

## Article

# Kitchenware Design for Parent-child

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**Abstract:** Children's cooking equipment is not toys but has a limited effect on children's learning. The kitchen is full of dangers, but by learning how to avoid them, cooking stimulates a child's creativity by producing delicious dishes. Therefore, cooking is helpful to develop children's culinary abilities with parental guidance and instruction. Children can learn cooking skills, recognize the characteristics and nutrients of various ingredients, and experience the changes in ingredients in the cooking process. By recognizing what causes dangers and accomplishing the purpose of cooking, children can improve their learning ability and creativity.

**Keywords:** Parent-Child co-cooking, Cooking Learning, Food Farming Education, Children Kitchenware

## 1. Introduction

Food safety is important in today's society, coupled with the rising awareness of healthy eating and changes in eating habits, especially those affected by COVID-19. The number of people dining out is decreasing and many are cooking for themselves. The concept of "parent-child co-cooking" has also emerged with children's learning of cooking emphasized as children's health consciousness at an early age is much concerned. However, "parent-child kitchen sharing" has been known while most shared kitchens are still for children to share adult kitchenware. Thus, kitchen appliances do not conform to children. Kitchen appliances for children are not produced while pretend kitchen toys are available. This hinders the integration of the concepts of "parent-child co-cooking" for children and "co-cooking" of parents and children with less burden.

## 2. Materials and Methods

### 2.1 Parent-Child Co-cooking

Li (2022) pointed out that to help children develop a good eating attitude, "pre-meal rituals" are necessary for children older than 3 years old. Parents and children can decide the menu, purchase ingredients, set the table, and cook together. "Parent-child co-cooking" allows children to be accustomed to ingredients with five senses and to solve the problem of picky eaters. Parent-child co-cooking is "an activity in which children and parents prepare meals together", which includes the purchase of ingredients, pre-processing of ingredients, cooking, cleaning up, and sharing meals (Chen, 2017). Cai (2017) explained that in parent-child co-cooking, parents and children cook and enjoy meals together, while Chen (2021) described parent-child co-cooking as an activity at home. "Parent-child cooking together" does not have a clear definition or explanation so far. Thus, in this study, parent-child co-cooking is defined as parent-child cooking activities at home, including pre-processing, cooking, cleaning and aftercare, and sharing meals.

### 2.2 Physical and Mental Development

Children's comprehension develops from an early age. They turn their heads when someone says their name at 6 to 9 months old and understand and recognize basic words such as "daddy," "mommy," "apple," and "no" by 12 months of age (Kerry & Lauren, 2021). At 15 months, they can speak three to five words and understand basic commands such as "throw this pumpkin in the bucket"; at 18 months they start to experience a "verbal explosion", and by 24 months they can say almost 100 words, including their name (Julie, 2017). According to the stage of children's development announced by the National Health Administration of the Ministry of Health and Welfare, children can rotate and open the bottle cap by themselves at about one and a half to two years old, which

can be regarded as having a basic grip and can perform more complex force application methods. Eli, a parent-child cooking blogger who has two children, said that children can start to prepare the kitchen from about 2 years old, such as washing ingredients, stirring, kneading dough, selecting ingredients, and providing different levels of work participation according to the child's age. She also observed that her daughter, who had been participating in the co-cooking since she was 2 years old, became a less picky eater, having more flexible hand movements, a sharper sense of touch, and even improved her acceptance of new things (Hung, 2021). Previous studies and observations showed that children can learn cooking at an early age. After children begin to understand simple instructions and have enough hand strength, the learning experience of cooking is effective and positive in children's physical growth and psychological cognitive development.

### *2.3 Impact of Parent-child Co-cooking on Children*

A survey report by the British Food Standards Administration pointed out that people form lifelong eating habits in their childhood. To develop good dietary concepts, it is necessary to guide children through clear and continuous education to choose appropriate foods. In 1896, Dr. Sagen Ishizuka of Japan also proposed the concept of "food education" in his book, which includes not only culinary education, but also comprehensive education such as eating habits, attitudes toward food, nutrition, traditional food culture, and understanding the blessings of nature (Chen, 2017). Co-cooking has many positive effects on children and families. A study conducted by the University of London in Liverpool found that cooking classes for both adults and children positively impacted children's eating habits, as many students became less picky eaters and more willing to eat more fruits and vegetables. A study result by the School Food Trust that examined school-based cooking classes for children aged 4 to 8 across the UK showed that students' awareness of healthy eating and their desire to eat healthy food was increased by learning to cook (Philippa Roxby, BBC News, 2012). Fiona Lavelle and Moira Dean (eds. Lam, 2021) mentioned that modern children did not develop fine motor skills at the expected normal rate, which may be because modern children are increasingly using technological means, such as video games, rather than traditional activities such as playing blocks or board games. However, cooking helps children improve this skill. Lam mentioned that there were many cases where children's cooking helped parents better understand their children's potential and the learning benefits of "letting children into the kitchen". Children who were exposed to cooking in childhood, even if they had little experience, enjoyed the process and results of cooking and concentrated on learning. They bought ingredients with their parents, baked cookies, and shared them with their classmates. The experience of co-cooking increases the sense of accomplishment brought by the shared cooking. At the same time, it cultivates the children's "sense of ability", which refers to the children from "I want to try" to "I'll try it"; from "I've finished it" to "I am very good" (Chen, 2020), strengthening children's ability to continue to accept challenges, which is helpful for children's growth. The "sense of ability" in co-cooking was witnessed by parents and children, which was internalized in children (Chen, 2021).

### *2.4 Current Situation of Parent-child Co-cooking*

"Kitchen teaching" is considered new in teaching. In it, parents are beginning to understand that children cannot focus on reading books and do not know how to live. There are many cooking and baking classes for children. Tang Xianmei, an associate professor in the Department of Life Sciences at Air University, suggested that parents need to stimulate their children's enthusiasm for learning after the children attend cooking classes. For example, by asking children to teach their parents how to cook, communication between parents and children is enhanced and enables finding their talents. It also increases parent-child interaction and increases the amount of time that both spend with each other (Lin, 2010). Chen (2021) concluded that co-cooking provided families with the experience of "playing together" as they spent time together and improved relationships in the family. Chen (2017) mentioned that by spending time with family members at home, they could understand each other, thereby enhancing family cohesion. Therefore, it is recommended that parents cook with their children to have good interactions with their families and diversify learning. Cai has promoted parent-child co-cooking and believes that the kitchen has always exuded the charm of warmth, creativity, safety, and production. A well-used kitchen soothes children's emotions, deepens parents' love, and inspires children's creative inspiration (Taipei Parents Association, 2011). Cai (2017) also proposed that the kitchen is an important place in home life as it controls the taste of family members and condenses the family's centripetal force. It is a place where family members connect emotionally.

According to the studies, kitchens are regarded as the core of a family, and family activities in kitchens positively impact relationships. Children learn cooking skills in cooking classes, which is helpful for children's personal development. Family communication is the only way that can further sublimate the parent-child relationship.

### 3. Results and Discussions

According to the literature review results, we re-examined "parent-child co-cooking to change the perspective considering the needs of parents and children and adding more children's perspectives. The following is a summary of the issues.

1. Difficulty in the implementation of food education: Parents are unable to start with food education due to a lack of environment or resources.
2. Unsuitable environment: The design of the existing kitchen environment is relatively dangerous for children and the size is not suitable, and the kitchen in the family has usually formed a parental cooking habit, which is easy to limit children's creative development and reduces the opportunity for children to explore independently.
3. Lack of market supply: At present, it is difficult to find kitchen utensils designed for children on the market and only more children's kitchen toys can be purchased.

Therefore, we proposed the solutions for the following problems.

1. Resource provision to provide parents with basic resources and an environment for food education.
2. A suitable environment to design a special cooking environment for children to improve safety while eliminating various restrictions.
3. Increasing market diversity with high educational depth as product characteristics with more options.

Based on the above problems and possible solutions, we designed a kitchen considering the size of children's bodies. Height of 95 and 125 cm for children aged approximately between 3 and 7 years old were regarded as main users. The kitchen consisted of the guidance part and a kitchen cart. In the guidance part, simple and easy-to-understand guidance cards (Fig. 1) were used to establish a pre-processing procedure. For example, potatoes need to be washed, peeled, and cut into appropriate sizes and shapes before they are used for cooking. The card showed the process of washing, peeling, and cutting potatoes and displayed the instructions according to the difficulty of the operation. The cards guided parents to assist children. For example, for peeling, parents need to complete it on their behalf; or when a child needs to cut a potato into cubes, parents can help them divide the potato into two or three pieces on a flat surface. The cards were also used to teach food-related content and cooking methods. The kitchen cart was designed for children considering human factors. The kitchen cart could be adjusted to children's height and hand size and in a suitable hardware environment for cooking learning. Cutting boards, pots, knives, and other tools were equipped. Under the systematic operation, the parent-child co-cooking format was developed for parents and children to read the guidance cards together and for children to complete the pre-processing of ingredients. Parents could provide food according to the guidance of the cards. Appropriate assistance or experience was necessary to assist children in cooking. Except for tasks that required water such as food washing and aftermath cleaning, the original kitchen sink could be moved in each household. On the kitchen cart, parents put tools for their children to teach basic cooking skills and knowledge. Children learned cooking in their small kitchen. In the kitchen, safety conditions were better than in ordinary kitchens, allowing parents and children to enjoy the process of cooking together.

### 4. Discussion

To allow children to learn cooking, improvements were made after repeated discussions with experts and users, and relevant settings were improved through simulation until completing this work. After using it with children, we found that residues were left when handling food. Therefore, cutting boards with specially designed grooves were developed to prevent the juice from flowing around for anti-slip effects. The design made it easier to pick up the cutting board and clean up the remaining juice at the same time (Fig. 2). As the shapes of the ingredients are diverse, the height difference and the edge of the board prevented the ingredients from rolling down, making children feel more comfortable during the preparation process (Fig. 3). For preparing and serving dishes after cooking, a retractable platform (Fig. 4) was designed on both sides of the cart as a flexible extension space. In addition, bottles and jars essential in cooking were placed in the most obvious and convenient place for easy access (Fig. 5). For cleaning, the finished cutting boards need to be stored in a ventilated environment. The design of the flexible wave-shaped shelves (Fig. 6) allowed the process of drying the cutting boards, and children learned how to align the top and bottom. The storage space for pots and pans was designed with sliding doors, and the classic cylindrical kitchen with cultural connotations was designed to look better (Fig. 7). The kitchen cart allowed for freedom with which children could be interested in cooking (Fig. 8). In the design, the functions and practices were revised and discussed so that children could understand and consider the design of the shared kitchen.



**Fig. 1.** Guidance cards.



**Fig. 2.** Cutting boards.



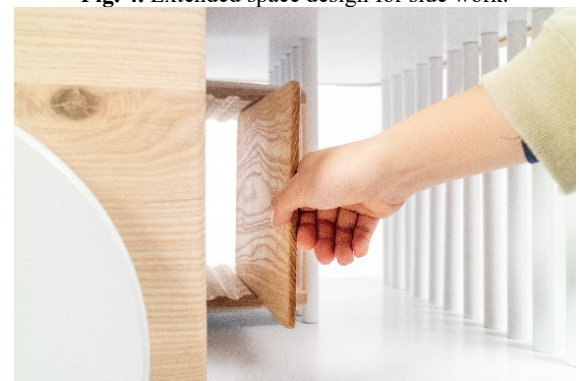
**Fig. 3.** Difference in panel edge height.



**Fig. 4.** Extended space design for side work.



**Fig. 5.** Seasoning canisters.



**Fig. 6.** Cutting board storage.



**Fig. 7.** Sliding doors.



**Fig. 8.** Big wheels of cart.

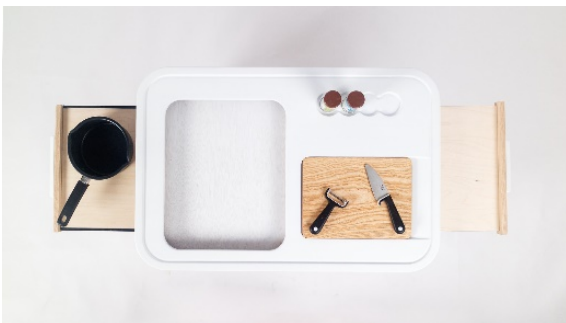
The kitchen cart had a round and cute shape to make it closer to the general perception of children. We used white color for children to focus more on the ingredients and cooking when using them (Figs. 9–11).



**Fig. 9.** Appearance of cart.



**Fig. 10.** Side view of cart.



**Fig. 11.** Overall view of kitchen.

The kitchen was used by three groups of parents and children. Afterward, they feedback about follow-up development. The adjustment of the kitchen has been an issue as the children keep growing. Knives and real cooking were concerned in terms of safety. Parents were positive about using the kitchen. Things in the kitchen were made of wood, which provided a warm feeling for children's aesthetic training of ingredients and presentation. Parents thought the kitchen cart was heavy because of its large wheel. Children thought the kitchen was interesting and fun as there was no machine. Their emotional expression and interaction with their parents were observed. Therefore, the design was appropriate for parent-child co-cooking.

## 5. Conclusions

To cultivate children's understanding of ingredients and cooking, a kitchen was designed and created for them to cook with their parents. Food education by their parents, we created a kitchen for parent-child co-cooking and the desirable eating and cooking habits of "suitable food, suitable reason, and suitable season". Education is a lifelong matter, and children's education is necessary from an early age. By using "food" as an educational theme available every day and learning together with their parents, children can establish a stable correct concept and implement it effectively into their daily lives. Children can learn the methods and necessity of healthy eating by cooking and using the kitchen. At the same time, they can gain the ability to be independent after training and cultivating a positive personality.

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