

Article

Research on the Development and Creation of Gender Equality Teaching Aids

Ya-Jane Chaung ^{1,*}, Hsiu-Chun Lin ², Cing-Chuan Li ³ and Yu-Ting Wu ³

¹ Department of Early Childhood Care, Chang Gung University of Science and Technology, Taiwan

² Zhongzheng Public Welfare Kindergarten, Taiwan; h072081@mail.cgust.edu.tw

³ Wenzhong Non-profit kindergarten, Taiwan; h072006@mail.cgust.edu.tw; h072008@mail.cgust.edu.tw

* Correspondence: th990068@ms57.hinet.net; Tel.: +886-0988921170

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Abstract: Teaching aids that allow young children to understand the concept of gender equality in "learning by play" is proposed in this study. We designed the storage method of picture books and teaching aids into backpacks, which were convenient for caregivers or children to carry by using self-made picture books as the primary medium. The appearance was designed with the supporting role of the pink elephant in the picture book. In addition to the cute and eye-catching appearance, it allowed children to integrate into the situation. Gender equality-related issues were mentioned many times in picture books, including the three categories of "clothing", "color", and "occupation" which often appear as stereotypes from the starting point. Rich and easy-to-understand plots were designed to enhance the fun of teaching aided by playing with operating help, so the gender equality problems were naturally integrated into the activities. The teaching aid was filed for a patent for invention and design. After completing the work, a questionnaire with reliability and validity was compiled for 34 subjects, and the result was conducted for a dependent-samples t-test. It was found that combining self-made gender equality picture books and teaching aids enhanced children's learning interest more than traditional gender equality teaching aids. Children's awareness of gender equality was raised to have them learn the concept of gender equality in their careers.

Keywords: Gender equality, Teaching aids, Invention patents

1. Introduction

Gender stereotypes are pervasive throughout society (Charlesworth and Banaji, 2021). Gender equality is one of the Sustainable Development Goals (SDGs) that define it as women and men must have equal rights and opportunities (Saleemi and Kolfol, 2022) for economic, social, cultural, civil, and political rights (Wu and Rong, 2022). Gender stereotypes have been maintained in Chinese cultures and even extended to 12-year-old children (Zhang, Cui, He, and You, 2022). Regarding the development of gender, children started to observe gender before the age of one. Even at the age of two or three, people showed acts for their gender (Zhu, 2003). The five-year-old children knew that no matter how they wore, gender was an unchanged variable (Lin, 1995). For example, males must have short hair, trousers, braveness, aggressiveness, and violence (Giles and Heyman, 2005), and worked as truck drivers and policemen. It was thought that males liked to play with robots, swords, and firearms while females preferred long hair, beautiful clothes, became nurses or nannies, liked to play with dolls and drank special wine. On the whole, the concept of gender roles of children still conformed to the traditional gender stereotype. Certain characteristics, occupations, and things were thought to be for "boys", while others were for "girls" (Peng and Ho, 2014). The family was the earliest social place for children. Family, schools, and society play an important role in and jointly promote the concept of gender equality (Xie, 2001). Therefore, to overcome the problems in educating gender equality, this research was conducted innovatively to develop a set of gender equality teaching aids with the following characteristics.

(1) Combined picture books as teaching aids

The backpack shape was designed with the image of the pink elephant that appeared in the story. The "red bow" was used in the story to design a hairpin on the storage bag. Readers are allowed to contextualize gender equality when reading a story with the teaching aids. The appearance adopted the important supporting character "Pink Elephant" based on the modeling idea. Soft colors were used with cute images to make the overall appearance eye-catching. A backpack with the pink elephant and color was designed to carry conveniently.

(2) Creative teaching aids to make picture books more interesting

We creatively used the game concept. The curiosity and imagination of young children can be used to freely match the accessories in the teaching aids. Adhering to the idea of "learning by playing", the teaching aids make gender equality education a natural fit into the game to change the traditional paper cramming-style education and teaching aids. Coupled with the guidance of adults, children happily understand the meaning and importance of it.

(3) Colorful and easy-to-understand content and a book full of small ideas

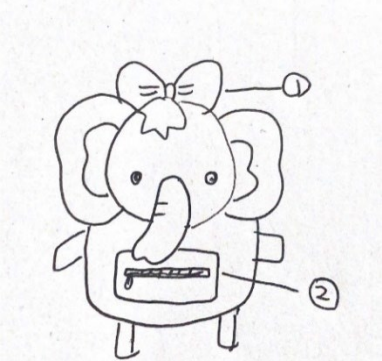
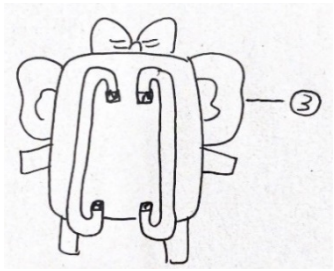
Times are changing with each passing day, and 3C products, computers, communication, and consumer electronic products are gradually replacing traditional SMS. While information flows quickly, it is difficult for parents to see what their children are watching. Sometimes, this has negative effects on health and learning. Thus, we tried to advocate the good habit of reading texts. Parents or teachers used picture books to tell stories for reading and learning with children. The content is easily understood by young children, and with teaching aids, the operation becomes more interesting to promote children's development.

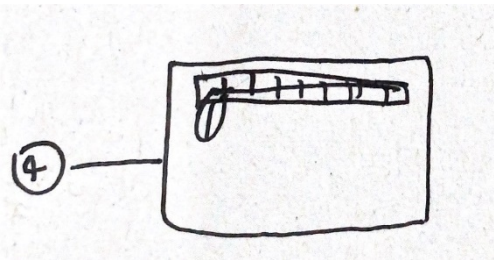
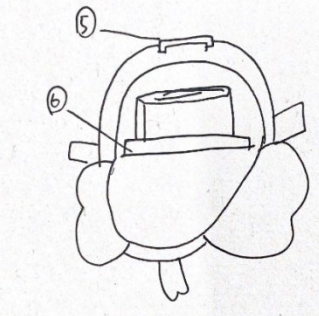


2. Research Methods

2.1. Picture Book

The self-made picture book guided the children to operate the teaching aids through the content. In addition to reading picture books to understand the concept of gender equality, children increased their impressions by operating the teaching aids. In addition to the picture book and teaching aids, there were question cards to match the teaching aids and elephant backpacks.

Table 1. The introduction of gender equality teaching aids

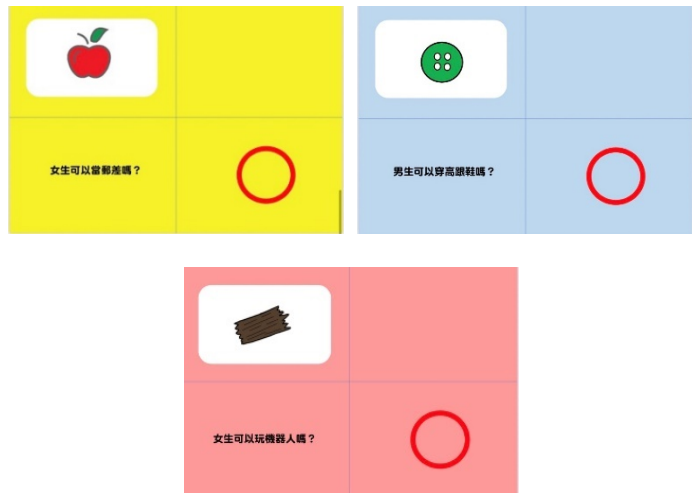
 <p>The front view of "Pink Elephant Organizer"</p>	<p>Design concept:</p> <p>No.1: Hair accessories with bows match the content of picture books, let children integrate into the plot, and are used as general hair accessories when going out.</p> <p>No. 2: Elephant Backpack: The cute appearance was on a backpack with picture book characters. In addition to being a storage bag for teaching aids and picture books, it is suitable for carrying and use.</p>
 <p>Reverse view of "Pink Elephant Organizer"</p>	<p>Design concept:</p> <p>No. 3: Elephant head: In addition to being cute and eye-catching, the elephant head also has a protective function. The elephant head is filled with soft cotton, which not only reduces the chance of injury to children but also allows children to promote Tactile stimulation in young children.</p>

 <p>"Pink Elephant Storage Bag" zipper bag</p>	<p>Design concept:</p> <p>No. 4: Small bag outside the backpack: In addition to keeping the question cards in the teaching aids, this zipper bag usually is placed in the carry-on items. It is pretty and easy to obtain.</p>
 <p>"Pink Elephant Storage Bag" inner bag</p>	<p>Design concept:</p> <p>No. 5: Inner bag: An inner bag was designed in the backpack for storing A4-sized books or papers. In addition to being convenient for storage, it reduces the chance of paper and books being damaged.</p>
	
<p>Colorful and rich in content to attract children's attention</p>	<p>The "Pink Elephant Storage Bag" is made with picture books with cute shapes and bright colors.</p>



The picture treasure box is used with picture books to store teaching aids cards.

Teaching aids help the elf dress up through teaching aids cards, and purple magnets can fix the cards.



Teaching aid cards: There are occupation cards, clothing cards, and hairstyle cards. There are 30 cards.

Question cards: For the operation of picture books and teaching aids, the children use the questions on the question cards to clarify the concept of gender equality (30 cards).



Fig. 1. Demonstration picture of the elephant backpack was actually on the back.

2.2. Questionnaire Survey

We developed gender equality teaching aids with a phase-dependent sample experimental design. The research subjects were invited to try out the current teaching aids on gender issues and then fill in the questionnaire. The gender equality teaching aids in the research were shown and explained to the subjects. After demonstrating how to use and having the subject use the aids, they were asked to fill out the questionnaire. The subjects used two gender-themed teaching aids at the same time. Based on the structure of the questionnaire, revision comments were provided for reference. The questionnaire consisted of 12 questions with a five-point Likert scale. We invited 100 adult women over the age of 20 to conduct test. After the test, the item analysis was carried out first, and the Pearson correlation analysis was conducted. Correlation coefficients below 0.3 at a significant level of 0.05 were discarded. Then, 27% of the highest and lowest total scores were taken from the result and divided into high and low groups to perform an independent sample t-test. The results found that all the items showed an F score higher than 3.5, so all items were reserved.

To understand the appropriateness of the items, we carried out the KMO sampling appropriateness test. The closer the value was to 1, the higher the correlation of the variables, and the more suitable it was for factor analysis (Wang, 1999). The KMO value of this scale was 0.90. Then, factor analysis was carried out, and factor loading was extracted by principal component analysis. The factor loadings greater than 0.3 and the eigenvalues greater than 1 were chosen as the criteria for grouping (Wang, 1999). According to the results, the eigenvalue of factor 1 was 7.91, which explained 65.94% of the variance. The loading value of the factor 1 group was in eee range of 0.70 and 0.87, and factor 1 was named "the overall characteristics of teaching aids". The eigenvalue of the factor 2 group was 1.39, which explained 11.54% of the variance. The loading value of the factor 2 group was between 0.73 and 0.92, which was named "learning effectiveness of teaching aids", and the total variance explained by the two factors accounts for 77.49%.

Table 2. Gender Issues—Summary Table of Factor Analysis for the Interactive Picture Book Scale.

No.	Content	Factor1	Factor2
1	The combination of picture books and teaching aids enhanced children's interest in learning	0.87	
6	Teaching aids and picture books were creative	0.84	
2	The style and color of the picture book attracted children's attention	0.81	
11	This teaching aid was practical	0.76	
4	Teaching aids promote hand-eye coordination	0.73	
3	The teaching aids achieved the function of complete storage	0.71	
12	Through the clothing cards in the teaching aids, the development of children's fine motor skills can be promoted	0.70	
8	Picture books and teaching aids enhance children's perceptions of gender equality		0.92
9	Teaching aids enable young children to learn about the concept of gender equality in occupations		0.90
10	Question cards in teaching aids promoted gender equality awareness		0.85
7	Teaching aids allowed young children to learn the concept of gender equality in clothing		0.83
5	Teaching aids allowed young children to learn about the concept of gender equality in color		0.73
Eigenvalues		7.91	1.39
Explained variance (%)		65.94	11.54
Cumulative explained variance (%)		65.94	77.49

3. Results and Discussions

We recruited 34 teaching staff as research subjects. First, the current traditional gender teaching aids were used by them for a questionnaire survey, and then, the proposed teaching aids were used with explanation, demonstration, and trial. After learning about the gender equality teaching aids developed by the researchers, a questionnaire was conducted again. Table 3 presents the mean scores and standard deviations of each item on the "Overall Characteristics" subscale of traditional gender teaching aids and self-made teaching aids.

Table 3. Mean scores and their standard deviations for items in the questionnaire survey.

Overall Characteristic Subscale				
Group	Traditional Teaching Aids		Proposed Teaching Aids	
Topic	Average	Standard Deviation	Average	Standard Deviation
1. The combination of picture books and teaching aids enhanced children's interest in learning	3.11	0.57	4.75	0.44
6. Teaching aids and picture books were creative	2.94	0.75	4.75	0.50
2. The style and color of the picture book attracted children's attention	3.08	0.69	4.70	0.52
11. This teaching aid is practical	3.00	0.68	4.61	0.50
4. Teaching aids promoted hand-eye coordination	3.00	0.68	4.52	0.65
3. Teaching aids achieved the function of complete storage	2.97	0.70	4.67	0.48
12. Through the clothing cards in the teaching aids, the development of children's fine motor skills promoted	3.00	0.70	4.72	0.50

Table 4 shows the mean scores and standard deviations of traditional gender teaching aids and the proposed teaching aids in each item of the "Learning Effectiveness" subscale.

Table 4. Mean scores and their standard deviations for learning outcome.

Learning Outcomes Scale				
Group	Traditional Gender Teaching Aids		Interactive Drawing	
Topic	Average	Standard Deviation	Average	Standard Deviation
8. Picture books and teaching aids enhanced children's awareness of gender equality	3.06	0.63	4.70	0.52
9. Teaching aids allowed young children to understand the concept of gender equality in occupations	2.98	0.84	4.72	0.51
10. Question cards in teaching aids promoted gender equality awareness	2.94	0.58	4.61	0.55
7. Teaching aids allowed young children to learn the concept of gender equality in clothing	3.02	0.65	4.70	0.52
5. Teaching aids allowed children to learn the concept of gender equality in terms of color	3.06	0.75	4.67	0.59

The dependent sample t-test was conducted for the score of "overall characteristics". The results showed that all p-values were lower than a significant level of 0.05. Therefore, displaying interactive picture book games, creativity, practicality, picture book style, teaching aids storage, and teaching aids were significantly better than traditional gender teaching aids. "Learning Effectiveness" also showed a significantly better result. The characteristics of gender equality concept, cognition, and diverse knowledge displayed in the proposed picture books were significantly better than in traditional gender teaching aids.

Table 5. Dependent sample t-test result for subscales, $p < 0.05$.

Subscale	The average number of traditional gender aids	Interactive picture book averages	The standard deviation of traditional gender teaching aids	Interactive picture book standard deviation	T value	p value
Overall characteristics	3.01	4.67	0.59	0.42	11.53	<0.001
Learning effectiveness	3.01	4.68	0.65	0.50	11.28	<0.001

4. Conclusions


We developed self-made situation picture books for young children to understand the concept of gender equality in "learning by play". We designed the storage method of picture books and teaching aids as a backpack to make it portable for caregivers or young children. The appearance was based on the pink elephant, the supporting role in the picture book as the design concept. In addition to the cute and eye-catching appearance, it allowed children to integrate into the situation. Gender equality-related issues were mentioned many times in the picture books in the three categories of "clothing", "color" and "occupation" as they often appear as the stereotypes of gender inequality. A rich and easy-to-understand plot was used to enhance the fun of the teaching aids by playing and operating the teaching aids so that the issues could be naturally integrated into the activities. The reliability and validity of the questionnaires were validated for 100 subjects to respond to the survey. The dependent sample T-test was carried out to analyze the result. The combination of picture books and teaching aids enhanced children's interest in learning more than traditional teaching aids. Teaching aids and picture books were more creative, and innovative gender equality teaching aids enhanced children's awareness of gender equality. Teaching aids allowed young children to learn about the concept of gender equality in occupations, colors, and clothing.

5. Patents

This product has passed the invention patent and appearance design patent. It shows that the research and development content of this research is original and novel.

Ya-Jane Chaung. Interactive teaching aid system. (Patent application country/type/certificate number/patent date: Republic of China/Invention No. I765802/2022.5.21-2041.8.9)

Ya-Jane Chaung, Hsiu-Chun Lin, Cing-Chuan Li and Yu-Ting Wu. teaching aids. (Patent application country/type/certificate number/patent date: Republic of China/Design No. D219637/2022.6.21-2036.12.20)

	
<p>Invention patent</p>	<p>Design patent</p>

Author Contributions: Literature review, research design, questionnaire survey, establishment of reliability and validity, statistical analysis, picture and teaching aid ideas: Ya-Jane Chaung; Picture book illustration, picture and teaching aid ideas, questionnaire design, product production, Hsiu-Chun Lin, Cing-Chuan Li, and Yu-Ting Wu.

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Conflicts of Interest: The authors declare no conflict of interest.

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