VR in the Kitchen

Jordan Trcka

Colorado State University

jtrcka@rams.colostate.edu

Abstract

Cooking is an essential life skill. Unfortunately, studies have shown that cooking competency is declining. While the knowledge of cooking skills may be decreasing, tech-savviness is on the rise. The virtual world is here. New technologies are constantly improving our lives, and while they might be partly to blame for the decrease in competency for certain life skills, this technology can also be used to hone these skills. An area that shows particular promise is the virtual and augmented reality field. This paper attempts to illustrate several methods by which virtual reality and augmented reality can be used to build and improve cooking competency in the kitchen.

**Keywords**: Virtual Reality, Augmented Reality, Digital teaching, cooking skills, simulated kitchen.

# Introduction

Certain skills are essential to leading a comfortable and successful life. In most cases, a basic knowledge of the skill is enough to get by. But to truly live and enjoy life, sharpening these skills is necessary. It has been said that the key to happiness is a full stomach. This paper will focus on the important life skill of cooking. Firstly, it will look at some of the reasons cooking is an essential skill, and some of the benefits cooking competency brings. Next, some of the reasons people are cooking less will be considered. Then a solution will be presented in the form of Virtual Reality (VR). Having gone over VR in general, this paper will present a possible study that could be conducted to analyze how effective VR is at improving cooking skills. Lastly, this paper briefly touches on some other areas VR can be successfully used in the kitchen.

# What Makes Cooking Essential

Other than being able to provide for yourself and family when access to modern conveniences is unavailable, the skill of cooking has several other aspects that make it crucial. The most obvious perk of being a skilled cook is the impact it can have on health. When a person is unable to make healthy meals for themselves, they can begin to rely on fast food and ready-to-eat meals. These are more often than not far less healthy than a well-prepared meal.

# Declining Skills

Cooking prowess has been declining over recent years for a multitude of reasons. Table 1 below shows the findings from a poll given to 7–16 year-olds.

**Table 1: Young People’s Skills: ‘Which of these can you do yourself?’**

|  |  |
| --- | --- |
| Skill | Percentage with these skills |
| Play computer games | 93 |
| Use a music player or CD | 77 |
| Record something on TV | 61 |
| Heat up pizza in a microwave | 60 |
| Make a cake | 54 |
| Cook a baked potato in the oven | 38 |

Source: National Food Alliance / MORI 1993[1]

Several reasons can be credited with this decline. The rise of pre-packaged and ready-made meals are a large contributor. While these foods can add lots of variety to meals, they often require little to no preparation or cooking. The abundance of fast-food restaurants also is a factor. Many times, it can be far faster and cheaper to get a meal at a fast-food restaurant than to make a meal. Although it is not as much of an influence today, new technology is making it easier to prepare meals.

# How Virtual Reality Can Help

Virtual Reality is an up-and-coming technology with vast possibilities. The ability to immerse oneself in a situation virtually presents many avenues to better society. The education field is full of opportunities for VR, and this isn’t limited to just academics. Making use of VR to learn life skills can be just as practical. This paper is going to focus on how VR can help improve specifically cooking skills.

# Cooking Comprehension

Virtual Reality simulation fosters excellent understanding of the cooking process. It allows for a priming process prior to actually attempting to cook the meal. The visual and kinematic nature of VR helps imprint the process more vividly in the persons brain, making it easier for them to visualize the steps needed to complete the recipe.[2] This is especially true for more complex recipes.

# Learning new Skills

Learning to cook something new or trying a new method of making a meal is one of the more difficult aspects of meal preparation. Using VR, it is possible to learn specific techniques needed to prepare food. It can also teach a user how to operate kitchen appliances, like large volume mixers.

# Limitless Resources

One of the many advantages of learning to cook in a VR environment is the lack of limitations. As all the ingredients, utensils, and appliances are digital, there is no need to resupply or maintain them. Additionally, it provides access to recipes that might not be feasible for a user to complete in a real-world setting, so they can try their hand at exotic or expensive meals. Digital resources also mean there are no physical losses if mistakes are made. The system can simply be reset, and the user can try another time.

These three categories combined make for a learning environment that is not only effective, but also enjoyable. Cooking is a hobby or a passion for many people, and VR simulation can help people learn and have fun at the same time.

# The Experiment

The application I designed for this project ended up as more of a proof of concept than a full simulation. I bit off a bit more than I could chew for a solo project, and this ended up taking far more work than anticipated. For that reason, it is a barebones setup, with a stovetop and a few items in a room. It is set up for further expansion with a system for creating scriptable objects for ingredient and utensil items, as well as inventory objects for handling what ingredients are contained in each utensil. Currently, the only implemented appliance is an adjustable stove. The project was started using Unity’s introduction to VR project. When the user first opens the application, they find themselves in the virtual kitchen. Here, they can grab the ingredient objects, and put the desired ingredient into the desired utensil (i.e. put an egg into the pan). The pan can be placed on the stove, and the heat level can be adjusted. The higher the heat, the faster the object will cook.

The most effective study to conduct with this application is a between-subjects analysis. Subjects would be randomly separated into two groups. Group A would be tasked with making a meal, given only a recipe written on a piece of paper, while group B would be making the same meal after making a simulated version in the VR application. One participant from each group, as well as one other random participant to try the food, would be run through the study each ‘round’. Each participant who is cooking would be timed, and after the food is prepared, the third participant would try both meals, and answer a survey about how they felt the food tasted and looked. The survey would be as objective as possible and serve to obtain a fairly accurate assessment of the quality of the food. The survey should be a modified version of the NASA Task Load Index survey. The more participants in this study the better, but 16 people should be the target minimum number of participants. This is so enough data can be collected from both groups to attempt to find a statistical significance between meal quality and using the VR kitchen application.

# Other Uses for VR in the Kitchen

Beyond just learning how to make a meal, VR has many other applications that can be further explored. Several cognitive rehabilitation studies have been conducted in a VR kitchen environment to see if using virtual cooking techniques could help individuals with Alzheimer’s disease relearn how to cook and recover more autonomy.[3] The kitchen is a fairly universal space across several different cultures. Because of this, it can be a great area to teach vocabulary for other languages. VR can make this especially effective.[4]

# Conclusion

To conclude, some important life skills are deteriorating. By experimenting with new technology like virtual reality, new ways to improve these skills can be discovered. The experiment outlined in this paper is a good starting point to expand from and build further experiments.

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