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Incorporating Proper Food Safety and Sanitation into Middle Schools through Family and Consumer Science Classes

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Abstract

The internet, and computer-based learning, has become an increasingly important feature of the learning environment for middle school students. The connection between food safety education and the school subject of Family and Consumer Sciences has opened a door for research to examine what students know, what teaching methods they learn best from, and how they can best implement their learning in practical applications in the classroom and in the household.

The commonly utilized method of research was the implementation of questionnaires. The questionnaires were distributed to both students and educators, allowing for a thorough selection of subjects to achieve a well-balanced study. The questionnaires were varied in questions; however, the main focal point was food safety knowledge such as hand washing, safe cooking and holding temperatures for meats, and to determine the preferred method of teaching and learning for both students and educators.

The overwhelming conclusion was that both students and educators preferred a combination of web-based learning and in-person instruction. This allows everyone the ability to learn at their own pace, while the educators still have control of the information being shared. It was also a common factor that students were unaware of the proper food handling temperatures and all the food safety and sanitation rules. The students polled were aware of the need to wash hands appropriately before and during food handling, but it was found that it was not always adhered to.

Keywords: Family and Consumer Sciences, safety and sanitation, sanitation, web-based learning, hands-on learning

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In the middle school classroom, we are beginning to see the re-introduction of Family and Consumer Sciences classes. With this reemergence, we also see students who are learning about the culinary world and food safety and sanitation for the first time. Students who are learning in schools currently are not subject to the same guidelines and restrictions of the past; we see students learning through both a hands-on approach and also through web-based instruction. As we look at Family and Consumer sciences classes, there needs to be the determination of which approach will lead to a better understanding of safety and sanitation practices: fully hands-on, fully web-based, or a combination of the two (Beffa-Negrini et al., 2007). At the conclusion of the learning, will the students have gained enough essential knowledge to continue the learned practices at home?

The procedures used to determine the best course of teaching student's food safety and sanitation was through the of questionnaires which were offered to current students and educators of Family and Consumer Sciences classes. The questions asked varied from what each respondent knew regarding food safety and sanitation, if they utilized the practices at home, and what the preferred method of delivery was. While each questionnaire varied, the results tended to lean in the same manner, however not all questionnaires offered a section of the preferred type of instruction and learning; this led to limitations within the current research.

Review of Literature

As Family and Consumer Sciences classes were removed from the middle school curriculum, U.S. public schools began to see a decline in students receiving the food safety and

sanitation training that is needed to meet academic standards (Barrett et al., 2020). As the classes started being offered in middle schools, the need arose to determine what method of instruction would lead to the desired outcome. An effective way to teach pupils about food safety can be to make it both theoretical and practical, even though knowledge does not automatically lead to changed behavior (Haapala & Probart, 2004) is probably the most efficient explanation of the need to incorporate both web-based and hands-on instruction in the Family and Consumer Sciences classes.

Once the determination to bring back food safety and sanitation into the classroom had been established, and the desire to offer options for instruction, a need arose to create effective education instructions that addresses the food safety needs. It was realized that there are four main areas of concern and the focal points were established: clean, chill, cook and separate (Byrd-Bedbenner et al., 2013). The United States Food and Drug Administration also contributed to the findings and included items such as poor personal hygiene from the person handling the food (Howton et al., 2016).

As the groundwork was established, the implementation of new material was utilized in high school classrooms. When the instruction was well-received, it was determined that a curriculum should be developed for middle schoolers also. There needed to be an equal acceptance of educational materials in the classroom for the educators while being well-received from the students and keeping them engaged. Would the material being presented be engaging enough for students to be interested, learn, and retain the knowledge? (Shearer et al., 2013).

Previous research into instructional methods for students had indicated that middle school students were interested in using computers for educational purposes. By including web-based learning with hands-on instruction, educators are able to meet the needs of all students and

the schools are able to teach the curriculum even if educators are not well trained in the field of food safety and sanitation. Students shared a need for the information given to engaging which would lead to a stronger link between teaching and understanding. Middle school youth are interested in learning about food safety but also was the education to be fun, interesting, interactive, visually intense and hands-one with technology involved (Lynch et al., 2008).

The research and studying of the preferred methods of instruction for food safety and sanitation practices in the Family and Consumer Sciences classroom has certainly ascertained that there is a need and desire for both hands-on and web-based instruction. This leaves room for research to continue and develop new programs to be introduced into the classroom setting and protocols change and evolve. Follow up research, to learn the retention and utilization rate of sanitation practices in the home, are necessary and may lead to new findings.

Methodology

The introduction of questionnaires was commonly utilized as a means to gain a baseline of the food safety and sanitation rules that the studied middle school students held prior to teachings through school. As we see with Lynch et al. 2008, a questionnaire designed around Blooms Taxonomy was created to measure the student's knowledge and attitudes regarding the use of the food safety computer program and computers in general. A baseline needed to be established before the creation of an interactive web-based computer program is developed. The students were not the only ones to take part in surveys and questionnaires, however, and educators also took part in the development.

Another method utilized was the introduction of both a pretest and a posttest survey to measure the teacher's comfort level in teaching food safety and sanitation before and after the introduction of a web-based teaching module. It was determined that teachers needed to have the

ease of use to assure flexibility in design for application across the curriculum, classroom time constraints, and students' prior familiarity with the topic. It was further recommended that each of the components be complementary but also appropriate for stand-alone use so that teachers could integrate selected materials based on time, audience, and complement to previously used resources (Beffa-Negrini et al., 2007). This is an essential component for educators' as flexibility is necessary for each lesson.

The common thread amongst the questionnaires reviewed were components pertaining to the understanding of food safety and sanitation practices. As Haapala and Probart (2004) stated "the key issues identified to be important in food safety is to check foods, cook to proper temperature, chill promptly, separate raw and cooked foods, and wash your hands. While each issue identifies plays a key role in food safety, there tends to be a main focus on what is known as the 4 C's: cooking, cleaning, chilling, and cross contamination (p. 72).

Findings

The discussion of how students prefer to learn and deciding the most effective approach to teaching food safety and sanitation in the classroom, it was suggested that the blended style of learning was the preferred method. The blended method is a combination of delivery, involving both direct instruction and a web-based program, which allows flexibility for both the educator and the learner. This approach to teaching and learning also allow the student to learn at their desired pace while still having the learner practice through the inclusion of scenarios based on the web-based modules (Howton, et al., 2016). One of the reasons for these results as that students were found to pay more attention to cooking and sanitation after exposure to food safety curriculum. After taking part in web-based and instructor-led teaching, fewer cross-contamination events and more handwashing were observed (Feng et al., 2019).

The students who participated in assisting with the design of the lessons were of the middle school age (youth) and it was found that the desired teaching techniques involved a variety of learning: board style games, video games, and videos as well as the more traditional teaching of experiments/science and food preparation labs (Byrd-Bredbenner et al., 2010). It is apparent that there is a disconnect between the knowledge and behaviors the youth have before participating in a class which showcases the need for a relevant and motivating food safety educational curriculum (Haapala & Probart, 2004).

One reason student's have done well with the two types of learning is that they benefit from both the theoretical and practical teachings of food safety and sanitation practices. The changes need to be continually taught and practiced as students do not automatically continue with the changed behavior (Lange et al., 2014). This can best be described by Shearer et al. (2013) who created both case studies for students and educators for in-person instruction and a series of web-based activities were also created. This allowed educators to interact with the students and the students were able work and learn at their own pace; the web-based offerings also provided 10 different activities across multiple fields of study along with questions posed as multiple choice, shuffled questions, and matching terms.

Limitations

The limitations of the research conducted for the food safety and sanitation practices taught in the Family and Consumer Sciences classes are currently limited to classes that have recently be introduced. Through all the research and questionnaires conducted, the focus was on current students and educators; there was no research conducted with past students. There was also no research conducted to test the retention of the knowledge learned in the Family and

Consumer Sciences classes when the students were at home and participating in food tasks that require proper safety and sanitation protocols. The data gained did not offer any findings on the chosen mode of instruction for classes, only what methods were preferred by students and educators; nor did it determine which method would allow for student's knowledge retention.

There was also limitation in the research in regard to any findings on the retention rate of learning for the students and the implementation of food safety and sanitation practices at home. While this may pose a new line of research, it is possible to include it in the current area of research being studied.

Implications

Throughout the research, there were various options studied as well as what knowledge students and educators possessed before determining what particular sections of learning should be added into the curriculum. It was also thoroughly research as to the desired teaching methods for both students and educators, with a focus on the preferred method of learning from both sides and the level on interaction necessary.

According to Barrett et al. (2020) the main area that needs to continue in research is how the developed curriculum should aligned with academic standard, time restrictions, space and instruction material and the costs involved with the lab activities. By following up and researching more on how these areas can be smoothly adjusted to work well in the classroom, researchers will be able to produce a viable transition option for the addition of new teaching materials into the classroom.

As research continues in the field of Family and Consumer Sciences, with the matter of food safety and sanitation in the classroom, there is ample opportunity to ascertain more knowledge of which chosen method of instruction leads to the desired result. There is also room

for future research in the form of at-home follow up questionnaires to acquire information on sanitation practices encouraged and practiced outside of the classroom.

Conclusion

There is a strong need to implement proper training and teaching of food safety and sanitation in the Family and Consumer Sciences classes in the middle school classroom. Through the implementation of web-based and in-person teachings, educators are able to teach students how to properly handle food and remain sanitary through the use of hand washing and keeping foods at the proper temperature, both in the classroom kitchen and at home. This arena of learning and retention is essential for everyone, simply for the safety and sanitation practices of proper food preparation, but it also opens the door for students to begin to see some aspects of the culinary field. The research also exhibited valuable methods for teaching and learning, as to be inclusive of all types of learning aspects for all students. As the student-base changes through the years, the integration of technology needs to change also, and the value of technological inclusion was well received.

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