

Consumer education for junior high-school pupils within a technological project

Abstract

Consumer education was examined within a project-based technology study course. Pupils participated in the design and construction of a product called a "Water Level Detector". Throughout the course, various aspects of marketing and consumerism were addressed. The instrument applied was a Consumer Behaviour Questionnaire in which pupils recorded their preferences when considering the purchase of products like clothes or shoes. The questionnaire was given pre and post the study to an experimental class in an urban school, an experimental class in an outline area, and a control class. Results showed that both experimental classes improved their scores on wise consumerism more than the control group, while the urban class pupils performed better than the outline class.

Introduction

Among the current trends that have underscored the need for consumer education are increased use of advanced technology in everyday life, changing lifestyles, environmental and social awareness, and the new levels of purchasing power and marketing attention given to adolescents. Recent technology education goals reflect an increased emphasis on the study of critical consumerism. Foster and Perreault (1986) suggest that the technologically literate person expresses a broad knowledge of technology and its many and varied effects on issues such as consumerism, politics, culture, values, work and basic societal institutions. Jephcote and Hendley (1992) point out that design and technology education can contribute to the development of pupils' understanding of economics. According to Dyrenfurth (1996) one of the characteristics that describes technologically literate people is the ability to apply an understanding of technology to purchasing decisions and other aspects of every day life. The consumerism dimension is incorporated into a number of programmes aimed at teaching technology to young pupils.

Consumerism and project-based technology

Many programmes for technology education emphasise the importance of building the classroom learning process on hands-on

experience (Hawkridge, 1976; Fay, 1991; Kanis, 1991; Yager, 1993). Learning and carrying out a planning process is a central component in project-based technology studies (Rennie et al, 1992). Barlex (1994) points out a list of activities that characterise a technology project: researching, investigating, specifying, developing, optimising, planning and evaluating. Consumerism touches upon most of these activities. According to Foster and Perreault (1986) project-based technology studies can illuminate the aspect of consumerism from the technological scholarship point of view including: meeting a need, quality, reliability, price, market survey, ease of use, company's reputation, product safety and warranty, personal taste, fashion and advertising. Technological practice is multi-dimensional. Medway (1989) proposes that a realistic project in engineering design education should provide experience of customer liaison, project planning and control, budgetary control and purchasing. Teachers will need to consider which functions it is desirable and possible to introduce to pupils and at what stages.

The present study examines the process of developing an awareness of the elements of consumerism in junior-high school pupils within a project-based technological course. Despite the common expectation that technological studies affect pupils' purchasing decisions, there is a relative lack of empirical data to suggest the best way to achieve this goal. In most project-based programmes, the pupil's attention is likely to stay on the practical aspects of the project, i.e. design and construction, and leave consumerism aside. Another question addressed in this study has to do with the effect of technology and consumerism studies on children in an established urban environment in comparison with children in outlying areas. In Israel, the percentage of children studying advanced mathematics and science in outlying areas is lower than that of children in urban areas. One of the reasons for this is the lack of experienced science teachers in the outlying areas (Barak, 1993). With regard to technology and consumerism, experienced teachers are rarer, either in the cities or outlying areas. The question is whether providing appropriate training to local technology teachers, and making suitable learning

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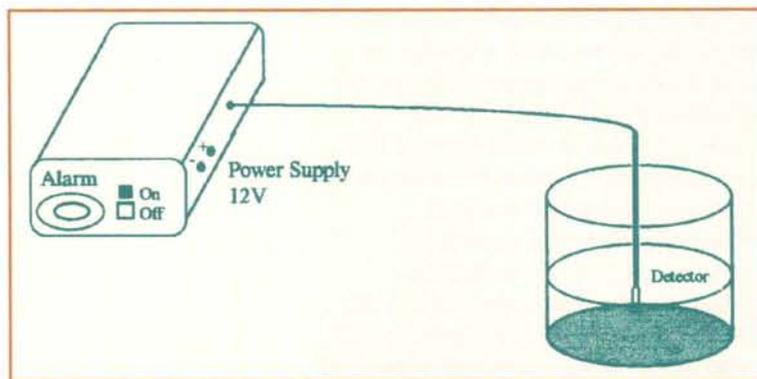


Figure 1: Water level detector

materials available, would prove to be an effective strategy for building good consumer skills in most students.

The pupils' project: a water level detector

Within the framework of a comprehensive project aimed at promoting science and technology education in junior-high schools, a project-based curriculum was developed. Pupils produced a technological product called a "Water Level Detector", shown in Figure 1.

The pupils went through the following process:

- identifying the need for a flood alarm device
- proposing a variety of solutions and selecting an appropriate one based on technical and consumer factors, like availability and price
- building the product
- testing
- conducting a market survey.

During the class an article on consumerism was read and discussed and guidelines for wise consumer choice were identified. Parents were interviewed by the pupils with regard to their consumer behaviour when purchasing a product, and pupils conducted a market survey on between three and ten products identifying those factors most likely to influence a choice to purchase. Here consumer education was being taught as an

integral part of a technology project instead of as a separate subject.

Teacher in-Service Training

As part of the project a group of 44 teachers participated in an in-service training course (56 hours) addressing all the issues they would need to raise in the classroom. Of these, 15 actually taught the module in the classroom. They also received on-going guidance and support. Beardsley (1992) points out the importance of school supervision in conjunction with training and warns against relying solely on a one-time training event.

Method

Participants and design

The experimental population was made up of three classes (94 pupils) representing a sample from approximately 20 classes (560 pupils) who studied the water level detector unit in junior-high schools. Two classes (57 pupils) came from an outlying school and 37 from an urban school. The control group comprised two classes (44 pupils) from a medium-sized town. This group studied a traditional arts and crafts curriculum in a school which did not engage in any programme for promoting science and technology education. All pupils were in the 7th grade (age 13-14).

Instrumentation

Pupils from both the experimental groups (urban and outlying) and the control group were given a Wise Consumerism Questionnaire at two different points in time. Pupils in the experimental group were questioned before and after they studied the water level detector module. Pupils in the control group were questioned at the same times, without any intervention.

The first step in developing the consumer behaviour questionnaire was to give a preliminary open-ended questionnaire to 40 pupils not participating in experimental or control groups. They were asked to choose the products they would buy if they possessed a certain amount of money. The six most preferred products were: p1 = shoes, p2 = clothes, p3 = a pen, p4 = a bag, p5 = a book, p6 = a game. In the final questionnaire, the experimental and control groups were asked open-ended questions

Group	N	Pre-test		Post-test		Difference	
		Mean	SD	Mean	SD	Mean	SD
Experimental Urban	34	1.524	0.928	2.779	1.199	1.259	1.334
Experimental Outline	55	1.463	1.031	2.224	1.054	0.760	1.350
Control	37	0.973	0.820	1.507	0.892	0.504	1.014

Table 1: Wise Consumerism Score

where they had to specify factors taken into consideration before buying each of the above mentioned products.

Pupils' responses were coded into the following categories of Wise Consumerism:

c1 = Meeting a need, c2 = Quality, c3 = Reliability, c4 = Price, c5 = Market survey, c6 = Ease of use, c7 = Company reputation, c8 = Product safety, c9 = Warranty.

Elements c1-c9 reflect factors inherent in the technological project, i.e. raised and

discussed during lessons and class activities. Pupils were given 9 binary (0 or 1) scores c1-c9 for each of the products p1-p6. The Product Consumerism score PC(i) is the sum of scores c1-c9 for product 1. The final Wise Consumerism Score (WCS) is the mean of the 6 scores PC(1) – PC(6).

In addition to the Wise Consumerism Score, each pupil was given a Subjective Consumerism Score (SCS), computed similarly. The subjective considerations computed were: s1 = Personal taste, s2 = Fashion, s3 = Promotion. These factors were not directly discussed during the

Figure 2: Wise Consumerism Scores in pre-post tests

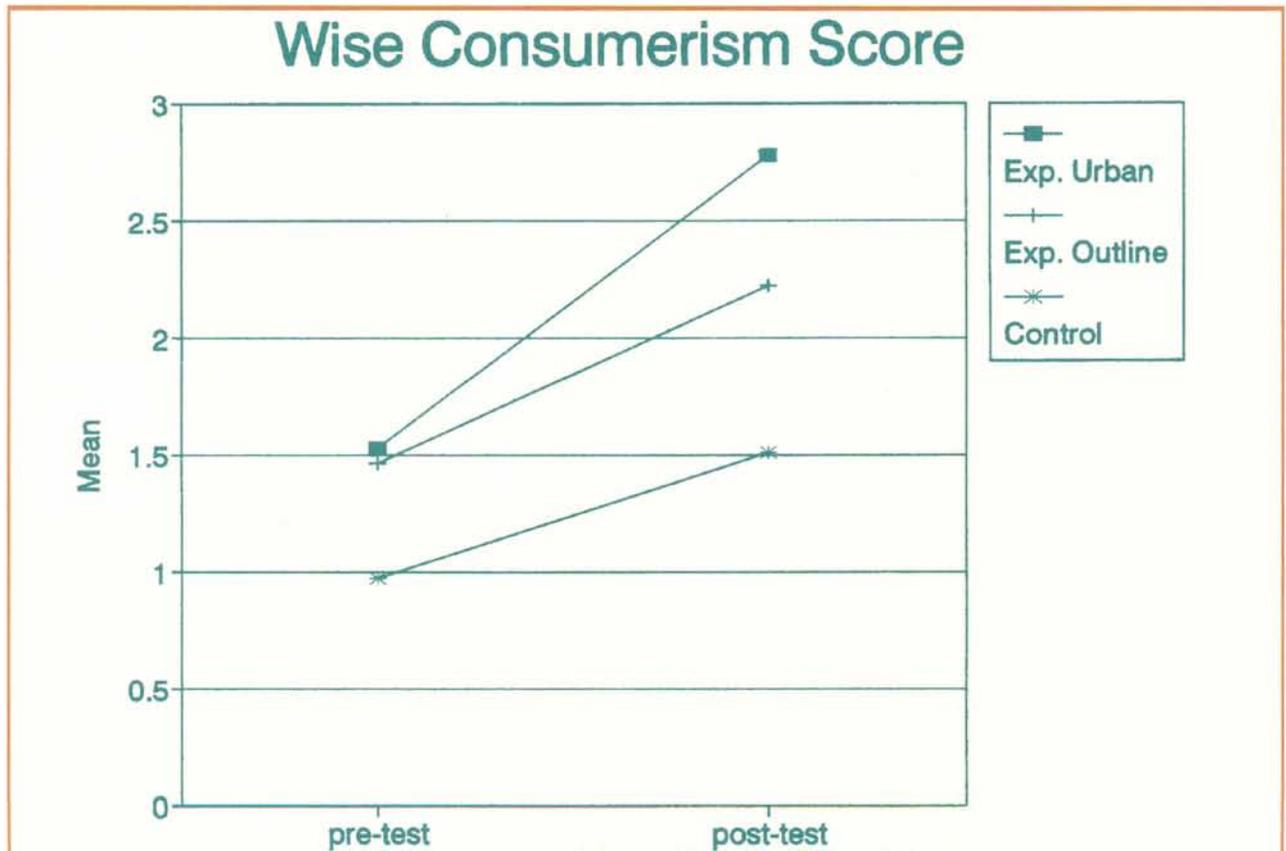


Table 2: Analysis of variance tests for between subject effects, for Wise Consumerism Score (WCS).

Repeated measure level information (Manova)					
Effect	Statistic	Value	F	DF	Signif. level
Time	Hotelling-Lawley Trace	2.064	243.632	1,118	0.01
Time*Group	Hotelling-Lawley Trace	0.228	13.498	2,118	0.01

Test of hypotheses for between subject effects					
Source	DF	Type III SS	Mean Square	F	Signif. level
Group	2	27.451	13.725	30.90	0.01
Error	118	52.410	0.444		

course. The Product Subjective score PS(i) is the sum of scores s1-s3 for product i. The final Subjective Consumerism Score (SCS) is the mean of the 6 scores PS(1) – PS(6).

Validity and reliability

Each pupil answered the open-ended questions in his own way. One tester checked the questionnaires and indicated where a pupil identified categories c1-c9 or p1-p3 for each product. About 20% of the questionnaires were checked again by two other external specialists: an economist and a marketing expert. The computability between each of the external experts' scores and the primary scores given by the tester ranged from 79% to 99%. An internal consistency test, using Cronbach's Coefficient a was performed on the scores PC and PS for the six products. The findings were a= 0.656 in the pre-test and a= 0.814 in the post-test.

Findings

Table 1 presents the results for the Wise Consumerism Score (WCS) from the urban and outlying areas in both the pre and post tests. The findings are also displayed in Figure 2.

Prior to comparing the pre-post test results and control groups in pairs, a comprehensive repeated measure analysis of variance was taken, as shown in Table 2.

Table 2 shows significant differences between the three groups regarding the WCS pre-post effect. A contrast analysis of the difference between the pre-post results was conducted to examine the differences between each pair of groups, as presented in Table 3.

Table 3: Pre-Post differences on WCS (contrasts analysis)

Contrast	DF	Contrast SS	Mean Square	F	Signif. level
Experimental Urban – Control	1	10.107	10.107	26.99	0.01
Experimental Outline – Control	1	2.945	2.945	7.86	0.01
Exp. urban – Exp. Outline	1	2.970	2.970	7.93	0.01

Table 3 shows that the urban experimental pupils improved their Wise Consumerism Score (WCS) between the pre-post tests more than the control pupils did. A similar pattern was found for the outlying test group. The improvement obtained by the urban test group was greater than that obtained by the outlying test group.

The findings concerning the variable Subjective Consumerism Score (SCS) were analysed using a similar procedure. A repeated measure analysis of variance was carried out, showing no significant differences between groups in the SCS pre-post measures.

Discussion

Findings indicate that all groups improved their average grade on "wise consumerism" from the pre-test to the post-test. A significant difference was found among the three groups in terms of the extent of the improvement, where the order is: experimental-urban > experimental-outline > control. As a result of studying the water level detector module the pupils reported wiser consumer behaviour when considering the purchase of new products, while the subjective consumer behaviour results were similar among all groups. That both experimental groups (urban and outline areas) enhanced their performance would support the notion that within project-based technology studies there is the potential for consumer skill building. Although the new curriculum was introduced to the urban experimental group and the outline experimental group in the same manner, the extent of improvement within urban pupils was higher. Since the starting point of the two groups in the skill under discussion was found to be similar, and the topic of consumerism was new to both groups, we attribute the gap in the achievements to the different background of the teachers in terms of pedagogical knowledge (Shulman, 1986), i.e. knowledge of principles of teaching and learning, classroom behaviour and management. Less experienced teachers, such as the teachers in the outline schools in our study, are more concerned with the completion of the practical side of the technological project. The aspect of consumerism should be given appropriate consideration and weight within the technological project.

References

- Barak, M. (1993). 'To master the knowledge, acquire the methods, lead the pupils.' Paper presented at the international conference for science education in developing countries, Jerusalem, Israel, January 3-7, 1993.
- Barlex, D. (1994). 'Organising project work' in F. Banks (Ed). *Teaching Technology*, Routledge, London and New York. (c) The open university, 124-143.
- Beardsley, T. (1992). 'Teaching real science'. *Scientific American*, October, 79-86.
- Dyrenfurth, M. J. (1996). 'Towards a generic model of technological literacy.' Paper presented at the second Jerusalem international science and technology education conference (JISTEC), January, 8-11, 1996, S1- 15,16.
- Fay, G. M. (1991). 'The project plan'. *The Science Teacher*, 58, 40-42.
- Foster, P. R., and Perreault, R. J. (1986). 'Characteristics of technological literacy: perspectives from the industrial and educational sectors'. *Journal of Epsilon Pi Tau* 12, 55-58.
- Hawkrige, D. G. (1976). 'Next Year Jerusalem! Rise of educational technology'. *British Journal of Educational technology*, 7, 7-30.
- Jephcote M., and Hendley, D. (1992). 'Making links between design and technology and economic understanding'. *Economics*, 28, 72-75.
- Kanis, I. (1991). 'Ninth grade lab skills' *The Science Teacher*, 58, 28-33.
- Medway, P., (1989) 'Issues in the Theory and Practice of Technology Education', *Studies in Science Education*, 16, pp 1-24.
- Rennie, L. J., Treagust, D. F., and Kinnear, A. (1992). 'An evaluation of curriculum materials for teaching technology as a design process'. *Research in Science and Technological Education*, 10, 203-217.
- Shulman, L. S. (1986). 'Those who understand: knowledge growth in teaching'. *Educational Research*, 15, 4-14.
- White, B. (1990). *Technology education: industrial arts in transition*. Hawaii University, Honolulu: Office of the state director for vocational education.
- Yager, R. E. (1993). 'Make a difference with STS'. *The Science Teacher*, 60, 45-48.