Investigating the role of whole-school input on children's knowledge and selection of healthy foods.

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Professional Masters of Education

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Date of submission: Thursday 10th May 2018

Word Count: 10,999

This dissertation is submitted in fulfilment of the Professional Masters of Education, for Marino Institute of Education, an associated College of The University of Dublin, Trinity College.

Declaration

I hereby certify that this material, which I now submit for assessment on the programme leading to the award of the degree of Professional Master of Education, is entirely my own work and has not been taken from the work of others, save to the extent that such work has been cited and acknowledged within the text of my work. I further declare that this dissertation has not been submitted as an exercise for a degree at this Institute and any other Institution or University. I agree that the Marino Institute of Education library may lend or copy the thesis, in hard or soft copy, upon request.

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Acknowledgements

Firstly, I would like to express my sincere gratitude to my Supervisor Mairéad Minnock. Without her expertise, constant support and invaluable constructive suggestions, the completion of this Dissertation would not have been possible. Her willingness to give her time so generously, despite her own busy schedule has been very much appreciated.

My special thanks are also extended to all of the staff in Marino Institute of Education, particularly those involved with supporting the Professional Masters of Education students over the past two years.

In addition, I would like to thank my own parents, Maria and Niall, for their wise advice and their sympathetic ears. Finally, I must express my profound gratitude to my sister Aoife, my boyfriend Fionn and fellow PME student and dear friend, Meave. This accomplishment would not have been possible without their ongoing encouragement and guidance.

Abstract

In today's society, there is an increased emphasis on the importance of maintaining a balanced, nutritious diet. With this in mind, it should be understood that Irish primary schools should be one of the main bodies responsible for educating children about healthy eating.

The aim of this research was to determine whether implementing a short term whole-school approach to healthy eating would impact on a child's knowledge and selection of food, with the awareness that if presented with a positive correlation, a long term approach to healthy eating may further heighten these positive results. The research question is answered through an experimental design that consists of both quantitative measures and action research. Over a period of five weeks, the researcher distributed two set of questionnaires to all participants, as well as conducting in-school action research. Children aged between four and eight, from Junior Infants up to 2nd class completed these questionnaires, and the whole school participated in the action research element of the design.

These results indicated that a short term whole school approach to healthy eating does have an impact on children's knowledge and selection of foods. On this basis, it is recommended that Irish Primary Schools take the responsibility of educating children about healthy eating from Junior Infants all the way up to 6th class. In addition, formal healthy eating policies should be created by schools nationwide, as well as the implementation of whole school approaches which may influence children's knowledge and selection of healthy foods.

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List of Abbreviations

CDC	Centers for Disease Control and Prevention
DEIS	Delivering Equality of Opportunity in Schools
DES	Department of Education and Skills
ENHPS	The European Network of Health Promoting Schools
HFSS	High in fat, sugar and salt
HPS	Health Promoting Schools
HSE	Health Service Executive
SPHE	Social, Personal and Health Education
WHO	World Health Organisation

Introduction

This Chapter discusses the background of this research, the research problem, the rationale for the research and finally, the research question. Moreover, an outline of both the research hypotheses and the structure of the chapters to come are provided.

1.1 Background

Replacing Curaculum Na Bunscoile (1971), The Primary School Curriculum was presented by the National Council for Curriculum and Assessment (NCCA) in 1999, and has since been implemented across all Irish primary schools. The Curriculum's main objective is to provide children with opportunities to develop to their full potential, whilst also cognisant that individual learning styles are unique. Despite its fundamental strengths, this Curriculum has presented teachers and children with some flaws. One major rationale for this research is founded on one of these flaws – the lack of access to pedagogical input surrounding healthy eating across the Curriculum.

Despite the irrefutable evidence of benefits associated with teaching about healthy eating from a young age, the Curriculum is not reflective of this widespread knowledge. Considering this, this study analysed what impact the implementation of a whole-school approach over a five week period could have on a child's knowledge and selection of different foods. This research focused on children aged between four and eight from Junior Infants through to 2nd class, in a working class DEIS (Delivering Equality of Opportunity in Schools) school in Ireland.

1.2 Research Problem

Primary level teachers in Ireland consult the 1999 Primary School Curriculum for the recommended skills and topics to be taught during the academic year. Critically reflecting on the components of the 1999 Curriculum, with particular reference to the subjects Social Personal and Health Education (SPHE) and Science, little emphasis is awarded to the

delivering of lessons around healthy eating. Without ongoing input on the topic of healthy eating, McKinley et al (2005) state that we have inadequately prepared children for a healthful future.

1.3 Rationale

Although extensive research has been published in relation to the importance of healthy eating for children, little of this research considers the implementation of whole school promotion approaches within the Irish Primary School context. This enquiry also sought to compliment any pre-existing research completed in relation to healthful choices, for example, the unanimous opinion among international researchers such as Burke (2002) and Bauer, Yang and Austin (2004), that food education should be delivered to children as young as four. Practical implications of this research which may benefit both the researcher and the wider teaching community may include the comprehensive health education training of school communities, and in turn, form more health conscious children who make conversant decisions about foods they consume. While this study is based upon numerically and geographically small sample groups, the findings may be useful in some contexts.

1.4 Aims/Research Question

This investigation explores the impact that a five week whole-school approach to healthy eating can have on children's knowledge and selection of different foods following a short term implementation.

1.5 Hypotheses

The research hypotheses are as follows:

- The implementation of a whole-school approach to healthy eating may positively impact primary school children's knowledge and selection of foods.
- A retention of learning will be present in some cases but not all, and hence the necessity of implementing a long-term approach.

- Evidence of a correlation between children's age, gender, class level and their knowledge and selection of different foods.

1.6 Structure of Chapters to follow

This Dissertation is divided into six chapters, each containing headings and subheadings. Chapter one provides an introduction to the study, and Chapter two offers an extensive review of relevant literature. Chapter three outlines the rationale supporting the selection of the mixed methods approach utilized during this research, a synopsis of how the research was undertaken, and some limitations. Within Chapter four, the results of this research are presented in graphs and tables. Chapter five delivers an in-depth discussion and analysis of the results under the themes of Gender, Age, Class Level, Consumption & Interest and Knowledge & Understanding of Healthful Choices. Finally, Chapter Six concludes with a short review of the study and recommendations for future research in this field.

Literature Review

2.1 Introduction

Studies conducted by Burke (2002) and Bauer et al (2004), have shown that the school environment should be the primary point of nutritional education, in order to enhance children's understanding and awareness of their food choices. The question that remains however, is whether or not children in the Irish primary school context receive enough curricular input to sustain these choices into early adulthood? Worsley (2002, p. 584) suggests that there is a need for a "student centered life skills curricula", in order for children to be equipped with the abilities to evaluate the nutritional gains of particular foods. Worlsey (2002) also detects the scarcity of research relating to children's knowledge and selection of foods, and states that it is often taken for granted that children are knowledgeable in this area. He considers that researches must pay greater attention to children's knowledge frameworks or "schema building" in order to maintain that nutritional knowledge can change food behaviours (Worsley, 2002, p. 584).

This chapter examines the National Curriculum and International Curricula, as well as some universal healthy eating implementation strategies. Furthermore, it incorporates views of the World Health Organisation (WHO), the Health Service Executive (HSE) and children's own perspectives, whilst questioning the necessity of a whole-school approach to this pedagogical input.

2.2 Curricula

2.2.1 The Irish Curriculum. Examining the Irish Primary school Curriculum (1999), it is evident that nutrition does present itself in a variety of different topic areas and themes. Under the strand unit of "human life" in the strand of "living things", children in Irish 3rd and 4th classes get the opportunity to examine the "need for a balanced and healthy diet" and can "design and make a nutritious sandwich for lunch" (NCCA, 1999, p. 61). In 5th and 6th class,

this concept is progressed further whereby the children are encouraged to recognise "the importance of food for energy and growth", the "importance of a balanced and healthy diet" and can even "design and make a balanced and nutritious lunch menu for self or younger child" (NCCA, 1991, p. 82). This may seem like sufficient educational input on the theme of nutrition, however, this would pose many problems for researches such as Pérez and Aranceta (2001). Their belief is that nutritional education is a key element of the promotion of lifelong healthy eating patterns and should be developed from a young age. Although children do explore food choices on the Irish language curriculum under the theme of "Bia", there is no requirement by the NCCA (1999) for children to identify or justify healthier food choices and would be seen as a major flaw by Burke (2002).

The NCCA (1999, p. 24) state in the Science Curriculum that teachers should inspire Junior and Senior Infant children to "become aware that people have a variety of needs for growth (exercise, food, clothing, shelter)". Notably, teachers may opt to incorporate the idea of healthy eating and food choices, however, this is by no means a direct requirement of the Science Curriculum. This objective remains the exact same for children of a first and second class level, with no curricular development present. Bauer et al (2004) would challenge this lack of curricular advance, given their belief that education based around nutrition should be constantly enriched and evolved.

In order for a child to fully comprehend personal food choices, nutrition education should be intertwined into curricular areas such as Maths, Languages and Drama (Pérez & Aranceta, 2001). They also maintain that children should be taught about food preparation and food preservation/storage as a vital aspect of the Curriculum. The SPHE Curriculum strives for teachers to educate children about balanced diets, healthy and unhealthy foods as well as examining the food pyramid from as young as Junior Infants. On the weekly time framework based on Circular 0056/2011, SPHE has an allocation time of a mere 30 minutes (NCCA,

2016). Burke (2002) reiterates that educating children about health and nutrition is vital during early childhood, not only because it influences healthy choices in the short-term, but it also has a long term cognitive effect of the individual.

> According to the Department of Education and Skills (DES, n.d.):
>
> Social, Personal and Health Education (SPHE) and Physical Education (PE) at primary level, and these subjects together with Home Economics at second level, cover the areas of healthy eating and the food pyramid, healthy lifestyle, physical health, body care, exercise, relaxation and diet.

Although this statement is not false given the ongoing attempts of the government to devise healthy eating policies, planning templates and programmes such as "Food Dudes", the effectiveness of these efforts are unknown. The DES (2016) reveal that only 40% of Primary Schools are involved in the 'Health Promoting Schools' (HPS) initiative.

The aims below, as taken directly from the "Promotion of Healthy Lifestyles in Primary Schools" (DES, 2016) Programme, are relevant to teaching about healthy eating, however, it should be considered whether children are benefiting from them given the limited time allocation to the teaching of SPHE and Science. The aims of the HPS are as follows:

- Foster the healthy development of the whole-school community.
- Provide a framework for developing health promotion initiatives whilst supporting and enhancing implementation of the Curriculum.
- Support the planning, implementation and evaluation of health-related activities under school self-evaluation, and school development planning processes.
- Enhance links between schools and their communities (DES, 2016, p. 3).

Considering that some schools are implementing the initiative and are incorporating programmes such as 'Food Dudes' or the 'Incredible Edibles', it should be uncovered whether

new information the children are receiving in stand-alone lessons is visible in the whole-school environment, similar to the idea of Burke (2002).

2.2.2 Californian Curriculum. From Kindergarten through to Grade twelve in California, "Health education is an integral part of the education program for all students" (Californian State Board of Education, 2009, p. VI). There are eight overlapping standards from Kindergarten to Grade twelve which explore Health in general, however a number stand out given their specific connections to nutritional education. These include, Essential Health Concepts, Practicing Health-Enhancing Behaviours and Health Promotion. In Kindergarten, Grades two, four, five, seven, eight and nine, through to Grade twelve, children have the opportunity to focus specifically on the Irish equivalent of a strand unit, "Nutrition and Physical Activity". The objectives of this Strand are as follows:

1. Name a variety of healthy foods and explain why they are necessary for good health,
2. Identify a variety of healthy snacks,
3. Describe the benefits of being physically active,
4. Recognize the importance of a healthy breakfast" (Californian State Board of Education, 2009, p. 1).

These objectives further advance as the child matures, and incorporate the importance of water, different drinks and their health benefits or detriments, food preparation and storage, nutrients, food groups, nutrition fact labels and differentiating between diets that are health promoting and supressing.

2.2.3 International Curricula. The Centers for Diseases Control and Prevention (CDC, 1996) offer recommendations to schools in the USA within their varying curricula. Like the NCCA, it is hoped that young children are exposed to health education, explicitly within the schooling environment. The CDC (1996) argue that schools have access to more children than any other place in society. Secondly, within schools, children have many opportunities to

utilise their newly learnt healthy eating mannerisms. Furthermore, children can be taught to resist external pressures from society which may discourage their attempted healthy eating patterns. Finally, the CDC (1996) recognise that teachers in US are highly trained personnel who are adequately equipped to deliver nutritional programmes to children.

2.3 The whole-school approach

A study was conducted by Burke (2002) in Coleraine, Northern Ireland, which examined whether nutritional theory that eleven and twelve year old children learnt in the classroom, was put into practice in school. Markedly, what these children learnt in the classroom was weakened by the lack of contribution by the whole-school community. Neumark-Sztainer, Story, Perry, & Casey (1999) all support Burke's (2002) belief that if nutritional education in schools is to be effective, teachers, parents, and the wider community must be committed to the education, or in cases, re-education, of children. In addition, Zarnowiecki, Dollman and Sinn (2011, p. 177) believe that from the early stages of life, "influential attributes" are formed which can be difficult to modify in later life.

Bauer et al (2004, p. 43) reinforce that schools are likely the most influential place which "promote and sustain" healthful nutrition in children. During their research they noticed disconnect between content taught in lessons about nutrition, and the way in which the "school environment constrains and compromises healthful choices" (Bauer et al, 2004, p. 43). Neumark-Sztainer et al (1999) state that if programmes in schools delivering information about nutrition are to be effective, they must consider environmental factors such as the whole-school approach, since, an absence of cooperative learning and implementation could potentially inhibit the successful implementation of good health habits in pre-adolescents.

2.4 School garden schemes

Morgan et al (2010) discovered that students exposed to a school garden were significantly more willing to taste vegetables, and had rated them higher than children who had

no exposure. Morgan et al (2010) decipher that the presence of a school garden can enhance children's willingness to sample new foods. The research of Christian, Evans, Nykjaer, Hancock and Cade (2014) compliments that of Morgan et al (2010), and reiterates that although a challenge, when gardening interventions are effectively implemented within schools, there is the possibility of increasing children's daily fruit and vegetable intake.

2.5 International attitudes

2.5.1 World Health Organisation. The WHO (2006) identifies that the acknowledgement of the benefits of healthy eating have been misplaced due to globalisation and the constant expansion of international food markets. Therefore, the "nutritional status" of children's food regimes worldwide has suffered as a result of trade actions that have amplified dependence on food importations (WHO, 2006, p. 7). Comparable to Burke (2002), the WHO (2006, p. 7), acknowledge that "a whole-school approach to healthy eating can provide children and adolescents with both the opportunity to learn food and nutrition skills and how best to implement them both within and outside the school setting".

Considering this, the WHO devised a holistic European plan in 1995, incorporating a top-down approach targeted at influencing parental, school catering and all food providers' perceptions and actions. This is imperative when addressing child nutrition and health, as, anybody involved in the provision of school food can impact on the overall nutritional quality, and consequently, diets of young consumers (WHO, 2006).

The European Network of Health Promoting Schools (ENHPS) aims to incorporate "health promoting school policy" into broader health and educational sectors. The ENHPS have devised nutritional campaigns across Europe, including "Tutti Frutti" in Brussels and the "Tiger Kids" Programme in Germany, not dissimilar to the Irish equivalent of "Food Dudes". Programmes such as the former foster physical well-being and thus, contribute to improved self-esteem and positive body image (WHO, 2006).

2.5.2 HSE Healthy eating guidelines. The findings from the HSE's 'Healthy Ireland Survey' (2015), was of significant concern to the Department of Health. 60% of Irish residents eat high in fat, sugar and salt (HFSS) snacks on a daily basis, with almost half of the population eating more than six portions daily. In response, the Department of Healthy devised a long term plan (2016-2025), which provides daily meal plans for children aged five and over. This publication also reinforces the concept of "size matters" as a pedagogical instruction, suggesting that children should learn to opt for smaller portions by referring to the food pyramid.

2.5.3 Food Dudes. The Food Dudes Programme was developed by the University of Wales, Bangor, to encourage school children to learn about healthy foods and to eat more fruits and vegetables, given the increased control that they have over food choices than they did in early life (Food Dudes, 2011). Between the ages of five and eleven, children have a strong ability to retain newly acquired information taught in school, but are also heavily influenced by popular fads and their own acquaintances. "It is ultimately designed to enable children to enjoy eating healthy diets, and to create a healthy eating culture within schools" (Food Dudes, para. 2). Food Dudes reiterates the belief of researches that pedagogical input in early life is essential for the lifelong development of healthy eating patterns in children.

2.6 Children's perspectives

Frobisher, Jepson and Maxwell (2002) conducted research in relation to children's attitudes to, and knowledge of nutrition and healthy eating. It was concluded from their research that females were more health conscious than their male counterparts. Over half of the male participants believed that healthy eating involved dieting and a further 80% of both male and female participants claimed they understood the concept of a healthy diet, yet had minimal knowledge on fat, carbohydrate and fibre consumption (Frobisher et al, 2002). Burke (2002) conducted similar focus groups and outlined how male participants stated that if provided with

more hands-on experiences whilst learning about nutrition, it would serve them significantly better in the future.

Subsequently, Frobisher et al (2005) found that 71% of pre-adolescents knew that jam doughnuts were high in fat, yet their knowledge of the fat content of other foods was unsatisfactory, with only 46% of participants identifying that sausage rolls were not low in fat. Correspondingly, Zarnowiecki's et al (2011) findings demonstrated that although 90% of children classified doughnuts, chocolate and lollipops as unhealthy, over 50% of the children did not recognise that muesli bars, fried chicken and coco pops were unhealthy.

McKinley et al (2005), identified some of the major blocks against healthy eating in children. These include but are not limited to the taste of food, its appearance, the cost of good foods and body image/weight concerns. Parallel with the research conducted by Frobisher et al (2005), there were similar disparities between the sexes, with female food choices generally motivated by appearance and male food choices determined by sport (McKinley et al, 2005). It should be noted that although there were discrepancies present, both male and female participants could categorise food as "good" or "bad".

During a project conducted by McKinley et al (2005) with groups of children from eleven schools in Northern Ireland and England, they attempted to gain an understanding of children's opinions about food and nutrition, and influences on their food choices and eating habits. To their surprise, it was discovered that the majority of children associate the term "healthy eating" with the consumption of fruits and vegetables, excluding all other foods which are deemed healthy. A small number identified that brown bread and milk are healthy options, yet presumed that healthy foods they had not yet tried, would not be tasty. For example, "'Organic ice cream – that's probably minging'" (McKinley et al, 2005, p. 546). This belief coincides with findings from the HSE's 'Healthy Ireland Survey' (2015) that there is a presumption by children that healthy foods are associated with being unappetizing.

Furthermore, McKinley et al (2005) reiterate the critical need to develop effective educational tools and interventions to improve the nutritional attitudes of children, given their misinterpretation that the preparation of healthy meals is more time consuming. Additionally, McKinley et al (2005, p. 546) found that "taste was by far the biggest impediment, as healthy food was not positively associated with taste", which progresses into the following discussion on the barriers impacting children's healthy eating habits.

2.7 Barriers to healthy eating – Intrapersonal & Environmental

Nepper and Chai (2016) identify a handful of barriers which inhibit children's healthy eating patterns based on the knowledge that over 65% of children's calorie intake occurs within the home. Nepper and Chai (2006) uncovered that cost is a major factor inhibiting parents buying healthier foods for their children. Ling, Robbins and Hines-Martin (2005), agreed that parents voiced that healthier food items generally came in at a higher cost, and thus, could not support this financial burden on a weekly basis. Revealed by parents to both Nepper and Chai (2016) and Ling et al (2005), was the presupposition that their children's early exposure to unhealthy foods and lack of support from their spouse have made it increasingly difficult to implement healthy choices all the time. Ling et al (2015), uncovered that young parents in particular, expressed having limited cooking skills and found it difficult to produce colourful meals that were both tasty and aesthetically pleasing for their children. In response, these parents suggested that cooking skills and classes need to be provided by schools to their children, so that they don't inherit their own poor eating habits.

Parents in the research of the Ling et al (2015) reported that pre-adolescents did not have equal access to after school programmes in their communities, and that the sheer lack of these programs which provide children with excellent opportunities to learn about healthy eating were uncommon. Parents also reported that their children did not comprehend the benefits associated with healthy eating, and suggested that their children may not be able to

recognise fruits and vegetables due to a lack of "age appropriate education in school or at home" (Ling et al, 2015, p. 6). Parents then suggested employing effective strategies with young children in the classroom, including role-play, dressing up as fruit or vegetables in drama, artwork based around healthy foods and even watching televisions programmes and videos which demonstrate healthy eating behaviours to their children. Again, parents stated that schools should deliver age and stage appropriate health education to their children "in a kid form" (Ling et al, 2015, p. 6).

An additional barrier to implementing healthy choices within the home as identified by Nepper and Chai (2016), is of course, the busy schedules that parents have to cope with. The majority of parents who participated in the research stated that they had overwhelming schedules, which included children's activities and extensive working periods, causing a lack of time and energy to cook healthy foods and family meals. They also reveal that, while parents generally have strategies in place to incorporate healthy choices in their day to day lives, the media often makes it extremely difficult for them to follow through with these approaches when their children are asking for junk food items on a regular basis.

2.7.1 Influence of the Media. Briefly examining the role of television advertisements in children's food choices, Batada, Seitz, Wootan and Story (2008) express that advertisements can negatively impact and educate children about "good" food choices. Food items such as fruit, vegetables, low-fat dairy products and whole grains are seldom shown in advertisement and 90% of advertisements on Saturday morning children's television show foods and drinks which are high in fat, sodium and added sugars and thus, are low in nutrients (Batada et al, 2008). Consequently, if children aren't learning about good food choices from the mass media, Batada et al (2008) support the strong beliefs of researches such as Burke (2002), that schools play a pivotal role in the nutritional education of young children.

2.8 Conclusion

In conclusion, research supports the conviction that instruction relating to healthy eating should have a secure place on the National Curriculum. This is necessary to help foster healthy attitudes and knowledge of foods and healthy eating in pre-adolescents. "Nutrition education is an accessible effective tool in health promotion programmes with a focus on the development of healthy eating practices" (Pérez & Aranceta, 2001, p. 131). Pérez and Aranceta (2001) reinforce that when interlinked into the school Curriculum, food education should be age appropriate, should address the needs and interests of the child and must consider what children already know.

Both Frobisher et al (2005) and McKinley et al (2005) suggest that health care specialists and teachers have a huge challenge ahead, which involves encouraging young people to view healthy eating as an "attractive and achievable behaviour" (McKinley et al, 2005, p. 542). The limited time allocated by the DES to teachers examining nutrition and healthy eating with children on the Irish Curriculum, may impact children's knowledge and selection of healthy foods, given the inadequate pedagogical input.

Methodology

3.1. Introduction

This chapter outlines the procedures involved in assessing and implementing a whole-school approach to influencing children's knowledge and selection of food. This was conducted by means of a mixed methods approach, including both quantitative measures and action research. Within this chapter, the Researcher will discuss the participants, the selected methodologies, the procedure, how the data was analysed and the limitations of this research.

3.2 Participants

A total of one hundred and twelve consent forms were distributed to parents and guardians, however, only eighty three of these were returned. Three children were opted out of the research by parents, and therefore, a maximum of eighty Participants could take participate. The inclusion criteria involved participants filling in a consent form, completing two questionnaires over a period of five weeks and participating in the whole school approach to healthy eating. Eighty participants completed Questionnaire 1 and seventy six completed Questionnaire 2, representing 71% of the expected population. Participants came from Junior Infants through to Second Class, and their age range varied from four to eight years of age. A slight drop of four participants occurred between the administration of Questionnaire 1 and 2 given that 4 participants were either unwell, had moved school or were on holidays.

Crossman (2018) identifies that heterogeneous purposive sampling is most efficient when examining a broad range of perspectives from a variety of angles, relating to a particular phenomenon. Therefore, the researcher employed this technique given that the aim was to implement a whole-school approach and to investigate its impact.

3.3 Methodologies & Justification

This research includes elements of quantitative research in the form of questionnaires, action research and the use of literature (previously reviewed in Chapter 1).

3.3.1 Quantitative Research. According to Babbie (2010), quantitative methods of research accentuate the statistical mathematical examination of data collected through polls, questionnaires, and surveys. One aspect of this research concentrates on assembling and analysing numerical data, and generalizing it to elucidate a specific phenomenon, and thus, quantitative research was selected as an effective methodology.

3.3.2 Research Design. The quantitative aspect of this research consisted of two questionnaires, spaced approximately five weeks apart. Questionnaire 1 was completed between the 9th and the 13th of February 2018, and Questionnaire 2 was completed between the 21st and 22nd of March 2018. This deliberate gap between Questionnaire 1 and 2 was vital for uncovering any potential positive or negative impacts correlating to a whole-school attempt to influence children's selection and awareness of healthy foods.

Questionnaire 1 consisted of three Sections, all containing some visual representations. Section 1 encompassed questions with yes or no answers, Section 2 utilized a Likert Scale to assess participant's opinions, and finally, Section 3 requested that the participant circled one option. Section 2 of Questionnaire 1 offered five different facial expressions to children, which represented how they felt about a certain statement. Examining Section 2 of Questionnaire 1 (see Appendix E), reading from left to right, the faces represent the following: Really like, Like, Neutral, Dislike and Really Dislike. For the purpose of Questions 22-24 they represented the following: Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree.

Questionnaire 2 was more simplistic in nature, and all questions, with the exception of question 15, sought for the participant to tick one box, be it yes or no (see Appendix F). Question 15 of Questionnaire 2 requested that the participant selected one of two options.

3.3.3 Procedure

A pilot study was conducted on the 6th of February with one child from both Junior Infants and 2nd class. As a result of this, it was determined that a minimum of twelve minutes

would be required per group extraction to complete the separate questionnaires. Some additional visual representations were included in Questionnaire 1 in order to support children with weaker reading skills and to make the questionnaires more pleasing to the eyes of the Participants.

Initially, participants from First and Second class were extracted in small groups of four, for a period of approximately twelve minutes. Although effective with older participants, when dealing with younger participants, this became increasingly difficult and elongated. For this reason, the Researcher decided that the protocol would be much more simplistic in nature if participants completed the questionnaires in a one on one setting. The Researcher situated themselves outside the class of the participant and could read questions aloud for the participants where necessary.

Prior to the completion of Questionnaire 1, the Researcher drew the participant's attention to a mini whiteboard which contained all facial expressions in Questionnaire 1 (See Appendix E). A written description was provided under each face, meaning that the Researcher's description of each remained constant as they read these aloud to the participants. In cases where participants required support reading questions, the Researcher read the question aloud twice from start to finish, maintaining a neutral tone.

3.3.4 Action Research. The purpose of action research is defined by both Reason and Bradbury (2001, p. 2) as follows:

> A primary purpose of action research is to produce practical knowledge that is useful to people in the everyday conduct of their lives. A wider purpose of action research is to contribute through this practical knowledge to the increased wellbeing – economic, political, psychological and spiritual – of human persons and communities.

The action research element of this mixed-methods approach was an on-going experience for both the participants of the research and the wider school community. Two major events were

held in the school, in unison with some minor, yet influential inputs into children's knowledge and selection of varying foods. This comprehensive approach commenced on the 9th of February and continued for a period of five weeks.

Previously imposed in said school is an informal healthy eating approach whereby teachers encourage children to eat healthily throughout their schooling career and model healthy eating on a daily basis. Given the DEIS status of the school, all children received school lunches and thus, most items fell in line with the healthy eating belief of the school. The Researcher monitored children in classes and gathered field notes in a copybook, identifying who chose to evade the fruit in their lunches. In these cases, children were encouraged to try a small portion of the food in question.

The Researcher organised for a representative from Keogh's Farm in County Dublin to visit and deliver a one hour presentation to the children from First and Second class. During this period, the children were taught about the growth and mass production of the potato on Keogh's Farm. They were also taught about the importance of eating potatoes in line with maintaining a balanced diet. Additionally, "Intercultural Day" was held during this five week period, and children were invited to represent their individual Nationalities by means of attire and foods from their own cultures. The Researcher was responsible circulating all classes prior to the event on the 22nd of February 2018, in order to motivate children to bring healthy dishes into school for other members of the school community to sample. On the day, it was specified in the Researcher's field notes that children were willing to taste new healthy dishes if their classmates did alongside them.

The Researcher also enrolled the school in Agri Aware's Incredible Edibles Programme. This healthy eating initiative for Primary School children in Ireland inspires schools across the country to facilitate children in growing a range of vegetables and herbs. All

participating schools are provided with "grow packs" containing everything needed to grow and nurture a selection of healthy foods.

The most significant event held for the school community during this phase was a Fruit Tasting Morning (See Appendix G for photographs). This was hosted by the Researcher and students from Second Class on Tuesday the 27th of February, 2018, in attempt to mould children's perceptions of healthy eating. Thanks to the generosity of a local supermarket, there was an abundance of fruit for the children to sample. The fruits included mangos, apples, bananas, oranges, tangerines, pineapples, melons, pomelos, strawberries, kiwis, grapes watermelon and pears. Children visited the classroom alongside their class teacher, and the Researcher used their field notes to record observations made.

3.4 Methods of Data Analysis.

Data from both Questionnaire 1 and 2 were inputted in Microsoft Excel, with the three sections of Questionnaire 1 split onto separate sheets. All of data was converted into Pivot Tables, where it could be manipulated and analysed in great depth. Here, comparisons could be drawn between Questionnaire 1 and 2 and data could be filtered based on Participant's Gender, Class, Age, the question, and the answer/opinion of the Participant.

3.5 Limitations.

The following themes were identified as limitations to this research project:

1. **Time scale:** This mixed-methods research was completed over a five week block. To ascertain whether a whole-school approach can inform children's knowledge and selection of different foods, research needs to be conducted over a longer period of time.
2. **Scale of Research:** This body of research was designed to reflect the impact that a whole-school approach to healthy eating may have on a child's knowledge and selection of healthy foods. A total of 80 Participants completed Questionnaire 1, and

76 Participants completed Questionnaire 2, all from one DEIS school in Dublin. It is recognised that this sample merely reflects a small portion of children aged between 4 and 8, and omits addressing the entire Irish primary school population.

3. **Memory:** Similar to the point made in relation the research time scale, it is acknowledged that children had a small window to learn and retain new knowledge in relation to healthful choices. If completed over a longer period of time, there is the possibility that the participants may cease to recall this newly acquired information.
4. **Age:** It has been taken into consideration that the younger the participant, the more likely they are to say that they understand a certain concept even if that is not the case. As discussed in Chapter 4, when asked about their familiarly with Food Dudes, 13 Participants aged five, 8 aged six, 5 aged seven and 0 aged 8 were unfamiliar with Food Dudes (I.e., lack of knowledge decreased as age of Participant increased). Theoretically, those Participants aged four should have less of a knowledge about the Food Dude Programme than their older counterparts, yet only a mere seven expressed unfamiliarity.
5. **Previous assumptions:** This research assumes that all children in the school start in Junior Infants and progress through the vertical classes within the school, and that there is a correlation between the Participants age and their knowledge of healthy eating.
6. **Decreased number of Participants:** Although it will be addressed in Chapter 4, it is important to note that there was a slight percentage drop (-5%) in the number of participants who completed Questionnaire two. 95% stated that they liked fruit in Questionnaire 1 whereas only 93.4% expressed that they like fruit in Questionnaire 2. This drop of -1.6% may be due to the decrease in the number of overall Participants in the second Questionnaire. Had an additional two Participants completed Questionnaire 2 and answered that they liked fruit, there would have been an overall percentage

increase in the number of Participants who liked fruit between Questionnaire 2 and the initial Questionnaire. Notably, had these four Participants completed Questionnaire 2, it is likely that the percentage of those who eat fruit every day, like vegetables and eat vegetables every day would have been further amplified.

7. **Cost:** During Questionnaire 2, participants were asked whether they have continued to eat some of the fruits that they tried during the Fruit Tasting Morning. 62 Participants (81.6%) said that they had continued to do so, however, 14 (18.4%) said that they had not. This may have a direct link to the cost of fruit and the social/financial backgrounds of the families of the participants. In addition, it has been considered whether the purchasing of healthy items is sustainable for all families.

Results

This Chapter offers a presentation of the results of Questionnaire 1 and 2, as well as a discussion relating to the action research component of this study.

Figure 1. A breakdown of the eighty male and female participants.

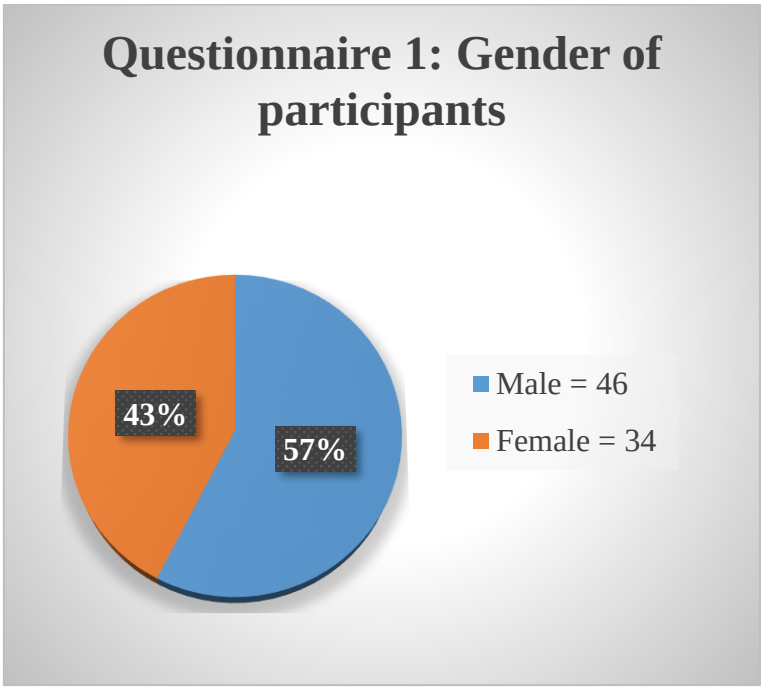


Figure 2. A breakdown of the participants aged four to eight.

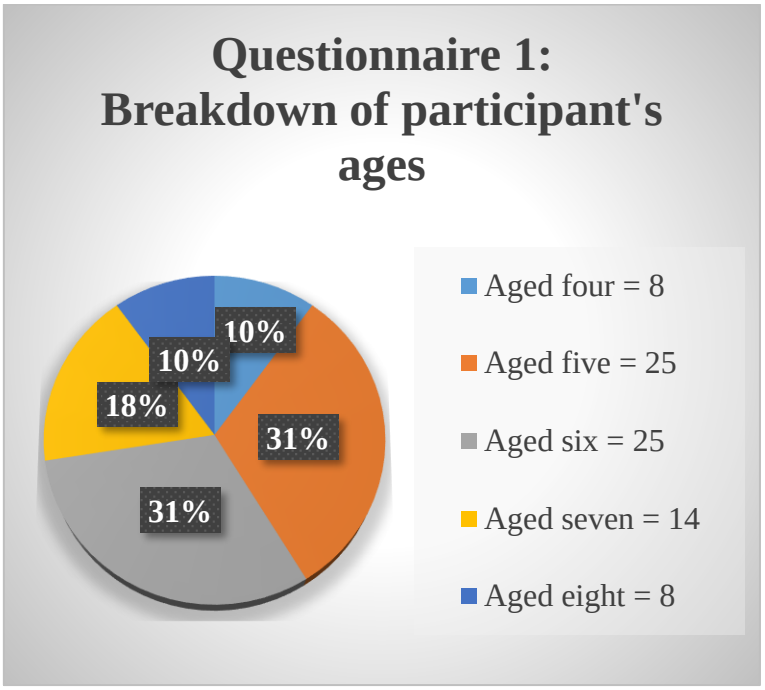


Figure 3. A breakdown of the Participants from Junior Infants to Second Class.

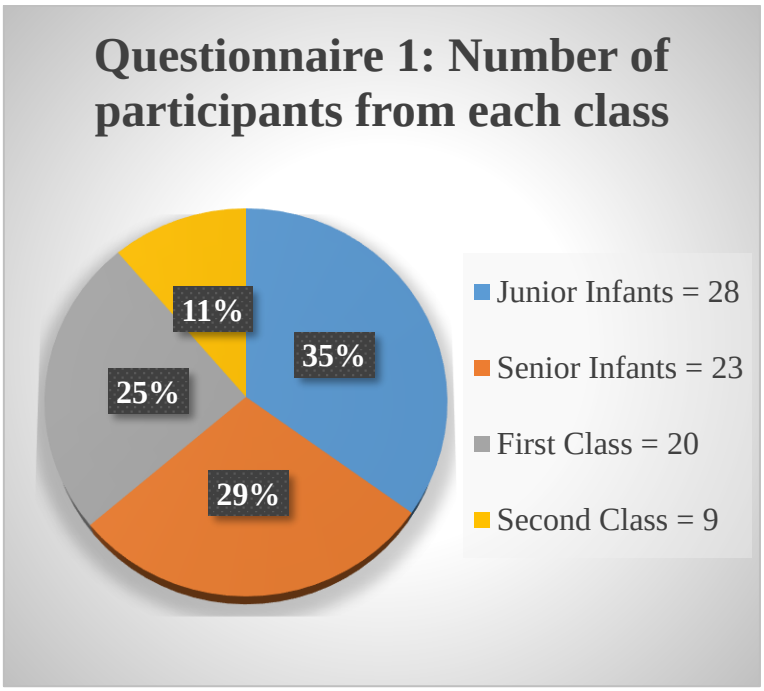


Figure 4. Participants who like/dislike fruit and who eat fruit every day, as well as the number of participants who like/dislike vegetables and who eat vegetables every day.

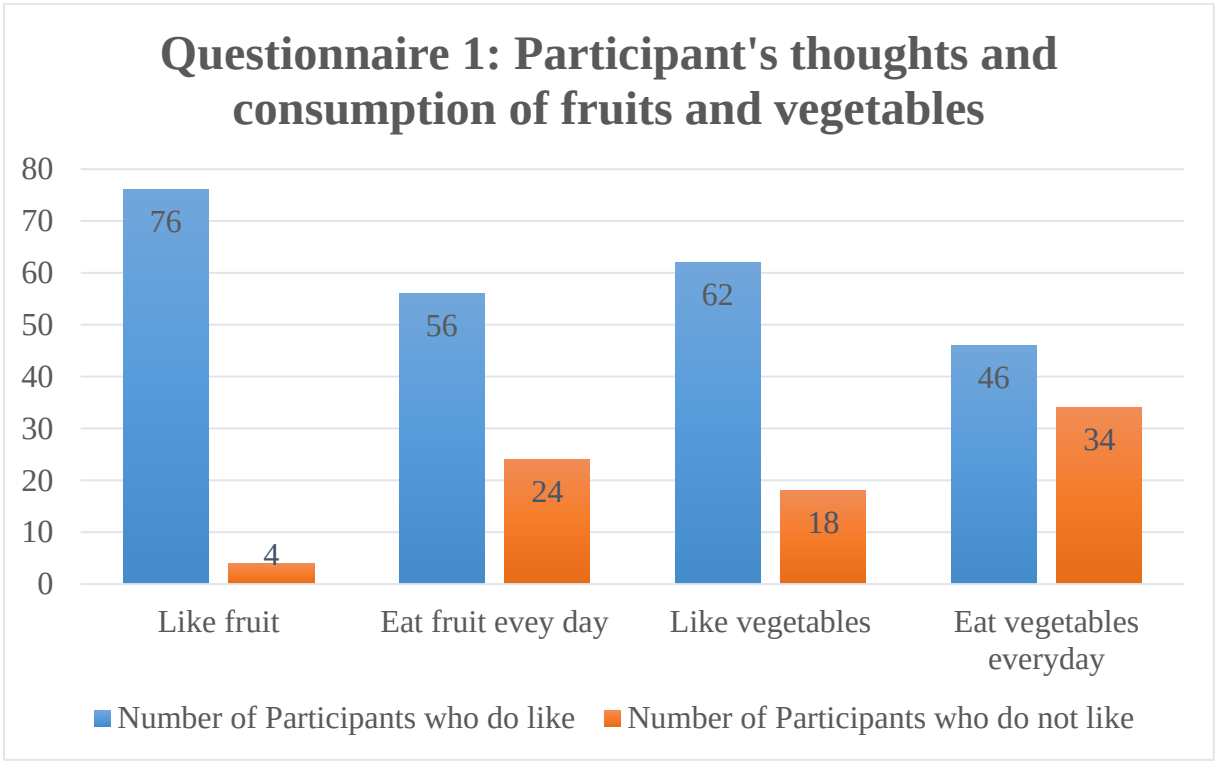


Figure 5. Participant's understanding of the healthiness and sugar content of foods.

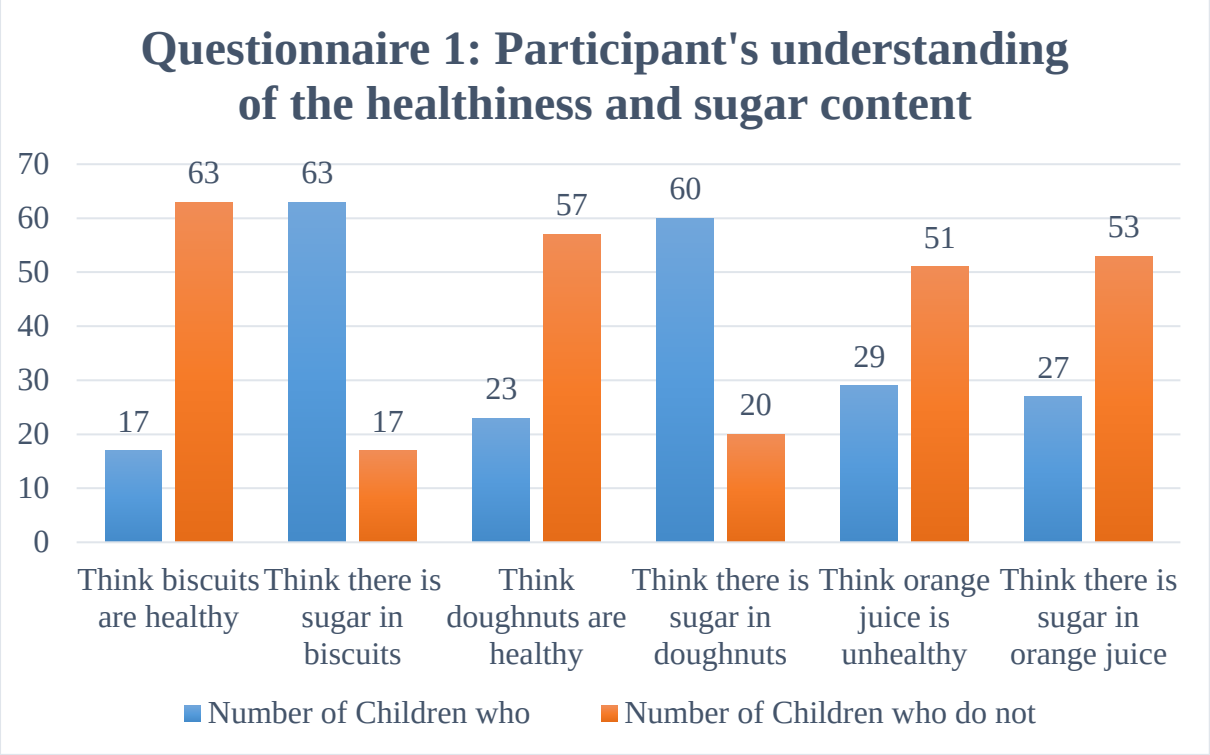


Figure 6. Participants who have visited the school garden since commencing school.

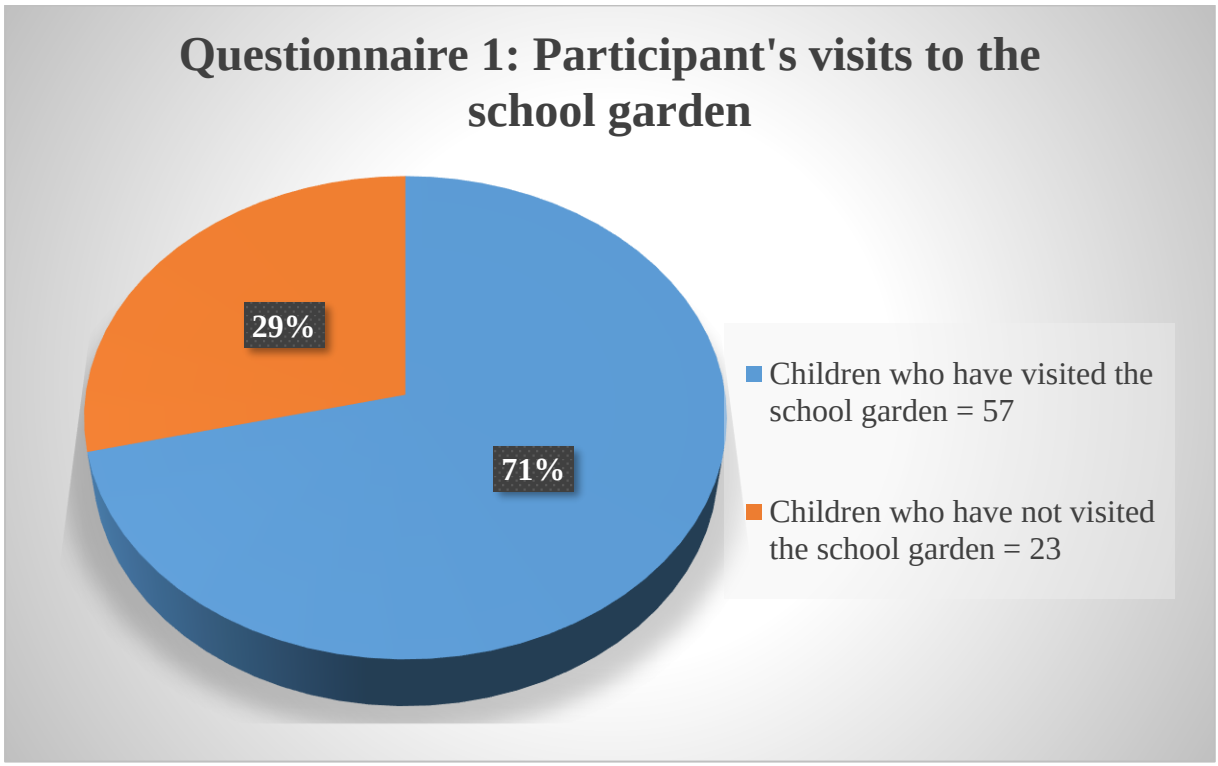


Figure 7. Ages of the participants who have visited the school garden.

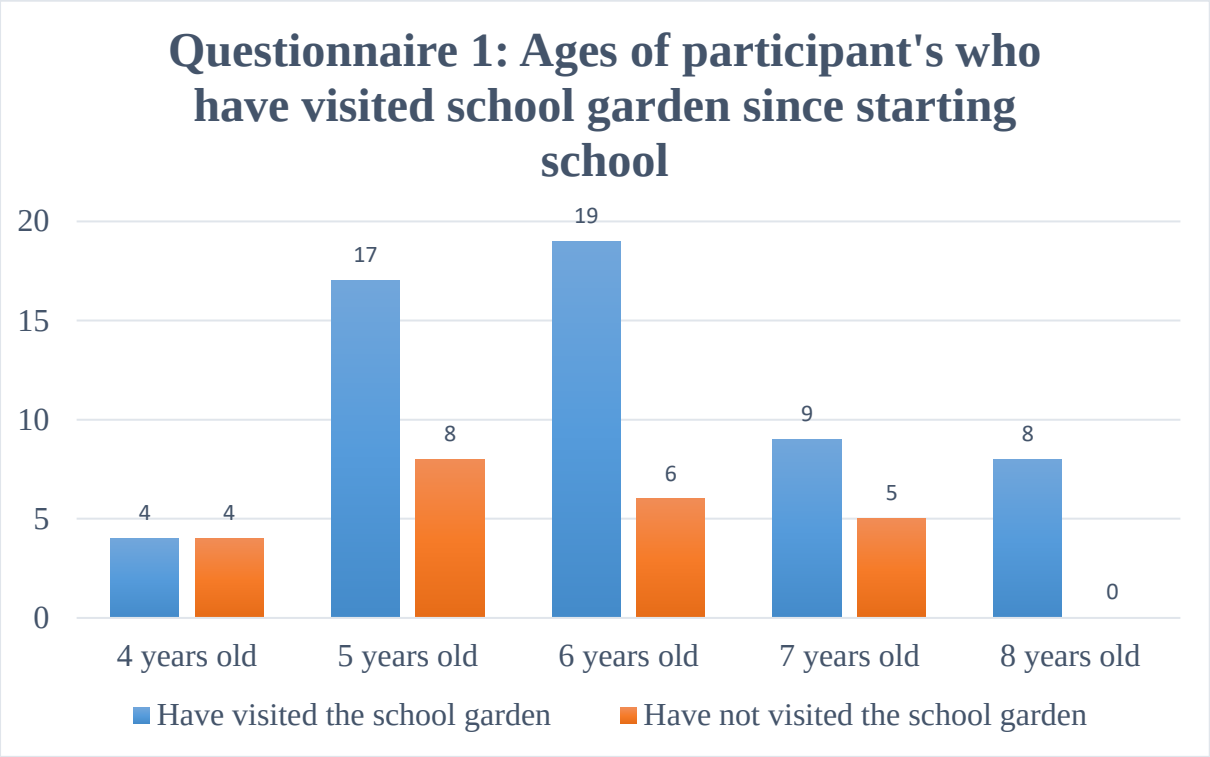


Figure 8. Male and Female Participants views on Coco pops

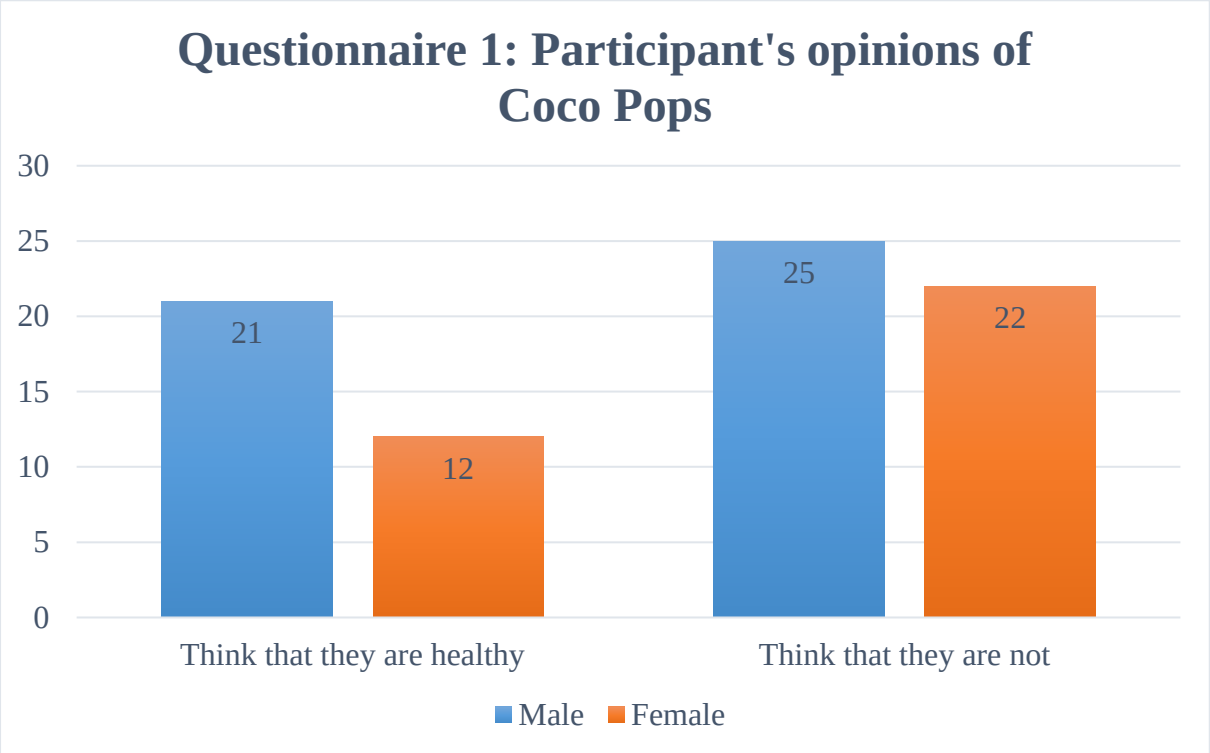


Figure 9. A breakdown of participants aged four to eight who think Coco Pops are healthy.

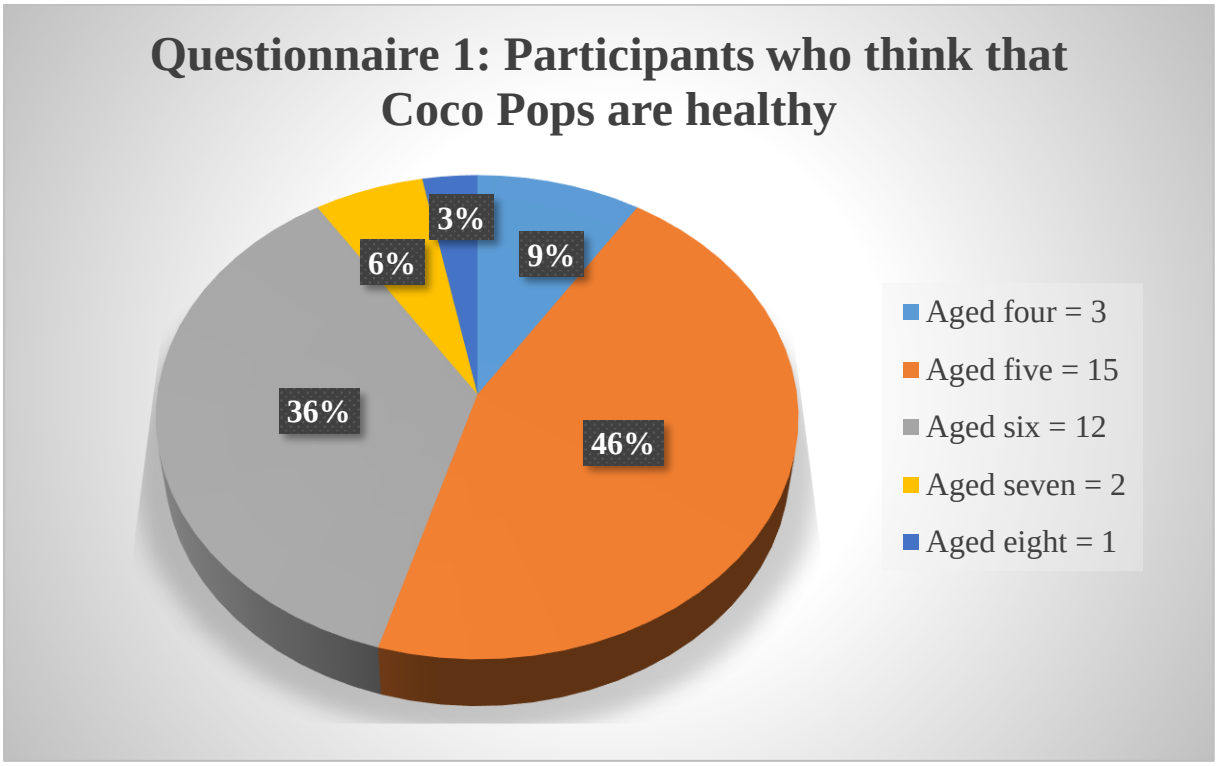


Figure 10. Participant's familiarity with the Food Pyramid and "Food Dudes" Programme.

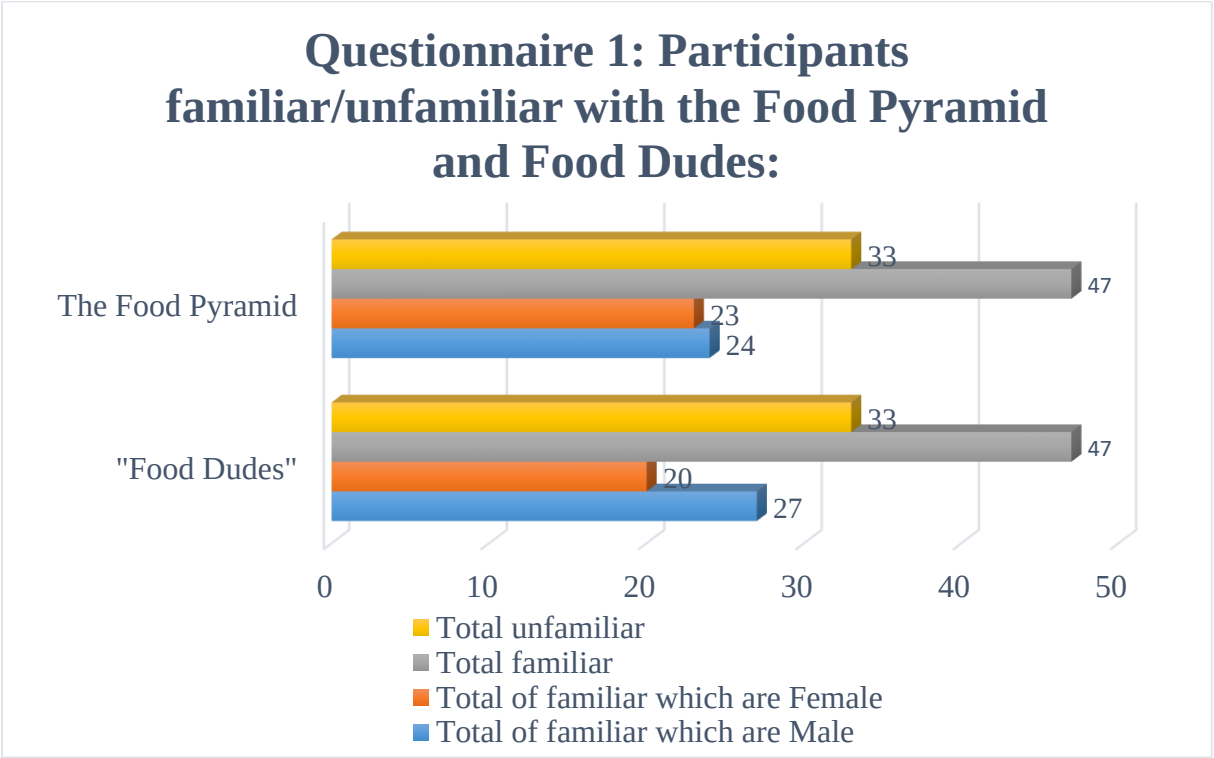


Figure 11. Participants who were familiar/unfamiliar with the "Food Dudes" programme.

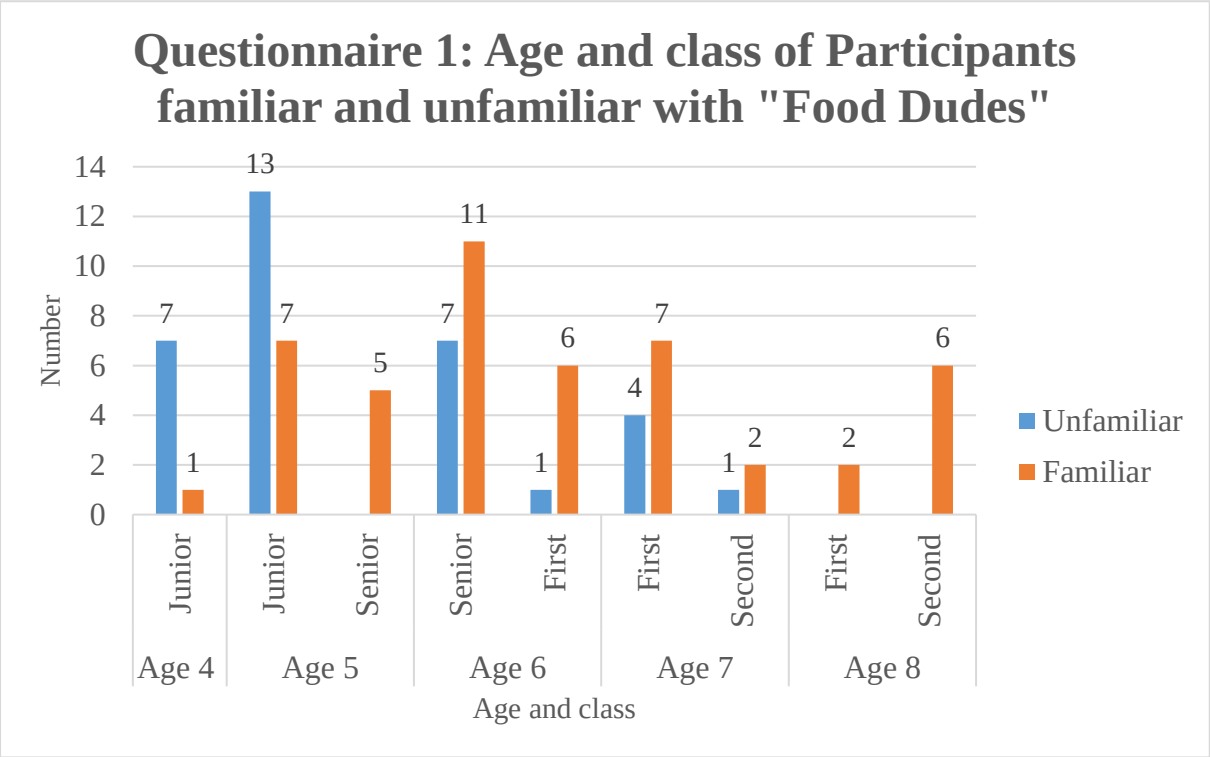


Figure 12. A breakdown of the Participants aged four to eight, who were familiar/unfamiliar with the "Food Pyramid"

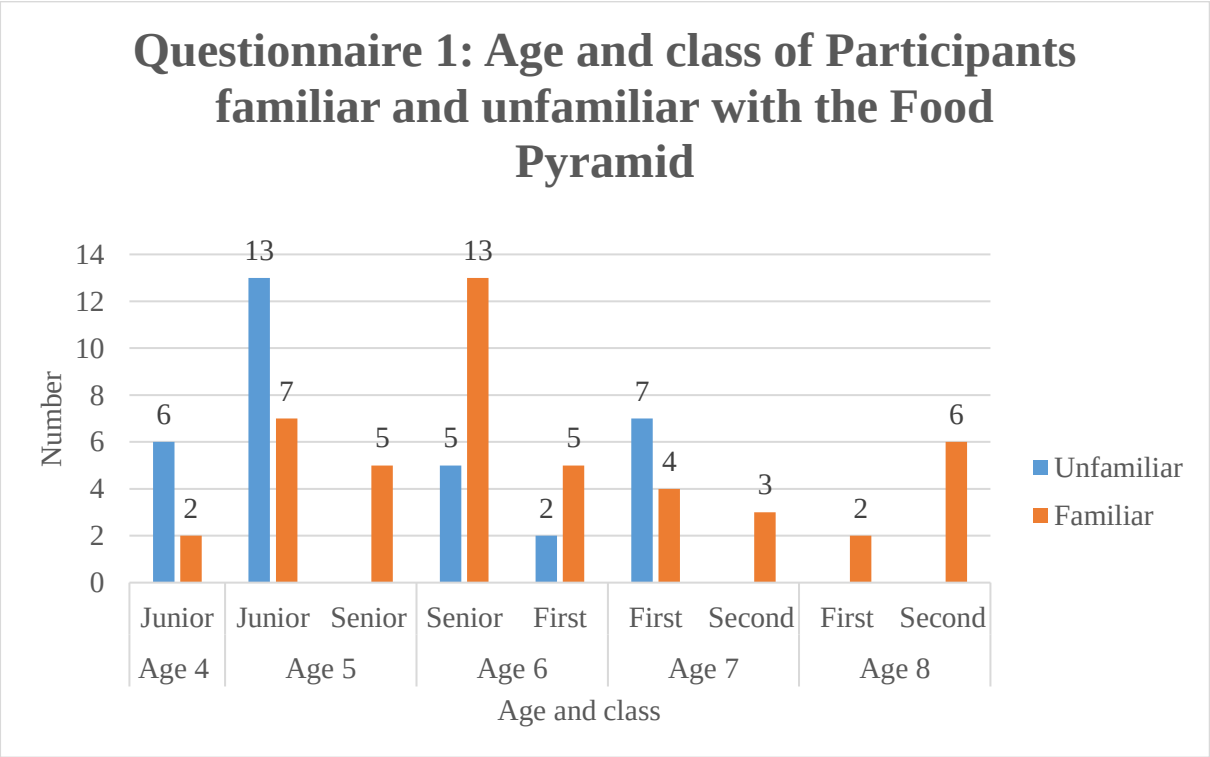


Figure 13. The gender and age of Participants who have discussed healthy eating in school.

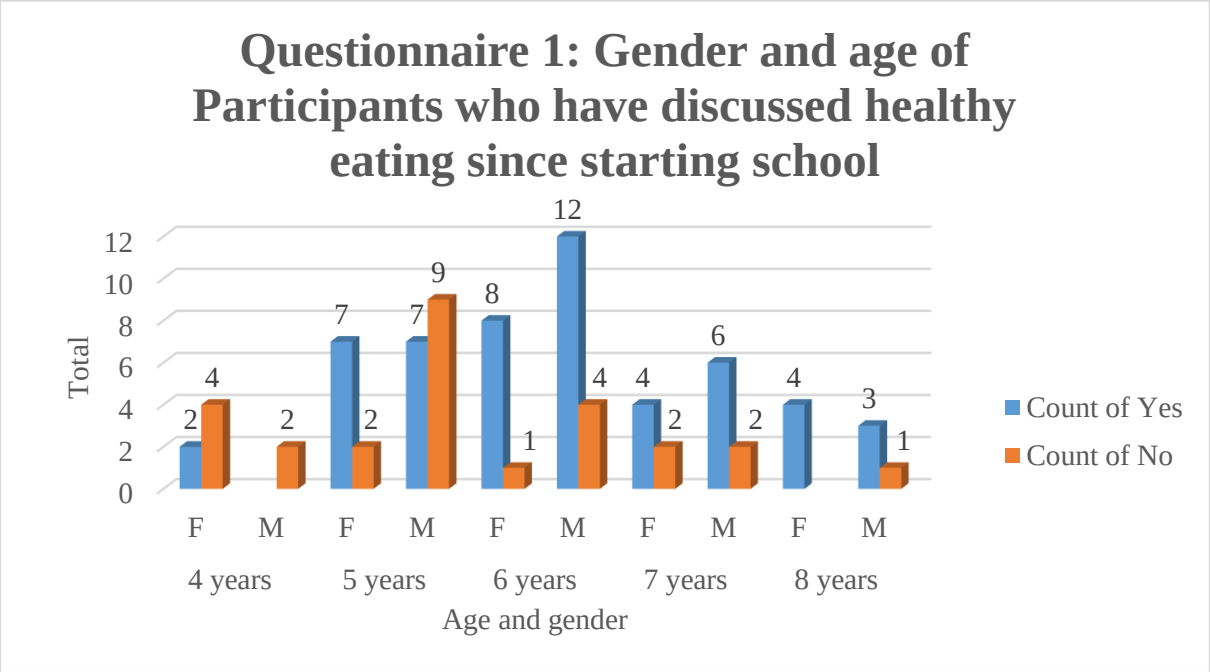


Figure 14. Participant's opinions of apples.

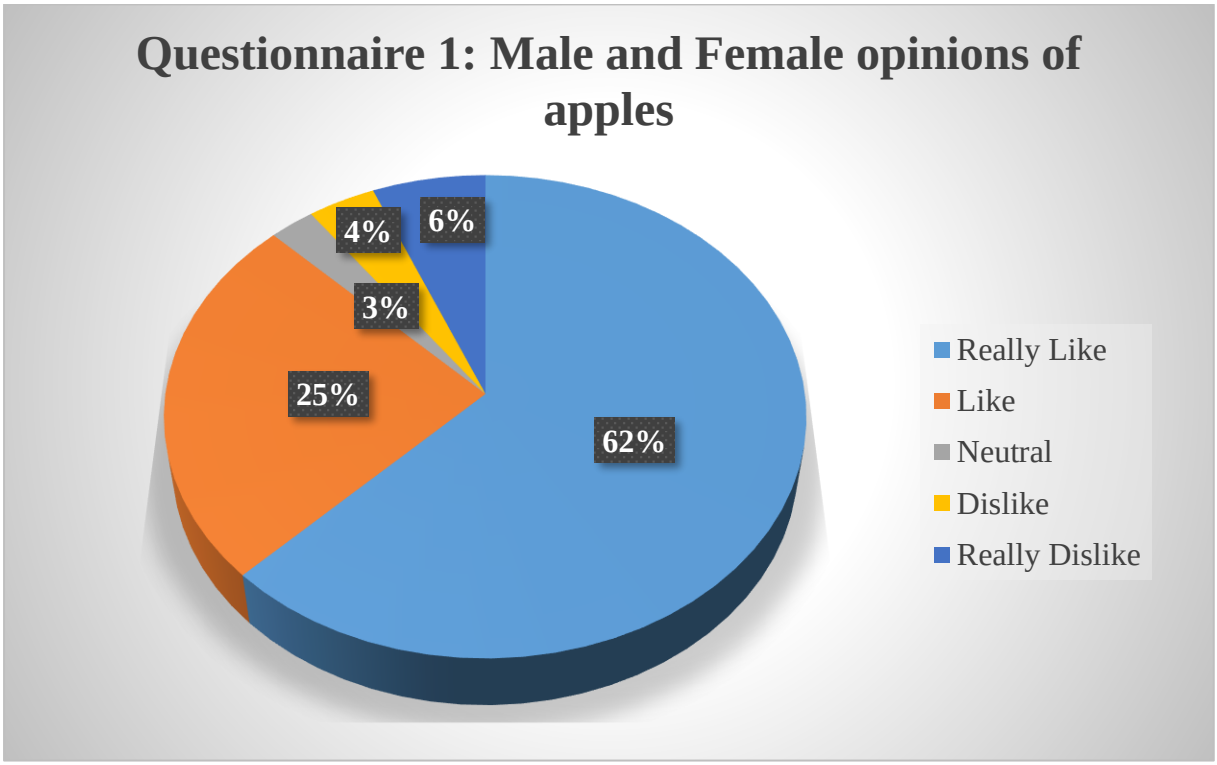


Figure 15. Participant's opinions of bananas.

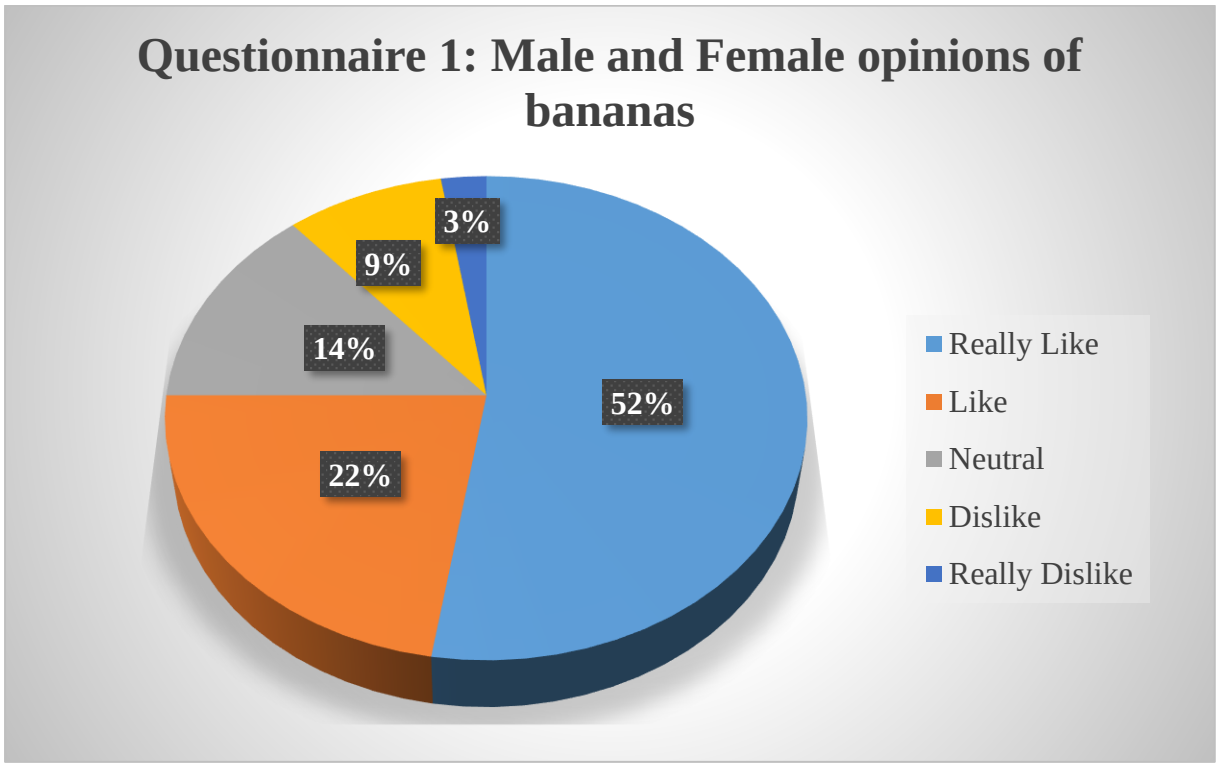


Figure 16. Participant's opinions of carrots.

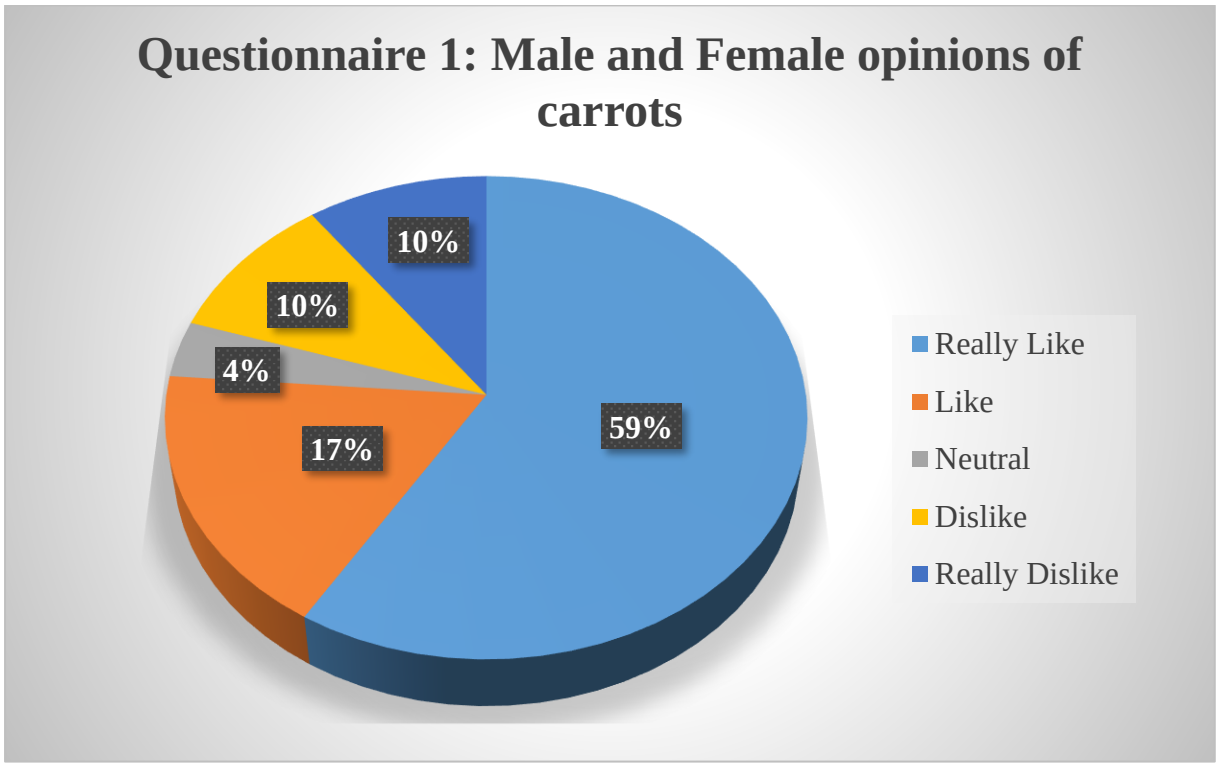


Figure 17. Participant's opinions of potatoes.

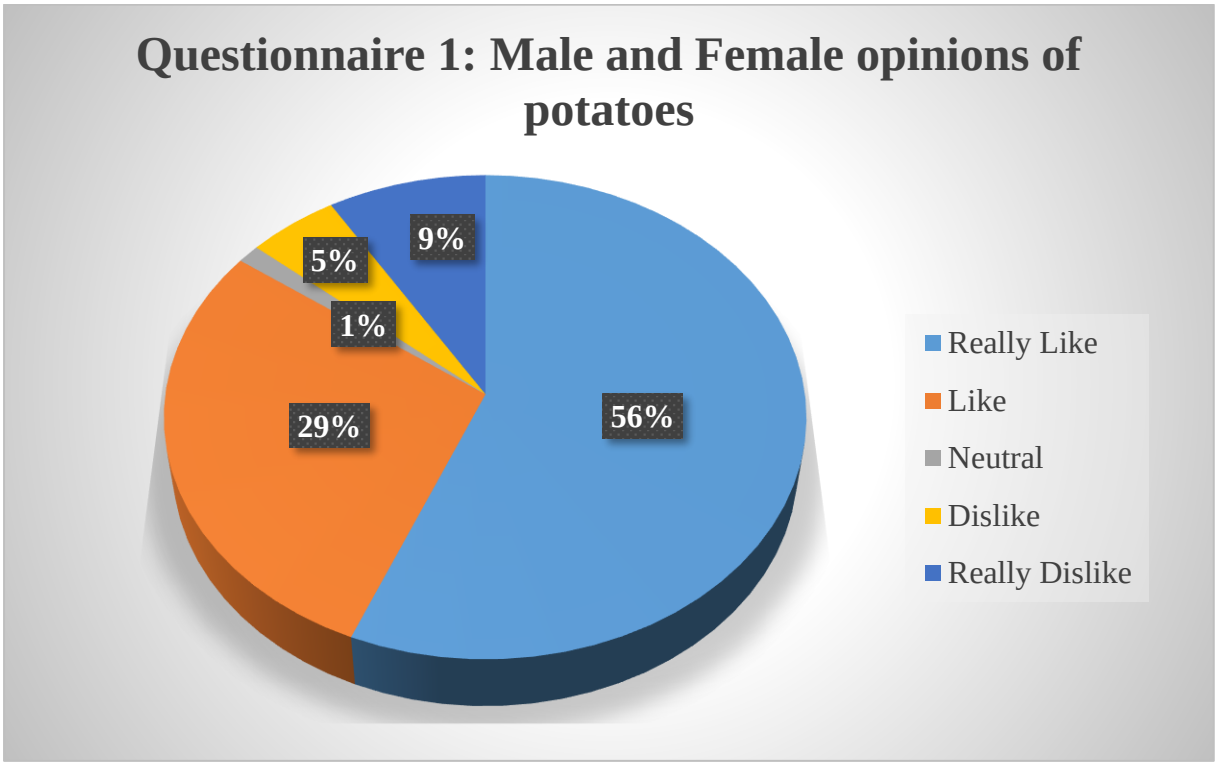


Figure 18. Participant's opinions of broccoli.

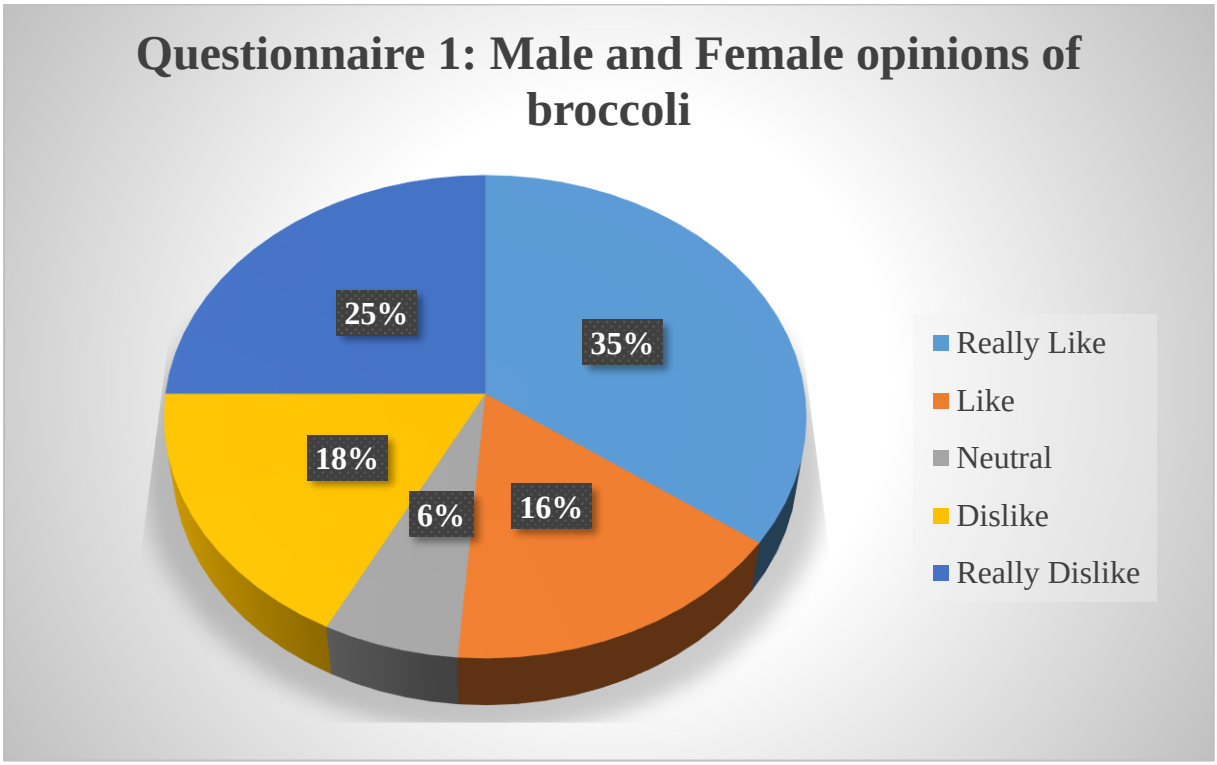


Figure 19. Participant's opinions of oranges.

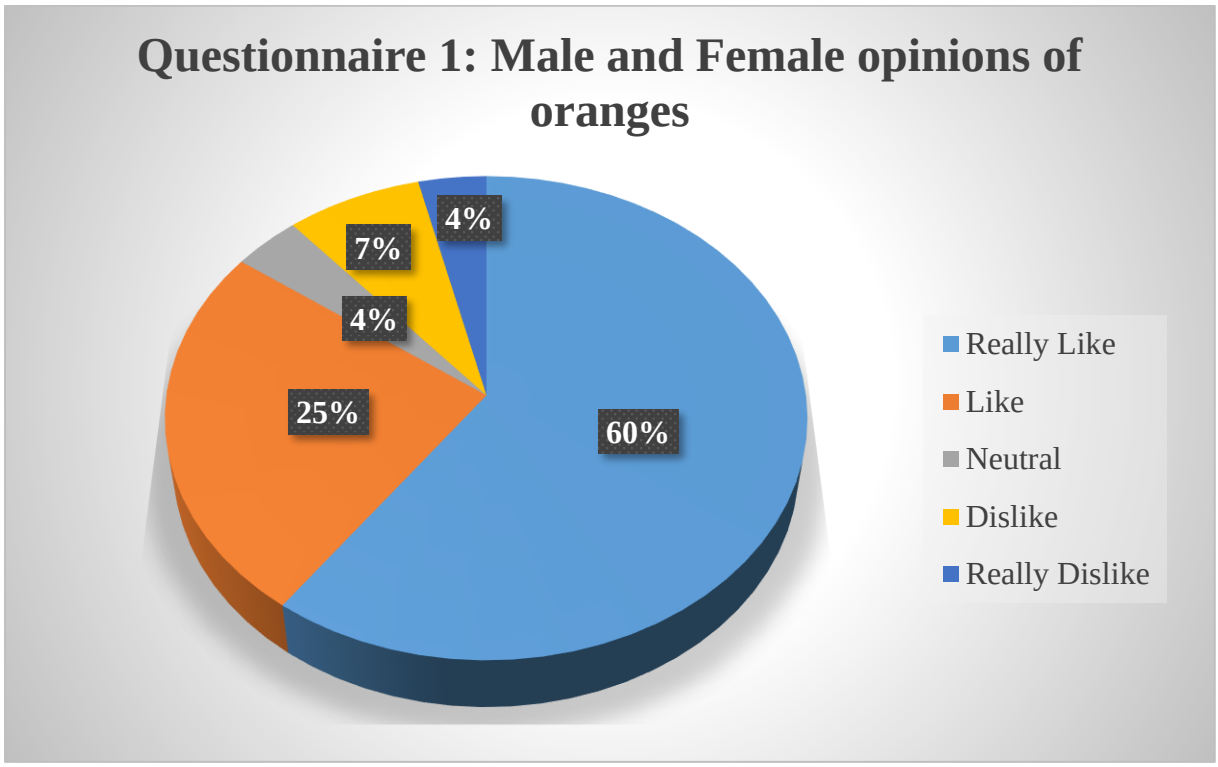


Figure 20. Participant's opinions of their school lunch, their thoughts on visiting the school garden more often and finally, whether they believe that their school lunches have lots of fruits and vegetables.

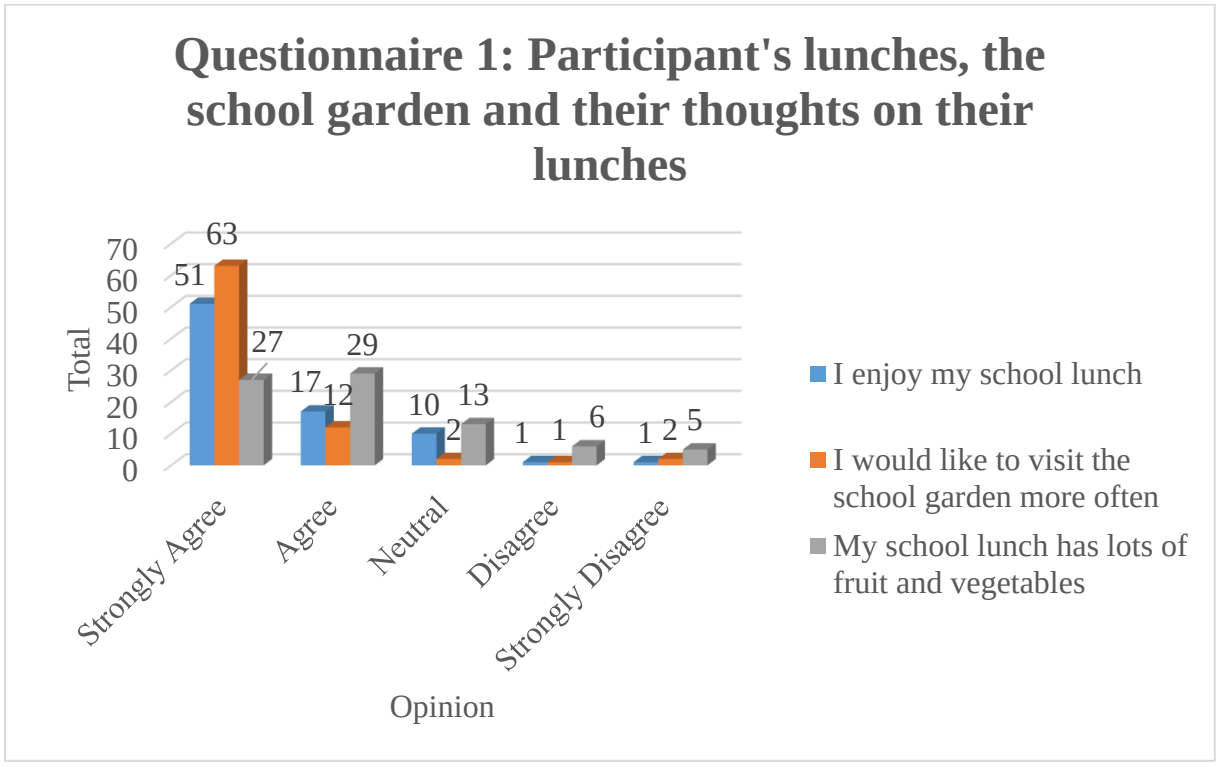


Figure 21. A breakdown of the gender of the participants who selected the healthiest item from a list of three.

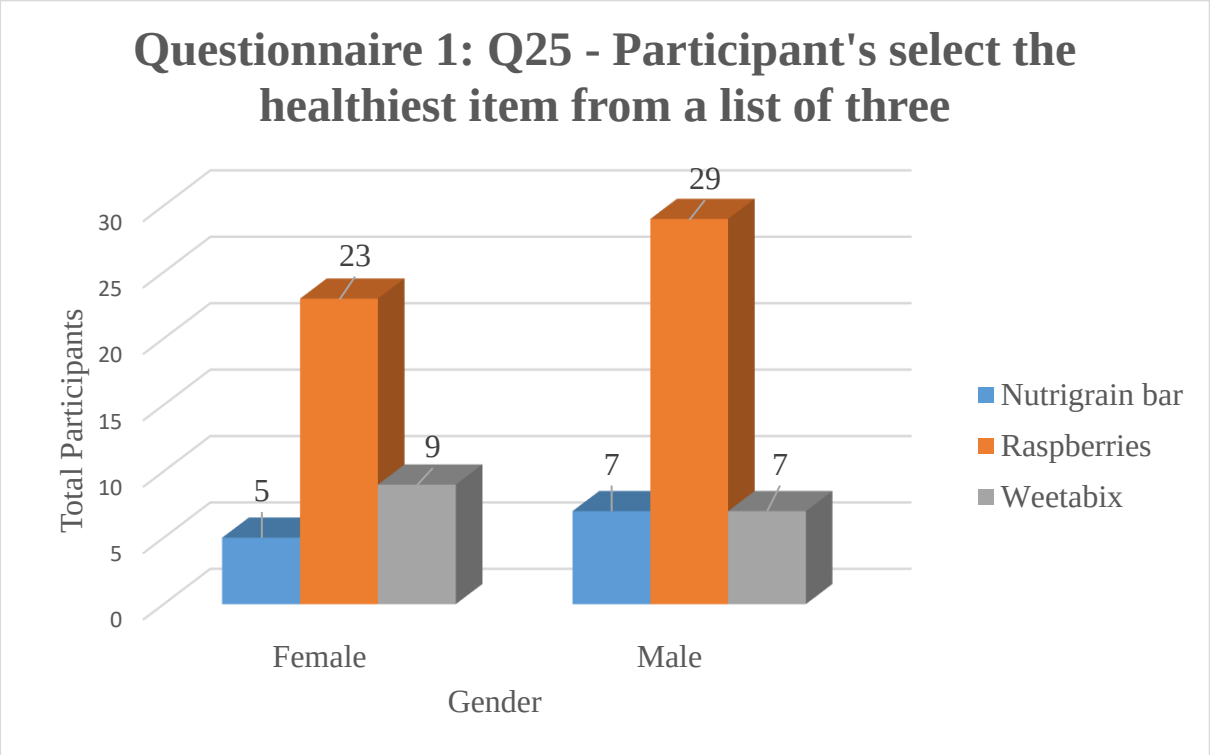


Figure 22. A breakdown of the gender of the participants who selected the healthiest item from a list of three.

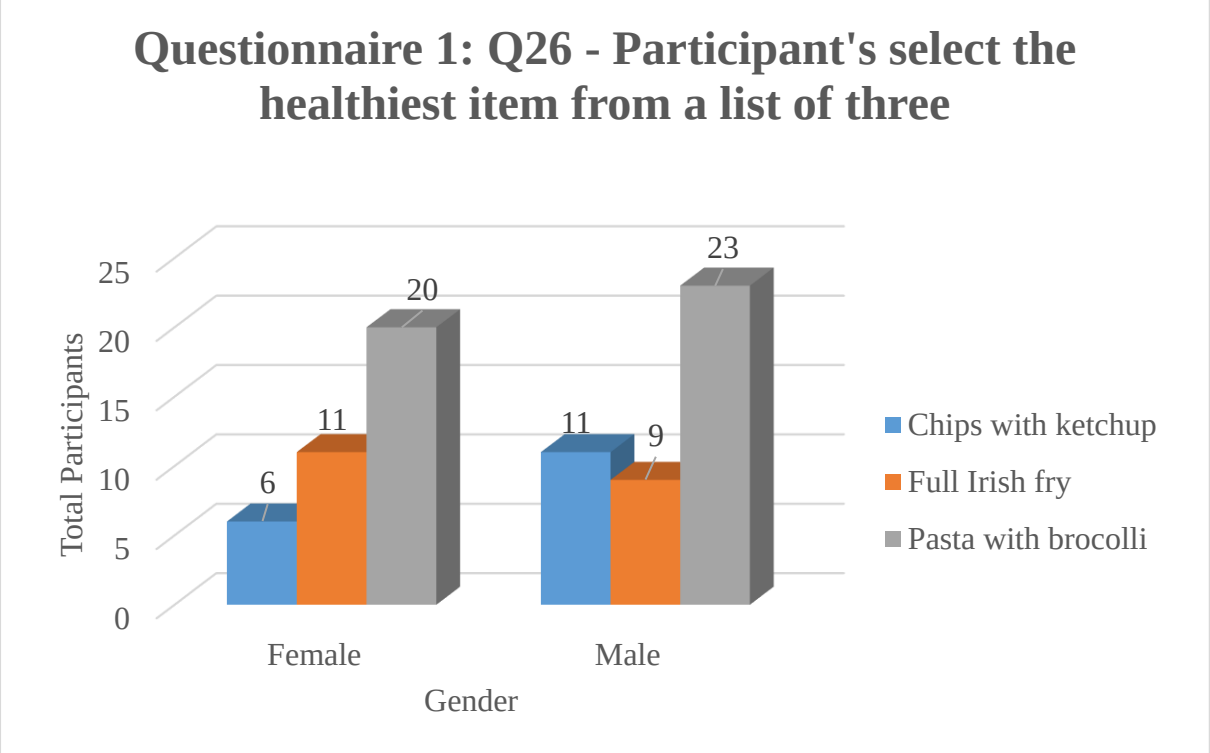


Figure 23. A breakdown of the gender of the participants who selected the healthiest item from a list of three.

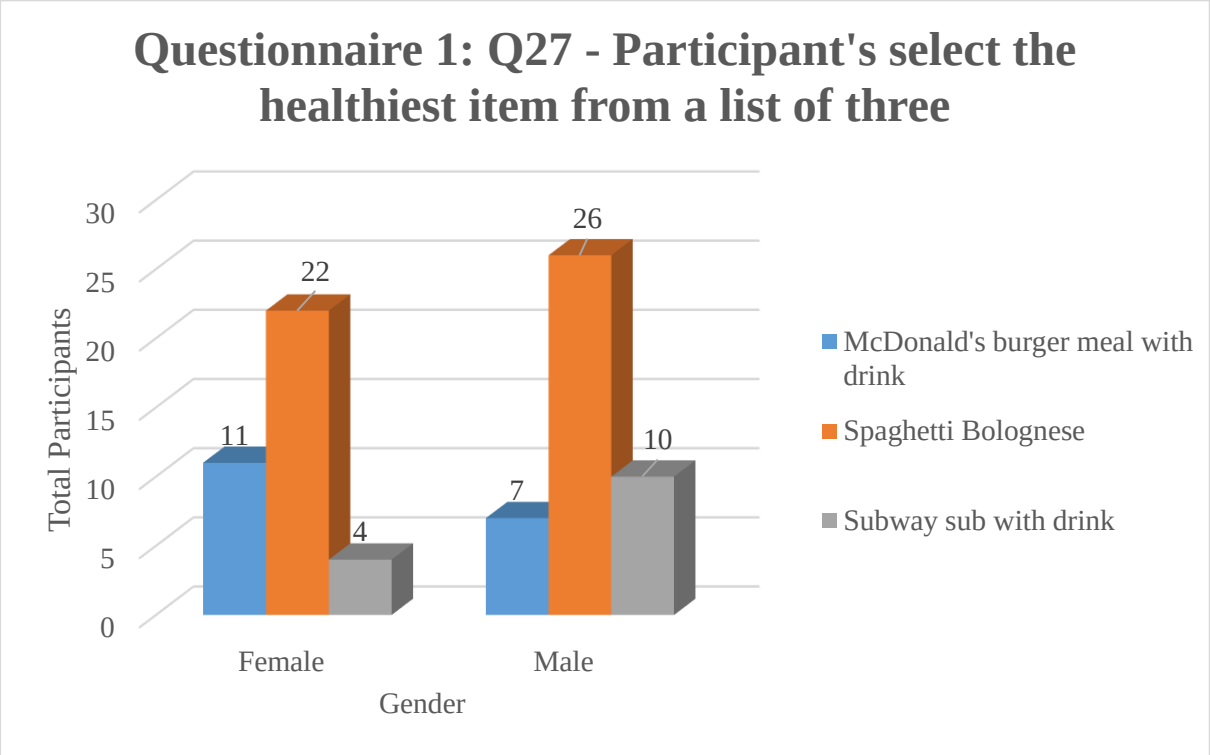


Figure 24. A breakdown of the 76 Male and Female participants.

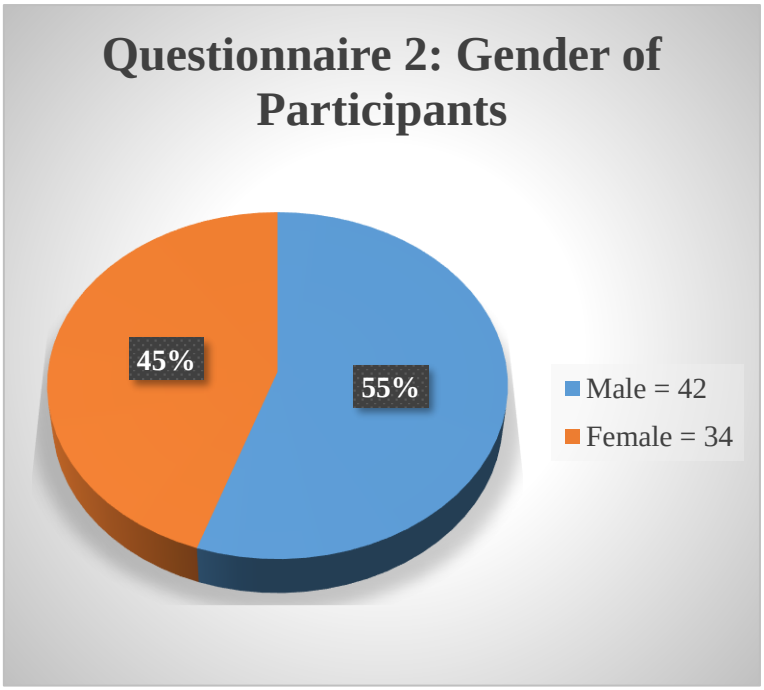


Figure 25. A breakdown of the participants aged four to eight.

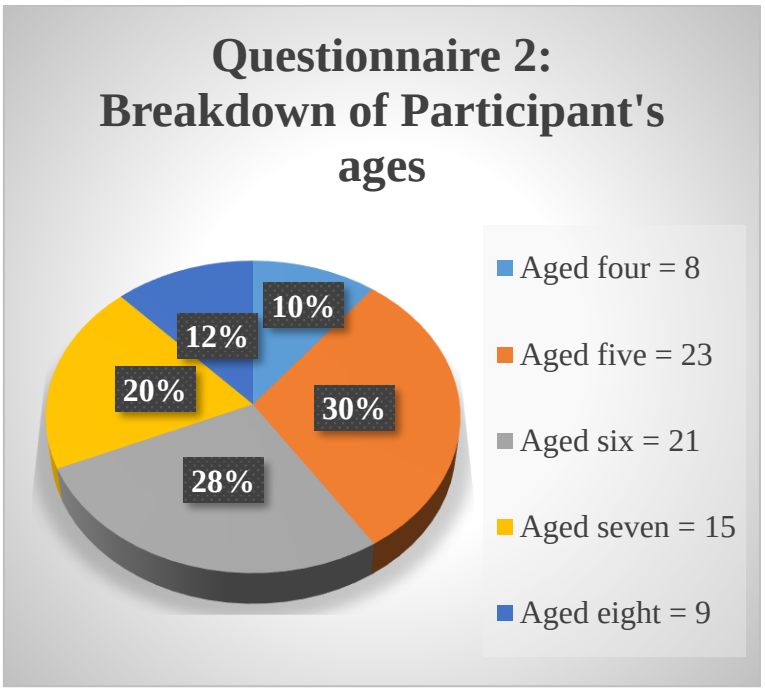


Figure 26. A breakdown of the Participants from Junior Infants to Second Class.

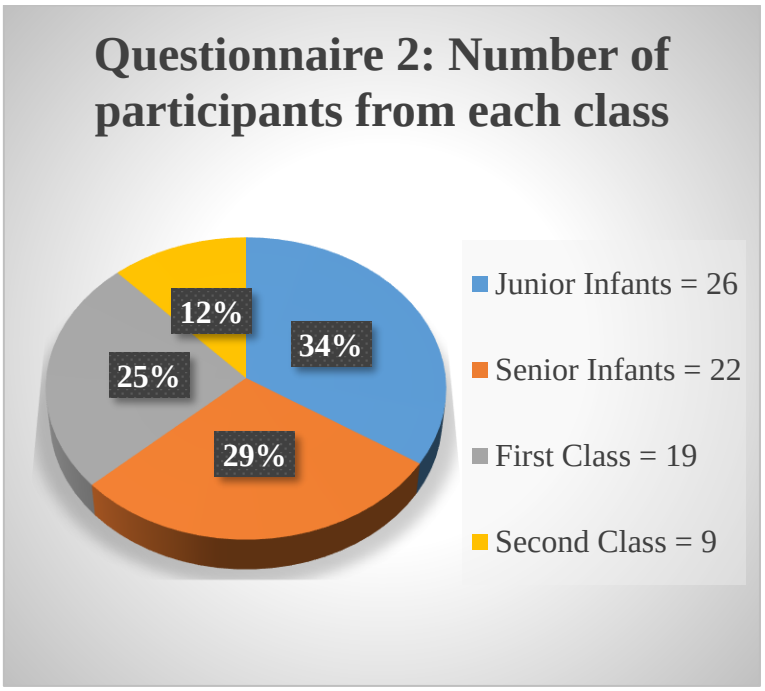


Figure 27. Participants who like/dislike fruit and who eat fruit every day, as well as the number of participants who like/dislike vegetables and who eat vegetables every day.

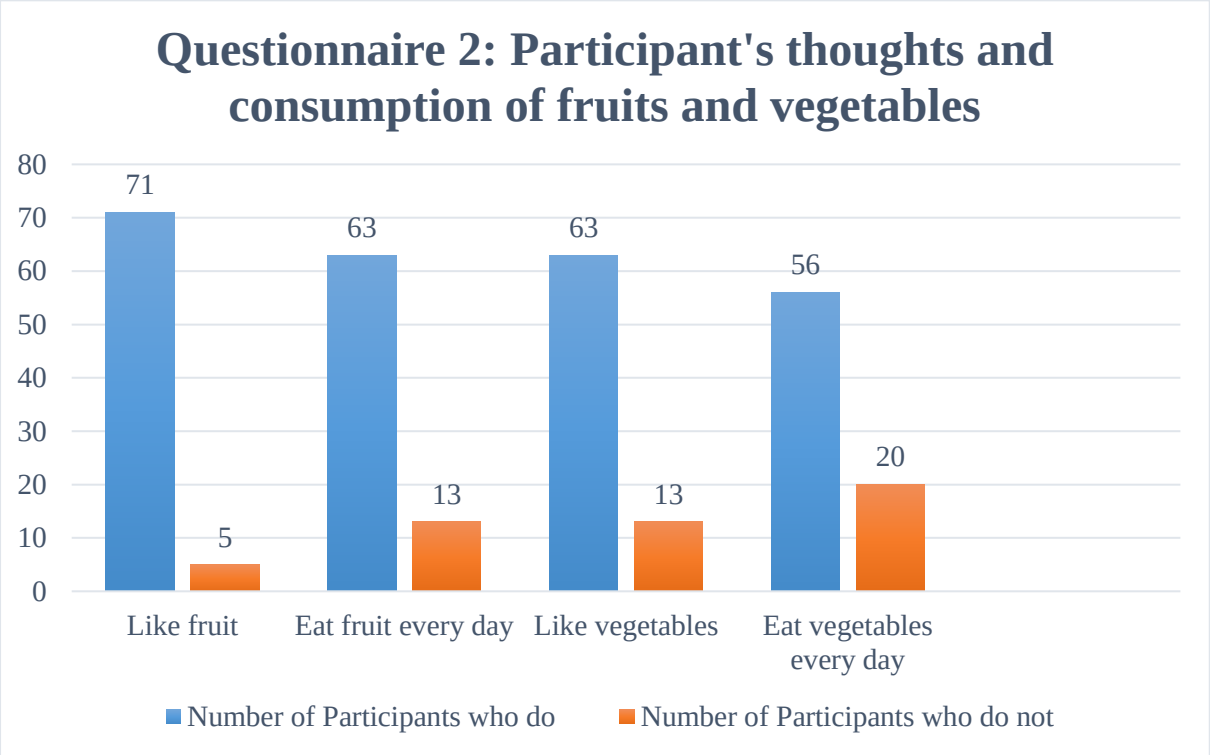


Table 1. The increase and decrease (%) of participants who like/dislike fruit and who eat fruit every day, as well as the number participants who like/dislike vegetables and who eat vegetables every day, following the 5 week interim period between Questionnaire 1 and 2:

Question	Questionnaire 1	Questionnaire 2	% increase or decrease
Like fruit?	95%	93.4%	-1.6%
Eat fruit every day?	70%	82.9%	+12.9%
Like vegetables?	77.5%	82.9%	+12.9%
Eat vegetables every day?	57.5%	73.7%	+16.2%

Figure 28. Feedback about the Fruit Tasting Morning.

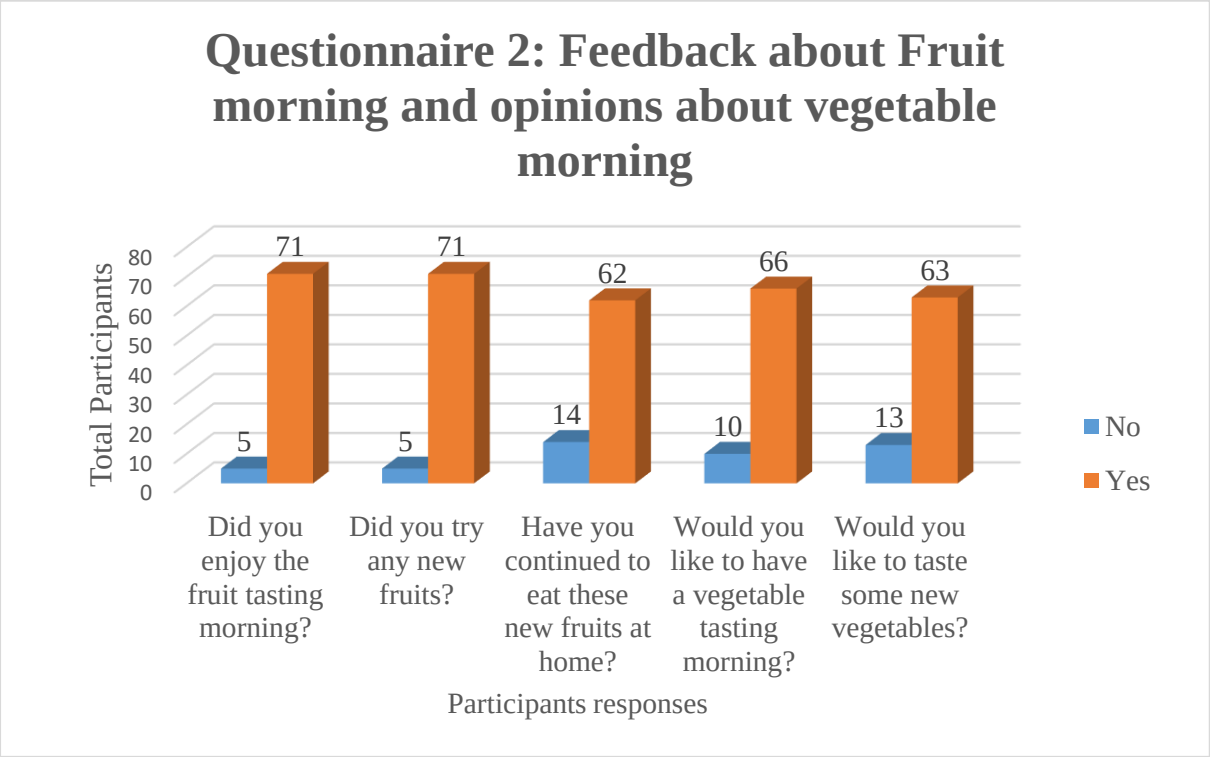


Figure 29. A breakdown of the participants who have spent time exploring healthy eating habits in class since the Fruit Tasting Morning.

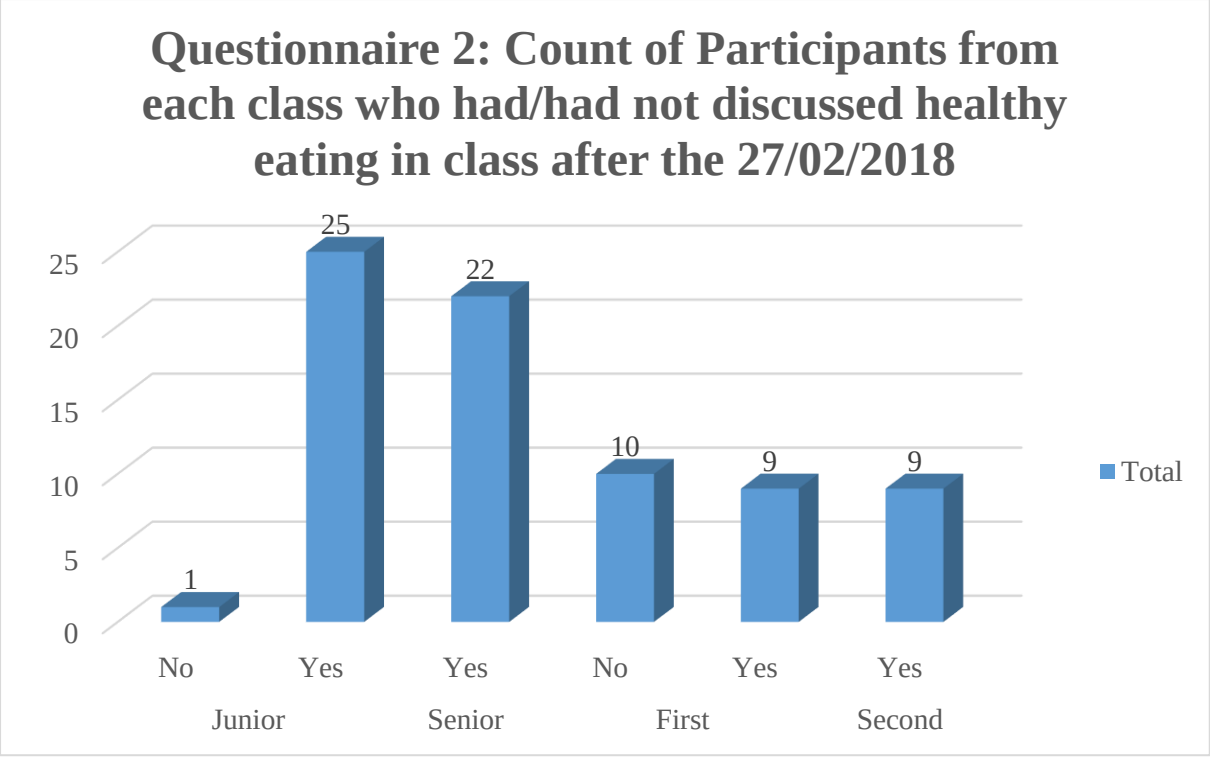


Table 2. An analysis of the percentages of participants who had/had not discussed healthy eating habits in class since the Fruit Tasting Morning.

Class	% that they had discussed healthy eating after the 27/02/2018	% that they had not discussed healthy eating after the 27/02/2018
Junior Infants	96.2%	3.8%
Senior Infants	100%	0%
First Class	47.4%	52.6%
Second Class	100%	0%

Figure 30. A breakdown of the number of participants who view both healthy and unhealthy foods as good choices.

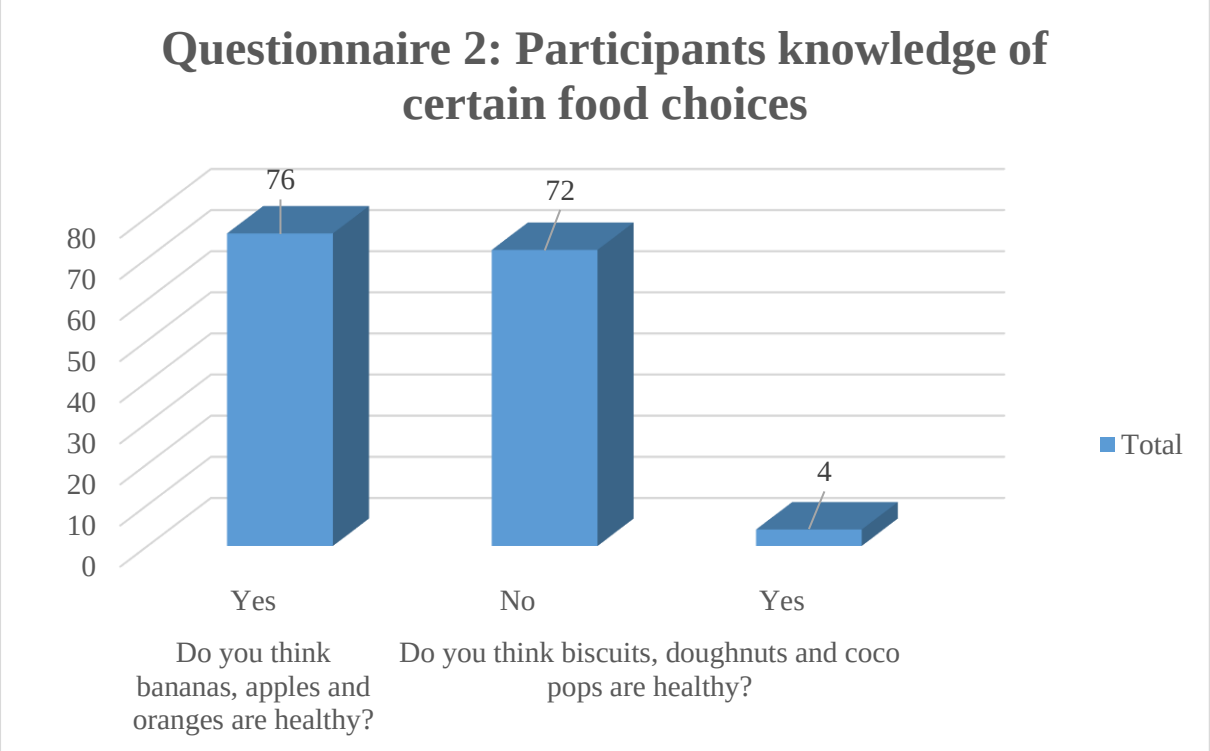


Figure 31. Participants who recognise that McDonald's is not healthy and those who think that it is beneficial to one's health.

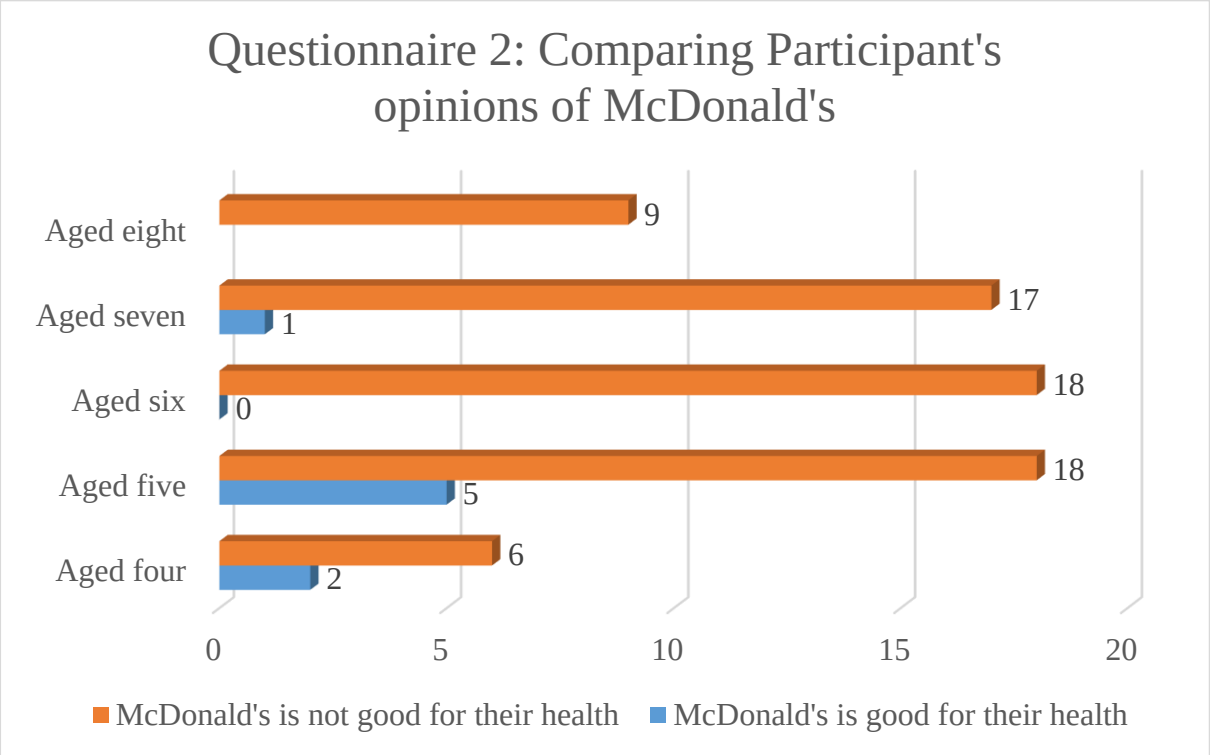


Figure 32. The number of Participants who have/have not spent time preparing food and cooking in school since starting.

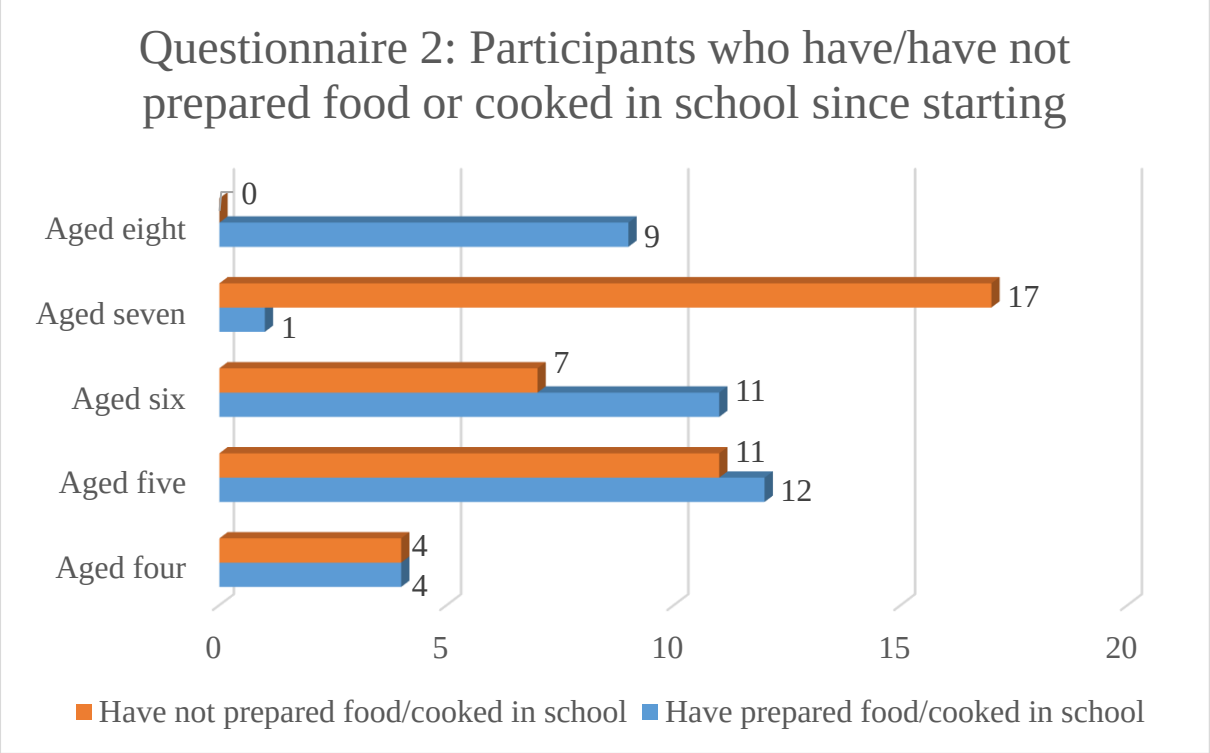


Figure 33. Participant's choice of either a chocolate bar or an apple as a healthy snack before dinner time if they were hungry.

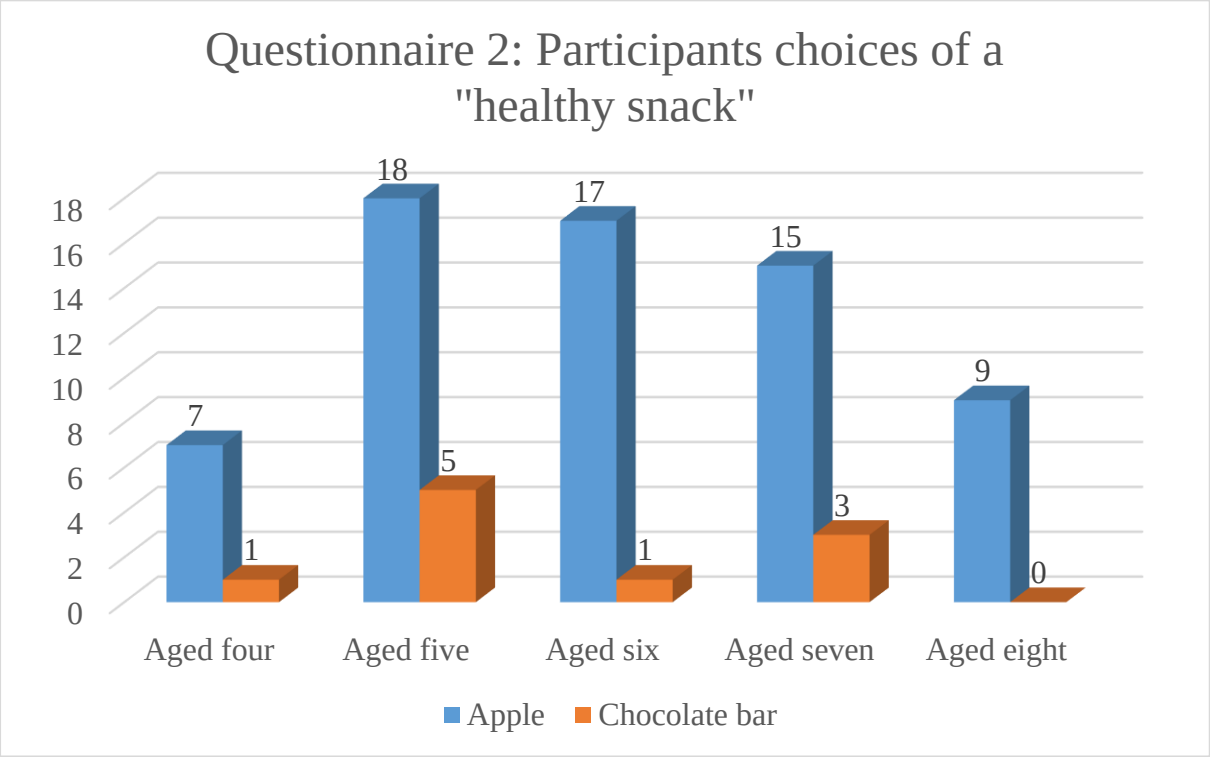


Figure 34. A breakdown of the Participants in Figure 34 who chose an apple as a healthy snack before their dinner.

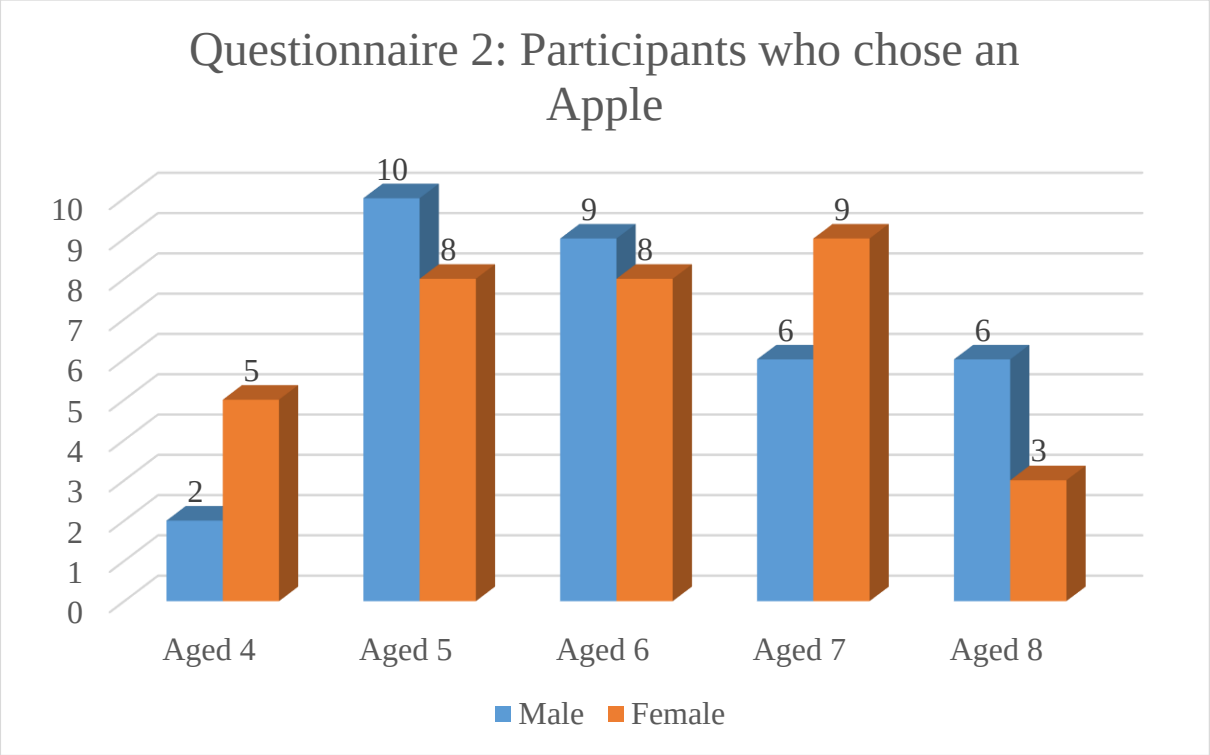
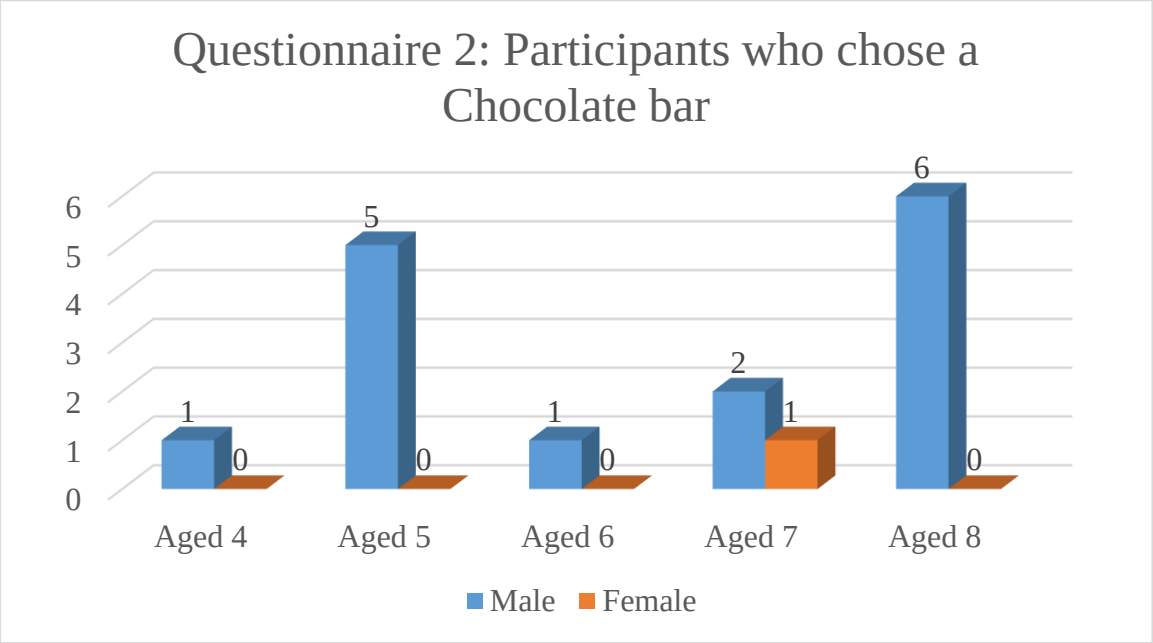


Figure 35. A breakdown of the Participants from Figure 33 who chose a chocolate bar as a healthy snack before their dinner.



Findings, Discussion & Analysis

5.1 Introduction

This chapter incorporates thematic analysis of the emergent themes from Chapter 4. Each theme opens with a statement of finding and is followed by an in-depth discussion of these research discoveries which relate to the questions that guided this study. Data was analysed to recognise, define and discover the impact that a whole-school approach to healthy eating and health education may have on children's selection and knowledge of different foods.

5.2 A Thematic Approach to Data Analysis

Given the vast information extracted from both Questionnaire 1 and 2, the Researcher has taken a thematic approach to analysing the Data. These themes include Gender, Age, Class level, Consumption & Interest and Knowledge & understanding of Healthful choices.

5.2.1 Theme 1: Gender. Comparable with the discoveries of Frobisher et al (2002) and McKinley et al (2005), it was noted that gender played a central role in shaping the outcomes of the research findings. The main finding under the theme of "Gender" was that female participants were more health conscious their male peers. Additionally, female participants had the ability to retain new learning for a longer period of time.

Participants specified their gender at the start of each Questionnaire (See Appendix 5 & 6). 43% of participants who completed Questionnaire 1 were female, and 57% were male, as can be seen in Figure 1. Evident in Figure 24, the number of male participants completing Questionnaire 2 decreased slightly to 42 (55%), and female participants also decreased to 34 (45%).

Consistent with the discoveries of Zarnowiecki et al (2011) which demonstrated that over 50% of the children did not recognise that Coco Pops were unhealthy, as we examine Figure 8, it is evident that 46% of males believed that Coco Pops were healthy, whereas only 35% of females assumed so.

In addition, Figure 13 exposes that 73% of female participants specified that they had discussed healthy eating during their schooling career, yet only 60% of male participants suggested that they had done so. This raises a vital question as to whether their male counterparts are as tuned into, and aware that they are learning about healthy eating in school. On average, 33% of participants in Questionnaire 1 claimed that they have never discussed healthy eating during their schooling career.

Comparably, upon inspecting Figure 21, it is apparent that less than 70% of all participants identified raspberries as the healthiest food item from a list of three. Further, 16% of males suggested that a Nutrigrain bar was healthier than raspberries, and an additional 16% thought that Weetabix was healthier than the natural, unprocessed fruit option. In accordance with Burke's (2002) view, it is conceivable that new information projected to these children about healthy eating during stand-alone lessons is being hindered by an absence of a whole-school collaborative application, such as the one implemented during the action research phase of this research project.

As shown in Figures 34 and 35, female apprehension of beneficial foods is far superior to that of their male counterparts. It is evident that there is a greater chance of female participants identifying and describing benefits of healthy foods under the Californian State Board of Education's Curriculum (2009). Frobisher et al (2002) would deduce that comprehension of fat content is lacking, particularly among male participants granted that 21% of four year olds selected a chocolate bar as a healthy snack, alongside 40% of eight year olds.

In comparison to the 62% of females who chose an apple, only 25% of male participants thought that this was the healthier item. Similarly, 50% of female participants aged seven identified that the apple was the healthier item of the two, yet only 33% of male participants aged seven selected this option. Finally, a mere 2% of female participants aged seven selected a chocolate bar as the healthiest option, in compassion to the 44% of seven year old male

participants who chose the chocolate option. Critically evaluating the HPS initiative by the DES (2016), it would be anticipated that through the healthy development of the entire school, all children should be empowered to select the food item most beneficial to their health, and thus, optimise the quantity of male and female children classifying an apple as the healthiest item.

5.2.2 Theme 2: Age. The main finding under the theme of "Age" was that older participants were more knowledgeable and better retain information relating to healthy eating than the younger participants. Furthermore, older participants had greater exposure to approaches which encourage healthful choices, for example, the school garden or cooking in school.

It can be construed from Figure 2 that 10% of participants were aged four at the time of Questionnaire 1, 31% were aged five, 31% were aged six, 18% were aged seven and 10% were aged eight. Figure 25 displays the age profiles of all 76 Participants in Questionnaire 2. There was a slight shift in the ages of participants in Questionnaire 2, due to a number of birthdays which took place during the period in between the completion of both Questionnaires. 10% of Participants remained aged four, 30% were aged five, 28% were aged six, 20% were aged seven and 12% were aged eight.

Focusing on Figures 6 and 7, a significant proportion (71%) of participants expressed visiting the school garden since commencing school. There is a direct correlation between the age of the participant in this research and the likelihood that they have visited the school garden. 50% of four year olds, 68% of five year olds, 76% of six year olds, 64% of seven year olds and 100% of eight year olds had visited the garden during their time in the school. Morgan et al (2010) would reiterate the significance of children visiting a school garden, given that those with greater exposure were more willing to sample new vegetables, and ranked them higher than participants with no exposure.

It is depicted in Figure 9 that 46% of five year olds and 36% of six year olds assumed that Coco Pops were healthy, however, only 6% of seven year olds and 3% of eight year olds agreed. This suggests that as children mature, they become more conscious of healthy choices. In a similar style, 33% of participants aged four, and 21% of participants aged five thought that McDonald's was good for their health. The older participants were pointedly more aware that McDonald's was in fact not good for one's health, with only 5% of seven year olds believing that it was healthy, and 100% of six and eight year olds aware that this was not the case. Although the school may not be promoting and educating children fully in relation to healthy eating, Batada et al (2008) would express concern that the media is negatively influencing children's choices.

Figure 32 unearths that only 50% of four year old participants, 53% of five year olds, 51% of six year olds and 6% of seven year olds said that they had spent time preparing or cooking food in school. This is in direct opposition to the belief of Pérez and Aranceta (2001) discussed in Chapter two, which suggests that all children should be exposed to curricular input surrounding the themes of food preservation, preparation and cooking at an early stage. Implementing Burke's (2002) similar ideology would entail children as young as four learning about health and nutrition education, and thus as a result, it would be expected that all children would gain individual experience handling and learning about food.

Examining Figure 33, it is again established that younger participants are less health cognisant. When asked to choose between an apple and a chocolate bar, 19% of participants aged four and five chose a chocolate bar, whereas only 8% of those six and over chose the chocolate option. This is underpinned by Food Dudes (2011) who recognise that children aged between five and eleven have a greater retention of new learning. This correlation between age and knowledge of wholesome choices is again reinforced by the 83% of seven year olds who chose the apple and 100% of eight year olds who did so too.

5.2.3 Theme 3: Class Level. The main finding under the theme of "Class Level" was that participants from lower classes were less familiar with healthy eating programmes and concepts such as "Food Dudes" and the Food Pyramid. Also, there is a clear correlation between healthy eating input and children's class level, however, exposure to such conversations should come from early on in a child's schooling career.

Figure 3 states that 35% of participants came from Junior Infant classes, 29% from Senior Infants, 25% from 1st class and 11% from 2nd Class. In Figure 26 we see that Questionnaire 2 presented a slight decline in the number of participants, with two less partaking from Junior Infants, one less from Senior Infants and one less from 1st class. The number of Participants from 2nd class remained constant.

Although Food Dudes (2011) reaffirms the sentiments of researchers that food education is essential in early life for the lifelong development of good eating patterns, 53% of participants in Junior and Senior Infants were unfamiliar with the programme, and a further 47% had never heard of the Food Pyramid. Comparably, only 17% of 1st and 2nd class participants had not heard of Food Dudes and only 31% had not heard of the Food Pyramid. Figure 11 reveals that 87.5% of participants aged four, 65% aged five, 32% aged six and 36% aged seven had never heard of the Food Dudes Programme, despite it being implemented in the school last year. Although there is a positive parallel between knowledge, age and class level, Food Dudes (2011) argue that this input must come earlier in life.

Following the Fruit Tasting Morning on the 27th of February 2018 which presented children with beneficial hands-on experiences as discussed by Burke (2002), teachers agreed to deliver lessons about healthy eating in class. In accordance with Figure 29, 96% of Junior Infant participants knew that they had discussed healthy eating since that day, alongside 100% of Senior Infants, 47% of 1st Class and 100% of 2nd class. The reasons for the skew in data at

1st class level is unknown, however, it may be due to children's misunderstanding of when they are discussing certain topics, or, absenteeism on days spent covering healthy eating.

5.2.4 Theme 4: Consumption & Interest. The main finding under the theme of "Consumption and Interest" was that an increased number of participants in Questionnaire 2 expressed that they liked fruit and vegetables, and consumed vegetables on a daily basis, following a short term implementation of a whole-school approach to healthy eating. This finding compliments the belief of Bauer et al (2004) that schools should cater for children's newly learnt eating mechanisms.

During Questionnaire 1, participant's interest in, and consumption of fruit and vegetables was analysed. A combined total of 95% of participants responded that they liked fruit and 70% acknowledged that they eat fruit daily. Drawing on Figure 27, during Questionnaire 2 participants were re-asked this question in order to determine whether there had been any progression in their interest in and consumption of fruits. As discussed in the limitations section of Chapter four, and evident in Table 1, there was a minor decrease of -1.6% in those who said that they liked fruit, however, there was a major increase of 12.9% in those who clarified that they consumed fruit on a daily basis. This slight decrease is likely a direct result of the slight drop in the number of participants completing Questionnaire 2.

During Questionnaire 1, participants were asked to share whether they liked vegetables, and whether they consumed vegetables every day. Examining Figure 27, it may be deduced that 77.5% stated that they did like vegetables, however, only 57.5% of these Participants admitted to consuming vegetables every day. Prominently, it was detected during Questionnaire 2 that an increase in the number of Participants who liked vegetables rose by 12.9%, and an outstanding increase of 16.2% arose in the number of Participants consuming vegetables on a day to day basis following the 5 week implementation of a Whole-School approach to healthy eating. In line with the beliefs of Morgan et al (2010), this increased daily

consumption and fondness of vegetables could relate directly to the school's catering of children's newly learnt eating mechanisms. For example, visits to the school garden between the Questionnaire 1 and 2, their exposure to a guest speaker from Keogh's and their direct classroom input.

Figure 14 and 15 expose that over 62% of participants really liked apples, 52% really liked bananas, 64% really liked/liked oranges and only 4% expressed really disliking fruit. In a similar way, Figures 16 and 17 conclude that 59% of participants really liked carrots, while 56% of participants really liked potatoes. Overall, Section 2 of Questionnaire 1 highlights conclusively that over 52% of participants really liked all fruits and vegetables mentioned, with the exception of broccoli. 43% of participants stated that they really disliked/disliked broccoli, and only 25% suggested that they really liked this vegetable. The disparity in participant's reactions to broccoli could be defined by the finding of McKinley et al (2005) that a major block against healthy eating the appearance of food.

Although Questionnaire 2 primarily assessed knowledge progression in relation to healthful choices, Figure 28 offers feedback in relation to participant's engagement and enjoyment of the Fruit Tasting Morning, in order support and enhance future recommendations. 93% of participants said that they enjoyed the morning and tasted new fruits, and more importantly, 81% declared that they have continued to eat some of these fruits outside the school environment. As outlined by Burke (2002), these practical opportunities for children to sample and handle foods are quintessential. Although consumption of and interest in vegetables was slightly lower than that of fruits, 86% of participants expressed an interest in a Vegetable Tasting Morning and 82% affirmed that they would sample new vegetables.

5.2.5 Theme 5: Knowledge & understanding of Healthful choices. The primary finding under the theme of "Knowledge & understanding of Healthful choices" is that participants had limited knowledge of benefits and detriments of some food items to their diets.

Participants were also aware that their school lunches may not contain enough fruit and vegetables.

In Figure 5, participants understanding of healthiness and sugar content of certain foods is assessed. 78% of participants recognised that biscuits are unhealthy and contain sugar, however, often participants didn't recognise the parallel between unhealthy items and their sugar content. In line with the research conducted by Frobisher et al (2005) where it was found that 71% of pre-adolescents knew that jam doughnuts were bad for one's health, 71% of participants in Questionnaire 1 comprehended that doughnuts are unhealthy, however, 25% of the participants believed that doughnuts contain no sugar. Moreover, 70% of participants believed that orange juice is good for one's health, and of these, 66% believed orange juice contains no sugar.

Figure 20 highlights that the majority of participants enjoy their school lunches, given that less than 3% expressed a disliking of their lunches supplied by the external lunch provider. Over 30% of participants disclosed that they felt neutrally/disagreed/strongly disagreed with the statement "My school lunch has lots of fruit and vegetables". In accordance with the Californian State Board of Education's (2009) Nutrition and Physical Education strand, there is some awareness among participants that their lunches may not contain as many fruits and vegetables they believe are required on a daily basis. Furthermore, 93% of participants expressed that they strongly agree/agree with the statement "I would like to visit the school garden more often". As previously explored in Figure 6, 29% of participants had never been to the school garden – an experience which could heighten their vegetable consumption according to Morgan et al (2010).

Figure 22 reiterates the sheer necessity for additional input in relation to healthful choices at primary level for children, and further justifies the requirement of whole-school approaches to delivering healthy eating education. 53% of male participants and 54% of female

participants chose pasta and broccoli as the healthiest dish from a list of three. 21% of participant assumed that chips with ketchup were the healthiest meal, and 25% selected a full Irish fry. Likewise, Figure 23 uncovers that 60% of participants selected spaghetti bolognese as the healthiest meal from a list of three. 17% of participants thought that a Subway meal was healthier than spaghetti bolognese, and 22% choose a McDonald's burger meal with a drink over both other options. Contrary to the view of the CDC (1996), these participant's choices have not been supported by early healthy eating interventions in school.

In Questionnaire 1 and 2, participants were questioned about the healthiness of some foods. Questionnaire 1 revealed that 46% of males and 35% of female assumed that Coco Pops were a healthy cereal. Following a five week implementation of healthy eating approaches in school, Figure 30 shows a significant decrease in the numbers of participants who thought that Coco pops were healthy. 100% of participants identified that bananas, apples and oranges are good for one's health, alongside 94% of participants agreeing that biscuits, doughnuts and coco pops are not healthy. This percentage decrease is likely a direct result of the short term implementation of a whole-school approach to healthy eating, as Bauer et al (2004) highlight that schools have power over enhancing children's understanding of foods. Similarly, there was a significant percentage decrease in the numbers of participants assuming that Coco Pops (-37%), biscuits (-17%) and doughnuts (-24%) are healthy between Questionnaire 1 and 2.

5.3 Discussion of the Action Research

As discussed during Chapter three, the school was exposed to activities and events which assisted the implementation of a short-term, whole-school approach to healthy eating. This played a pivotal role in the changing of participant's attitudes during the interim period between Questionnaire 1 and 2. Firstly, the representative who visited the school Keogh's Farm explained to all children that potatoes are an effective source of vitamin B6, potassium, copper, vitamin C, manganese, phosphorus and dietary fibre, whilst also containing a variety of

phytonutrients that have antioxidant activity (Link, 2017). The school's address and contact details were also obtained by the representative, in order to distribute potato growing kits to all children in mid-April, in preparation for the peak budding time. This concept is again buttressed by Morgan et al (2010) who advocate the exposure of children to vegetables, as a mechanism to increase consumption levels.

Based on observations during Intercultural Day as the Researcher circulated the various classrooms, there was an awareness amongst a proportion of children and guardians that school is associated with the provision of healthy food. Akin to Food Dude's (2011) theory that children are influenced by fads and their peers, most children provided a dish which included a combination of meats, vegetables or fruits. The number of those who opted for healthier, more wholesome dishes far outweighed those who brought desserts. In concordance with Food Dude's (2011) above principle, during the Fruit Tasting Morning, children initially opted for apples, bananas and oranges, however, upon seeing more adventurous children choose more exotic fruits, the majority of children wanted to taste everything.

Whilst the Researcher organised events during the five week block, it was noted that this whole-school implementation would be ineffective if measures were not implemented on a long-term provision. Adapting theories of researches such as Burke (2002) and Ling et al (2015), the school were enrolled in Agri Aware's "Incredible Edibles" Programme, which commenced in early April. The school were sent equipment necessary to grow the different crops, and have been invited to participate in the "Incredible Edibles" competition which involves photographing, videoing, documenting and journaling about their growing experience.

In conclusion, it has been established that females are more health conscious than males and retain new learning for a longer period of time. Further, females are more knowledgeable about, and have had greater exposure to healthy eating approaches. Children from lower classes

were less familiar with healthy eating models and there is an evident parallel between healthy eating input and children's class level. A short term implementation of a whole-school approach to healthy eating directly impacts children's knowledge and selection of foods and finally, there is a definite need for pedagogical input relating to the health promoting and inhibiting elements of certain foods.

Conclusion & Future Recommendations

6.1 Conclusion

In conclusion, this research sought to examine the impact that implementing a whole-approach to healthy eating could have on children's selection and consumption of different foods. This final chapter will review the conclusions drawn from the findings and discussions of the data in Chapter four and will finish with some recommendations for any future investigations carried out in this subject field.

As discussed during Chapter five, there is an undeviating correlation between children's knowledge and selection of food and their age, gender and class level. Young male participants from Junior Infants were least educated in relation to healthy eating, and contrastingly, older female participants from 1st and 2nd class made the most informed decisions when choosing from a range of food items. Data obtained from two questionnaires relating to children's "Knowledge & understanding of Healthful choices" and "Consumption of & Interest in food", has added to the current research beliefs that young children are underprepared for their future accountability to select healthful foods for their growth and sustainment. Although a short-term, five week whole-school approach to healthy eating presented numerous positive effects, in order to guarantee withstanding changes, long-term whole-school implementation projects are required. Envisioning the effects of a long-term approach conjure images of life-long learning and informed decision making in relation to food.

Although this research was conducted with children primarily from working class backgrounds, in Ireland families generally have access to good food. The foundations are rooted for healthy eating education, given that a significant proportion of participants like fruit and vegetables and also eat them on a daily basis – be it at the discretion of their parents and guardians, or not. Continuing on, a major question which has arisen as a result of the findings

in this paper, is whether or not children comprehend the importance of incorporating healthy foods into their diets at a young age in order to benefit them in the future.

Finally, a re-evaluation of the Irish Primary School Curriculum should be considered, with particular reference to the subjects Science and SPHE – two important subjects with scope to encompass opportunities to educate all children about healthy eating. In comparison to the action research outlined during this paper, these educational support approaches should, in an idyllic world, be implemented on an unremitting basis over a longer period of time as an achievement of any changes due to enhancements and developments in school culture are likely improbable during a short timeframe.

6.2 Recommendations

Firstly, there are a number of possible future recommendations that should be deliberated in order to enhance the literature surrounding this topic. These recommendations have been compiled after taking into account the results received, possible limitations of this study and current research. The recommendations are as follows:

1. An immediate re-evaluation of the current Irish Primary School Curriculum is necessary, whereby International Curricula and Policies such as the Californian Curriculum and WHO guidelines are adapted to suit the Irish context.
2. A unanimous National Healthy Eating policy which would outweigh current healthy eating policies in schools should be generated and circulated, whereby the entire school community must adhere to its fine print.
3. Based on the finding that males are less conscious of healthy foods, a gender specific methodology should be considered, in terms of both conduct and of physiology, when generating new policies and implementing whole-school approaches

4. The provision of low cost food preparation and cooking classes to all children of a primary school age, thus, accommodating families from all classes within Irish society, as this is not a problem specific to DEIS schools only.
5. A revision of the "healthy school lunches" which are provided by external companies to DEIS schools in Ireland. The contents of these "healthy lunches" are often questionable, and there needs to be an undisputed decision as to what is classified as a "healthy lunch", in fitting with prospective National Policies.
6. Given the sheer lack of comprehension among all participants aged between four and eight of the sugar content of many every day food items, be they healthy or unhealthy, the provision of direct teaching on this specific topic to children, with immediate effect from Junior Infants is necessary.
7. Teacher self-evaluation of their own diet and food choices should be encouraged prior to asking staff to take on some of the chief roles in implementing a whole-school approach to healthy eating, given that this form of approach incorporates, teachers, Special Needs Assistants and the wider school community.
8. Adequate teacher training should be provided so that teachers are not only equipped to teach children about healthy eating and nutrition, but also to put into practice their own selection and consumption of nutritious foods in front of the student in their classes. Also, an investigation as to whether training like this could be provided as part of staff professional development.
9. Finally, the supporting of schools is vital as they connect with local shops and businesses who may be willing to provide them with funding to buy for example, cooking utensils or educational resources, sponsorship or even free samples of healthy foods.

Finally, the research and recommendations described in this Dissertation could be used to guide further studies in this field. If conducted on a larger scale, across multiple schools, the findings could be enhanced, and thus, a greater insight into the research question could be secured.

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Appendices

Appendix A: Consent form for Parents/Guardians

Institiúid Oideachais MARINO Institute of Education
Coláiste Cleamhnaithe de chuid
Choláiste na Tríonóide, Baile Átha Cliath, Ollscoil Átha Cliath

29th January, 2018.

Dear Parents & Guardians,

Over the coming weeks, I will be giving questionnaires to children in _____ School, in relation to healthy eating and food choices.

If you would be happy for your child to complete one of these questionnaires, please complete the form below.

If you need extra information, please do not hesitate to talk to me, or email me at crobinsonpme16@momail.mie.ie

Best wishes,

Ms Robinson

_____

✂----------

(Tick **one** box)

☐ **Yes** – I give permission for my child to take part in this research

☐ **No** – I do not give my permission for my child to take part in this research

Child's name: _____ **Date:** _____

Parent/Guardian's signature: _____

(Please return to your class teacher **as soon as possible.** Thank you!)

Appendix B: Additional Information sheet for Parents & Guardians (If requested)

Title of the project:	Investigating the role of whole school input on children's knowledge and selection of healthy food choices
The study:	I am a Masters student from Marino Institute of Education (Trinity College). During my time in _____, I am investigating whether a whole school approach to healthy eating influences children's food choices.
Participant information:	If you allow your child to take part in this study, they will be asked to complete a questionnaire, investigating their personal knowledge of healthy and unhealthy foods. This should take no more than 15 minutes to complete. This will be followed by a short lesson, where we will look at every day food/drinks, and finally they will be asked to complete another short questionnaire. I foresee no risks for your child's participation in the study, beyond those experienced in everyday life. The information gathered will be treated with privacy and anonymity and no personal information regarding your child will be revealed in the research. Information will be stored safely on a password protected computer, with access only available to the research team and examiners, and it will all be destroyed after 13 months. The anonymised results from the study will be included in a dissertation and may be published at a later date. Your child does not have to take part in this study if you don't want them to, or if they don't want to, and they can withdraw from the study at any time, without saying why. If you have any questions or if anything is unclear, please get in touch. Finally, thank you for taking the time to read this.
Researcher contact details:	Ciara Robinson crobinsonpme16@momail.mie.ie
Supervisor contact details:	Mairéad Minnock mairead.minnock@mie.ie

Appendix C: Children's conent form

MARINO
INSTITUTE OF EDUCATION

I understand that I will be answering two questionnaires for Ms Robinson. I will answer one now, and another one in a few weeks' time. I know that if I have any questions I can ask my class teacher or Ms Robinson.

I know that I can decide to stop taking part in the research at any time if I want to.

Please tick one box:

☐ Yes – I would like to participate ☺

☐ No – I would not like to participate ☹

Name: _____ **Age:** _____

Boy or Girl: _____

Date: _____

Researcher's signature: _____

Appendix D: Research Information sheet for the Principal

Dear Principal,

My name is Ciara Robinson and I am currently a Professional Masters of Education student in Marino Institute of Education, Trinity College Dublin. As part of this programme I am conducting research in the area of children's diets. My research is under the supervision of Mairéad Minnock and is entitled: "Investigating the role of whole school input on children's knowledge and selection of healthy food choices".

This action research project wishes to investigate whether a whole school approach can positively impact children's food choices on a day-to-day basis. The data collection for the project includes a questionnaire which would be completed by a minimum of 50 children in the school. It is anticipated that the first questionnaire will take no longer than 15 minutes to complete. Following this, the children will be asked to participate in a mini activities based around the theme healthy eating. During my 2 week Activity Block, I hope to run a number of different healthy eating events such as a fruit tasting morning, a guest speaker and some competitions. Finally, the children will be asked to complete a follow on questionnaire.

I am aware that this is a very busy time of year for you and your school and I would greatly appreciate your assistance with this project. I can foresee no risks being associated with individual and school participation in this study beyond those experienced in everyday life. The information gathered will be treated with the appropriate privacy and anonymity and no information about your school or the participants, will be identified in the research. All information will be stored safely with access only available to the research team and examiners via a password protected computer. Data will be destroyed after a period of 13 months. The anonymised results will be included in a dissertation, and may be discussed at conferences or published in academic literature. As your school would be the site for data collection, a copy of the results can be made available to you if requested.

Please note that your school or the children involved are under no obligation to participate in this study. If a participant wishes to withdraw from the study, they may do so at any time, without a reason and without prejudice.

If you have further questions regarding this research please feel free to get in touch using the email addresses listed below. Finally I would like to thank you for taking the time to consider my research. Without your generous participation, conducting such research would be impossible.

Kind Regards,

_____

Email: crobinsonpme16@momail.mie.ie
Phone: 087 2452432

Supervisor email: mairead.minnock@mie.ie
Supervisor number: 01-8535162

Appendix E: Questionnaire 1

Children's Food choices

Questionnaire

1. What class are you in?

- Junior Infants ☐
- Senior Infants ☐
- First Class ☐
- Second Class ☐

2. Are you a boy or a girl?

- Boy ☐
- Girl ☐

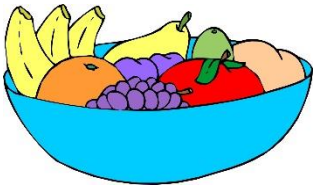
3. How old are you? (Circle one)

4 5 6 7 8 9

Section 1

Instructions: Colour in one box.

1. **Do you like fruit?**



Yes ☐ No ☐

2. **Do you eat fruit every day?**

Yes ☐ No ☐

3. **Do you like vegetables**

Yes ☐ No ☐

4. **Do you eat vegetables every day?**

Yes ☐ No ☐

5. Have you ever been to the school garden?

Yes ☐ No ☐

6. Do you think biscuits are healthy?

Yes ☐ No ☐

7. Is there sugar in biscuits?

Yes ☐ No ☐

8. Do you think doughnuts are healthy?

Yes ☐ No ☐

9. Is there sugar in doughnuts?

Yes ☐ No ☐

10. Is orange juice unhealthy?

Yes ☐ No ☐

11. Is there sugar in orange juice?

Yes ☐ No ☐

12. Have you ever heard of Food Dudes?

Yes ☐ No ☐

13. Are Coco Pops healthy?

Yes ☐ No ☐

14. Have you ever talked about healthy eating in school?

Yes ☐ No ☐

15. Have you heard of the food pyramid?

Yes ☐ No ☐

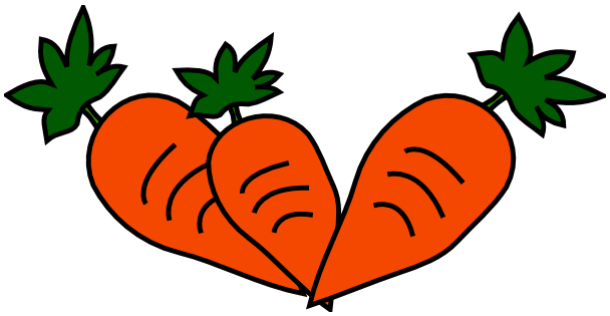
Section 2:

Instructions: Colour in one face.

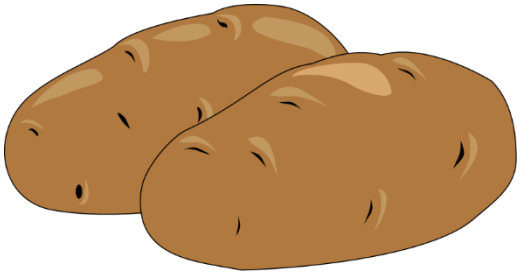
16. I like apples.

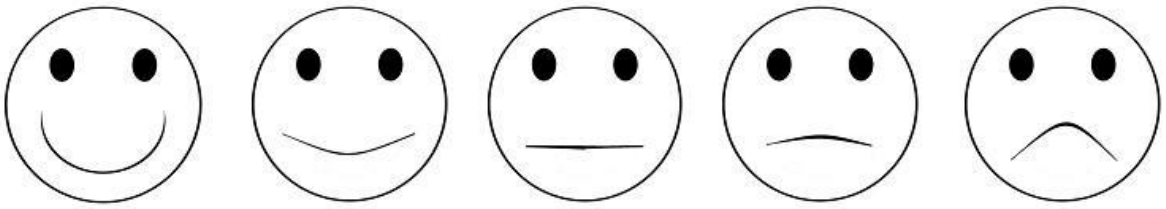
17. I like bananas.

18. I like carrots.

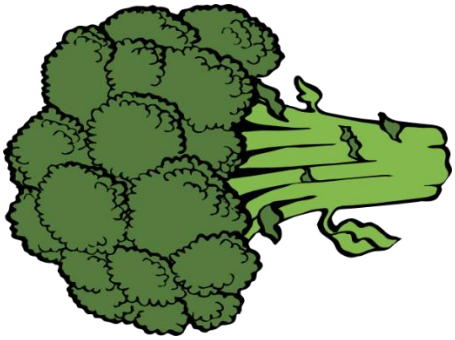


19. I like potatoes.

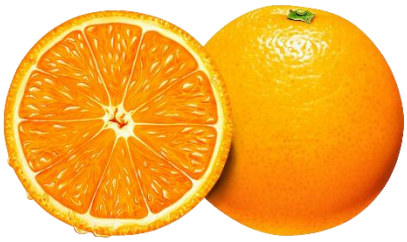


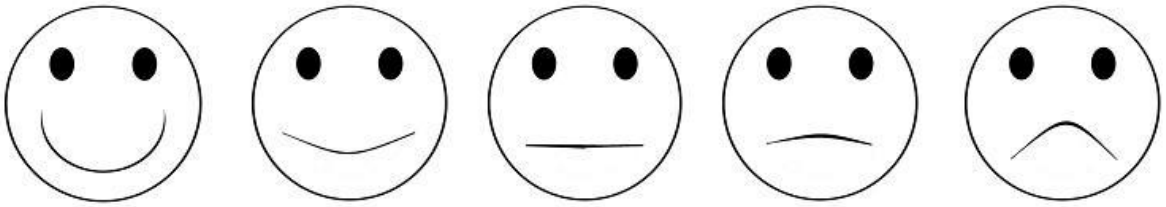


20. I like broccoli.

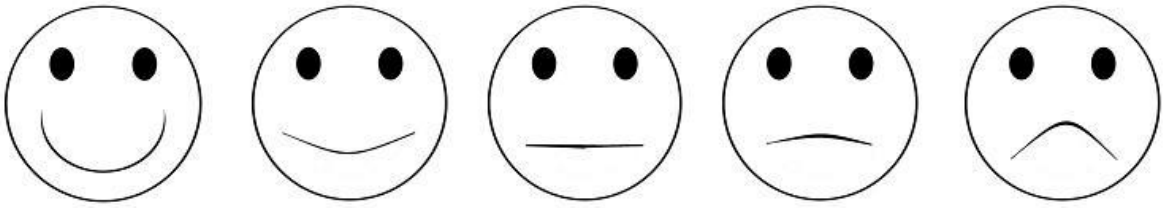


21. I like oranges.





22. I enjoy my school lunch.



23. My school lunch has lots of fruit and vegetables.

24. I would like to visit the school garden more Often.

Section 3:

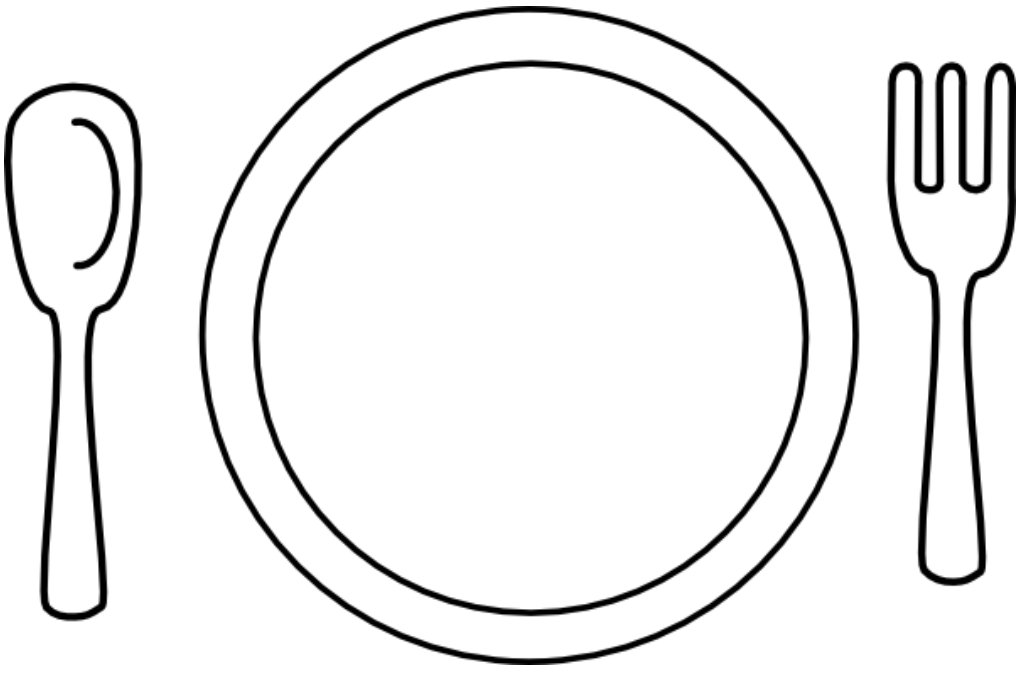
Instructions: Circle the healthiest item

25.

26.

27.

28. Draw & label a healthy dinner:



Appendix F: Questionnaire 2

Questionnaire number 2 - Follow on from Questionnaire 1

(To be completed ASP Activity Block & LS/Resource weeks)

Date: _____

Class: _____

Age: _____

Gender: _____

Questions:	Yes	No
1. Do you like fruit?		
2. Do you eat fruit every day?		
3. Do you like vegetables?		
4. Do you eat vegetables every day?		
5. Did you enjoy the fruit tasting morning?		
6. Did you try any new fruits? (If no, skip question 7)		
7. Have you continued to eat these new fruits at home?		
8. Would you like to have a vegetable tasting morning?		
9. Would you like to taste some new vegetables?		
10. Have you spent any time exploring healthy eating habits in class since the fruit morning on the 27th of February 2018?		
11. Do you think bananas, apples and oranges are healthy?		
12. Do you think biscuits, doughnuts and coco pops are healthy?		
13. Is McDonald's good for your health?		
14. Have you ever cooked or prepared food in school?		
15. If you were hungry before dinner, would you choose an apple or a chocolate bar as a light snack?	Apple?	Chocolate Bar?
16. Is breakfast an important meal?		

Appendix G: Photographs from the Fruit Tasting Morning on the 27th of February 2018


Easy Peelers