Presentation	Food is <i>presented attractively appropriate food portion size</i> to plate size  <i>Balance</i> of colour and texture <i>Appetising aroma</i> – <i>well seasoned and tasty</i> food		<i>Some attention</i> given to food presentation – <i>appropriate food portion size</i> to plate size  <i>Some variety</i> of colour and texture of food items		<i>Careless presentation</i> – too little or too much food or <i>carelessly plated</i> food  <i>No variety</i> of colour and texture. Unpleasant aroma or taste (overly salty, overpowering spiciness)
Food service	Serving dish and plate <i>clean and free of fingerprints</i>		<i>Evidence of fingerprints or grease</i> on serving dish or plate		Serving dish or plate <i>greasy or grimy</i>
<b>5.Cleaning Up “Clean as you go” approach</b>	Adopts a ‘clean as you go’ approach to cleaning up		<i>Some cleaning up</i> during food preparation and		<i>No cleaning up</i> during food preparation and



During and After food service			service Equipment allowed to accumulate		service
<p><b>5.Cleaning Up “Clean as you go” approach</b></p> <p>Pre-wash Wash, rinse and dry dishes, preparation and cooking equipment</p> <p><b>“Does washing -up water look as clean as your bath water?”</b> (if not, then replace it)</p>	<p>Saucepans and other cooking vessels <i>soaked</i> in cold water (if necessary)</p> <p>All dishes, cooking equipment , cutlery and preparation dishes <i>scraped clean and pre- rinsed</i></p> <p>Dishes <i>stacked neatly</i> on draining board – <i>washed from cleanest (glasses, cutlery) to least clean (saucepans)</i></p> <p>Hot soapy wash water ( <i>water changed regularly</i>), dishes <i>rinsed clean</i></p>		<p>Saucepans and other cooking vessels <i>not soaked</i> in cold water</p> <p><i>Some evidence of food debris</i> on plates, equipment</p> <p><i>Some organisation evident</i> – dishes stacked but not washed in specific order.</p> <p><i>Washing up</i> water could be replaced more frequently or could be hotter.</p>		<p><i>No soaking</i> of saucepans – scorched</p> <p>Plates, equipment <i>remain greasy or grim</i>. Dishes <i>not scraped</i></p> <p><i>Minimal organisation</i> of washing up procedure – no stacking of dishes, no wiping down of bench tops, <i>Cold or dirty washing up</i> or <i>rinse water</i> – <i>uses same washing up water</i> throughout.</p>
<p>Use clean, dry cleaning and drying equipment (sponges, scourers, dish brushes, kitchen cloths and tea towels)</p>	<p><i>Uses clean</i> sponges/scourers or dish brush to thoroughly wash dishes and equipment</p> <p><i>Uses rinsed</i> clean kitchen cloths to wipe down bench tops and stove tops <b>before</b> washing up and <b>after</b> stacking up</p> <p><i>Uses clean dry</i> tea towel to thoroughly dry dishes – replace if necessary</p> <p>All cooking equipment and eating utensils <i>thoroughly clean and free of grime and scorch marks</i> (saucepans)</p>		<p><i>Uses inappropriate cleaning</i> equipment</p> <p><i>Uses</i> washing up sponge to wipe down bench tops</p> <p>Some food debris <i>allowed to remain</i> on bench tops or stove top</p> <p><i>Uses damp</i> tea towel (or <i>uses inappropriate</i> hand towel)</p> <p><i>Some evidence of</i> grime, grease on dishes and equipment.</p>		<p>Uses grimy or greasy sponges</p> <p><i>No wiping down</i> of bench tops</p> <p>Food debris and grease <i>remain</i> on bench tops and stove tops</p> <p><i>Uses wet</i> tea towel</p> <p>Dishes and equipment <i>remain</i> wet and greasy</p>

## **APPENDIX K STUDY 3 LETTER OF INVITATION AND INFORMATION TO PARTICIPANTS**



University of Wollongong

### **LETTER OF INVITATION**

Title: Evaluation of a Food Skills Rating Checklist

Dear Home Economics Professional

I am currently undertaking a PhD thesis evaluating skill-based healthy eating programs in Victorian secondary schools at the School of Health Sciences, University of Wollongong.

You have been approached as you have previously participated in my Study 2 online Teacher Survey and have kindly expressed an interest in participating in any follow up research. As part of my research project in Study 3, I plan to evaluate a food skills rating checklist that would be used to assess food skills learnt by junior secondary school aged students in Victorian secondary schools.

The aim of this project was to identify the checklist's ease and reliability of use and value to teachers in the classroom. In order to do this, I would like to invite you once more as a member of the home economics teaching profession to participate in this project. By participating in this research project you will have the opportunity to express your professional opinion on an evaluation tool that will help to measure the development of food skills in junior secondary school aged students. This data may then assist the home economics profession in making recommendations to appropriate authorities about food skills based curriculum.

Please see attached the Plain Language Statement including a list of Frequently Asked Questions for you to consider before deciding whether to proceed with this project. Of course your participation in the survey is entirely voluntary. I do hope that you will be able to participate in this project and look forward to your responses.

The formal team of investigators for this project are

Professor Tony Worsley	Assoc.Prof. Heather Yeatman	Sandra Fordyce-Voorham
Professor of Public Health	Assoc. Prof in Public Health	PhD Candidate
University of Wollongong	University of Wollongong	University of Wollongong
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Thank you for your interest

Sandra Fordyce-Voorham



## **PARTICIPATION INFORMATION SHEET FOR TEACHER RESEARCH PROJECT**

This Participation Information Sheet contains detailed information about the research project being conducted by the University of Wollongong. Its purpose is to explain to you as openly and clearly as possible all the procedures involved in this project before you decide whether or not to take part in it. If you have any questions about the project, please ask one of the investigators.

### **Frequently Asked Questions**

#### **WHO IS INVOLVED IN THIS RESEARCH PROJECT? WHY IS IT BEING CONDUCTED?**

The primary researcher for this project is Sandra Fordyce-Voorham, a PhD student of Health Sciences at University of Wollongong. Professor Tony Worsley, Professor of Behavioural Nutrition is supervising the project. Associate Professor Heather Yeatman Associate Professor of Public Health is the assistant supervisor for this project.

This research project is being conducted as part of a PhD study investigating and evaluating skill-based healthy eating programs in secondary schools. This project has been approved by the University of Wollongong's Human Research Ethics Committee.

#### **WHY HAVE YOU BEEN APPROACHED?**

You have been approached as a member of the home economics teaching profession to participate in this research project. You have also previously participated in my Study 2 online Teacher Survey and have kindly expressed an interest in participating in any follow up research.

#### **WHAT IS THIS PROJECT ABOUT? WHAT ARE THE QUESTIONS BEING ADDRESSED?**

This research project aims to gather information from home economics teachers about the ease of use and reliability of a Food Skills Rating Checklist as an evaluation tool on which to measure students' development of food skills. Specifically, we are interested in how these food skills are linked to improving the eating behaviours of young people now and in the future. We would like to know if the skills learnt at school are practiced at home and used later when young people choose to live independently and are required to shop, prepare and cook food for themselves.

#### **IF I AGREE TO PARTICIPATE, WHAT WILL I BE REQUIRED TO DO?**

This project involves you viewing three short videos of 5 minutes duration each (total time 15 minutes). Each video will demonstrate a different skill level (no skill, some skills and expert skills) in the completion of a simple food skills task (making a stir fry meal).

While you are viewing each video you will be required to rate each skill observed and indicate your rating on the Food Skills Rating Checklist. You will need to complete one Food Skills Rating Checklist for each video. After viewing the three video demonstrations

and completing the three Food Skills Rating Checklists you will be required to complete an Evaluation Form of the Food Skills Rating Checklist itself. It is estimated that this task will take 30 minutes duration each time the test procedure is conducted (total 60 minutes).

#### WHAT ARE THE RISKS OR DISADVANTAGES ASSOCIATED WITH PARTICIPATION?

Apart from the 60 minutes of your time to complete the initial and repeated task, we can foresee no risks for you. Your involvement in the study is voluntary. Refusal to participate in this project will not affect your relationship with the University of Wollongong.

#### WHAT ARE THE BENEFITS ASSOCIATED WITH PARTICIPATION?

The results of this survey will generate vital data which will assist in the development of an evaluation tool that will be used to assess food skill development in secondary school aged students. Upon completion of the project and further testing of the Food Skills Rating Checklist, it has the potential to provide you, as a home economics professional, with a valuable tool on which to assess your own students' level of skills. Overall, this data may then assist the home economics profession in making recommendations to appropriate authorities.

#### WHAT WILL HAPPEN TO THE INFORMATION I PROVIDED?

Any information obtained in connection with this project and that can identify you will remain confidential (solely to the named investigator and named supervisors). Any personal comments and ratings will not be individually disclosed nor used by the researcher as a personal or professional judgement of participants' as teacher professionals. Data collected will be de-identified in order to protect participants' confidentiality and will be stored securely in the researcher's password-protected computer. The results will be disseminated in a study submitted as part of the researcher's PhD thesis. The research data will be kept securely at the University of Wollongong for a period of 5 years before being destroyed.

#### SECURITY OF THE WEBSITE

Users should be aware that the World Wide Web is an insecure public network that gives rise to the potential risk that a user's transactions are being viewed, intercepted or modified by third parties or that data which the user downloads may contain computer viruses or other defects.

#### SECURITY OF THE DATA

This project will use an external site to collect data collected. The security of this site has been SSL encrypted. No personal information will be collected so none will be stored as data. Once data collection and analysis have been completed, the data collected will be imported to the University of Wollongong's server where it will be stored securely for a period of five (5) years. The data on the external site host server will then be deleted and expunged.

#### ETHICS REVIEW AND COMPLAINTS

This study has been reviewed by the Human Research Ethics Committee (Social Science, Humanities and Behavioural Science) of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted, you can contact the UoW Ethics Officer on (02) 4221 4457.

## CONSENT

You are invited to save and or print the Plain Language Statement.

I have read the Plain Language Statement above and I agree to participate in this research project (please click next to access the video link)

I DO NOT agree to participate in this research project (please click next to exit this website)

## APPENDIX L EVALUATION OF FOOD SKILLS RATING CHECKLIST



University of Wollongong

September 12, 2011

### Evaluation of Food Skills Rating Checklist

Please use this form after completing the Food Skills Rating Checklist.

Please complete all questions by selecting the best response in the box or filling in blank spaces and/or providing comments where possible.

#### Key Code

SD=Strongly Disagree

D=Disagree

Neutral= have no opinion

A=Agree

SA= Strongly Agree

Using a Food Skills Rating Checklist ...	SD	D	N	A	SA
is a good idea					
is an easy way to assess students' food skills.					
is an objective way of measuring students' food skills					
would help me more accurately assess students' food skills					
<b>Add own comments here</b>					

	SD	D	N	A	SA
<b>I would use a Food Skills Rating Checklist</b>					
If you have ticked Strongly Disagree or Disagree please outline your reasons below					

<b>Personally, I would use a Food Skills Rating Checklist...</b>	SD	D	N	A	SA
to assess my students' practical skills					
to assess the progression of my students' practical skills					
to help me report on my students' practical work					
Any Comments					

The following statements refer to **this** particular Food Skills Rating Checklist

<b>I would use <i>this</i> Food Skills Rating Checklist...</b>	SD	D	N	A	SA
to assess my students' practical skills					
to assess the progression of my students' practical skills					
to help me report on my students' practical work					
to compare my students' skills with those of colleagues' students					
<b>Any comments?</b>					

For me to use this particular Food Skills Rating Checklist it would need to...

1.
2.
3.
<b>Your suggestions for improvement</b>