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What Hong Kong People Think About Technology

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Technology Education is one of the eight Key Learning Areas for all Hong Kong students to study. In defining this necessary curriculum component, Hong Kong's Curriculum Development Council stressed that "technology" is more than computers and information technology. Despite this rhetoric, the reality is that many secondary schools do not offer subjects such as Design & Technology that are able to go beyond the narrow focus of technology as being computers. Interpretations and decisions made by schools about technology may in fact, parallel the public's opinion, suggesting a mismatch with desired goals. To explore this potential discrepancy, a poll of over 750 adults was conducted to determine what they think about technology and how it should be included in schools. The results indicated very strong support for the government's wide definition of technology education and the need for it to be included in schools. However, support was not as enthusiastic about technology education being included as a required separate subject. Comparisons made with the results of a previous U.S. study showed significant differences for many of the items.

Key words: technology education; attitudes; Hong Kong

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There appears to be universal agreement that as we live in such a technological world, the subject of technology requires proper attention in schools. Politicians, government agencies and education authorities recognize the need to have an educated citizenry equipped with the technological capability, understanding and awareness to meet the changes and challenges ahead. In Hong Kong, for example, the Chief Executive's Commission on Innovation and Technology (Hong Kong Government, 1998) and the Commission on Strategic Development (Hong Kong Government, 2000) echoed the need for a technologically literate and capable society. This request also stressed that "technology" was more encompassing than information technology and included areas such as transportation, electronics, biotechnology, material technology, and construction.

In a report commissioned by the Hong Kong Centre for Economic Research (Kwong, 1997), the Centre had concerns that Hong Kong people's awareness of technology was rather limited. The report stated that "people are not very inquisitive about the technology that drives the products they use", and that "in the school system, which is heavily exam oriented, little in the curriculum is designed to capture the imagination of the students and to make them see how they can use science and technology to enhance the quality of living" (p. 87). This concern about a lack of technological awareness and understanding goes beyond young people and formal education. For instance, Lee's (2000) study on Hong Kong elderly noted the complexity and lack of understanding of technology as being important factors in having elderly people adopt technology such as mobile phones and automatic teller machines.

The call for a technically-literate citizenry is not unique to Hong Kong. In France, Italy, Japan, Taiwan, and the United Kingdom, a study of technology education is required in secondary schools (International Technology Education Association [ITEA], 1997). In the United States, where individual States have their own education policy and regulations, some have made technology education a requirement for graduation, i.e., Maryland State Department of Education (2004). The policy paper prepared by the National

Academy of Engineering and the National Research Council entitled *Technically Speaking: Why All Americans Need to Know More About Technology* (Pearson & Young, 2002) provided ample evidence as to the need for technology education to be included in all American schools.

The Hong Kong's Curriculum Development Council's (CDC) (2000) document *Learning to Learn*, also recognized the importance of technology education. With eight Key Learning Areas (KLA) identified as necessary subjects for all Hong Kong students to study from primary grades through lower secondary grades, Technology Education (TEKLA) was included along with other subjects such as mathematics, science and Chinese. The CDC also applied a broad definition for technology as being "the purposeful application of knowledge, skills and experiences in using resources to create products or systems to meet human needs" (p. 2). Technology education topics appropriate for students to learn and explore include the classification and processing of materials, manipulating tools, design fundamentals, control systems, electronics, structures, mechanisms, the application of energy, as well as information and communication technology. The CDC also expected that through technology education, students are able to develop generic problem-solving, creativity and critical thinking skills as they progress from primary through secondary school. Similar to the aforementioned government commissions, as well as from comments made in the Chief Executive Policy Address (Hong Kong Government, 2003, 2004), the link between creativity and technological capability was made explicit.

Although the rhetoric suggests the inclusion of a broad study of technology in Hong Kong schools, the reality is that most schools are not meeting the challenge. Primary schools bury the content in the amorphous subject called General Studies, which would then share part of the 12–15 percent suggested time allocated along with Science and Personal, Social and Humanities Education. With limited resources, time and teacher training, most primary students receive just a cursory treatment of technology education. In secondary schools, the most relevant subject available that involves both the broad definition and creative aspects of technology education is Design

& Technology (D&T). Born out of the traditional craft subjects of woodworking and metalworking, D&T has evolved into a meaningful and authentic subject that uses a wide variety of tools, materials and technological processes. However, for some schools, the evolution of the subject has been slow, gender-specific and somewhat inconsistent. For other schools, the subject simply does not even exist.

Just a few years ago, only boys could take D&T, while girls would take Home Economics. Following a study on "Pupils' Attitudes Toward Technology" (Volk & Yip, 1997) which showed significant differences between boys' and girls' attitudes toward technology, the Equal Opportunities Commission reminded schools that the Sex Discrimination Ordinance made it unlawful to discriminate against a student in the way it affords him/her access to any benefits, facilities or services (Equal Opportunities Commission, 1999). Slowly, schools began to have girls participate in D&T, as well as boys in Home Economics. This action went a long way in starting to reduce gender stereotypes and making D&T a legitimate subject for all students in schools with D&T.

According to Curriculum Development Institute statistics (K. F. Lau, personal communication, September 3, 2004), only 298 of the 488 secondary schools (61 percent) currently offer D&T. With 100 percent of secondary schools offering instruction in computers, it is assumed the remaining 39 percent apply the narrow definition of technology being the same as computers. With approximately 250,000 students in Secondary 1–3, very few continue studying D&T beyond this level as an elective. Certificate of Education D&T examinations at the S5 level were offered in 37 schools, with 495 students taking the examination. For the Advanced Level examination, only 35 students took the examination in 2003 (Hong Kong Examinations and Assessment Authority, 2004).

Although the opportunity to study technology is no longer denied because of gender, equal opportunity does not ensure subject options are made available to all students in all schools. Principals and school management committees are responsible for deciding which subjects are offered. In this

way, school management may simply view D&T as an unnecessary distraction in an already crowded school curriculum, or just consider the study of computers to be sufficient to cover the TEKLA.

Herein presents a conundrum. Given the need for a technically literate citizenry as delineated in various government policy statements and the limited options afforded students to study technology education, are schools providing students with sufficient breadth and depth in the subject? Principals and school management committees may be in fact correct in their interpretation of technology education, for as a sub-set of society, they may be reflecting a larger public view (Postiglione & Lee, 1997). As suggested by Kennedy (1995), unless educational policy and reform efforts are consistent with the values and interests of the larger society, they will not be successful. In this manner, education policy and reform efforts such as those advocating technical literacy through a TEKLA may only be a symbolic political gesture and not necessarily desired or accepted by the public.

Based on this potential gap between rhetoric and reality, this study sought to determine if the public's perception of technology is congruent with the content identified in the Technology Education Key Learning Area. Furthermore, to ascertain how the goals and objectives stated in the TEKLA are to be achieved, this study examined the degree of public support for teaching technology in schools. If the public view was similar to what was already being done in most schools, that is, a narrow focus on computers and a lack of opportunity to study technology through subjects such as Design & Technology, then government attempts to achieve the meaningful goals set forth in the TEKLA may prove difficult.

Methodology

To research Hong Kong citizen's knowledge and attitudes about technology education, a telephone survey of over 750 adults was conducted during April 2004. The instrument and methodology used were based on a study con-

ducted by the International Technology Education Association (ITEA) and the Gallup Organization, with the authors of the ITEA/Gallup poll results encouraging others to conduct additional research based on their methodology (Rose & Dugger, 2002). The questions used in the ITEA/Gallup poll were largely derived from the technology education content identified in the *Standards for Technological Literacy* (ITEA, 2000) and its predecessor, the *Technology for All Americans: A Rational Structure for the Study of Technology* (ITEA, 1998).

The validity, relevance and importance of ITEA material for the Hong Kong context was evident in ITEA being cited as a reference for the development of the *TEKLA Curriculum Guide* (Curriculum Development Council, 2002). As a result, there are similarities and parallels in the documents. For example, the *Curriculum Guide* defined technology as "the application of knowledge, skills and experiences in using resources to create products to meet human needs (p. 4), while the *Rational* defines it as "the processes and knowledge to modify our natural world to meet human needs" (p. 13). Both identify general knowledge contexts or areas, and provided examples on how the scope, content and activities of technology education should relate to the age and ability of the student. For this reason, the instrument was found to be appropriate for the Hong Kong study, albeit some modification to match the local context. Through correspondence with one of the lead authors and member of the ITEA/Gallup Poll Survey Committee, the instrument was obtained for use in the Hong Kong study. Additional questions relating to demographics, i.e., gender, age, education, etc. were also included to determine sample composition and for further item analysis.

The advantages and disadvantages of telephone surveys were noted by Fraenkel and Wallen (2000). They stated that telephone surveys are cheaper than personal interviews, can be conducted fairly quickly and lend themselves to standardized questioning procedures. They also allow for questions to be clarified by the interviewer and provide greater geographical coverage. Disadvantages include the limited access to people without telephones and

the lack of visual observation may also limit personal feedback on sensitive issues. Finally, telephone interviews result in a response rate approximately five percent lower than through personal interviews. In this regard, Hoxx and deLeeuw (2002) noted that a response rate of around 60% may be expected. However, the results from the Public Opinion Programme at the University of Hone Kong suggest a response rate of around 50% is acceptable (University of Hong Kong, 1995a, 1995b)

Obvious concerns arise about the appropriateness of using an existing questionnaire from one culture and translating it into another. As noted by Behling and Law (2000), the lack of semantic equivalence across languages, lack of conceptual equivalence across cultures and the lack of normative equivalence across societies may be problematic. They point out measures which will help ensure reliability, validity and utility in the source language. Based on their recommendations, a modified direct translation was used for this study, whereby a panel of experts make independent checks on the work of the original translator. In this procedure, the panel (a) reviews the items and reacts in writing, (b) share their comments with one another, and (c) meet to consider the points made and make recommendations. For translating and preparing instructions, recommendations from Behling and Law were also taken into consideration to ensure proper words, grammatical forms and sentence structure follow cultural contexts.

The first step for using the ITEA/Gallup instrument was to examine each item for appropriateness and relevance for Hong Kong. With an initial independent review by three lecturers in Design & Technology at The Hong Kong Institute of Education, before the items were discussed as a group, it was determined only one item required modification. This question had a definition for technology, so the exact definition used in the TEKLA, rather than ITEA, was considered more appropriate.

After this initial review, the D&T lecturers then translated the instrument into Chinese. Careful attention was given to words such as "Technology", with the Chinese version of the *TEKLA Curriculum Guide* used as reference. From this translation by D&T lecturers, the original and

Chinese versions were sent to three lecturers in the Chinese Department for further comment and refinement.

Based on an estimated adult population of 5,008,886 (Hong Kong Census and Statistics Department, 2003), the sample size required for this study was determined to be approximately 750 (Gall, Gall, & Borg, 2003). This number would be sufficient for a margin of error of plus or minus 4 percentage points and at the 95% confidence level. Other Hong Kong surveys using telephone interviews suggested this number was appropriate. For instance, ACNielsen's (2003) survey of Hong Kong household grocery spending used telephone interviews with 300 parents. The Public Opinion Programme at the University of Hone Kong also regularly conducts telephone interviews, with sample sizes of around 500 providing data at +5% error (University of Hong Kong, 1995a, 1995b).

Datacap Computer Solutions Ltd, a data capturing firm experienced in telephone interviews for many Hong Kong government projects, was used to conduct a two-stage telephone interview of 750 adults aged 18 and older. Stage One involved households selected in accordance with the 2003 white page database issued by PCCW, the largest telephone provider in Hong Kong, with the telephone number randomly selected by CATI telephone survey system. Stage Two involved the random selection of household members with a base on the nearest birthday.

From the telephone interview process lasting one week, a total of 762 adults were interviewed. This represented 49.4 percent of the 1,541 total completed calls. Those not responding to the survey included "refuse/not-qualified" (16.4%), "language problem" (08.0%) and "disconnect" (26.2%). The sample composition is reported in Table 1.

The sample had generally similar distributions in gender, age and education as those in the Hong Kong population (Hong Kong Census and Statistics Department, 2003), with absolute differences being less than five percentage points. More females participated in this study than represented in the Hong Kong population (54.1% vs. 51.6%), but similar profiles were found in other Hong Kong telephone interviews (i.e., McGhee, Hedley, & Ho, 2002; McGrath,

Table 1 Sample Composition (%)

Gender			Have Taken Technology Subject in Secondary School	
	Male	45.9	Yes	19.8
	Female	54.1	No	80.2
	Total	100.0	Total	100.0
Age			Education	
	18–23	21.5	Primary or below	11.2
	24–29	11.3	S1–S3	14.4
	30–39	25.4	S4–S5	30.7
	40–49	24.2	S6–S7	12.7
	50–59	10.4	Tertiary (non-degree)	4.8
	60 or above	7.2	Tertiary (degree)	26.2
	Total	100.0	Total	100.0

Liu, & Lam, 2002). Slightly more of the subjects also had tertiary education than the Hong Kong general population (26.2% vs. 13.4%).

As the information gained from the telephone interview is basically an opinion poll, and recognizing such surveys are about what people think and what it prepared to support or not support, percentages were used to analyze the data. Chi-square was also used to examine whether there was some relationship between demographic variables such as gender, age, and education from which the sample was drawn. Babbie (1999) and Baker (1999) noted the use of chi-square as being one of the most widely used tests for statistical significance in the social sciences when the variables are nominal or ordinal in measurement. Bernard (2000) even explained how chi-square can be used to make comparisons across complex tables with several subvariables. All authors cautioned that chi-square does not measure the strength of the relationship.

Findings

The survey of what Hong Kong people think about technology contained two sections. The first section dealt with the public's understanding of technology and the second focused on the study of technology and technology education as part of the school curriculum. The findings for each section are generally presented as percentages, with comments made on chi-square significance, if any, for the demographic categories examined.

Understanding Technology

There were four questions examining the public's understanding of technology. Tables 2–5 provide details of the findings. The public's response to the first question suggests Hong Kong people place great importance on technological literacy. Over 93% of the total population viewed understanding and using technology as being "very" or "somewhat important". This response seems to echo the government's call for technological literacy. There were no significant differences found using the chi-square test for gender, age or past experience studying technology.

Table 2 Just your opinion, how important is it for people at all levels to develop some ability to understand and use technology? Would you say it is: (%)

	Total	Male	Female	Age 18–23	Age 50+	Studied Tech	No Study Tech
Very important	28.9	32.0	26.2	22.7	36.6	30.6	27.6
Somewhat important	64.2	62.0	66.0	70.0	56.8	64.9	65.2
Not very important	6.6	5.4	7.6	6.9	6.1	4.5	6.6
Not at all important	0.4	0.6	0.2	0.4	0.5	0.0	0.6

The next question was open-ended, asking people what comes to mind when they hear the work "technology" (科技). The responses were first read and entered into a database, then grouped under similar themes. The results in Table 3 indicate a large percentage of the public has the initial perception of computers being the same as technology. This was not surprising. However, it was interesting to observe that technology was viewed as being more than material goods and hardware, with positive descriptors such as

Table 3 When you hear the word "technology, what first comes to mind?(%)

	Total	Male	Female	Age 18–23	Age 50+	Studied Tech	No Study Tech
Computers	47.3	40.9	52.8	56.1	28.9	48.1	50.6
Advancement	6.8	8.5	5.3	3.2	12.5	4.7	7.0
New inventions	6.5	7.9	5.3	3.2	9.4	7.8	5.7
Electronics	5.1	6.1	4.3	5.8	4.7	6.2	5.1
Information	3.8	3.5	4.0	3.2	7.8	5.4	3.2
Science	3.4	2.9	3.8	3.2	6.3	1.6	3.4
Space	3.1	3.5	2.8	1.3	3.1	2.3	3.0
Making life easier	2.7	4.1	1.5	3.9	3.1	4.7	2.1
Others	18.9	19.7	18.2	16.9	19.8	15.3	18.4
Nothing	2.4	2.9	2.0	3.2	4.4	3.9	1.5

"advancement" and "making life easier" being used. Again, there were no significant differences found using the chi-square test for gender, age or past experience studying technology.

When the public was then asked to choose between a specific broad definition of technology as used in the TEKLA or one defining technology as computers and the Internet, the results appeared to reflect a broader understanding and appreciation of the subject. As indicated in Table 4, over two-thirds agreed with the TEKLA definition of technology. Although those who studied Design & Technology-type subjects appeared to have a broader definition of technology than those that did not, there were no significant differences found within this or other groups.

Table 4 When you hear the word "technology" do you think of "computers and the Internet" or do you think of "the purposeful application of knowledge, skills and experiences in using resources to create products or systems to meet human needs"?

	Valid Percent	Male	Female	Age 18–23	Age 50+	Studied Tech	No Study Tech
Computer and the Internet	33.6	31.4	35.4	30.9	33.1	26.1	34.1
Purposeful application of knowledge, skills and experiences...	66.4	68.6	64.6	69.1	66.9	73.9	65.9

The last question in this section asked about the person's ability to understand and use technology. Table 5 presents the results. Significant differences were found between males and females, with females perceiving they had less ability [χ^2 (3, $N = 740$) 28.74, $p < 0.01$]. Those studying technology appeared to have more confidence to use technology, but the results were not significant.

Table 5 To what extent do you consider yourself to be able to understand and use technology? (%)

	Valid Percent	Male	Female	Age 18–23	Age 50+	Studied Tech	No Study Tech
To a great extent	2.0	3.1	1.0	1.2	2.3	2.3	1.8
To some extent	22.4	29.4	16.5	29.6	13.6	32.8	22.5
To a limited extent	65.5	60.9	69.4	65.6	65.2	61.2	69.1
Not at all	10.1	6.6	13.1	3.6	18.9	3.7	6.6

Technology and Education

The second series of questions (Table 6 through 12) examined the study of technology and technological literacy in the school curriculum. The public's response to the first question about a potential shortage of qualified technical people (Table 6) indicated only 15.8 percent thought it was appropriate to bring in people from outside Hong Kong. The response from males and females was found to be significant [χ^2 (1, N = 746) 8.812, $p < 0.01$], with women wanting schools to do more. Perhaps this reflects the past lack of opportunity women had to participate in such subjects.

Table 6 When a shortage of qualified people occurs in a particular area of technology, which of the following solutions would you feel is the most appropriate course of action for the Hong Kong government to take? (%)

	Total	Male	Female	Age 18–23	Age 50+	Studied Tech	No Study Tech
Bring in technologically literate people from outside Hong Kong	15.8	20.1	12.2	13.5	14.2	19.5	15.8
Take steps through our schools to increase the number of technologically literate people in Hong Kong	84.2	79.9	87.8	86.5	85.8	80.5	84.2

The next three questions used the TEKLA definition of technology education to gauge public opinion on the need to have such a subject in schools (Table 7). Overwhelmingly, the public viewed the study of technology as being a necessary part of the school curriculum. However, by only a two to one margin, the public believed technology should be studied as a separate subject. Differences existed between young and older people over this question [χ^2 (2, N = 734) 12.223, $p < 0.01$], with the young believing it should be a separate subject, perhaps by their own experience with subjects such as D&T being a part of their own experiences. By almost by the same two to one margin, the public believed the study of technology should be optional and not required. Again, differences existed between the young and old [χ^2 (2, N = 750) 6.976, $p < 0.05$] on this response. The public's answer to

this last question does not supply a lot of confidence for schools to convince either parents or their children on the need to study technology subjects, especially given time constraints and the pressures of other more-established and perhaps more-respected disciplines.

Table 7 Using a broad definition of technology as "the purposeful application of knowledge, skills and experiences to create products to meet human needs", do you believe the study of technology should be included in the school curriculum or not? (%)

	Total	Male	Female	Age 18–23	Age 50+	Studied Tech	No Study Tech
Yes	97.6	98.6	96.8	96.0	97.7	97.8	97.6
No	2.4	1.4	3.2	4.0	2.3	2.2	2.4
(Asked of those saying "should be included in the curriculum") Should the study of technology be made a part of other subjects like science, maths and social studies, or should it be taught as a separate subject?							
Part of other subjects	31.6	28.1	34.6	26.2	43.4	26.7	33.6
As a separate subject	68.4	71.9	65.4	73.8	56.6	73.3	66.4
(Asked of those saying "separate subjects") Should the subject be required or optional?							
Required	38.3	38.3	38.3	30.9	46.6	33.0	38.0
Optional	61.7	61.7	61.7	69.1	53.4	66.7	62.0

Relating to what should be taught in technology education programs, the public seemed to believe the technology relationships between mathematics and science were important, but did not view aspects relating to design as important (Table 8). With the item relating to "design" rated lowest, this may have implications for D&T programs that continue to focus on craftwork and portfolios at the expense of more "academics". Differences were found between those aged 18–29 and 50 and above for the "relationships between technology, mathematics and science" [χ^2 (4, N = 752) 14.306, $p < 0.01$], the "role of people" [χ^2 (4, N = 752) 13.669, p <0.01], and "product design" [χ^2 (4, N = 752) 19.228, $p < 0.01$], with the latter seeing the items as being more important. Gender differences were also observed for the "role of people" item [χ^2 (2, N = 762) 16.258, $p < 0.01$], with women seeing it being less important as a topic for schools to cover.

Table 8 Tell me how important is it for schools to prepare students in the following areas. Would you say it is very important, fairly important, or not very important? (%)

	Very Important	Fairly Important	Not Very Important
a. The relationships between technology, mathematics and science	31.0	62.2	6.8
b. The role of people in the development and use of technology	25.8	68.0	6.2
c. Knowing something about how products are designed	10.8	62.3	24.9
d. The ability to select and use products	14.0	73.4	12.3
e. An understanding of the advances and innovations in technology	15.1	70.1	13.9

Hong Kong and United States Comparisons

Before making any comparisons between the results of the study done in Hong Kong with the one done in the U.S. by ITEA/Gallup, several comments are necessary. First, caution needs to be raised about the appropriateness of using data from two studies for comparisons, especially between countries. Perhaps one of the biggest abuses according to Noah (1984), in his critique of the comparative education research, was ethnocentrism. This relates to looking at the world primarily from a point of view of the observer's own culture and values. In this regard, using a survey designed for a U.S. study may limit comparisons, as not only are the respective culture and values different, so are the economies, education systems, and politics.

As far as the use and impact of technology in Hong Kong and the United States, many similarities and parallels can be drawn. One obvious area is the parallel confusion over technology education (TE) and educational technology (ET), the latter going under names of information technology (IT), information communication technology (ICT), computer studies (CS) and others. Petrina (2003) addressed this confusion and pointed out the attempts by organizations such as the International Technology Education Association (ITEA) and the International Society for Technology in Education (ISTE) to maintain differences despite the great overlaps in content, ideology and standards. He stated: "ITEA is promoting its standards for 'technological

literacy' and ISTE is promoting its standards for 'technology literacy.' In one glance... they are cut from the same cloth" (p. 67). Dugger and Naik (2001) also raised similar concerns of overlap and confusion and tried to explain the differences between technology education and educational technology. However, in acknowledging the problem in misconceptions that even exist for educators, the authors challenge technology education teachers to be the ones that must educate others.

Similar confusion exists in Hong Kong, with different public groups offering different emphasis or meaning about technology. For example, the Education Commission's (1999) *Education Blueprint for the 21st Century* report was rife with references to technology, but almost totally related to information technology. This was in contrast to other aforementioned pubic bodies such as the Curriculum Development Council. In this regard, comparing U.S. and Hong Kong general public opinions about technology education is warranted, especially given both have publicly stressed the need for technology education.

There were many differences found between Hong Kong and the U.S. responses. For instance, when asked to provide their own definition for "technology" (see Table 3), Hong Kong people provided a wider range of definitions, with only 47.3% indicating "computers" as opposed to 68.0% of Americans. When then provided with two definitions for "technology" (see Table 4), more Hong Kong people agreed with the more-broad definition (66.4%) than the U.S. (36.7%) [χ^2 (1, $N = 2376$) 183.177, $p < 0.01$]. The response from Hong Kong people to these questions may suggest greater success than the U.S. has in having the public accept a technology curriculum that is more than "computers". The ability of Hong Kong people (see Table 5) to understand and use technology was also significantly less than Americans [χ^2 (3, $N = 2397$) 579.239, $p < 0.01$], suggesting perceived deficiencies may require more deliberate action in Hong Kong.

For the last series of questions relating to technology and education, other significant differences were found between Hong Kong people and

Americans. To address a shortage of qualified people in areas of technology (see Table 6), 84.2% of Hong Kong people surveyed indicated steps should be taken through schools to increase the number of technologically literate people, while 95% of Americans desired this [χ^2 (1, N = 2003) 66.503, $p < 0.01$]. The Hong Kong response probably reflects the long-standing economic structure and policies that encourages employment opportunities for expatriates.

The only question that indicated agreement from the Hong Kong and the U.S. sample was for overwhelming support for students to study technology (see Table 7). When provided with the broad definition of technology, both samples highly agreed (HK 98% / U.S. 98%) that a study of technology should be included in the school curriculum. However, significant differences existed when asked how the subject should be taught. More Hong Kong people (68.4%) indicated it should be a separate subject, while Americans (36.3%) were not as supportive [χ^2 (1, N = 2302) 209.119, $p < 0.01$]. When those who indicated a study of technology should be a separate subject were asked if it should be required or optional, Americans were more in favor of it being required (50.7%), as opposed to Hong Kong people (38.3%) [χ^2 (1, N = 1073) 16.630, $p < 0.01$]. The response for the last two items from Hong Kong people may reflect the established practice of having distinct, non-integrated subjects in schools, the heavy reliance of examinations, and the growing public awareness of the excessive number of subjects students currently have (Education Commission, 2000).

Finally, the last series of questions relating to curriculum matters (see Table 8), there were significant differences for all items, with Americans viewing all as being more important than Hong Kong people. For example, the first item asked about preparing students in the relationships between technology, mathematics and science. Americans saw this as being very important (78.8%), while Hong Kong people were less convinced (31.0%) [χ^2 (2, N = 2394) 516.762, $p < 0.01$].

Implications

From the results of this study, it appears Hong Kong people have a similar broad concept of technology as defined in the TEKLA. In this sense, technology is more than computers. This suggests that technology education, as conceptualized in the TEKLA, is compatible with the public's perception. In this way, the TEKLA is reflecting public understanding and thus communication about a common topic is possible. However, the public's understanding is in conflict with the situation that exists in schools, whereby all students receive instruction in the narrow view of technology (computers), but not in the broader sense of "using resources to create products or systems to meet human needs".

There is very strong public support for including broadly defined technology education in the school curriculum. This appears to reflect public awareness of how technology impacts lives, as well as the important role it will play in the future. With two-thirds responding technology education should be a separate subject, and out of these respondents only one-third indicating it should be required for all students, the support to ensure adequate student knowledge and experience appears less committed, enthusiastic and certain. It would be difficult to imagine the public not supporting other KLAs such as mathematics, Chinese, or science as separate and required subjects, yet with the tepid response for technology education the TEKLA is likely to remain marginal along with other "cultural" subjects such as art and music. In fact, the public response for the inclusion of technology in the school curriculum is almost at the same proportion as the number of schools currently with the subject of D&T. If progress is to be made to insure that all students receive the knowledge, skills and attitudes as outlined in the TEKLA, then more proactive steps will be needed to overcome the apathy and lack of conviction about how technology education is to be included in schools.

As far as differences within gender, age or past studies in technology, only gender and age indicated significance for some of the items. With

women traditionally not being able to experience school subjects such as Design & Technology, it is possible their perceived ability to use technology and their sense of need for schools to do more with technology might have been different, had they been exposed to the subject. Evidence as to changes in junior secondary girls' attitudes toward technology once they have participated in Design & Technology supports this suggestion (Volk, Yip, & Lo, 2003). On the other hand, when the variables of having or not having studies in technology were examined, no significant differences were found. This seems to be a contradiction and poor testimonial as to the value of the subject as it has been taught in many schools. However, an argument could be made that much of what students often study in D&T may not truly reflect what is called for in technology education, but rather traditional craft and skill development (Volk, Yip, & Lo).

Finally, many of the responses from the Hong Kong and U.S. samples indicated significant differences. This points out that even though technology can be considered as "universal", especially in countries that have many economic and demographic similarities, the response to curriculum matters remains unique to each population. Perhaps the only "universal" in the response from Hong Kong and the U.S. was that all students should study technology. How technology education should be included in the curriculum and how it should be taught was another matter.

Conclusion

This study examined whether Hong Kong education policy regarding the need for students to study technology, as outlined in position papers, reform proposals and directives, is congruent with what Hong Kong people think about technology and technology education. It appears that although there is agreement on the need to study technology when defined in a broad sense, i.e., more than just computers — the public's response to the manner and degree to which technology education should be made available to all students does not provide convincing evidence that the goals outlined in the

TEKLA can or should be fulfilled. Furthermore, with the only Bachelor of Education program that prepares Design & Technology teachers now closed at The Hong Kong Institute of Education, even at tertiary levels, there is a lack of understanding, interest and responsibility in seeing that technology is taught in a holistic manner in schools. As a result, a gulf exists between the rhetoric and reality of implementing the TEKLA, with potential problems regarding public support, trained teachers, viable school programs, and commitment necessary to fulfill policy objectives.

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