



Research Collaboration between Open Education Providers and Consumers in developing an Academic Programme Preference Inventory in Hong Kong

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ABSTRACT :

This paper reports on the development of an online inventory to measure the preferences for open education programmes among school leavers and adults in Hong Kong. The study was a collaborative effort headed by the Centre for Research in Distance & Adult Learning at the Open University of Hong Kong and included a local Student Guidance Centre (the Hok Yau Club) and eight secondary schools in Hong Kong. Trait-factor theory and personality type theory were employed. The inventory was developed by the project team and consisted of academic scholars and practitioners in education. The final version consisted of 128 items and was validated by 7 local guidance counselors and 20 international experts in psychology. 1,288 respondents in Hong Kong were surveyed. Schools were selected based on geographical location, academic level and language of instruction. Ten personal attributes were found including: *Influential, Mechanical, Scientific, Sociological, Organizational, Mathematical, Literary, Musical, Aesthetic, and Social Service*. The test-retest reliability coefficient was 0.72. It is hoped that the inventory could help school leavers and adults in Hong Kong in making wise decisions on their career path and strengthen their opportunity for academic success.

1. INTRODUCTION :

In order to meet the needs of a society increasingly devoted to life-long learning, higher education institutions have introduced an increasing number of different programmes at tertiary levels for school leavers and adult learners in Hong Kong. One type of programme that is gaining popularity and is the focus of this investigation is based on open education. Open education implies entry based on open access, meaning students are accepted into a programme irrespective of prior academic qualifications.

A recent review we carried out indicated 542 open education programmes were in existence provided by nine continuing education institutes in Hong Kong. A breakdown of the major suppliers is as

follows: 115 programmes offered by the Open University of Hong Kong, 39 by the University of Hong Kong, 68 by the Chinese University of Hong Kong, 25 by Hong Kong Polytechnic University, 35 by the City University of Hong Kong and 39 by Hong Kong Baptist University.

According to his October 2000 Policy Address (Hong Kong General Chamber of Commerce, 2000), the Chief Executive of the HKSAR Government pointed out that the quota for new students at the tertiary level would be doubled in the next ten years. To achieve this goal, the HKSAR Government is encouraging higher education institutions to introduce more diploma and sub-degree programmes for school leavers, a process seemingly well underway as indicated by the above figures.

With a wider base of academic choices,

school leavers and adults in Hong Kong not only have to consider which programmes will be most useful to their careers, but must also take their own apparent or potential interests and abilities into account when making these decisions. If people do not have a thorough understanding of their interests and abilities, or more aptly put as psychological characteristics, it will be difficult for them to make informed decisions on their academic direction. If the programmes students select do not match their psychological characteristics, students may have difficulty in motivation, personal fulfilment and ultimately academic success. To facilitate a suitable match between students' psychological characteristics and the programmes they select, it may prove valuable to develop a comprehensive psychological test to help them select continuing higher education programmes.

However, one underlying obstacle is the cultural context of the existing psychological tests. The majority is developed in Western countries raising the issue of suitability to Hong Kong learners. Several scholars (Yang, 1990; Zhang, 1998) examined the most popular psychological tests and concluded that none were applicable to Chinese society because of different traditions and culture, educational systems, economy, environment, and family dynamics. In addition, psychological tests in Western countries are designed on the basis of local academic offerings and job markets. Despite Hong Kong's appeal and recognition as a global urban centre, there is a substantial difference between education systems to other areas of the World, even in Mainland China. For example, farming, mining, forestry, and material handling are major components of academic programmes in other countries, but these economic activities are of little significance to Hong Kong.

In September 2002, the Centre for Research in Distance & Adult Learning (CRIDAL) and the Registry at the Open University of Hong Kong (OUHK) launched the first online Measurement of Academic Programme Preferences (MAPP) (Zhang, et. al., in press) in Hong Kong, available on the university's website (URL).

Since this date, the number of users of the MAPP has exceeded 3000. However, the MAPP was designed based on the 115 OUHK programmes offered and aimed only at those who were considering choosing OUHK programmes.

Therefore due to the OUHK being exclusively an open and distance learning institution, it may be the case that, a programme selection inventory based on all continuing higher education programmes in Hong Kong be designed and implemented.

The purpose of this study is to develop an Academic Programme Preference Inventory (APPI), which offers a standardized test on the measurement of academic programme preferences for potential learners based on all open education programmes in Hong Kong. It is expected that, through assessing learners' psychological characteristics with academic preferences, the APPI can enable school leavers and adults to better understand their own interests and abilities and make wise educational choices.

2. COLLABORATIVE RESEARCH DESIGN AND METHODOLOGY :

2.1 Collaboration between Open Education Providers and Consumers :

This study was a collaborative effort headed by the Centre for Research in Distance & Adult Learning at the OUHK and included a local Student Guidance Centre (the Hok Yau Club) and eight Hong Kong secondary schools that were selected according to geographical location, academic level and language of instruction. The combination of researchers in open and distance education and local practitioners in student guidance provided a more holistic perspective in developing an inventory of this magnitude. The researchers had expertise on how to develop psychological tests and understood local open education programmes. The practitioners had rich experience in student guidance and had a sound understanding of school leavers and adult learners' needs for further academic study.

2.2 Theoretical Framework :

The framework of trait-factor theory and personality type theory was used in this study. Based on the framework of trait-factor theory, this study was designed to follow the following steps: analysis of Hong Kong's continuing higher education programmes, classifications of programme types based on all programmes, item construction concerning peoples' preferences for social, school, family and

2.5 Sample of Survey :

Aiken (1997) reported that interests of children and young teenagers are relatively unstable until the ages from 15 to 17, when their preferences for varying types of activities are generally established. In this study, it was deemed appropriate to select students from Form 4 to 7, ranging in age from 15 to 19 as samples for the various surveys. Table 1 displays the data of samples used in the surveys.

Table 1 : Samples for Development of the APPI

Survey	Male subjects	Female subjects	Total number
Pilot study	30	19	49
Test-retest	81	61	142
Main study	635	653	1,288

leisure activities in Hong Kong, item suitability assessment by local practitioners, item validation by international experts, pilot study, test-retest, and main study to the targeted participants and finally the establishment of an online academic programme preference inventory (APPI).

2.3 Research Method :

The method of questionnaire survey was employed to identify types of personal attributes. The suitability of the inventory was evaluated by local practitioners in student guidance, and the validation of the inventory was assessed by international psychologists and career guidance experts. Different stages of the questionnaire survey were carried out through collaborating with the Hok Yau Club and guidance counselors from each of the 8 schools.

2.4 Design of Instrument :

Research has shown that people who are interested in the same area of education will have similar preferences towards school subjects, hobbies, entertainment, social activities, etc. (Janda, 1998 ; Murphy & Davidshofer, 1994). Therefore, in this study, the construction of inventory items was based on people's interests and abilities in school, social, family, and leisure activities in the Hong Kong context.

2.6 Procedures of the Study :

Design of the Inventory: the period of design was from March to August 2002. The result was a 14-dimension 454-item inventory developed and reviewed by the project team.

Suitability and validation of the inventory: this process commenced in September and concluded in December 2002. The inventory was assessed by local practitioners in student guidance, and international psychologists and career counselors. Based on their feedback, the draft inventory was revised and 34 items were deleted. A new draft containing 420 items was finalized for the pilot study.

Pilot study: the pilot study was carried out on 49 Form 4 to Form 7 students at a secondary school on Hong Kong Island in January 2003. The order of the 420 items was randomized before the pilot study.

Test-retest: the rest-retest was conducted from February to March 2003. 194 completed and valid questionnaires were received for reliability analysis. The time interval between test and retest was four weeks. The test-retest reliability coefficient was 0.69. 102 items with item-total correlations less than 0.4 were discarded (Nunnally, 1967) and the test-retest reliability coefficient of the remaining 318-item scale rose to 0.72.

Main study: the main study was conducted from April to July 2003. The 318-item scale was administered to 1,288 students in Forms 4 to 7 in six secondary schools. A factor analysis of the data revealed ten interpretable factors. There was a further reduction of 190 items from this scale based on their factor loadings and item-scale reliability. The resulting 128-item scale had an alpha reliability of 0.98. Gender-based norms for each attribute type were also established.

2.7 Statistical Considerations :

The statistical package, SPSS version 10.1, was used for data analysis. Descriptive statistics were computed including mean and standard deviation. T-tests, reliability and factor analyses were also conducted.

3. RESULTS OF COLLABORATIVE RESEARCH :

The following section reports on the detailed analyses of the 128-item APPI.

3.1 Results of Factor Analysis :

An exploratory factor analysis (principal component analysis with varimax rotation) of the data was administered and revealed ten interpretable factors. All 128 items were found to load significantly (> .40) on the ten factors. The results of factor analysis are shown in Table 2.

3.2 Personal Attributes and their Definitions :

Based on the item content of each factor ten adjectives were deemed most suitable to describe the personal attributes: *Influential, Mechanical, Scientific, Sociological, Organizational, Mathematical, Literary, Musical, Aesthetic, and Social Service*. Each is defined below.

Factor 1 : Influential

This individual’s persuasive and charismatic qualities usually situate him or her in a leadership role with others. This is also reflective in their ability to make sound decisions in a timely manner, thus indicative of an individual who is intuitive and highly independent.

Table 2 : Results of Factor Analysis

Factor	No. of Items	Item Examples
Factor 1	13	<ul style="list-style-type: none"> ○ Making judgments by inference ○ Influencing other people’s opinions
Factor 2	15	<ul style="list-style-type: none"> ○ Working with audio and video equipment ○ Installing computer software
Factor 3	14	<ul style="list-style-type: none"> ○ Understanding the properties of a disease ○ Working with experiment equipment
Factor 4	13	<ul style="list-style-type: none"> ○ Studying the unemployment problems in Hong Kong ○ Reading news about current affairs
Factor 5	12	<ul style="list-style-type: none"> ○ Planning and organizing activities ○ Hiring venues, tools and materials for activities
Factor 6	13	<ul style="list-style-type: none"> ○ Solving mathematical problems ○ Doing numerical data analysis
Factor 7	12	<ul style="list-style-type: none"> ○ Expressing myself in writing ○ Finding mistakes in writing
Factor 8	13	<ul style="list-style-type: none"> ○ Playing in a music band ○ Being musically inclined
Factor 9	10	<ul style="list-style-type: none"> ○ Designing and decorating rooms ○ Illustrating things with drawings, sketches or diagrams
Factor 10	13	<ul style="list-style-type: none"> ○ Working for charity organizations ○ Comforting people who are suffering setbacks

Factor 2 : Mechanical

This individual can be characterized by their ability to manipulate machinery, electronics and computers. This refers to operating, installing, repairing or troubleshooting various devices. In addition, such an individual is skilled at designing applications for computers or mechanical objects.

Factor 3 : Scientific

This individual enjoys all science disciplines, including biology, physiology and chemistry courses. Beyond the classroom, this individual will also interact with the environment examining the constituents of food, medicine, plants, microscopic organisms and also has an interest in conducting various science experiments.

Factor 4 : Sociological

This individual is well read in various areas that directly or indirectly affect society such as law, politics and economics. Such an individual is also inclined to actively participate in political activities or interact with others to discuss politics or gather individual's perceptions on social issues.

Factor 5 : Organizational

This individual is creative and is driven by ideas and enjoys interacting in public. For example, hosting or planning events and marketing various commodities are what this individual does best. Other characteristics include public speaking and working with others.

Factor 6 : Mathematical

This individual is skilled at manipulating numbers. Some examples include solving mathematical and practical problems, understanding and analyzing numerical data and measuring objects. This individual is also interested in studying arithmetic courses.

Factor 7: Literary

This individual expresses interest and skill in reading and writing in the areas of literature and language. Interests include

memorizing literary passages, writing short stories and learning new vocabulary. This individual expresses themselves well in their writing and is also skilled at proofreading, grammar and analyzing literature.

Factor 8 : Musical

This individual is musically inclined in all areas of the discipline. For example this individual is interested in reading music theory and biographies of musicians, composing or writing songs, playing a musical instrument or singing on stage. This individual is also skilled at teaching others to sing or play an instrument and conducting a band.

Factor 9 : Aesthetic

This individual is skilled at drawing, photography and especially design. Skills in design include advertisements, interior design and stage props. This individual is interested in visiting galleries and photo exhibitions.

Factor 10 : Social Service

This individual enjoys working for the community. Specifically, this person engages in activities to help individuals in need (senior citizens, the mentally challenged, depressed, the sick), volunteer for charity organizations and for protecting the environment.

From these definitions, it is apparent that each factor is mutually exclusive from the other, further supporting the statistical analysis previously detailed. This is further supported in the ensuing section.

3.3 Reliability Tests of the APPI :

Cronbach's Alpha reliability and split-half reliability tests were conducted. It could be seen from Table 3 that the internal consistency of the total score of the APPI was 0.96 and the subscale internal consistency coefficients ranged from 0.86 to 0.94 based on Cronbach's Alpha reliability test. The split-half correlation of the APPI scale was 0.86 and the subscales split-half correlations ranged from 0.76 to 0.88.

Table 3 : Reliability Tests of APPI

Factor	Cronbach's Alpha	Split-Half Reliability
<i>Influential</i>	.88	.86
<i>Mechanical</i>	.94	.85
<i>Scientific</i>	.92	.88
<i>Sociological</i>	.90	.82
<i>Organizational</i>	.87	.85
<i>Mathematical</i>	.91	.82
<i>Literary</i>	.88	.83
<i>Musical</i>	.92	.85
<i>Aesthetic</i>	.86	.86
<i>Social Service</i>	.88	.76
Total score	.96	.86

3.4 Suitability and Validity of the APPI:

The items of the APPI were constructed based on the Hong Kong context. The suitability of the items was assessed by the President of Hok Yau Club in Hong Kong and 7 guidance teachers in participating schools. In addition, the survey instrument was pilot tested.

Content validity of the items in the APPI subscales was evaluated by 20 international psychologists and career counselors from the United Kingdom, the United States, Taiwan and Mainland China.

3.5 Subscale Inter-correlations of the APPI :

Subscale scores were calculated by averaging scores on the items that loaded onto the relevant factor. To check whether the subscales measured different personality traits, Pearson correlation coefficients

between the subscales were examined. The correlation coefficients ranged from -0.02 to 0.69. There was no indication of multicollinearity. The correlation matrix between subscales is shown in Table 4.

3.6 Gender-based Norms of the APPI :

Independent-sample T-tests were employed to examine if significant gender differences existed in the mean score of each subscale. The results revealed significant gender differences in nine out of ten subscales of the APPI. It was found that male respondents scored higher than their female counterparts on *Mechanical*, *Scientific*, *Sociological*, and *Mathematical* attributes, whereas females scored higher on *Organizational*, *Literary*, *Musical*, *Aesthetic* and *Social Service* aspects. Both gender groups did not differ on the attribute of *Influential*. Gender differences in subscale

Table 4 : Subscale Inter-Correlations

Subscale	I	II	III	IV	V	VI	VII	VIII	IX	X
<i>Influential</i> I :										
<i>Mechanical</i> II :	.24									
<i>Scientific</i> III :	.29	.35								
<i>Sociological</i> IV :	.44	.22	.26							
<i>Organizational</i> V :	.69	.17	.22	.43						
<i>Mathematical</i> VI :	.30	.46	.40	.32	.23					
<i>Literary</i> VII :	.45	.02	.15	.45	.41	.12				
<i>Musical</i> VIII :	.30	.05	.13	.11	.39	.06	.28			
<i>Aesthetic</i> IX :	.46	.15	.19	.23	.67	.16	.37	.42		
<i>Social Service</i> X :	.50	-.02	.23	.32	.60	.17	.38	.30	.42	

Note : N = 1288

Table 5 : Gender Differences in Subscale Mean Scores

Subscale	Male (N = 635)		Female (N = 653)		p-value
	Mean	SD	Mean	SD	
Influential	3.20	0.60	3.19	0.57	0.62
Mechanical	3.16	0.79	2.36	0.70	0.00**
Scientific	3.01	0.73	2.86	0.73	0.00**
Sociological	2.66	0.69	2.50	0.58	0.00**
Organizational	2.80	0.61	3.01	0.63	0.00**
Mathematical	2.83	0.73	2.58	0.72	0.00**
Literary	2.65	0.64	2.91	0.65	0.00**
Musical	2.64	0.84	2.94	0.82	0.00**
Aesthetic	3.07	0.65	3.38	0.68	0.00**
Social Service	3.06	0.61	3.44	0.58	0.00**

Note : N = 1288, ** significant at the $p < 0.01$ level

mean scores are shown in Table 5.

4. DISCUSSION :

4.1 The Experiences of Research Collaboration with Local Educational Practitioners :

The success of this research largely depended on the co-operative collaboration with the local Student Guidance Centre (the Hok Yau Club) and eight secondary schools. The President of the local Student Guidance Centre (the Hok Yau Club) was invited to be co-investigator of the project and helped the project team tremendously through his connections with local secondary schools.

This collaboration is beneficial for both open education researchers and local educational practitioners. First, the Hok Yau Club is the main agency to provide student guidance for educational programme selection in Hong Kong. School guidance teachers are counselors for school leavers and aid these individuals on how to choose educational programmes. Therefore, the Hok Yau Club and school guidance teachers could benefit from the APPI and guide school leavers to use this inventory in helping them make sound educational choices. This inventory would provide them with an effective instrument to help their clients choose suitable open educational programmes. Second, the joint participation

of the Hok Yau Club and school guidance teachers played an important role in item construction and assessment for local suitability of the APPI. Because the items of the APPI were constructed based on peoples' interests and abilities in local school, social, family, and leisure activities, their familiarity with Hong Kong's social and education system enabled them to give constructive comments on the items in the draft inventory. In summation, we conclude that this makes the inventory exceptionally suitable for the Hong Kong people.

4.2 The Experiences Developing an Inventory Based on the Local Context :

In this study, items were designed based on the Hong Kong context. Ten different personal attributes were identified: Influential, Mechanical, Scientific, Sociological, Organizational, Mathematical, Literary, Musical, Aesthetic, and Social Service. The inventory items used reflected the local economic environment, labour market, and educational system. Hong Kong is one of the world's leading international cities. Most people in Hong Kong are employed in the business and service industries. Therefore, the personal attributes of *Organizational*, *Influential*, *Sociological* and *Social Service* are particularly relevant to Hong Kong. Hong Kong is also a centre for computer and communication technologies in the Asian-Pacific region. The three personal attributes,

Scientific, Mechanical and *Mathematical*, are closely related to these developments. And more interestingly, Hong Kong is famous for its entertainment business, such as music, arts, and movie making, and the personal attributes *Musical* and *Aesthetic* are closely related to the entertainment industry. Hong Kong is a multi-language international city dependent on Cantonese, English and Mandarin, placing great importance on linguistic capabilities for Hong Kong people. The *Literary* attribute reflects this aspect.

In developing psychological tests, the item construction process should take into account the various local contextual factors. This paper represents an effort to develop such a model of personal attributes suited to the Hong Kong context.

5. CONCLUSION :

Through the development of the APPI, we found that programme selection inventories that target a specific group are more beneficial to the targeted users. The APPI has overcome the need to borrow existing inventories from the West, with the goal to provide more accurate and effective guidance to Hong Kong school leavers and adult learners to select suitable programmes for their continuing higher education needs and wants. This research model can be applied to other Chinese regions as well, such as urban centres in Mainland China and Taiwan.

6. FURTHER STUDIES :

The multidimensionality of the APPI will be verified and the gender-based norms will be updated through further data collection from APPI users. An online APPI will then be established and linked to the homepage of the local Student Guidance Centre (the Hok Yau Club), and the general public will be able to access it free of charge.

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