RESEARCH ARTICLE

'A time of constant innovation!' - The impact of the COVID-19 pandemic on the teaching of food practical Home Economics in Ireland, and learning for future best practice: an explanatory mixed methods study [version 1; peer review: awaiting peer review]

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Abstract

Background: The ongoing global pandemic of SARS-CoV-2 (COVID-19) (WHO, 2020) utterly disrupted traditional modes of education nationally and internationally. Mastering online teaching imposed by the COVID-19 pandemic was challenging for many teachers. The purpose of the study was to illuminate the challenges experienced by food practical Home Economics teachers, investigating their ability to innovate, adapt and proceed with food practical classes during the COVID-19 pandemic. This study also aimed to discover best practical methodologies for online and face-to-face food practical classes while looking forward with reimagined approaches to teaching and learning for a post-pandemic world and documented teachers experiences, agency, adaptations and innovations.

Methods: Both qualitative and quantitative research methods were employed to meet study objectives. Data was gathered in the Republic of Ireland via 132 questionnaires with Home Economics teachers and semi-structured interviews with six Home Economics teachers.

Results: Results revealed that COVID-19 imposed serious challenges on teachers who nonetheless adapted well to the changing environment. They employed innovation and determination to proceed with practical classes in very challenging working environments, resulting in many positive educational advances. Teachers up-skilled, reflected and collaborated to proceed safely with practical's and deduced best practice methodologies which in a number of cases arose from trial and error. Findings were employed to produce frameworks for best practice when conducting food practical Home Economics classes (both online and face-to-face). These frameworks have national and international relevance in
considering new models of teaching in which authentic teaching can occur and provide alternative pedagogies and technologies to support the food practical.

**Conclusion:** This study recommends more technological training for Home Economics teachers, specifically regarding practical classes, as well as support for physical working environments, collaboration and innovation. This research is focused on how teaching can be reimagined, strengthened and valued to inform future teaching and learning models.

**Keywords**
Home Economics, Distance and Remote learning, Digital Pedagogies, Active Learning, Covid-19, Teacher Innovation, Agency, Practicum

This article is included in the Digital Pedagogy collection.
Introduction
The coronavirus (COVID-19) pandemic was an unprecedented emergency that has affected all global industries, including education (Ayittey et al., 2020). The COVID-19 pandemic has disrupted long-standing educational practices and has precipitated an urgent need for many institutions to rapidly implement alternative educational and assessment strategies (Longhurst et al., 2020). To date, reports on the impact of school closures as a result of the pandemic have focused on whether such closures were effective in controlling the spread of disease (Rauscher, 2020; Viner et al., 2020), and their effects on pupils’ learning and well-being (Colao et al., 2020; Kim & Asbury, 2020). Little attention has been paid to the impact school closures have had on teachers ability to teach practical subjects, an important gap given that the strength of many subjects lies in the application of theory to practice (Pendergast, 2009). This study explores how Home Economics teachers in the Republic of Ireland adapted professionally to the changes necessitated by COVID-19 while teaching Food Practical Home Economics (FPHE) and how these changes may impact on the teaching of Home Economics in a post COVID-19 world. There is currently a dearth of published research to support Home Economic teachers to proceed with the practical element of the curriculum. This research, based upon the experiences of and challenges faced by Irish Home Economics teachers, may also contribute to the growing discourse around preserving quality education in the Irish and International context in light of the changes imposed by a highly infectious, potentially life-threatening virus.

To increase the relevance of educational research, it is important to conduct projects that reduce the gap between research and practice, which will in turn enhance the professional profile and quality of teaching and education (Hammersley, 1993). This research was conducted during the most profound disturbance of education in the history of education (Flores & Swennen, 2020; Quezada et al., 2020). As well as the concerning physical symptoms of the virus itself and potential after-effects, the rapid acceleration rate of COVID-19 throughout the world has created psychological pressure on adults and children alike (Rodriguez-Ray et al., 2020), with a moderate to severe rise in negative effects such as stress, anxiety, depression, insomnia and fear (Brooks et al., 2020; Wang et al., 2020). Güler and Haseki (2021) explored the positive psychological effects of culinary experiences during the pandemic they found that culinary activities offered an outlet to reduce these newfound stressors and were considered an important “escape activity” during the COVID-19 lockdown. Their research concluded that people who spent time completing culinary activities left the kitchen with eudaimonic outcomes “gaining skills, knowledge, self-actualisation and self-enrichment”. The pandemic has shown that together humanity can do the seemingly impossible (Alfvén, 2020). This research may add value and provide guidance to sustain and progress FPHE classes in a post-pandemic world.

Literature review
Education in a global pandemic
Bozkurt and Sharma (2020) described the impact of the pandemic as placing the global education system into the centre of a hurricane. The World Health Organisation classified COVID-19 as a global pandemic in March 2020 (WHO, 2020). In an effort to slow down the spread of the disease, protocols such as lockdowns, working from home, flexible working hours or closure of many institutions and services was introduced. Education institutes in the Republic of Ireland were formally closed on the 12th March 2020, and face-to-face teaching was suspended from 16th March, following government advice (Department of Education, 2020). By this time, schools in 137 countries were already closed as a result of COVID-19 (The World Bank, 2020). Educators were forced to rapidly find solutions to many challenges; replacing traditional learning modalities with distance and blended learning approaches (DES, 2020). As of 15th August 2022, there has been 1.65 million confirmed cases and 7,743 people have died from the virus (Government of Ireland, 2022).

Education is essential for society to survive and flourish, it must be “comprehensive, sustainable, and superb”, whilst steadily evolving and progressing to “meet the challenges of the fast-changing and unpredictable globalised world” (Serdyukov, 2017). COVID-19 has imposed hardships and dangers to education, but possibilities have also been created (Stoller, 2021). Interest and research on the challenges and opportunities imposed on education as a result of COVID-19 continues to grow (Adedoyin & Soykan, 2020). To meet this evolution and progression some SWOT analysis studies (strengths, weaknesses, opportunities and threats) associated with COVID-19 and its impact of education has emerged. Longhurst et al. (2020) presents SWOT evidence on the pedagogical opportunities and challenges that were documented over the pandemic in Irish higher Education institutions, whilst Stoller (2021) looked at the SWOT model in education within the medical clinical setting.

Positive opportunities provided by the pandemic included academic collaboration and working remotely, as well as the opportunity to implement blended learning in future curriculum development (Longhurst et al., 2020; Stoller, 2021). Nevertheless, considerable threats such as reduction in quality of resources, reduced student engagement and diminished student-teacher relationships were identified (Longhurst et al., 2020). Stoller (2021) further this perspective and insists the sudden movement to virtual teaching and learning provides an opportune time to create excellent virtual teaching practices. Longhurst and Stoller research strongly points out that COVID-19 has forged a necessity to transform and innovate in education and suggests that COVID-19 created an environment favourable for creativity, novel virtuosity, self-reflection and a responsibility to act nobly for both educators and learners. While these studies are somewhat applicable, at this point in time, there is no SWOT paradigm
of the impact of COVID-19 on post primary education. As such, further study on the opportunities and challenges is required to establish a comprehensive view of its implication within second level education. Furthermore, Hughes et al. (2020) presents the pandemic as a positive teaching moment suggesting that it is a transformative time in education. Corbera et al. (2020) concurs, arguing that, amidst the disruption and disorder, COVID-19 can be a catalyst to refocus priorities, redefine excellence, and in turn foster an academic practice of respect and sustainability.

Challenges of teaching in a pandemic
COVID-19 is the greatest challenge education systems have ever faced (Daniel, 2020). Hughes et al. (2020) formulated a list of factors from their review of ‘situated cognition and course design’ (Brown et al., 1989; Fink, 2003; Hansman, 2001) that can affect teaching and learning. Key factors included: prior knowledge, learning goals, nature of the subject, learner characteristics and teacher characteristics. UNESCO (2020) highlighted interrupted learning, parents being unprepared for distance/home schooling, unequal access to digital learning and social isolation as some of the consequences of COVID-19 on education. The key challenges arising in literature and pertinent for investigation in this research are interrupted learning and emergency remote teaching (ERT), the particular challenge of moving a practical subject online, challenge of technological competence of teachers, home economics and the challenges of COVID-19 on food practical classes, and the challenge of wellbeing for teachers and students.

Challenge of interrupted learning and emergency remote teaching
COVID-19 resulted in the cessation of face-to-face learning with many governments asking educational institutions to move from traditional to virtual education and online teaching (Rogers & Sabarwal, 2020). In March 2020 until May 2020 Ireland swiftly moved to online teaching. The challenge was sudden and undefined (Sousa, 2020). According to Rogers and Sabarwal (2020) the emergency shift to remote learning required teachers to learn digital skills to operate technologies and to adapt the teaching-learning materials into a synchronous or asynchronous mode. The rapid shift to remote learning during the coronavirus crisis was difficult for technology-aware teachers as well as young-adult students (Kundu & Bej, 2021a; Kundu & Bej, 2021b). The challenge would have been multiplied for technology-skill-deficient teachers, as those who lack the competence avoid using technology (Glasel, 2018).

When for a second time Ireland’s schools had to move suddenly to emergency remote teaching (ERT) in January 2021, it became clear that widespread online learning would continue for a much longer time period. Teachers could no longer take the “triage” approach and merely find a quick fix to teach online for a short time. They would have to be more ambitious and tenacious with pedagogical decisions and course plans (Daniel, 2020). ERT should not be confused with virtual education (online learning and teaching) which Cavanaugh et al. (2004) defines as a form of distance education where one of its specific characteristics is the separation of the learner and the teacher. Whereas ERT has been defined as a temporary shift from face-to-face instruction to entirely digital education due to external factors (in this instance COVID-19) and where there is no time for preparation (Hodges et al., 2020). Pestano Pérez et al. (2020) classifies ERT as a short-term solution to an urgent problem.

Rogers and Sabarwal (2020), evaluating virtual learning education substantiates that it can never fully supplant in-person teaching but can capture and connect students in effective and purposeful ways to reduce learning losses. Kundu and Bej (2021a) conducted research to analyse the success and challenges of digital teaching practices capturing the challenges teachers encountered while implementing virtual learning. They conducted online surveys (N=141) and categorised challenges uncovered into eight themes: student engagement; training need; parents’ engagement; access to digital equipment; monitoring learning; teaching difficulties; systematic challenges; hectic and frustrating. However, it should be noted, although this study provides insights into the challenges faced by teachers, the sample was collected via social media, therefore, as the authors point out, the results cannot be generalised.

During COVID-19, flipped learning methodologies using pre-made videos were frequently employed (students receive prepared materials, study asynchronously and explain any uncertainties they might have in synchronous communication with the teachers) (Lipomi, 2020). Wagner et al. (2020) undertaking a meta-analysis of 44 independent sources concluded that well-designed flipped learning was more effective for post primary school students than traditional teaching, with the highest correlation of success linked to STEM teachers (Science, Technology, Engineering, Maths). Furthermore, according to Daniels (2020), an asynchronous digital classroom gives teachers and students more space to breathe. However, flipped learning is not without challenges including: heavy teacher workload; lower activity levels among students; and longer working hours creating material (Lo & Hew, 2017; Zhu et al., 2019). Gewin (2020) further highlights that learning to use new technologies and create new resources is time consuming, as it can take at least three times as much work compared to a traditional format. Worryingly, that study observed that instructor-made videos potentially lead to no measurable improvements in student achievement (Gewin, 2020). In contrast to this, Longhurst et al. (2020) affirms teacher resources and videos do have a positive impact on student engagement levels. Nevertheless, and of particular relevance in this research, it must be acknowledged that online resources cannot replicate the wealth of information available in a practical class and not physically attending a practical session will limit haptic understanding (Ali et al., 2015; Estai & Bunt, 2016).
Daniels (2020) reassures teachers claiming “this emergency is not the time to put into effect complex institutional plans for distance learning that were meant to be implemented over months or years”. He takes the view that full attention needs to be placed on encouraging and comforting students rather than endeavouring to master new pedagogy or technology in the midst of a global pandemic. The pandemic is recognised as a transformative period for teachers virtual teaching; their contemporary ideas, innovations and experiences need to be realised and studied in order to inform and progress this area (Stoller, 2021).

Particular challenge of moving a practical subject online
Online learning is generally associated with adult students, with convenience alluded to as its most appealing feature (Christensen & Eyring, 2011). Many studies advocate that online learning helps curtail workload, reduces the convolutedness of learning, as well as lightening the strain of face-to-face interaction with classmates and the teacher (Adedoyin & Soykan, 2020; Hans & Ellis, 2019; Vlachopoulos, 2020). In addition, it can offer a sense of privacy and fulfilment (Cole et al., 2014; Kerby et al., 2014). Contrastingly, online learning has generated a false narrative of being easier and less meticulous than its traditional face-to-face contender. While online learning can be advantageous for experimental and creative learners as they find the convenience of ‘any time, any place, any pace’ appealing (Serdyukov, 2017). Serdyukov (2017) suggests that such convenience may lead to the development of indolence. Furthermore, Zhao (2012) suggests online learning can mean a “less demanding and less rigorous school experience”. Howbeit, the research on online learning is in the main dedicated to third level institutions (Hodges et al., 2020; Salturk & Gungor, 2020; Vlachopoulos, 2020), leaving a dearth in research for post primary level. Chadwick and McLoughlin (2021) explore the impacts of COVID-19 on practical activities in science with their research revealing that 90% of Irish teachers found COVID-19 had a negative impact on teaching, learning and assessment. Prior to the COVID-19, three quarters of second-level science teachers conducted practical classes most or every lesson and this decreased to one in eight teachers during November 2020 (Chadwick & McLoughlin, 2021). The decrease in facilitation of practical science was even more profound during ERT, citing inadequate resources as a barrier. If a teacher is not willing to blur the work-home boundaries to enable continuation of learning then a practical vacuum can become apparent (Kidd & Murray, 2020). To date, there is a dearth in research on the impact of ERT on the Home Economics practical discipline and this study aims to bridge said gap.

Challenge of technological competence of teachers
The digital age had arrived, and schools were not yet ready for it (Pestano Perez et al., 2020). While there was some use of digital approaches in education pre-pandemic, the sudden move to ERT necessitated as a result of COVID-19 rapidly exposed educator competence, or lack thereof, with ICT (Coeckelbergh, 2020). Teachers should “in these times (and all other times) think about not only the content of their teaching but also the medium they use” advises Coeckelbergh (2020). Falloon (2020) outlines that a digitally competent teacher must continuously reflect of their students’ needs and capabilities. Teachers should attend professional courses to respond to meet the demands of the ever-changing educational environment (ibid). However, as Adedoyin and Soykan (2020) point out, not all educators possess the digital competencies necessary to carry out emergency remote learning or to use new technologies within the classroom during social distancing. They explain if a student or a teacher has low digital competence, they are more likely to fall behind in online learning. Lund et al., (2014) identify the unique position held by teachers, as they are placed with the responsibility to develop a holistic view of digital competence with their students. Not only must they educate their students using current and emerging digital resources, they must also make their students, “capable of using technology in productive ways”. This is challenging to achieve and more research needs to be done in this area to understand how to best support students when engaging in digital learning (Lund et al., 2014). Additionally, Uwameiyre (2019) states, “this present generation was born into technology and must be taught with them”. Technology and e-learning must no longer be viewed as an ‘add on’ for students. It is pivotal to how students orient their learning and enables them with flexibility of use which in turn empowers them to take ownership of their own leaning and meet their own educational needs (Conole et al., 2008).

Prior to the pandemic, the major barriers that limited teachers’ ability to use and integrate technology into classrooms were lack of resources, time, and support (Pittman & Gaines, 2015). In addition, teachers were likely to experience stress if they have to operate technology that they do not feel they are competently trained in (Klapporth et al., 2020). During school closures, Klapporth et al., 2020, conducted a cross sectional survey in Germany to assess the level of stress that teachers experienced looking at the internal and external challenges for distance teaching (N=380). The results revealed teachers experienced medium to high levels of stress. Teachers involved agreed on technical challenges such as lack of adequate computer equipment alongside low internet connectivity as major challenges to successful teaching. Interestingly, their results revealed that female teachers experienced significantly more stress than male teachers (ibid). Clark et al. (2021) offer an explanation for this, maintaining females experience higher levels of work stress due to gender differences which results in increased domestic tasks and higher workload for teaching. Furthermore, with women generally assuming more care responsibilities than men, the closure of childcare and schools disproportionately increased their workloads (Darmody et al., 2020) and placed heavier burdens on females, which in turn restricted their capacity to work (Petts et al., 2020).

Home economics and the challenges of COVID-19 on food practical classes
In Ireland, Home Economics is an optional subject studied in post primary school. The rationale for the subject Home Economics is to ensure that students are equipped “with
knowledge and skills” to deal with “practical, real-world, perennial problems” relating to “food, nutrition, diet and health, family and social concerns, consumer issues, sustainability in the home; responsible family resource management; and textiles and clothing (NCCA, 2017).

In regard to teaching Home Economics during the pandemic, the Department of Education issued the ‘Return to School Guidance for Practical Subjects in Post-Primary Schools and Centres for Education’ in August 2020 with an update in February 2021 (Department of Education, 2021). The aim of the document was to provide advice and instruction to subjects that was connected with the use of equipment in order to support the safe implementation of the practical aspects of those subjects. The guidance for Home Economics food studies was:

To ensure that a safe and practicable working environment can be provided, it is advised that a maximum of one student per work station completes practical work in a lesson; this will possibly result in students completing practical work on alternating lessons. Students not completing practical work could complete tasks linked to the practical work being undertaken.

(Department of Education, 2021)

This guidance acknowledged one of the key challenges “of balancing the need for a practical and sensible level of caution with the need to provide a supportive environment for teaching and learning” all the while being cognisant of the need to change and adapt to public health situation at the time and the level of COVID-19 in the community. The document was highlighted as a prototype and stakeholder feedback was welcomed to refine, enhance and improve this guidance for practical subjects. Notably, no official guidance was issued for the continuation or guidance on proceeding with practical classes (food studies Home Economics) or the teaching online from home period of January 2021 until April 2021.

Pendergast and Dewhurst (2012) argue that student’s motivation and enthusiasm in Home Economics is heightened when engaging in active learning. COVID-19 restrictions reduced student’s ability to partake in active learning in class settings (Beinert et al., 2020). Most teachers used approximately 80% of allocated time on cooking, thus showing that practical cooking is a highly regarded and prioritised area of the subject (Beinert et al., 2020; Øvrebo, 2019; Veka et al., 2018). The main barriers to practical classes as documented by Beinert et al. (2020) include lack of equipment, non-optimal premises and economic factors. COVID-19 has now introduced an additional barrier of social distance, coupled with the Department of Education guidelines for conducting practical classes (Return to School Guidance for Practical Subjects in Post Primary Schools and Centres for Education, 2021). The effectiveness of practical food skills, being taught in Home Economics, are often challenged by the size of the class cohort involved.

The average post primary class size in Ireland is 25 pupils to every teacher, compared to the EU average of 20 pupils (OECD, 2020). Arguably, the greatest challenges to teaching in Ireland are large classes, insufficient staffing, inadequate accommodation and equipment. Ann Piggott, president of the Association of Secondary Teachers in Ireland (ASTI) highlights that in a pandemic, these deficits make operational measures such as social distancing and remote learning highly problematic, whilst also impacting on the quality of teaching that can be achieved (Casey, 2020).

**Challenge of wellbeing for teachers and students**

As acknowledged by Wang et al., 2020, there has been widespread emotional distress in response to the COVID-19 pandemic (Wang et al., 2020). Twenty-five per cent of the general population have experienced moderate to severe levels of stress or anxiety-related symptoms, with reduction in quality of life (Qiu et al., 2020; Wang et al., 2020). Research from previous pandemics suggest that the scope of distress related symptoms is much more extensive (Taylor et al., 2020). This led Taylor et al. (2020) to the development of five inter-correlated factors corresponding to a COVID-19 stress syndrome as follows:

- Fear of the dangerousness of COVID-19, which includes fear of coming into contact with fomites potentially contaminated with SARS-CoV2
- Worry about the socio-economic costs of COVID-19
- Xenophobic fears that foreigners are spreading SARS-CoV2
- Traumatic stress symptoms (nightmares, intrusive thoughts or images related to COVID-19)
- COVID-19 related compulsive checking and reassurance seeking.

Other studies focused primarily on fear of infection which are narrow and unidimensional (Ahorsu et al., 2022; Lee, 2020; Mertens et al., 2020). COVID stress syndrome is a complex phenomenon and it is pertinent that educators understand reactions and inter-relations in order to inform practise and reduce COVID-19 related distress in the classroom (Taylor et al., 2020). In Ireland, a once-off survey of 959 Leaving Certificate students revealed high levels of depression, anxiety and stress amongst students in the academic year 2021 (Quinn et al., 2021) and evidence indicates that educators are also working through the pandemic fog (Brazeau et al., 2020).

**Best practice in online teaching and learning practices.**

Literature on best practice teaching online generally strongly identifies that educators need to provide flexibility, with clear timelines to foster self-paced learning (Duncan & Barnett, 2009), to ensure lesson inclusivity through the intentional planning for individual needs, strengths, interests and cultural awareness (Chambers et al., 2012; Tai et al., 2019) and to shift focus from summative to formative assessment (Uribe & Vaughan, 2017). Recommended design principles for online
assessments include, concentrate on grounding the learning in relatable issues to enable the learners to apply the knowledge to their everyday lives (Evens et al., 2017; Lee & Martin, 2017), whilst providing assignments that can be built up and link together (Swaggerty & Broemmel, 2017).

Hodges et al. (2020) purports for best practice to occur during the pandemic educators need to go beyond the ‘emergency’ online practices, encouraging to delve into meticulous instructional planning and lesson design, so quality online teaching and learning become the norm. Carrillo and Flores (2020) declared the pandemic period as a pivotal moment in education, from their review of 134 empirical studies on online teaching and learning practices, they believe good practice involves the need to collate, merge and marry the work that has been achieved in this area for educators to be informed on future best practices. From an online pedagogical stance the role of the teacher shifts to one of guide and facilitator of learning (Boling et al., 2012) therefore, the students become central in the achievement of the learning goals with more responsibility and independence placed upon them (Forbes & Khoo, 2015). The teacher must act as a facilitator and provide regular constructive feedback to the students (Thurlings et al., 2014) because as Muir et al. (2019) highlights students need adequate support from their teacher to retain effective learning and to remain committed and motivated. Carrillo and Flores (2020) summarises best practice as basing the learning on everyday relatable situations, ensuring its personalised, focus on the process with opportunities for formal and informal learning, and most notably the teachers main role is that of a facilitator to support and make meaningful productive interactions with the learners. Notably these studies focus only on the online element of best practice and there is a gap in literature in best practice for in person teaching in pandemic.

Home Economists must understand and remain cognisant of the value and importance of relating content to their surrounding situation (Brown et al., 1989). Hughes et al. (2020) reaffirms this notion and recommend that educators are encouraged to include real-life relevant student experience and acknowledge the conditions of living in the midst of a global pandemic, in order to realistically meet curriculum objectives. McKenzie (2020) advocates for the integration of COVID-19 into each subject area in order to enhance the curriculum. Wiggins and McTighe (2005) assert that “an essential act of our profession is the crafting of curriculum and learning experiences to meet specified purposes”. To merge real life examples of COVID-19 into course content will not only strengthen a subjects relevance, but also it will enrich the current curriculum (Fleming, 2020; McKenzie, 2020). From this perspective, of thoughtfully merging the pandemic into pedagogy and use of remote tools, Hughes et al. (2020) suggests that students will be more prepared for careers in health promotion than if they had completed their studies in a pre-COVID-19 world which is an important consideration for FPHE teachers.

Constructing teacher agency and innovation in response to COVID-19. Agency is defined as how an individual can act by means of their environment, resulting from the complex interplay of individual effort, available resources and contextual and structural influences within the place and space of which the individual operates (Biesta & Tedder, 2007). Hitlin and Elder (2007) agree that agency is “the socioculturally mediated capacity to act”. However, Ahearn (2001) argues that agency must be linked to reflexivity to self and it is about taking action and forming choice’s that alter or continue routines. The complexity of agency has been amplified during the COVID-19 pandemic with teacher agency a necessity to facilitate student learning, maintain professional development and collaborative teaching (Toom et al., 2015). To be an ‘agentic’ teacher one must recognise themselves as a pedagogical expert with ability to conduct new learning at both individual and community levels (Pyhältö et al., 2012). Teachers should have the capability and capacity for “will, autonomy, freedom and choice” (Lipponen & Kumpulainen, 2011). Agency in the context of learning is about an individual who comprehends how to teach, identifies the constricts of their subject knowledge and enables themselves with the skills and knowledge to expand their expertise, in order to be in control of what is taught and how it is taught (Hull, 2020). When teachers perceive themselves as ‘active agents’ with the school environment this has a positive effect on student learning (Pyhältö et al., 2012). However, if there is a weak sense of agency a teacher will feel controlled by the education system, curriculum demands, parent and student expectations (Biesta et al., 2015; Wei & Chen, 2019). Additionally, this can negatively impact upon pedagogical tasks, pupil learning and collegiality amongst teachers (Toom et al., 2015).

Throughout the pandemic teachers have been placed as education’s frontline responders (Beames et al., 2021; Campbell, 2020). Campbell (2020) emphasised the extraordinary weight that had been placed on teachers during COVID-19 to partake in professional learning, formulate new practices, make crucial decisions based on intricate guidance from the government and school leaders in order to ensure the wellbeing and safety of the staff and students as they return to school. However, as Shields (2018) asserts for transformation within education to occur, it requires change, change is complex, and is usually meet with uncertainty and struggle. Therefore, it is crucial that agency must be discussed and established in practice through the same consultation (Campbell, 2020). Rather than giving teachers a reformed curriculum or expecting them to implement regulations or guidelines, Severance et al. (2016) suggests that it is best practice for teachers to reflect actively and agentively on the curriculum they are teaching so that they can be part of the creation of the new implementations, guidelines or curriculum. It is clear that environments that promote active participation help develop professional agency (Pyhältö et al., 2015).

Innovation. There is a clear interrelationship between teacher agency and innovation (Bakkenes et al., 2010). To prosper in a world of constant change implementing innovative solutions to problems is a key skill required in order to succeed (Barak & Usher, 2019; OECD, 2016; Short & Keller-Bell, 2019). Innovation is routinely acknowledged.
as “the successful introduction of a new thing or method” (Brewer & Tierney, 2012). Serdyukov (2017) advances the argument attesting: to innovate is “to look beyond what we are currently doing and develop an original idea that helps us to do our job in a new way”. Innovation in education can manifest as a new pedagogical theory, teaching methodology, instructional tool, learning technique, or institutional structure, that when enacted gives rise to a notable change in teaching and learning which in turn results in superior student learning (Serdyukov, 2017). Harris and Dakin (2020) state that the pandemic is an opportunistic occasion to seize learnings and solutions that have been generated in the short term and apply these findings to supplement our educational evolution going forward into the future: they refer to their five principles of Rapid Innovation and Evaluation; don’t reinvent the wheel, don’t let the perfect be the enemy of the good, measure as you go, document decisions, and stay connected to your communities (Harris & Dakin, 2020).

According to the OECD (2016) innovation within education is an idea that notably varies from previous ideas and one that is brought into use in its field of practice. Ellis et al. (2020) argues that this definition does not clarify if novel ideas and original contributions in times of emergency are regarded as innovations. Ellis et al. (2020) research concluded that COVID-19 had with certainty lead to an innovative stance, and that teachers new ideas during this time could be classed as potential innovations within education. It did leave the question; how can innovation be retained and nurtured in education in the years that follow this crisis and how can educational innovation be stimulated? The research aspires to bridge the gap and pursue with further depth teachers potential agency and innovation during this pandemic.

Innovation in Home Economics

Goatley and Johnston (2013) claim when people acknowledge the opportunities that new tools and technology can present then innovation can take place. Therefore, one way to bring innovation into the Home Economics classroom is by means of technology. Social media such as Facebook, YouTube, Twitter, WhatsApp and Instagram, paired with the emergence of smartphones, are instruments of communicative technology that can underpin and support students and teachers communications beyond the school setting. Uwameiye (2019) asserts that making use of technology should be an inherent method of teaching and learning, as it may prompt and generate the attention of younger students, thus strengthening their learning outcomes. This is further supported by others positing that social media has enabled new possibilities which has resulted in a fundamental shift in the way students learn, consume and produce new information (Braun & Schmidt, 2006; Dillon, 2006).

Adequate planning and organisation is another means of creating innovation within Home Economics. The Home Economics teacher must be able to provide activities that hold, motivate and maintain learner’s concentration and attention (Uwameiye, 2019). Darling-Hammond and Bransford (2005) noted teachers are faced with complex decisions daily and the demands on teachers are increasing. Complex decisions such as learning differences, language barriers, cultural influences, students temperaments, interests, and approaches to learning. Teachers must also be cognisant of the multiplicity of ways in which students learn and aware of the context of development (Darling-Hammond & Hyler, 2020).

A further means of innovation in the Home Economics classroom is by bringing into effective action suitable teaching methodologies. Teachers should employ methodologies that are student centred, allow for active learning, be motivating, innovative and encourage self-discovery (Herrmann, 2013). To be an innovative teacher, one must supply learners with the opportunity to access learning-resources to assist learning tasks, with students having control over their time and space (Boling et al., 2012). This provides support for the use of technology (smartphone or computer) for teaching practical lessons. Teachers must also be flexible in their methods of evaluation of students work (Uwameiye, 2019). Moreover, the lesson plans and content in an innovative Home Economics classroom must be diverse, varied and meet the needs and requirements of the learners. The purpose of practical Home Economics is to bring a necessary balance of theory and practise. Magee (2010) notes the “relatedness and relevance of the subject to life and living and the ease of transferability of learning to real life situations gives meaning and purpose to the learning process”. Home Economics teachers must move away from the orthodox practice where the teacher is the master of the classroom and progress towards a classroom of novelty, adjusted to the interests and capabilities of the learners and adapting the curriculum to suit those learners (Guri-Rosenblit et al., 2007).

Innovation requires a teacher to reflect-in-action (Schoen, 1983). A study by Lovsin Kozina (2016) on teachers attitudes on selected aspects of practical teaching exposed the importance of colleagues in reflection, highlighted “colleagues support is more effective than that of a mentor”. Similarly, Malm (2009) research revealed teachers viewed communication skills and ability to be reflective practitioners as very important to developing pedagogy. COVID-19 pandemic is an opportune time to reflect and “is a potential catalyst for change” (Moyo, 2020). Home Economists have the potential to skillfully adapt as they are never expert at one thing, but become expert through reinterpretation, rethinking new skills, new material, new comprehensions, contemplating, and renewing (Pendergast, 2001). It is recommended that, to sustain and future proof Home Economists one must be “expert at being novices” (Pendergast, 2009). Expert novices are “good at learning new things” (Pendergast et al., 2012). They become experts at finding answers and solutions for emergent issues and obstacles (Pendergast & Deagon, 2020). McGregor (2008) added that because things are always changing, home economists should change too especially by “letting go of expertise if it is not meeting the needs of society anymore”. Hopefully it is through this ‘novice’ expertise that innovation can occur and be given space to flourish.
Methods

Ethics

Ethical approval for this study was granted by the St. Angela’s College, Sligo, Research and Ethics Committee on the 1/12/2020. This study was conducted as part of a Masters in Education (Home Economics). In line with the Ethics Approval granted the participants involved in this research volunteered to partake in the study on the grounds that the interview data was anonymised, that all data gathered was stored securely, used within data protection guidelines and appropriately and confidentially destroyed within the defined timeframe. The project was completed in August 2021.

Study design

This study adopted an explanatory mixed methods approach in order to obtain and interpret a wealth of data. Mixed methods is based on “practice-driven” approaches rather than “idealistic” ideas (Denscombe, 2008). In combining quantitative and qualitative methods, both “breadth and depth” of data has been achieved (Johnson et al., 2007). This approach added validity and transferability to the research, thus enabling the aim of exploring how Home Economists can teach food practical classes in a rapidly changing environment, to be achieved. There are 1,876 registered Home Economics teachers in the Republic of Ireland (Teaching Council, 2020). Non-probability sampling was used for this research as a particular group was the research target (Cohen et al., 2007). Questionnaires were circulated via email. In total, 400 schools were emailed, 132 questionnaires were completed, with all 26 counties in the Republic of Ireland represented. The timeframe of the research was March 2020 until March 2021.

Questionnaires completed by FPHE Teachers

A questionnaire was selected as one of the tools for this study because it has the ability to measure perceptions, attitudes and behaviour (Neuman, 2000). There were two inclusion requirements for selection of questionnaire participants: informed consent, and being a teacher of Home Economics in the Republic of Ireland. The questionnaire was cross-sectional in design, as it collected information about a population at one point in time. It was designed to provide insight into how Home Economics food practical classes were being taught during a period of the COVID-19 pandemic (March 2020 to March 2021), and to identify what methodologies teachers were using to conduct food practical classes in school and/or online. The questionnaire was divided into two sections to reflect school closure periods:

2. Teaching Home Economics food practical classes in the physical classroom (September – December 2020).

Questions were based on the objectives of the study, divided thematically but with no headings to avoid any bias upon completion. Questions were in the main closed ended questions for ease of analysis (Seliger & Shohamy, 1989), however some open-ended questions were included to allow for “a greater level of discovery” (Gillham, 2000). Questions were modelled on other peer reviewed studies to add validity to the themes, for example question nineteen was based upon Harris and Dakin (2020) Principles of Rapid Innovation and Evaluation: Responding to COVID-19. Question twenty was based upon Morad et al. (2021) ‘The validity and reliability of a tool for measuring educational innovative thinking competencies’. These are reliable, peer reviewed questions to gauge levels of innovation within the classroom. The final question asked participants if they would be willing to partake in further research in this area- an interview, and participants could voluntarily submit their email to do so. To reduce misleading or ambiguous questions a pilot of the questionnaire was conducted, with five Home Economics teachers from local schools, these teachers are not be part of the final research. Notwithstanding this questionnaires are one of the most practical, time efficient ways to collect large amounts of data. With the added advantage of respondents’ anonymity making them more likely to divulge information (Brown, 2001; Nunan, 1999).

Questionnaire data was gathered and collected via Survey Monkey (SM), as it could collect both quantitative and qualitative data, and present it in an easy to analyse manner (see Extended data, (Winters & Maguire, 2022). Quantitative data was coded numerically and entered into the Statistics Programme for Social Sciences (SPSS) Version 24, for which various tests were performed. Both descriptive and inferential analyses were performed on the data obtained. Pearson’s correlations were used to assess if there was any significant links could be inferred from the data. The inferential significance levels were identified at p=(<0.01) and p=(<0.05) to ensure generalisability and to add validity and reliability to the results of this study. Furthermore, T-tests were carried out to determine the reliability of the numbers.

Interviews with FPHE teachers

Subsequently, interviews were conducted with a sample of respondents as this “enabled participants to discuss their interpretations of the world in which they live, and express how they regard the situations from their own point of view” (Cohen et al., 2011). There was three inclusion requirements for participation in the interview: informed consent; being a teacher of Home Economics in the Republic of Ireland; and having conducted practical Home Economics classes both in the classroom and online. The interview tool allowed the researcher to probe and elicit detailed responses from the participants (Walford, 2001). This approach was very powerful as “voice” was given, for the first time to post primary Home Economic teachers in the Republic of Ireland to express in their own words the impact COVID-19 had on their ability to conduct FPHE classes. The interview provided deeper insight into the development of agency and innovation within Home Economics and the exploration of best practice methodologies for conducting FPHE classes in COVID-19 times and into the future. The follow-on semi-structured interview schedule emerged organically from questionnaire responses. The questions were initially drafted, piloted and then revised after an initial pilot took place. The schedule was designed; see Table 1.1.

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The follow-on interviews were conducted virtually via Microsoft Teams meetings. The interviews were recorded digitally using a dictaphone, transcribed verbatim using Microsoft Word, and checked twice for accuracy. Qualitative data was transcribed and analysed thematically in line with Clarke’s and Braun (2013) phase framework. In order to strengthen validity, scope, depth and consistency, triangulation of data gathered by questionnaires, interviews and peer reviewed literature was utilised in this research (Flick, 2009). The advantage of this approach was to eliminate bias and distortion that may occur as a result of analysis of just one single methodology (Creswell & Plano Clark, 2018).

Sample population

In total, 132 Home Economics teachers responded to the questionnaire. All twenty-six counties in the Republic of Ireland were represented in the questionnaire sample. In terms of experience teaching Home Economics, respondents with 15 years or more teaching experience made up 54.5% (n=73) of the sample, with the remainder teaching for 10–15 years 14.4% (n=18), 5–10 years 13.6% (n=18) and 1–5 years 17.4% (n=23). Of the 132 survey participants, 54.5% (n=72) taught in Voluntary Post Primary Schools, 23.5% (n=31) taught in a Vocational Post Primary school and 22% (n=29) taught in a Community/Comprehensive post primary school. The interviews, six in total, were conducted to address the research objectives in much greater detail and to garner a fuller and richer narrative of the Home Economics teachers experiences of conducting food practical classes during the COVID-19 pandemic. Pseudonyms were assigned to each participant to uphold anonymity. See further details of profile of interview participants in Figure 1.1.

Outcome: the frameworks/features of best practice

Once all the results from the questionnaires and interviews were collated, and fully analysed, a framework for best practice was created. The framework was based on the Valdez-De-Leon (2019) approach to reviewing, refining and validating the framework. In the case of this study two frameworks were created:

1. Features of best practice for FPHE classes in class setting and
2. Features of best practice for FPHE classes during online learning

Each framework was divided into features of best practice for: planning, conducting, evaluating, best strategies and methodologies one may use and alerting one to the biggest

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<th>Table 1.1. Interview schedule and themes.</th>
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<td><strong>Part 1</strong></td>
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<td><strong>Timeframe</strong></td>
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<td><strong>Question themes</strong></td>
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<td>• Challenges</td>
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<td>• Best practice methodologies</td>
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**Figure 1.1.** Details of Interview Participants.
challenges encountered when conducting FPHE online or in class amidst the pandemic. It is hoped that this research and the resulting frameworks will support Home Economics teachers to facilitate FPHE remotely and in-person, throughout the COVID-19 crisis and into the future.

Limitations
This research was conducted during a global pandemic; additional stress, potential illness, increased workloads, meant that teachers were time poor to partake in additional research for their discipline. Due to COVID-19 restrictions, this research had to be conducted online which reduced the wealth of data that could have been achieved from face-to-face meetings in school settings. Moreover, many teachers were experiencing ‘screen fatigue’ which may have resulted in lower response and volunteer rates for both the questionnaire and interview. The limited number of participants (132 out of 1,876 Home Economics teachers, 14%) may not be as representative of the population as a whole. However, these limitations should not detract from the strengths of this study and its value as a framework for future proofing FPHE classes in a post COVID-19 world.

Results and discussion
Since the questionnaire was extensive and the interviews yielded vast data, it is necessary to select the most important and germane data for discussion within the constraints of this paper. Key findings are presented here under the following four themes: Challenges; Innovation and Agency; Adaptability; and Features of Best Practice.

Challenges experienced by FPHE Teachers

Digital competency training. The majority of respondents, 80.3% (n=106), received training or support to conduct online remote teaching during the COVID-19 pandemic. This training ranged from school webinars, peer training, school-based training from digital leaders, PDST online courses, and many schools also signed up to ‘wriggle’ a self-directed learning digital education company. However, as reported, the quality and level of training differed greatly from school to school. One interview respondent Anna discussed the “trial and error” approach that took place greatly in her school due to the lack of formal ICT training from a whole school approach. She explained how competency of skills needed to cope resulted from “teacher to teacher support”. She explained how as the older teacher in her department the “younger ones helped me with technology” and there was a great sense of “collegiality”. Of those who did receive training, 65.25% (n=77) claimed that it did not specifically help them to deliver online FPHE classes.

This claim by 65.25% of respondents constituted a substantial number of Home Economics teachers in this research who may still need formal practical training on how to best use ICT to facilitate FPHE. Using SPSS a positive correlation was also found between teachers who received online training and those who went on to conduct FPHE classes online. A t-test was then applied, resulting in a statistically significant outcome (0.000%). This would suggest that the more training a teacher received the more likely they would embrace the challenge of conducting food practical classes online. This may help alleviate the current dearth in research noted by Pittman and Gaines (2015) as to why some teachers maintained daily contact with students whereas others found difficulties. Denise explained how her ICT skills were “really poor and they probably still are….in terms of setting up visualisers that’s fine but in terms of managing them and making sure that you have the right angles (for FPHE classes) I wouldn’t be particularly good”. Pittman and Gaines (2015) alluded to barrier of teachers’ ability to use and integrate technology into the classroom due to lack of resources, time and support. Similarly, many respondents noted there was no training or support given during lockdown. The training was often self-taught or gained via help from spouses.

Facilities to teach FPHE online. Recording online FPHE classes was not a popular option with only 3.79% (n=5) of respondents claiming to do so from their school classroom and 24.24% (n=32) recording from their own home. Many respondents in this research study 40.91% (n=54) did not record online FPHE classes during this period and 31.06% (n=41) used online resources (e.g., YouTube videos) to facilitate students instead of self-generated videos or demonstrations. Denise explained the rationale for not recording FPHE classes “I just found I was spending hours editing them. And it wasn’t worth it for how much they were getting out of it”. Further, she noted that in March 2020 she did use a lot of “random YouTube” videos but found them ineffective. These comments are insightful as they support Zhu et al. (2019) and Lo and Hew (2017) beliefs about online learning leading to heavy teacher workloads. Claire added she did not want her students “randomly looking stuff up on YouTube” as she found more often than not it was “not directly related to what you are doing” in the curriculum. These findings coupled with Denise and Claire’s discussion could be aligned with Gewin (2020) observation about how time consuming creating new resources is and their observance that it lead to no measurable improvement in students achievements. Denise similarly observed her students attitude to FPHE classes were a means of “maintain skill” rather than development of new skills. In concurrence with Longhurst et al. (2020), comments in relation to online resources positively impacting on students engagement levels, Florence conversely found YouTube beneficial stating that she would find someone students could “relate too” an Irish source, and felt that this encouraged and supported students to cook at home. In terms of facilities to teach FPHE from home, see Table 1.2.

Only 2.27% (n=69) respondents had access to their school during online teaching (March 2020 – May 2020 and January 2021) to record or carry out FPHE classes, whilst 47.73% (n=63) had no access. Microsoft Teams was the most popular platform used to access students during online learning with 58.33% (n=77) of participants selecting this option. This was closely followed by Google Classroom at 35.61% (n=47).
Cited unequal access to digital learning and铬book viewpoin ofOverhead demonstration mirror.

<table>
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<th>Facilities to teach FPHE from Home.</th>
<th>Other:</th>
<th>16.67% (n= 22)</th>
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<tbody>
<tr>
<td>Laptop 94.7% (n=125)</td>
<td>16.67% (n= 22)</td>
<td>94.7% (n=125)</td>
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<tr>
<td>WIFI 93.94% (n=124)</td>
<td>Chromebook</td>
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<td>Mobile Phone 77.27% (n=02)</td>
<td>WaCom</td>
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<td>Camera 31.82% (n= 42)</td>
<td>Lazy Arm</td>
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<tr>
<td>Visualiser 21.21% (n= 28)</td>
<td>Think Pad</td>
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<tr>
<td>Whiteboard 21.21% (n= 28)</td>
<td>Overhead demonstration mirror</td>
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Claire a teacher with almost five years teaching experience described Microsoft Teams as "an extension of your classroom" and she believed “that should have been there years ago”. She cited the advantage of an online platform to facilitate FPHE was its ability to store all information in one area, its ease of use for corrections as a teacher, coupled with the capacity to use it as “evidence” of learning if or when “an inspector comes in”.

Challenges conducting FPHE online. Of the 132 respondents only 56 conducted FPHE classes online/virtually (March – May 2020 and January to February 2021). This low uptake could be indicative of the 65.25% (n=77), who felt they did not receive adequate ICT training to conduct FPHE classes. This finding may support Adedoyin and Soykan’s (2020) assertion that not all educators possess the digital competencies necessary to carry out emergency remote learning or to use new technologies within the classroom during social distancing therefore, the students of these teachers may fall behind in online learning, specifically in this instance, the development or retention of their food practical skills. Fears for personal safety in relation to COVID-19 and invasion of privacy may also be a factor for teachers not continuing with food practical classes during this online period. In regard to not offering practical sessions online one SM respondent explained how she was:

not willing to allow students be this level of engaged with my personal space at home. There has to be some boundaries of where home life starts and work life ends. Also, availability of ingredients. I am not putting myself at risk going to shops unnecessarily to teach a practical class that may never be assessed now.

This attitude supports Kidd and Murray (2020) viewpoint of how a ‘practicum vacuum’ can become apparent if teachers are not willing to blur the work-home boundaries to enable the continuation of student learning.

The greatest challenges Home Economics teacher respondents had was assessment of their students practical skills (55.4%, n=31), followed by addressing students emotional needs (53.6%, n=30), and lack of training (25%, n=14). The challenge in relation to assessment of practical skills appears to intensify the threat that COVID-19 can have to education as mentioned by Stoller (2021) and Loghurst (2020). Other areas of concern mentioned included addressing students’ academic needs (64.3%, n=36), pedagogical preparedness and skill to conduct online/live FPHE classes (55.4%, n=31) and ensuring continuity of practical learning of students (53.6%, n=30). Other key challenges identified here included students refusal to turn on their cameras making it “impossible to know what they are doing” (SM respondent). While another teacher noted “I could provide live calls, assignments, videos, login deadlines, but it is difficult to get all students to engage, students are not comfortable having their camera on when cooking in their own home, some are not comfortable to have the microphone on” this in turn made it “nearly impossible to help them” (SM respondent).

The interview participants expanded further on the main challenges of conducting FPHE classes online. Supporting Émon et al. (2021) findings participants found that without the structure and support of school many students found it “extremely overwhelming to have to manage their own resources and manage their own time without any support in school” (Ellen).

UNESCO (2020) cited unequal access to digital learning and interrupted learning as pertinent challenges during COVID-19, similarly respondents asserted it was the teachers duty to be cognisant of students potential “bad WIFI connections at home” (Anna), “low socioeconomic backgrounds (Ellen), difficult personal situations in the home so as not to “generate extra stress on any family” with the pressure of demands for FPHE classes with students or families feeling the stress of “we really need to get this (ingredient/equipment) for the Home Economics teacher” (Florence). These findings with regard to experienced faced by teachers are very interesting and it is reasonable to suggest that there is some similarities to Hughes et al. (2020) who noted the importance of access and familiarity using technology, being aware of learner personal situation, and exploring the impact of COVID-19 on the learning and personal environment. Bridie explained “there’s just so much to be said in body language, when you cannot see them (refusal to turn cameras on), you don’t know what’s going on”. Claire supported this and elaborated “that wasn’t nice because you’re staring in at a blank screen”.

Table 1.2. Facilities to teach FPHE from Home.
Both UNESCO (2020) and Hughes et al. (2020) noted the challenge of access to digital learning on education, however data from the questionnaires in this study revealed access to WIFI was recognised by 57.10% (n=32) of respondents as not very challenging, but access to students was indicated as very challenging or somewhat challenging by 71% (n=40) of respondents. It would be reasonable to assume that WIFI, access to technology was a challenge for accessing students however one must also be aware of the broader socio economic and personal issues that can infringe of students accessing online learning.

**Experience of conducting FPHE online.** Conducting FPHE classes online during COVID-19 was almost always challenging (32.1%, n=18), created apprehension (21.4%, n=12), and exhaustion (25%, n=14). It was a stressful experience for many and often lead to feelings of frustration (51.6%, n=29). The initial response to the movement of FPHE classes online was one described in terms of “panic”, “worry” and “uncertainty” (SM respondents). Anna spoke of the different experiences she had with in the first lockdown should read as ‘different experiences she had in the first lockdown:

> I put up the ingredients (Google Classroom) you have so many minutes say to rub in the margarine or whatever, send me a photo let me see what you have, and it was constant photos and emails, and it was totally and utterly exhausting.

Overall findings such as these are statistically low, but for those who felt this way, it corresponds to Skaalvik and Skaalvik (2018) and Drossel et al. (2019) who claim that remote teaching may cause stress, apathy and reduced teacher wellbeing. In contrast for lockdown two, Anna ran live food practical classes only and “they worked extremely well”, her experience was very positive noting how it bonded her and her students; “we all did it together. We tasted it, we commented on it, and it gave a sense of community that was lacking”. Bridie’s experience further supported this, as she claimed running live FPHE class was “an act of solidarity with our students” and “built on relationships”. This finding is contrary to SWOT analysis findings of Stoller (2021) and Longhurst et al. (2020) who found COVID-19 posed as a potential threat to education as it may weaken teacher/students relationships.

Once some of the initial concerns and feelings of apprehension for conducting FPHE classes subsided and over 73% (n=41) did feel confident almost always or often when conducting online food practical classes. With 68% (n=38) feeling excited almost always or often. Bridie described her experience as “very positive”, she felt running live food practical classes strengthened the value and promotion of Home Economics as a subject commenting:

> “I’ve got nothing but positive feedback from students and parents. So I think as a subject. It has really brought home economics, the reality of home economics into a lot of homes and opened parents eyes to it. So I think that can only be a positive”

These align with Hughes et al. (2020) and Corbera et al. (2020) argument that COVID-19 has created a favourable, creative environment, with novel virtuosity for both the teacher and the students. “Exciting, experimental and authentic” was how Bridie described her experience of conducting live food classes at home. She noted in relation to the experience of meeting learning outcomes during this period “if we were to go back and look at the learning objectives they may not have been meet, but the learning for life has been met? Absolutely”. Magee (2010) argument on the strength of the relatability, relevance and ease of transferability of Home Economics is corroborated by Bridie’s experience.

It is even conceivable to consider that there is some benefit to adapting an asynchronous classroom when conducting food practical Home Economics. In concurrence with Daniels (2020) comments in relation to asynchronous digital classroom gives teachers and students more space to breathe, an interesting observation noted by one teacher, she claimed online food practical classes were:

> a less stressful experience for them, knowing you are only seconds away from answering their question or confirming that they are on the right track. Students seem to do much better at figuring out their own difficulties when they are not surrounded by classmates and are in the privacy of their own home.

(SM Respondent)

**Facilities to teach FPHE face to face.** In terms of facilities to teach Home Economics at school, see Table 1.3.

During the physical return to school (September 2020-December 2020) 91.67% (n=121) conducted FPHE classes.

**Challenges conducting FPHE face-to-face.** The challenges throughout this period (September 2020 to December 2020) where immensely stressful for Home Economics teachers as responded in this research. The main challenges were implementing social distance (57%, n=69), one student per group allowed to partake in practical work (53.7%, n=65) and fear of spreading COVID-19 through practical classes (51.2%, n=62). Large class size were a particular challenge with over 66% identifying it as an issue (45.5% strongly agree, and 20.7% agree). For some it was “very difficult to cook with the students (1 per unit) and near impossible to teach the other half of the students who were sitting at the top of the room supposed to be doing theory work” (SM Respondent). Concerns such as lack of motivation, classroom management issues arose with the students who were not cooking. Claire described the situation as a logistical “nightmare” with Ellen expressing the struggle of trying to “entertain, manage and monitor” the students not cooking. Feelings of vulnerability was discussed with one teacher going as far as proclaiming “even if I had divided myself in two it would not have been enough. I felt very vulnerable, no matter what went wrong I would be at fault and I was just trying to do my best and adequately cover the course
Ellen discussed the challenge of food practical classes with students that did not have previous Home Economics knowledge or skills (first year and transition year students). She believed second and third year students were easily to “build upon and scaffold skills” from experiencing the “traditional practical class” before COVID-19, whereas with students lacking that experience coupled with “no support with their partner” made it very challenging for both the teacher and the students. Ellen’s concern supports that of Hughes et al. (2020) when he noted prior knowledge as a factor affecting teaching and learning in a pandemic.

**Experience of conducting FPHE face-to-face.** Conducting FPHE classes in person left Home Economics teachers almost always feeling fearful of spreading or contracting COVID-19 (48.7%, n=57), challenged (42.7%, n=50) and exhausted (40.2%, n=47), nevertheless they did almost always feel equip with skills (45.3% (n=53) and confidence (40.2%, n=47). The widespread emotional distress caused by COVID-19 as mentioned by Wang et al., 2020 was reflected in this study. Denise noticed that the students were “scared to touch anything”, they feared “contamination” or making others sick. Using SPSS, Pearson’s cross correlation was carried out to see if there was a significant link between fear of spreading/contracting COVID-19 and number of years teaching. A correlation of 1 was calculated in both instances, proving there is a strong correlation between these two variables. A t-test was then applied, (resulting in 0.000%) demonstrating a statistically significant outcome. It can be deduced therefore that the more years’ experience teaching (therefore the ‘older teacher) had a greater fear of contracting the virus. However, Denise was confident to conduct face-to-face classes, she believed the “students thrived on getting to cook”, they “enjoyed it” and it gave them a sense of “normality”. She also spoke of her excitement at “embracing technology” within the face-to-face classes, through the use of QR codes that link to skill set videos for the students to follow, instead of teacher demonstrations. It is apparent some Home Economics teachers saw the pandemic as a positive teaching moment (Goatley & Johnston, 2013; Hughes et al. 2020).

Meanwhile Claire spoke of her experience of some older students dismissing the seriousness of COVID-19 as “not real”, she spoke about the difficulties of the students wanting to “argue about COVID-19” and their lack of understanding of how transmissible the virus can be. Taylor et al., 2020 posited how important it is to reduce COVID-19 related distress in the classroom. Claire cited the importance as a teacher to protect the other students and strictly “enforce rules and mask wearing” at all times in Home Economics. If the students failed to see the importance to adhere to the rules, there was a school consensus that they would not be allowed to stay in the classroom or partake in practical work. This promotion of a sense of safety falls in line with the five key principles laid out to foster resilience in the classroom (Department of Education (a), 2020).

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**Table 1.3. Facilities to teach FPHE face to face.**

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<th>Facility</th>
<th>Other:</th>
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<tr>
<td>Internet Access</td>
<td>iPads/Tablets</td>
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<tr>
<td>Whiteboard</td>
<td>Apple TV</td>
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<tr>
<td>Computer</td>
<td>Overhead Demonstration Mirror</td>
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<td>Overhead Projector</td>
<td>Lazy Arm</td>
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<td>Visualiser</td>
<td>Surface Pro</td>
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 content” (SM Respondent). Many of these challenges failed to be addressed in the Department of Education, Return to School Guidance for Practical Subjects in Post Primary Schools and Centres for Education (2021) resulting in respondents seeking support at department level, or in some instances the challenges were born individually.

There was a consensus amongst teachers that FPHE class posed physical and mental challenges. For many teaching FPHE distinctly different with “huge amounts of thinking in advanced” required (Bridie). Recipe’s had to be adapted firstly fit the new time frame of the one hour classes, and secondly to accommodate the recipe being used in rotation from week to week with a focus on “the core skills being maintained” (Bridie, Ellen, Claire). Planning had to be “meticulous” (Anna) with a lot of “advanced mental preparation” (Bridie) which they described as off putting (Anna, Bridie, Ellen). The difficulties of social distance and “being advised not to navigate around the room too much, that’s almost impossible to do in a cookery class” (Bridie). Some students undermined the safety of others by “not adhering to protocols, risk associated with sharing food outside of the Home Ec class.” (SM participant). This all lead to challenges of keeping students ‘occupied, engaged and separate” (Bridie) which was “very challenging” (Anna). These frustrations experienced by the teachers corroborated the challenges mentioned by Chadwick and McLoughlin (2021) and Beinert et al. (2020).

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that more experienced teachers are more confident to employ methodologies that enhance learning, while novice teachers are still evaluating their efficacy.

COVID stress and FPHE classes. The greatest fear encountered by respondents to the questionnaire was fear of the dangerousness of COVID-19/Fear of coming into contact with COVID-19, with 82.9% selecting this to a great (n=43) or some extent (n=64). In relation to anxiety or panic when conducting practical work 45% (n=58) said not at all. However, it is important to note the 17.8% who did suffer with anxiety and the 10.9% who had traumatic stress symptoms. These findings are insightful as Quinn et al., 2021 documented the high feelings of fear and anxiety amongst Irish post primary students during this time. Claire describes the junior years as “panic”, to alleviate this stress she would ensure strict adherence to COVID-19 social distance rules, going as far as using a meter stick in class to separate the students. Additionally, Florence spoke of how some of her student refused to cook. The students were very “open and honest” and explained that “they weren’t allowed to eat” the food prepared in the kitchen or they were told “not to cook at all” because their parents were too fearful of the potential contamination that might take place. It is feasible to suppose these fears are reflective of Taylor et al., 2020 five interrelated factors of COVID stress syndrome. Florence explained how gradually the fear reduced and she would encourage the students to cook the dish in class to “learn the skill” and then it was up to the student what they did with the food after class.

Although Fleming (2020) and McKenzie (2020) advocated for integrating of COVID-19 into the curriculum to enhance the subject respondents avoided mentioning COVID-19 in the class and they felt it “automatically brings a big level of fear” and the students would refuse to do practical work because they did not want to make someone sick through potential spreading of COVID-19 (Denise). Health and safety was mentioned in the context of the Home Economics curriculum with attention focused on “coughing etiquette, hand washing and cross contamination” (Bridie). Students were more “understanding and conscious of cleaning the unit and ensuring it was completely disinfected for the next students coming in” (Florence). This ‘thoughtful merging’ of the pandemic into students education will indeed make them more prepared for future careers beyond the classroom (Hughes et al., 2020).

Innovation and agency

Innovation. Anna, an experienced teacher, described how she never “had to innovate to the extent” she had too in “over 30 years” of her teaching career. She described it as a time of “constant innovation”. A time of “constantly meeting the demands (of the students) and coming up with new solutions on the spot”. Data showed that innovation was felt ‘often’ by 53.06% (n=30) of respondents conducting food practical classes online and 46.20% (n=54) in class. With over 20% of respondents almost always feeling innovative in both situations. Denise explained how she felt teachers viewed innovation as something “really broad... a really big innovation” whereas she viewed it as “small ideas, small changes”. She developed a “skills book” for her students so any recipe they had to complete they could refer back to the booklet for “adapted and accessible” recipes for all students. She viewed innovation as “a support” system for learning. Meanwhile Ellen viewed innovation as “a creative solution to a problem that you haven’t thought of before”, whereas many other respondents acknowledged how time consuming and physically draining this was. Experienced teachers reported having to change their ways and thought processes, to go beyond the familiar and think of ways “to innovate”.

COVID-19 strongly effected the way Home Economics teachers in this research taught practical food classes. Most notably impacted was teachers interaction with students with 76.5% (n=101) of survey respondents stating this as a main observance. Bridie felt COVID-19 was “like a spark”, she described how teachers had to be “willing to get out of your comfort zone and do things, that this time last year, you wouldn’t dream of doing”. Boling et al. (2012) explored the role of the teacher shifting to one of guider and facilitator of learning in an online setting. Florence painted a picture of how as a result FPHE teachers had become more facilitators rather than leaders in the FPHE;

I have a tendency to take over, whereas I’ve to resist all that and stand back and kind of give them more guidance. So it made me think that way that sometimes I suppose maybe I’m too overpowering in the classroom, too inclined to step in, that if I, if I take a step back, I’ve realised that they actually can figure it out themselves you know, gives them a little bit more credit.

Over 72% of respondents (n=95) agreed or strongly agreed that COVID-19 enabled them to become more creative and skilful in adapting to the needs of students. Serdyukov, 2017 deduced online learning advantageous for experimental and creative learners. Bridie further supported this viewpoint and added how she became “more experimental, more honest, more authentic” allowing more “flexibility on recipes” which enabled the learners to be more “experimental themselves”.

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Over 89% (n=118) agreed or strongly agreed that COVID-19 enabled them to be flexible in adapting to new technology. There is a clear link between these findings and Harris and Dakin’s (2020) assertion that now is an opportunistic occasion to seize new learnings and solutions. Bridie explains how:

We didn't have a choice, so we had to stop saying, oh that's for the young ones or I have no interest in IT, we had to just, you know, feel the fear and do it anyway, and now I feel I would have no problem now, trying out new ICT in terms of an app or a methodology or whatever I would have no problem in doing that.

Over 72% (n=95) agree or strongly agree that COVID-19 enabled them to be more dedicated and tolerant to students. Ellen asserts how:

It definitely has made me more cognisant of, maybe the backgrounds, the needs of some of my students that I wouldn't have been, I would have been aware of before but maybe wouldn't have been as aware of how it would impact their learning.

Over 76% (n = 101) said they became more experimental always or often. The importance of being open to new experiences both intellectually and experientially (Morad et al., 2021) was further expanded on by Denise:

I've really stepped away from the (planning) within an inch of life, we have a recipe, we're going to attempt it. If it goes terribly, it doesn't really matter that much. And hopefully we'll get something good out at the end of it.

**Agency.** Over 89% (n=50) of respondents felt in control of their actions almost always or often whilst conducting online FPHE classes. Over 83% (n=97) of respondents felt in control of their actions almost always or often whilst conducting face-to-face FPHE classes. Anna described herself as being “fully in control”. Bridie felt like she was in control but “more honest” and open to showing real life and how teachers can make learning moments from errors or mishaps. Similarly, Claire discussed how she was “more laid back” with her students and if something did not go to plan “it was good for them (the students) to see you’re a bit fallible”. Things go wrong, “this is real life” (Claire) but the lesson to take away was “not to panic” (Claire, Bridie). Such findings are reflective of Mota and Scott (2014) suggestion of how temporarily relaxation of rules allow exploration and creativity within the classroom, it also encourages problem solving and is a major facilitator of innovation within education. Using SPSS, the Pearson’s cross correlation and t-tests were conducted to find out if there was a link between respondent’s experience of feeling ‘in control of their actions’ and ‘innovative’ whilst they conducted FPHE classes online and face-to-face. A statistically significant outcome was discovered in both instances. It can be deduced therefore that the more in control teachers felt (agency) the more innovative they were in their approaches to teaching, supporting the viewpoints of Pyhältö et al. (2012) and Bakkenes et al. (2010) that there is a clear inter relationship between teacher agency and innovation. Contrastingly, Ellen at times struggled with her sense of control during FPHE “it was a matter of getting by”, “I didn’t feel comfortable recording in my own (home) environment” and there was a pressure (from management) to proceed with classes, almost an “expectation”. Ellen’s struggles are reflective of Campbells (2020) concerns on the extraordinary weighted expectations that had been placed on educators during COVID-19.

**Adaptability**

**Adaptations for face-to-face FPHE classes.** In some schools, block time tables were introduced meaning cookery class was generally one hour long rather than the typical 80 minutes (Florence, Anna, Bridie). Resultantly, dishes had to be much simpler in nature as students were cooking alone, with cross over of skills from week to week (Anna, Bridie, Ellen, Florence). Time had to be allotted for “precise planning” (Anna), cookery schedules were drawn up with images, methods and skills videos posted on Google Classroom for the other students to cook at home and submit images at an agreed time (Bridie). Florence acknowledged how “lucky” she was as management allowed “team teaching” for practical teachers, meaning at any given time there was only ten students allowed into the kitchen. She acknowledged this as an ideal, however many of her colleagues in other schools were not as accommodated in such arrangements and had to adapt to the demands of having “ten students cooking and ten students to occupy” (Bridie). In such instances, work had to be prepared for the cohort who were observing (extension worksheet on same topic) (Claire, Denise, Ellen) for example it could be a fact sheet on cholesterol, with differentiate questions and extension activities, a poster or a leaflet, to explain what a low cholesterol diet looks like or what are the symptoms of anaemia etc (Ellen). Each week one has to adapt the theory element of the cookery as repetition of questions was proving problematic, “you could not do the same higher order questioning two weeks on the trot because the students who were capable of those questions heard them and knew the answers” (Bridie)”. Bridie found it incredible difficult to challenge her students due to the said repetition, however Denise adapted her classes:

half the class would cook and the other half would do written work, and then we would swap for homework so whoever cooked in school did the written work for homework, and whoever did written work in school cooked for homework. So we ended up getting through work a lot quicker.

which allowed her more time to allow choice, freedom and creativity in the cookery classes. She also adapted to social distance issues through publishing QR skills codes on each students unit, which would take them to a video on the skill they needed, this reduced clustering of students together for spot demonstrations.
Adaptations for online FPHE classes. This was the first time ever that Home Economics teachers were asked to conduct FPHE classes online. It was a master class in “adaptability”, “it was adapt or die” (Bridie). There was no time to process or ponder “you just had to get on with it.” (Anna). The adaptation was “nerve wracking” and lots of “trial and error” at the beginning, each lessons was a steep learning curve, with “competence growing” by week three (Florence). This attitude reflects Brazeau et al. (2020) description of educators working through the pandemic fog, although you feel helpless and overwhelmed, you choose how to adapt. The teacher did so by embracing technology, with live classes deemed the best way to proceed with the classes. Claire acknowledged how technologically aware the students are and COVID-19 “pushed the teachers to move in that direction”, “taking pictures and recording became second nature” to the students (Denise). Brief based tasks where a choice is available to the students was one of the key adaptations (Bridie, Ellen, Denise), not only does this allow creativity, but it is also mindful of the personal situation people may be in at this time. Additionally, it is through this ‘letting go’ and adapting with ‘novice expertise’ the subject can remain viable and flourish (McGregor, 2008).

Uncovering positive benefits to education from COVID-19. The most unexpected positive education benefit of COVID-19 on FPHE classes, was the increased autonomy of students to manage their own learning, with over 93% (n=121) claiming this effect to a great or some extent. Anna described her students having to become “more reliant on themselves and less reliant on the teacher”. Additionally, using SPSS, Pearsons cross correlation was carried out to investigate if there was a link between ‘introduction of technologies and other innovative solutions’ and ‘increased autonomy of students to manage their own learning’. A correlation of 1 was calculated in proving there is a strong correlation between these two variables A t-test was then applied, resulting in 0.000% demonstrating a statistically significant outcome. It can be deduced therefore that technology has helped students become more independent learners. This strongly supports Conole et al. (2008) belief of the merging technology into education empowers students to take ownership of their own leaning and meet their own educational needs.

Over 77% (n= 82) of respondents noted students had a greater interest in the Home Economics.

COVID-19 has opened students and parents eyes to the value and relevance of Home Economics within the home, it has reemphasised the “importance of good food and the importance of commensality, just sitting down, the value of family and friends, friends but family first and foremost through this time” (Bridie). The commitment to students remained high throughout the pandemic, recording from their own homes their own personal spaces was very “promotional” for the subject. It showed parents the “lengths that teachers are prepared to go to for our students education” (Bridie) and it increased the opportunities to speak to the mission of Home Economics and showed how Home Economics “was able to be utilised through this pandemic be it through food, or through the making of masks, or even things like table setting” (Bridie). Live FPHE classes created a “sense of community” during a time of isolation and distance. It strengthened the relationships between students and teachers as “we were all doing it together” (Anna).

The positive role of practical food Home Economics and links to positive mental health arose strongly from the interviews. Mental health benefits were noted during the conduction of face-to-face food practical classes. The students “really thrived on getting to cook” (Denise), “students got a sense of satisfaction from creating something, they were doing it individually but at the same time say no matter what recipe we were doing” (Anna). Practical food class afforded the students a break from dense days of theory, they seen it “as a chance to take a breath and just talk to their friends and it was a bit of a sense of normality” (Denise). From this finding it is evident that FPHE classes helped to promote a sense of community, a sense of connectedness and a sense of hope, which supports the five principles of resilience recognised by the Department of Education (2020).

Mental health benefits from online food practical classes was also discussed by participants. Florence spoke of the practical classes as a “break”, an opportunity to “learn new skills, even the simplest of things”, and she highlighted the benefits of additional time “I have time to show them how to decorate it with the little bits of lemon on top, and you know we wouldn’t have that time, if we were here in the classroom because they’d be gone out the door”. Bridie noted the benefits of online cookery class at home “more than likely they were sitting down (to eat the meal), and more than likely there’s going to be discussion, all of that is positive for family life”. This would seem to appear to support the findings of Güler and Haseki (2021) study on the positive psychological impacts of cooking during COVID-19, including happiness, relaxation, self-actualisation and self-enrichment. The food classes offered students an escape from the pressure of a global pandemic, additionally, the findings may support Mosko and Delach (2020) study that cooking encourages more meaningful familial relationships.

Outcomes

Frameworks for best practice. Over 93% (n=123) of respondents claimed that they will increase the frequency of online teaching tools, encourage their students to use online learning environments in the future and use online tools for teaching FPHE classes to a great or some extent. For some, COVID-19 has progressed the use of technology in FPHE classes by being the “push” that teachers needed (Claire). Teachers “were thrown into the situation” (use of technology) and it had the benefit of “making a lot of teachers upskill, in areas they may have neglected before (ICT)”. These increased opportunities has been “transformative” on FPHE. Bridie explained the “innovative and adaptable” work one of her students
completed through submitting their cookery practical “as Gaeilge [Irish Language] through a TikTok”. She identified that she “hope(s) to stay true to this new momentum of just trying things”. All interview respondents discussed the value of social media during COVID-19. This accentuates the beliefs of Uwameiye (2019) who believed social media can support student and teachers relationships both in and outside the classroom. Enabling new possibilities and extending the subject from the classroom into real life (Braun & Schmidt, 2006). Many of the teachers posted students work school social media pages. Anna described how this “let other people see what’s going on in Home Economics and it also validates through likes and that what they are doing themselves”. Claire found her students were “so enthusiastic” about their dishes being posted on social media that they put so much more effort into their presentation and skill set. Similarly, Denise felt it created a healthy competition amongst the students, they “started embracing” their tasks (cooking) and used social media as a platform to “show off” their cooking skills. Many of the teachers discussed how they will focus more on the use of social media as a means to “engage” their students to see Home Economics as a subject that extends beyond the classroom, the more they see it as they “scroll on their phones” and they can be influenced “subliminally” the more value is placed on the subject (Denise). Some respondents even went as far as to set up their own personal Instagram food pages which allowed their students to see cooking fails and mishaps showing ‘vulnerabilities’ (Denise) but also allowing them to see Home Economics teachers cooking in their own home staying “true to the values that we teach” which was a very “empowering” experience (Bridie).

Best practice for online FPHE classes. The word cloud is comprised of the most frequently used words that arose in questionnaires and interviews in relation to best practice for conducting online FPHE classes (See Figure 1.2)

From the advice gathered through the questionnaires and interviews a framework for best practice was devised (see Figure 1.3)

Best practice for face-to-face food practical classes.
The word cloud is comprised of the most frequently words that arose in questionnaires and interviews in relation to best practice for conducting face-to-face FPHE classes (See Figure 1.4). From the advice gathered through the questionnaires and interviews a framework for best practice to conduct face-to-face food practical classes was devised (see Figure 1.5).

Conclusion
This study aimed to illuminate the challenges experienced by FPHE teachers, investigating their ability to innovate, adapt and proceed with food practical classes during COVID-19 pandemic. This study also aimed to discover the best practical methodologies for online and face-to-face food practical classes while looking forward with reimagined approaches to teaching and learning for a post-pandemic world.

Challenges
The key challenges identified for FPHE classes during the period of March 2020 - March 2021 were interrupted learning and emergency remote teaching (ERT), the particular challenge of moving a practical subject online, challenge of technological competence of teachers, the challenges COVID-19 placed on the ability to conduct food practical classes, and the challenge of wellbeing for teachers and students.

Figure 1.2. Frequency of repetition words from questionnaire and interviews for best practice for online FPHE classes.
Features of Best Practice For Food Practical Classes during Online Learning
As emanating from Home Economics participants in this study carried out 2021

Planning
- Ensure meticulous, differentiated planning
- Clearly report all information relating to dish and skills on ‘google classroom’ or (or equivalent) well in advance of the lesson
- Consider brief based tasks over specific recipes to facilitate students personal circumstances
- Test all technology prior to lesson
- Pre-weigh ingredients and ensure you are comfortable with the background on display
- Consider producing a skills booklet for all students as a support for them through this distance learning
- Focus on maintaining skills during this time

Conducting
- Model best practice
- Adhere to strict health and safety rules
- Present methods clearly and in great detail
- Consider recording lessons to help facilitate students who cannot attend live, or those who may be ill
- Focus on being authentic, experimental
- Allow students voice, be open to dishes, respect cultural diversity and encourage creativity
- Ensure to address link of home life and our mission as Home Economists

Evaluating
- Collect student evaluation through new concepts like Kahoot, Jamboard digital worksheets, Tiktok etc
- Consider running a competition to encourage students to send in evidence of work and foster creativity
- If in doubt on authenticity of students work encourage submitting time lapse videos to ensure it is students own work
- Allow students to reflect on the value of practical skills in their own lives.
- Be cognisant of personal circumstances and allow at least a week for submission of students work

Strategies/Methodologies
- Foster an experimental environment, where students showcase their creativity whilst maintaining and building on skills
- Consider live food practical classes as the ideal to encourage and support students at a distance
- Consider using pre-recorded demonstration skills videos prior to the class to help build students confidence
- Ensure flexibility and independence, open brief style tasks to be as inclusive as possible
- Focus on skill maintenance
- Allot time for live feedback
- Social media
- More real less perfect
- Offer reassurance and encouragement
- Be patient and understanding

Biggest Concerns
- Students not connecting for classes
- Invasion of teacher privacy
- Students refusal to show their faces
- Difficulty to gauge how they are progressing, or if their skills are developing
- Not knowing if the work was completed by the student
- Wifi issues
- Personal circumstances
- Time consuming
- Over whelming for students to manage their own resources

Figure 1.3. Features of best practice for FPHE classes during online-learning as emanating from Home Economics participants.

Figure 1.4. Frequency of repetition words from questionnaire and interviews for best practice for face-to-face FPHE classes.
The main challenges identified for FPHE classes online were difficulty assessing practical skill, addressing students emotional needs, lack of pedagogical preparedness and skills to conduct online classes. The challenge of access to students also arose, this was multi factorial involving internet issues, socioeconomic issues, personal circumstances among other factors.

The main challenges identified for face-to-face FPHE classes were large classes sizes, implementation of social distance, fear of spreading/contracting COVID-19 and the implications of only one student per group allowed to partake in practical cookery tasks. Recipes had to be simplified and broken down with innovative ways to support students (particularly those with no or limited previous knowledge) through demonstrations from an acceptable social distance or through thoughtful integration of technology.

Innovation
This research aspired to bridge the gap between teacher agency and innovation in a pandemic. Teachers viewed COVID-19 as a ‘spark’ that led to an ‘adapt or die’ attitude (Bridie). In general teachers described feeling innovative when conducting FPHE classes online and face-to-face. This was achieved through creative problem solving, flexibility, reflection and adaptability. Teachers felt there were engaging in innovative education through embracing new technologies, new skills and creative methodologies in their lessons. There was a strong correlation between reflection and connection to community, it was important to get new ideas. Empowerment was felt by teachers through learning new technologies, being proud of showing the subject as a real life subject increasing its value and being true to the core mission statement.

Positive benefits from COVID-19 to FPHE
The most unexpected positive educational benefit from COVID-19 as emerging in this research was the increased autonomy of students to manage their own learning. Students developed their creativity, embraced technology and this helped increase the value of Home Economics both in the classroom and as a real life subject. For the first time...
the true relevance and applicability of culinary skills and food literacy could be seen at home. Prominently, the interviewees’ spoke of the positive impact FPHE classes had on their students mental health during the pandemic. Therefore, it is recommended that FPHE be promoted and appreciated as a valuable activity to keep students’ psychology strong as we navigate a way through this time of global change. Consequently, more autonomy could be given to students in order to allows them to become more creative and express themselves through merging of practical skill and technology. Teachers in this research communicated their desire to increase the use of online teaching tools and encourage the use of an online learning environment for FPHE. They reflected it should be seen as an extension of the classroom that can be a useful revision tool or may absent students. Social media was also noted as a transformative element to culinary classes; its ability to motivate, engage and take the subject beyond the classroom and into real life, whilst also building student teacher relationships was seen as adventitious to the value of the subject and potential was identified for incorporation of more SM use going forward. Crucial to the viability of the future of FPHE is technology mediated learning, it is recommended that all teachers need to be adequately trained in how to use TML to support a practical – blending current skills with new technology.

Learnings for future best practice in FPHE
This research offers unique insights into the best practices of Irish Home Economics teachers during the COVID-19 pandemic. Figure 1.3 and Figure 1.5 offer a clear summary on how best to proceed. In relation to online FPHE classes, live classes were deemed the best way to conduct FPHE classes during the COVID-19 pandemic, “students get the most out of it” (SM Response) and it enabled the students to engage more, “to be there, available and facilitate and guide them to work through the problems was of critical importance” (Anna). Keep it simple, offer choice and flexibility are key attributes to a successful online FPHE class according to respondents. All interview participants urged Home Economics teacher to record any of the classes or skills that they completed, not everyone is available to log in at a certain time, it helps to compromise and be inclusive” (SM Respondent) and it will also lead to the building of a skills bank of resources that can be built upon and reused with other classes (Denise). Respondents spoke of the importance of allotting specific timelines to each FPHE task, including time for effective feedback (Bridie, Florence, SM respondent) in order to allow effective learning to take place (SM respondent). In relation to FPHE in class setting “meticulous planning” (Anna) and extreme organisation are key features for the class to succeed (Bridie, Ellen, Florence). Small class sizes are needed to run the classes successfully. There needs to be a huge focus on health and safety. There can be absolutely no sharing of ingredients or equipment which requires flexibility and simplicity when thinking of dishes to cook. Student’s must follow teacher’s advice and safety instructions at all times during the practical session. The data collected clearly showed the movement towards giving students more autonomy, creativity and freedom in food practical classes. It is crucial that Home Economics teachers orient the learning to empower students, to enable them to take ownership of their learning.

Data availability
Underlying data
Ethical approval was granted for the conduction of the project under the GDPR regulations; stipulating that the data was stored safely and securely for duration of research and destroyed thereafter. Therefore, restrictions on sharing the raw data apply to this project.

The research tools, researcher fieldnotes, and some processed data are available upon request from the corresponding author.

Extended data

This project contains the following extended data:
• FinalSurvey.pdf
• InterviewQs.pdf

Data are available under the terms of the Creative Commons Zero “No rights reserved” data waiver (CC0 1.0 Public domain dedication).

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