Consideration of "consumption" study in the elementary and junior high schools which paid attention to the clothes material

Yoshimi OKAMURA, Kenichi NAKABAYASHI, Toshifumi YUJI and Yuichi KIYOTA

Faculty of Education and Culture, Miyazaki University

Abstract-

We are now in an era in which we can select and purchase the fiber products of our choice; however synthetic fibers are now used for many of these products. Because synthetic fibers place a different demand on the environment, it is believed that their prolonged usage will lead to a reduction in environmental load. In this study, the authors proposed teaching materials and classes that educate students about synthetic fibers. They expect that this will lead to students choosing synthetic rather than natural fiber, which will ultimately lessen the impact on the environment; additionally, the authors discuss the validity of these proposals. As a result, the following conclusions have been obtained.

1. Information is involved in the selection of clothes.

2. Teaching materials that measure cloth temperature seemed to be effective for the elementary / junior high students' learning.

3. Understanding the raw materials used in the manufacture of clothes is important in the education of consumption.

I. INTRODUCTION

Recently, we are in the era in which we can select and purchase the fiber products we want: additionally, we are rich in material items. Natural fibers have been supplied at a relatively constant rate although chemically produced fibers have come to be widely available only recently. In addition, the production volume of these fibers has been increasing with the development of technology[1)], and has resulted in the mass production of fiber products. Although natural fibers are easily affected by the environments, chemical fibers - in particular, synthetic fibers that are produced from underground resources - are not influenced by the environment. Therefore, stable production can be expected which will contribute to an abundance of fiber products. Because a reduction of CO^2 discharge is obligated for prevention of global warming and interests in environment has been increasing, eco-products for power savings have been developed. Synthetic fibers are used for many of these eco products; however, these fibers become difficult to recycle if used in combination with other types of fibers. Considering that synthetic fibers remain strong under various conditions, they may be best suited for reducing environmental load with prolonged usage. In order to realize effective usage of eco-products, end-users need to have knowledge of fiber materials. However, using these eco-products effectively is difficult because the time allocated for teaching and learning about fiber performance is inadequate on the educational front[2)] and it is difficult to evaluate consumption performance[3)]. The goal of this study is to determine what is "necessary" or "unnecessary" knowledge in selection of clothes and recognizing the raw materials used for those clothes in order to gain an understanding of environmental preservation, using "consumption education" as a theme in elementary and junior high schools. In this paper, the authors propose teaching materials and classes for educating students about synthetic fibers and discussed the validity of these proposals. Finally, the study reports the results of the proposed teaching materials and classes.

II. METHOD

A. Class configuration

From August to September 2011, the authors conducted classes for 80 sixth graders at a public elementary school and 62 second and third graders at a public junior high school, using "Consumer Education of clothes" as the subject. The subtitles of the study for the elementary school students and junior high school students were "Let's examine wear comfort of clothes and warmth / raw material of clothes" and "Let's think about raw materials of clothes and environments, and clothes and environment", respectively. Each of the classes was conducted for two continuous hours: during the first half, the students learned about the basic contents. A session in which the students could actually feel raw materials was incorporated in the class of the elementary school students in order to facilitate their understanding of the importance of the selection of clothes as a way of wearing clothes. The relationship between the material of their clothes and raw materials was shown to the junior high students in order to

facilitate the realization of the importance in selecting clothes based on the relationship between the natural environment and the life with clothes. In the second half of the class, students learned about the warmth of the raw materials, such as cotton or wool, used in conventional underwear and Warm Biz using the calorific value measurement devised by the authors. In these classes, the students sought to understand their consumption method based on the relationship between the raw materials and the environment and by considering what they had learned and confirming the warmth of the raw materials.

B. Experiential learning

In experiential learning, measurement tools that had already been constructed were given to the elementary school students; they worked in groups, sharing their work and engaging in activities using the tool sets. Each of the junior high students also performed measurements during in their experiential learning. Prior to measuring the surface temperatures of the sample clothes, the students filled out their worksheets with the name of the sample cloth that was perceived as warm and the temperature change they expected. Thereafter the students wrote down the initial surface temperatures and then the temperatures after certain time periods and recorded the difference between those temperatures. Further, they determined the ranking of the clothes according to their warmth. Numbers were ascribed to the clothes samples and the fibers were identified after determining the ranking of the samples; this enabled the explanation that selection of clothes leads directly to environmentally-correct behavior.

Worksheet

○ Expectation of temperature change

(

○Temperature measurement

time / sample number	0 min.	30 sec.	1 min.	1 min. 30 sec.	2 min.	2 min. 30 sec.	3 min.	4 min.
1st time	℃	℃	℃	℃	℃	℃	℃	℃
2nd time	℃	℃	℃	℃	℃	℃	℃	℃

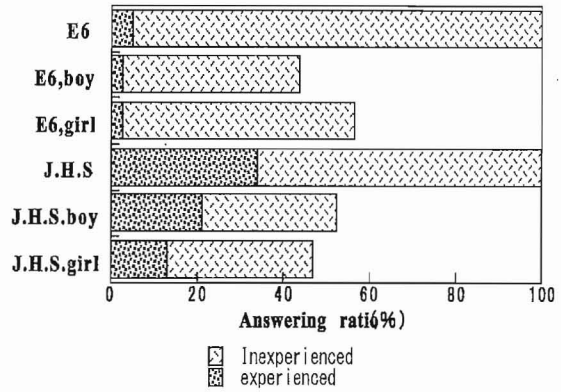
time / sample number	5 min.	6 min.	1st time of sample number	2nd time of sample number		
					temperature difference	order
1st time	℃	℃	1st biggest temperature difference ℃	2nd biggest temperature difference℃	1	
2nd time	℃	℃			2	
					3	

C. Class evaluation

Questionnaire surveys were administered before and after the classes in order to confirm learners' prior knowledge and evaluate the teaching materials and the classes.

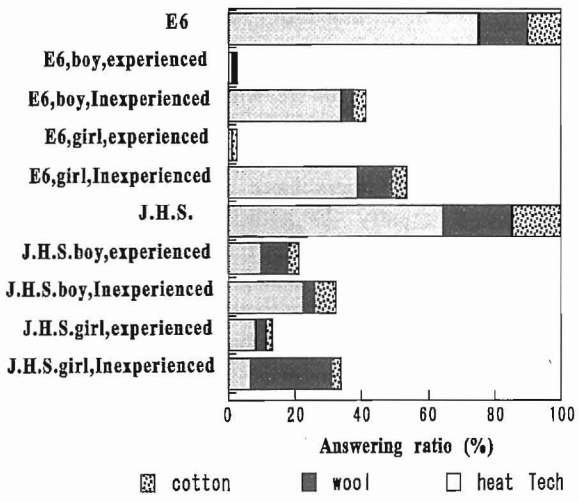
III. RESULTS AND DISCUSSIN

In the questionnaire administered before the classes, 5% of the elementary school students and 38% of the junior high school students answered, "I have thought about the raw material of underwear", thereby indicating that students in higher grades tended to have more interests in the raw materials used in underwear.



Presence of the experience which considered the mate of the underwear

Although difference by gender was not significant among elementary school students, among junior high school students, boys tended to have more interest in raw materials. In the case of cotton, wool and Warm Biz materials (heat tech material) the proportion of the

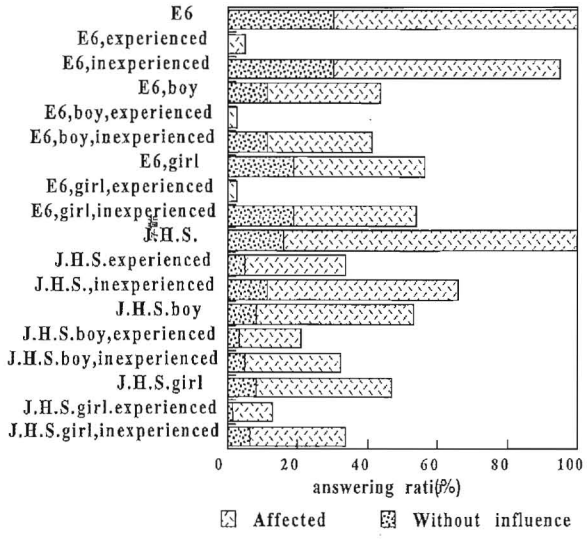


The underwear material by which I think it's warm

students who answered, "The warmest material is the Warm Biz material" was 75% among the elementary school students and 64.5% among the junior high school students; these were the highest rates in the results. Thus, it is evident that the proportion of students who selected the Warm Biz material was higher among the elementary school students than in the junior high school students. The authors speculate that the reason for this was that elementary school students had learned about types and materials of clothes in the first grade and that this knowledge affected the results.

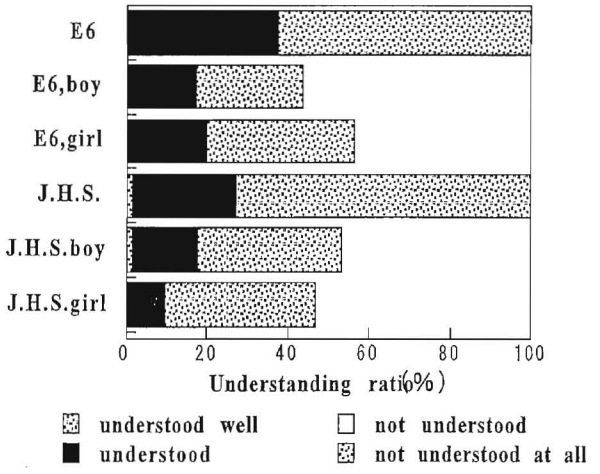
Moreover, since the proportion of the students who selected the Warm Biz raw material was high among the elementary school students and male junior high school students who had answered, "I have never thought about the raw materials used in underwear.", it was presumed that dependency on the information that was more easily available affected the results for those students who had no interest in raw materials.

In the results of the female junior high school students, the proportion of the students who selected the Warm Biz material was high among those who answered, "I have thought about the raw materials used in underwear.". Furthermore, since the proportion of the students who selected wool was high among those who answered, "I have never thought about the raw materials used in underwear.", the authors supposed that the girls' answers were based on their individual preferences. In addition, the proportion of the students who answered, "Selection of clothes influences the environment" was 60% and 80% among elementary school and junior high school students, respectively. With regard to the proportion of the students who answered, "Selection of clothes influences or does not influence the environment" gender difference was small among the elementary school students, while among the junior high school students, boys seemed to consider the influence on the environment.



Relation between how to choose clothes and environmental load

The questionnaire survey administered after the classes revealed that 99% of the students answered that they "Understood well" or "Understood" the relationship between the consumption of clothes and environment and therefore the authors believe that the class proposed in this study was effective as an effort to facilitate the understanding of the consumption in life with clothes. Most of the students answered that they thought the classed were "Very interesting" or "Interesting" in the questionnaire administered after the class. In addition, among both the elementary school and junior high school students, those who answered "Understood well" thought the classes were "Interesting" and, therefore, the authors suppose that a class in which students can experience the performance of the raw material used in clothes was important for learning about the life with clothes and their subsequent selection.



The percentage of the related understanding with elec of clothes and the environment

IV. CONCLUSION

In recent years, commodities have come to be obtained not merely by creation but mainly by selection. Further, most of the materials used in those commodities are from underground resources and clothes are no exception. In order to conserve the global environment, the effective use of the limited resources is essential; the authors of this paper believe that effective selection and use of clothes is also an important method of protecting the environment. The goal of this study was to determine what was "necessary" or "unnecessary" knowledge when selecting clothes and understanding the use of raw materials in clothes in order to understand environmental preservation, with consumption education as a theme. The authors have proposed both teaching materials and classes that educate students about synthetic fibers and discussed the validity of these

proposals. As a result, the followings have been obtained as conclusions.

1. Information is involved in the selection of clothes.
2. Teaching materials to measure cloth temperature seemed to be effective for learning among elementary / junior high students.
3. Understanding the use of raw materials in clothes is important in the education of consumption.

This study has revealed that classes that employ experiential learning using teaching materials that have a clear purpose, such as those introduced in this paper are necessary for learning about clothes.

REFERENCES

[1] Japan Chemical Fibers Association HP
N. OKADA et all, Visual Clothing Habit Theory, KENPAKUSYA, Tokyo, p.139(2010)

[2] A dean discretion report of expenses (the young people and schoolmistress) in fiscal year 2011, in print

[3] Y.OKAMURA and M.HIRATA, The Current Condition of Clothing Studies, Memoirs of the Faculty of Education and Culture, University of Miyazaki, pp.7-14(2005)

E-mail of the author:okamuray@cc.miyazaki-u.ac.jp