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School-based Assessment in Public Examinations: Identifying the Concerns of Teachers

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Although the Hong Kong Government has planned to expand school-based assessment in public examinations, we know little about teacher concerns regarding the adoption or implementation of such an educational innovation. This article presents the findings from a cross-validation study of a 5-stage model of teacher concerns. A 24-item questionnaire was constructed to measure teacher concerns on five sequential stages: (1) Indifference, (2) Informational-Personal, (3) Management, (4) Consequence-Collaboration, and (5) Refocusing. Using the questionnaire, a survey to study 290 Hong Kong teachers' concerns about school-based assessment as a component of the public examination was conducted. The survey results supported the 5-stage model, but information collected from another sample of 53 teachers through an open-ended survey indicated that the 5-stage model needed to be extended to include a stage of evaluation concerns. The nature of the six stages of concern is discussed.

Introduction

Many attempts at educational change fail. There are a lot of reasons why an innovation fails to be adopted or implemented by schools, but one important reason is that teacher concerns about the advocated innovation are not monitored and addressed throughout the process of educational change.

The change process may be analyzed at two levels — individual and organizational (Zaltman, Duncan, & Holbek, 1973). In their new book

Implementing Change: Patterns, Principles, and Potholes, Hall and Hord (2001) explain the significance of the individual level as follows:

> Although everyone wants to talk about such broad concepts as policy, systems, and organizational factors, successful change starts and ends at the individual level. An entire organization does not change until each member has changed. … Even when the change is introduced to every member of the organization at the same time, the rate of making the change and of developing skill and competence in using it will vary individually.… leader of organizational change processes need to devise ways to anticipate and facilitate change at the individual level. (p. 7)

Hall, George, and Rutherford's (1977) Stages of Concern Model is probably the most well-known individual-oriented model found in the educational literature which focuses on the concerns of teachers adopting or implementing innovations. Hall et al. defined concern as "the composite representation of the feelings, preoccupation, thought, and consideration given to a particular issue or task" (p. 5). Two assumptions are noteworthy in their model. The first is that teacher concern is a multidimensional construct; seven distinct stages of concern (SoC) are assumed to exist irrespective of the nature of educational innovations. The seven SoC have been labeled as Awareness, Informational, Personal, Management, Consequence, Collaboration, and Refocusing. According to the 7-stage model, a teacher can experience several SoC about an educational innovation concurrently, but there are differential degrees of intensity. The characteristics of the seven SoC as presented by Hall et al. (p. 7) are:

Stage 1 (Awareness) — Little concern about or involvement with the innovation is indicated.

Stage 2 (Informational) — A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about herself/himself in relation to the innovation. She/he is interested in substantive aspects of the innovation in a selfless manner such as general characteristics, effects, and requirements for use.

Stage 3 (Personal) — Individual is uncertain about the demands of the innovation, her/his inadequacy to meet those demands; and her/his role with the innovation. This includes analysis of her/his role in relation to the reward structure of the organization, decision making, and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.

Stage 4 (Management) — Attention is focused on the processes and tasks of

using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.

Stage 5 (Consequence) — Attention focuses on impact of the innovation on students in her/his immediate sphere of influence. The focus is on relevance of the innovation for students, evaluation of student outcomes, including performance and competencies, and changes needed to increase student outcomes.

Stage 6 (Collaboration) — The focus is on coordination and cooperation with others regarding use of the innovation.

Stage 7 (Refocusing) — The focus is on exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation.

The seven SoC can be categorized into three groups: self-concerns (Stages 1–3); task concerns about the innovation (Stage 4); and impact concerns regarding students (Stages 5–7).

The second assumption in the 7-stage model is that teacher concern is a developmental construct. Hall et al. (1977) conceptualized an educational innovation as a process involving developmental changes in teacher concerns. Initially, a teacher's self-concerns are expected to be the most intense. As the teacher becomes more experienced with the innovation, task concerns predominate. Finally, impact concerns become most intense. Hall et al. assumed that the seven sequential SoC form a simplex structure (Joreskog, 1970); that is, correlations among the seven latent SoC variables in a correlation matrix are expected to decrease as one moves away from the main diagonal.

Based on the 7-stage model, Hall et al. (1977) developed a 35-item Stages of Concern Questionnaire (SoCQ) to measure teacher concerns about educational innovations. The 35 items comprise seven subscales of five items each, which correspond with the seven SoC. With the aid of the SoCQ, change facilitators can monitor individual teachers' peak concerns at various times during the process of educational change and plan appropriate concerns-based interventions (Hall & Hord, 2001). One possible reason why many teachers find in-service workshops provided by change facilitators to be irrelevant is that they are not targeted toward their peak stages of concern.

Many studies have applied the SoCQ to measure teacher concerns

regarding innovations (e.g., see Aneke & Finch, 1997; Broyles & Tillman, 1985; Cicchelli & Baecher, 1989; Cunningham, Hillison, & Horne, 1985; James, 1991; Kember & Mezger, 1990; Kimpston & Anderson, 1985; Marsh, 1988). Despite the popularity of SoCQ, there has been little critical analysis or further elaboration of the 7-stage model since its initial development in the 1970s (Anderson, 1997). A recent study by Cheung, Hattie, and Ng (2001) revealed that Hall et al.'s (1977) model did not fit real data. They collected 1,622 teachers' concerns about the Target-Oriented Curriculum in Hong Kong and examined the construct validity and simplex structure of their SoCQ data by confirmatory factor analysis and structural equation modeling respectively. They found that Hall et al.'s 7-stage model did not provide an acceptable fit to teacher data; the SoCQ items did not load on seven factors in a pattern consistent with the model and the seven SoC variables did not form a developmental hierarchy. To improve the model fit, Cheung et al. regrouped some SoCQ items and proposed a 22-item 5-stage model. The Informational stage was merged with the Personal stage, and the Consequence and Collaboration stages were combined. The five modified SoC were labeled as follows: (1) Indifference, (2) Informational-Personal, (3) Management, (4) Consequence-Collaboration, and (5) Refocusing (Cheung & Ng, 2000). However, the model fit statistics generated by the simplex analysis were just marginal (e.g., goodness of fit index = .86), and the Indifference stage had relatively little influence on the Informational-Personal stage. Although the correlations among the five latent SoC variables formed a perfect simplex, all the correlations with the Indifference stage were surprisingly low, ranging from .05 to .16. Cheung et al. (2001) suggested that the Indifference stage might be irrelevant to the Stages of Concern Model or there might be some missing SoC between the Indifference and Informational-Personal stages.

To give a full picture of students' performance, the Hong Kong Government (Education and Manpower Bureau, 2001) has decided to expand school-based assessment in public examinations. This will have great impact on the secondary school education in Hong Kong and teachers will inevitably have a lot of worries. Unfortunately, the concerns of Hong Kong teachers about adopting or implementing school-based assessment as a component of the public examination system have not been systematically identified even though the first school-based assessment scheme was initiated for the Advanced Level Chemistry in 1978. The purpose of the present study was to investigate Hong Kong teachers' concerns about school-based assessment using Cheung et al.'s (2001) Stages of Concern Model as a conceptual

framework and to identify those concerns that might exist between the Indifference and Informational-Personal stages.

School-based Assessment

There has been recurring dissatisfaction with the current one-off public examination system in Hong Kong. About 140,000 Form 5 candidates sat for the Hong Kong Certificate of Education (HKCE) Examination in 1999. As in previous years, about one out of six of these candidates failed in all the subjects that they attempted, and most of them took at least six subjects. The Hong Kong Examinations Authority commissioned a team of consultants from Australia, Hong Kong and Britain to review the public examination system. One possible solution recommended by the consultants (Fung et al., 1998) is to expand school-based assessment in the HKCE and Hong Kong Advanced Level (HKAL) Examinations.

At present, only 12 of the 69 HKCE and HKAL subjects have a school-based assessment component called Teacher Assessment Scheme (TAS), which mainly focuses on internal assessment of students' development of certain skills. For example, 20% of marks are allocated to the TAS for the HKAL Chemistry (Cheung, Hattie, Bucat, & Douglas, 1996; Hong Kong Examinations Authority, 2000). In the TAS, chemistry teachers are responsible for assessing their students' practical performance continually during the two-year HKAL course. They have to assess students' manipulative skills, presentation of data, interpretation of results, planning of experiments, and attitudes toward practical chemistry. Students are required to carry out at least 18 experiments in Form 6 and 10 experiments in Form 7. At the end of each academic year, chemistry teachers have to submit the internal marks to the Hong Kong Examinations Authority and then a statistical moderation procedure is employed to adjust the raw TAS marks against the HKAL chemistry theory marks obtained from the year-end external examination. The moderation procedure assumes that there is a positive correlation between the raw TAS and theory marks. Moderation of TAS marks is done on a teacher basis; the mean mark of students within a school may be shifted upwards or downwards, but the rankings of students and the spread of marks are preserved. The adjusted TAS marks are aggregated with the theory marks, with a weighting ratio of 20:80, to produce each student's final score and grade.

The consultants (Fung et al., 1998) recommended that TAS be designed to cater for all HKCE and HKAL subjects. They also recommended that

those subjects which currently have TAS should review their design and try to incorporate other internal assessment activities currently undertaken in schools, such as mock examinations and fieldwork activities. TAS has an array of benefits, such as enhancement of the validity of assessment, integration of assessment into the normal teaching and learning process, provision of frequent feedback to students, and promotion of teacher professionalism. However, the introduction of TAS into public examinations has not been unproblematic; problems of school-based assessment are well documented in educational literature (Board of Studies, 1998; Choi, 1999; Daugherty, 1996; Hill, Brown, Rowe, & Turner, 1997; James & Conner, 1993; Jenkins, 1995; Scott, 1991; Taylor & Wallace, 1990; Torrance, 1986; Yung, 2001a). For example, Yung (2001a) described how three teachers performed the dual roles of teacher and assessor in the TAS for HKAL Biology. One teacher was able to integrate the TAS assessments with normal teaching nicely, but the other two teachers did not understand the rationale of the school-based assessment scheme and thus created a very tense learning atmosphere in TAS practical lessons. In Australia, schools were found to have great difficulty in ensuring that their students were not overburdened with multiple assessment tasks at a particular time (Board of Studies, 1998). Many Australian teachers also reported difficulties in motivating students to complete tasks that were not part of the school-based assessment component. Other problems discussed in the literature include comparability of assessments across schools, a narrow range of assessment tasks prepared by teachers, limited use made of the internal assessments for diagnostic purposes, ambiguous statements of attainment, and authenticity of work submitted by students. Because Hong Kong has decided to expand TAS, teachers' concerns about assessment of coursework for external examinations should be identified and monitored.

Data Collection and Analysis

The 22 SoCQ items retained by Cheung et al. (2001) were used to measure the relative intensities of teacher concerns at five stages: Indifference, Informational-Personal, Management, Consequence- Collaboration, and Refocusing. Items were re-worded so that they were appropriate for TAS in Hong Kong. All items were written in Chinese and were rated along an 8-point Likert scale ranging from 0 (not true of me now) to 7 (very true of me now). According to Cheung and Ng (2000), the 5-stage 22-item model had alpha reliability estimates of .79 for Indifference, .82 for Informational-

Personal, .76 for Management, .75 for Consequence-Collaboration, and .84 for Refocusing. Because the Consequence-Collaboration subscale showed the lowest reliability, two items were added to increase the number of indicators of that SoC. In addition to the 24 SoCQ items, two items were also included at the end of the questionnaire to collect information about a teacher's experience with TAS and the major subjects that the teacher had taught.

In September 1999, copies of the modified SoCQ were sent to a convenience sample of 160 secondary school teachers who had enrolled in a part-time postgraduate diploma in education program in the author's university. Teachers in six secondary schools were also invited to answer the SoCQ. A total of 290 teachers returned their completed SoCQ (return rate = 67%). The sample consisted of 55 TAS teachers and 235 non-TAS teachers. These 55 TAS teachers taught Chemistry, Biology, or Chinese Language and Culture; 35 of them had participated in TAS for 3 to 6 years, and the other 20 had joined TAS for more than 6 years.

Teacher responses to the 24 SoCQ items were first coded on a scale of 0 to 7. The reliability of teacher responses to individual items and to the five subscales was then examined on the basis of item-total correlations and coefficient alphas respectively. Those items with the value of item-total correlation less than .4 were not included to form a subscale. The sample size was too small to test the construct validity and simplex structure of SoCQ data by confirmatory factor analysis and structural equation modeling respectively. Instead, SoC profiles (Hall & Hord, 2001) were plotted for three groups of teachers: non-TAS teachers, teachers with 3 to 6 years of TAS experience, and teachers with more than 6 years of TAS experience. The stage-approach to investigating teacher concerns assumes that if an innovation is appropriate and the change process is facilitated, teachers will shift from self-concerns to task concerns, and ultimately to impact concerns. To test the validity of the 5-stage model, the three SoC profiles were analyzed to see whether teachers' peak stages of concern were related to their TAS experience in a pattern predicted by the model.

To identify concerns between the indifference and Informational-Personal stages, the procedure developed by Newlove and Hall (1976) was applied to collect teacher concerns regarding TAS through an open-ended questionnaire. As Hall and Hord (1987) pointed out, one strength of the open-ended survey is that "the descriptions are in the respondent's own word" (p. 68). The procedure has been successfully used to collect information about teacher concerns (e.g., see Anderson, Rolheiser, & Bennett, 1995), but it was slightly modified in the present study because the aim was to

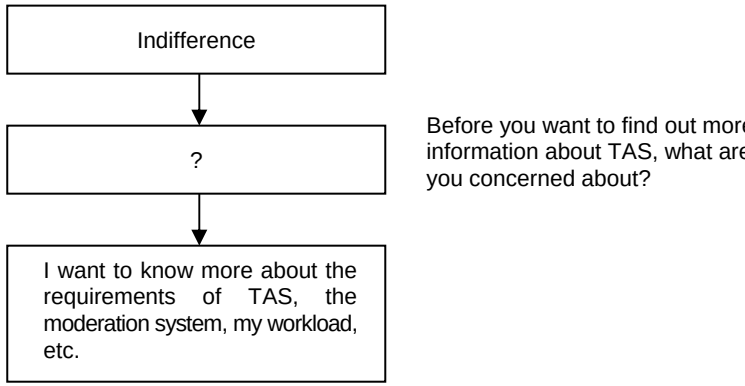
explore any missing SoC constructs between the first two stages of concern. In March 2000, a convenience sample of 62 non-TAS teachers who had enrolled in a part-time postgraduate diploma in education program in the author's university was invited to participate in the open-ended concerns survey. These teachers taught a variety of school subjects without a TAS component, such as Mathematics, Geography, English, Economics, and Chinese History. Each teacher was given a sheet of paper with the open-ended question: "Before you want to find out more information about TAS, what are you concerned about?" (see Figure 1). About half a page of space was given to every teacher to write a narrative of one or more sentences describing their concerns about TAS. The meaning of the open-ended question was explained and teachers were given about five minutes to write down in English or Chinese their concerns. Teachers were allowed to list as many concerns as they wished. A research assistant and the author independently categorized their concerns. Each statement of concern was coded on the basis of Cheung et al.'s (2001) 5-stage model, but particular attention was paid to those statements that could not be categorized according to that model.

Results and Discussion

Stages of Concern Questionnaire Survey

Table 1 summarizes the results of reliability test of the SoCQ data. Only two items were discarded due to their relatively low item-total correlations. The item-total correlations of the remaining 22 items varied between .48

Figure 1 Open-ended Question Used in Concerns Survey



and .87, giving support for the reliability of teacher data. Furthermore, the alphas of the subscales ranged from .81 to .91, indicating that the five subscales were of high reliability.

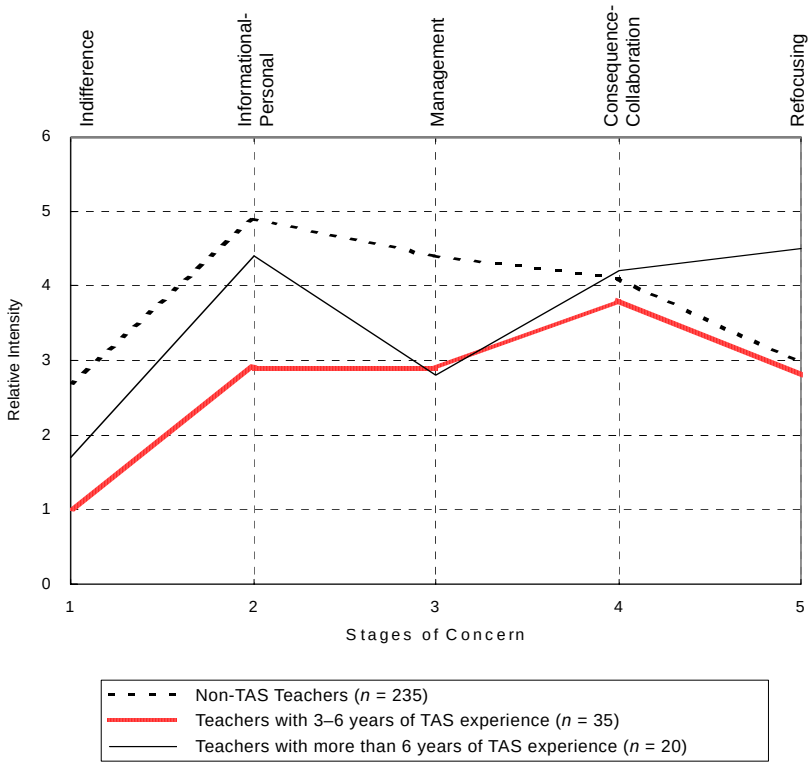
As Figure 2 shows, teachers' peak stages of concern varied with their experience in implementing TAS. The dotted line indicates the SoC profile of non-TAS teachers. As predicted by Cheung et al.'s (2001) 5-stage SoC model, these teachers experienced all stages of concern concurrently, but their peak concerns were at Stage 2 (Informational-Personal), indicating that they were interested in learning more about the requirements of TAS, moderation procedure, workload, and changes in teacher's role. They were

Table 1 Reliability Estimates for the SoCQ subscales and Items

Subscale/Item	Item-Total correlation
Stage 1 — *Indifference* (α = .81)	
Not concerned about TAS	.63
Occupied with other things	.70
Not interested in learning about TAS	.63
Stage 2 — *Informational-Personal* (α = .91)	
What teachers are required to do	.76
Time and energy commitments required	.87
How TAS marks are moderated	.72
How my role will change	.83
Stage 3 — *Management* (α = .83)	
Not having enough time	.80
Inability to meet all TAS requirements	.48
Time spent on non-academic matters related to TAS	.76
How to complete TAS tasks efficiently	.62
Stage 4 — *Consequence-Collaboration* (α = .85)	
Develop working relationships with other TAS teachers	.64
Let other teachers know the benefits and operation of TAS	.53
Concerned about the impact of TAS on students	.51
Let students understand their role in TAS	.79
Coordinate my teaching with other TAS teachers	.66
Know how other teachers are implementing TAS	.63
Stage 5 — *Refocusing* (α = .89)	
Revise the current TAS to improve its effectiveness	.69
Revise certain design of TAS	.69
Modify TAS based on students' learning experiences	.81
Find out how to supplement, enhance, or replace TAS	.65
Use feedback from students to change TAS	.79

Note: The questionnaire items are paraphrased.

Figure 2 SoC Profiles of Teachers



also quite concerned about the management (Stage 3) of TAS. The low, tailing-off Stage 5 intensity suggests that non-TAS teachers generally did not have other ideas that would refine or replace the current TAS practices.

The thick solid line in Figure 2 indicates the SoC profile of those teachers who had participated in TAS for 3 to 6 years. Again, these teachers experienced all the five stages of concern concurrently, and as hypothesized by the SoC model, teachers' peak concerns shifted to a higher stage when compared with those concerns of non-TAS teachers. The low Stage 1 (Indifference) intensity suggests that teachers were very concerned about TAS and were eager to learn more about the scheme. The peak concerns were at Stage 4 (Consequence-Collaboration). This implies that teachers were generally concerned about how cooperation among teachers could be

improved in order to enhance the effectiveness of TAS. They were also concerned about how TAS had affected student outcomes, such as motivation and problem-solving skills.

The thin solid line displays the SoC profile of those teachers with more than 6 years of TAS experience. Consistent with the 5-stage SoC model, teachers had the most intense concerns at Stage 5 (Refocusing). However, their Stage 2 (Informational-Personal) concerns were almost as intense as Stage 5 concerns. It is important to note that multiple-peak concerns profiles usually imply that the advocated innovation is inappropriate or there are problems in the implementation process (Hall & Hord, 1987; Hord, Rutherford, Huling-Austin, & Hall, 1987; Marsh, 1984). The multiple-peak profile illustrated by the thin solid line in Figure 2 signals the need for immediate attention by the Hong Kong Examinations Authority because these experienced TAS teachers wanted to change the current TAS design but they lacked a good understanding of the characteristics, benefits, requirements, and operation of TAS. They were also not sure about the role teachers should play in TAS. Unless appropriate interventions, such as in-service activities, are designed to allay these teachers' Informational-Personal concerns and to channel teachers' Refocusing concerns to improve the current TAS positively, there is a possibility that they would just implement TAS superficially, go back to more comfortable old assessment practices, or develop a negative attitude toward school-based assessment.

In short, results of the SoCQ survey have supported the dependability of the 5-stage 22-item SoC model proposed by Cheung et al. (2001). The five subscales are reliable and the model can predict the developmental changes in teacher concerns during the process of innovation implementation. However, the small number of experienced TAS teachers participating in the survey limits the generalizability of the results of the present study. Respondents' years of teaching experience were also not collected, which might be a confounding variable. Furthermore, it cannot be sure whether the SoC profiles shown in Figure 2 would be applicable to other teaching areas with a TAS component. Thus, the findings discussed above might better be treated as hypotheses for further research.

Open-ended Questionnaire Survey

Fifty-three non-TAS teachers returned their open-ended questionnaires. During an initial "wait-and-see" period, non-TAS teachers indicated a wide

variation in concerns before they adopted TAS (see Table 2). A content-analysis of teacher responses found that there were 155 statements of concern, but three statements were not coded due to ambiguity. The number of statements of concern listed by a teacher varied from one to seven. The inter-rater agreement determined using Cohen's (1960) Kappa was .89. Cohen's Kappa was preferred to simple percentage or proportion of agreement because it excludes agreement that can be accounted for by chance. Based on Cheung et al.'s (2001) 5-stage model, 38 statements were coded

Table 2 Categorization of Open-ended Statements of Concern

Category	No. of statements coded	Percentage
Indifference	0	0
Evaluation	102	67.1
Informational-Personal	38	25.0
Management	0	0
Consequence-Collaboration	12	7.9
Refocusing	0	0

Table 3 Teacher Concerns Coded According to Cheung et al.'s (2001) 5-stage Model

Stage of concern	Contents of statements of concern
Informational-Personal (38 statements)	• Operational features of TAS • Difference from the traditional assessment practice • How to implement TAS • How to convert teacher marks to public exam marks • Assessment methods to be used • Subject content to be assessed • Group or individual assessment • How to integrate TAS with the curriculum • Teacher workload • Time to carry out TAS • Whether my promotion will be affected • Any penalty if I make mistakes • Competition among colleagues • Need to modify the current curriculum • Need to modify my teaching process • My ability to design high-quality assessment tasks • Whether TAS will affect teacher-student relationship
Consequence-Collaboration (12 statements)	• My students' workload • My students' pressure • Impact on student learning

Informational-Personal and 12 statements Consequence-Collaboration. Typical expressions of concern at these two stages are paraphrased in Table 3. However, 102 out of the 152 statements of concern could not be satisfactorily coded on the basis of either Hall et al.'s (1977) original SoC definitions or Cheung et al.'s (2001) revised model. These statements were provisionally called Evaluation concerns and they appeared to have five components. Sample statements written by teachers who had concerns of this type are paraphrased in Table 4.

Table 4 Five Components of Teachers' Evaluation Concerns

Components	Contents of statements of concern
Worth	• Benefits to the school subject that I teach
(41 statements)	• Evidence of effectiveness
	• Improving the present exam system
	• Successful experiences from other countries
	• Improving my teaching
	• Feasibility
	• Enhancing the reliability and validity of assessments
	• Appropriateness for the subject I teach
	• A fair assessment system
	• Ease of use
Needs	• Incorporating TAS into the school subject that I teach
(38 statements)	• Reasons for implementing TAS in my subject
	• When to implement TAS in my school subject
	• A long-term policy to be implemented in Hong Kong
	• Related to my work in school
	• A compulsory part of the public exam system
	• Required by my school principal or head of department
	• The weighting of TAS in my school subject
Support	• Availability of clear guidelines
(19 statements)	• Availability of teacher training
	• The attitudes and stance of the Education Department
	• Availability of samples of other school subjects
	• Willingness of colleagues to try TAS
	• Support from the school's administration
	• Help from experts
	• Chance to try out TAS
	• Help from the Education Department
	• Favorable comments from the mass media
	• Acceptance by students
Accessibility	• Where to find out information about TAS
(2 statements)	• Any promotional activities/publicity to attract teacher attention
Popularity	• Used in other school subjects
(2 statements)	• A popular assessment scheme in public exam

Responses were coded Evaluation if a teacher expressed concerns about the worth, needs, support, accessibility, or popularity of TAS. The distribution of statements in Table 4 indicates that the major evaluation concerns expressed by prospective adopters of TAS belonged to the worth, needs, and support components. Typical statements reflective of these types of concerns are as follows:

- "Is TAS a fair assessment system?"
- "Is there any evidence of the effectiveness of TAS?"
- "Are we incorporating TAS into the school subject that I teach?"
- "Is TAS a compulsory part of the public examination?"
- "If my school subject implements TAS, what will the weighting be?"
- "Will there be any help from the Education Department?"

Such concerns are realistic, and teachers felt that these concerns must be resolved before they would search for detailed information about TAS. A great number of teachers in the sample were concerned about the fairness of TAS. This is not surprising because a lot of parents and students have voiced such a concern in the mass media. Furthermore, some teachers do not believe that statistical moderation is a fair way to adjust TAS marks across schools. One teacher wrote, "Not all TAS teachers are impartial. Some teachers may bias towards their own students and thus give them marks leniently or let them complete easy assessment tasks. I worry about the accuracy of TAS marks submitted by individual teachers." Research by Yung (2001b) has also confirmed that TAS teachers are very concerned about the issue of fairness. He discovered that teachers hold three different views of fairness in the TAS for HKAL biology. Some teachers believe that TAS is fair if assessment of students is conducted on a fair basis — not giving clues to students to solve problems, not answering students' queries, and not allowing students to discuss among themselves. There are teachers who conceptualize fairness as the good use of the formative functions of school-based assessment; TAS is fair as long as students are not deprived of opportunities to learn the subject matter while they are being assessed. Some teachers, however, believe that it is not fair if students are asked to stay after school until they have finished their TAS laboratory reports because students cannot participate in extracurricular activities and thus all-round education cannot be achieved.

Another common evaluation concern is whether TAS is being incorporated into the subject that a teacher is responsible for teaching in school.

This reflects that during the "wait-and-see" period, most teachers in the sample questioned about the needs for TAS. A teacher reported, "Will TAS be implemented in the subjects I teach? If yes, when?" A number of teachers in the sample also expressed concerns about availability of teacher training. Because assessment of student learning is an integral part of the school curriculum, implementation of TAS in a school subject will inevitably affect other curriculum elements such as the intent (aims, goals and objectives), content, and learning activities. Teachers must be clear about the purposes of TAS. They need to keep these purposes in mind as they design lessons and continually assess student learning. However, most postgraduate diploma in education programs in Hong Kong do not require students to take courses in instructional assessment. As a result, teachers generally lack an adequate knowledge base for implementing TAS. Unfortunately, the Hong Kong Examinations Authority and the Education Department have provided little support for TAS teachers. Few opportunities for teachers' professional development in the form of workshops, seminars, or continuing education courses have been available. The Hong Kong Examinations Authority sees its main task as organizing public examinations rather than dealing with teacher training, but the Education Department views TAS as a matter of the public examination and thus has merely participated in half-day "hit and run" in-service activities for new TAS teachers on an ad hoc basis.

The results of the open-ended survey indicate that during the innovation adoption process, teachers probably go through one more stage of concern than the one reported by Cheung et al. (2001). This additional stage is important because if a teacher's evaluation concerns about TAS are intense and cannot be alleviated, the teacher will not initiate a search for detailed information about TAS characteristics, requirements, and implications for teachers. Consequently, the long-term goal of the Hong Kong Examinations Authority — expansion of TAS in public examinations (Choi, 1999) — cannot be achieved.

Actually, the evaluation stage is not new in the adoption literature. For example, Rogers (1962) defined adoption as "the mental process through which an individual passes from first hearing about an innovation to final adoption" (p. 76). He conceptualized the adoption process in five stages: Awareness, Interest, Evaluation, Trial, and Adoption. However, his model focuses on a person's decision making rather than concerns during the adoption process. Rogers (1962) also emphasized, "The evaluation stage is probably least distinct of the five adoption stages and empirically one of the

most difficult about which to question respondents" (p. 83). In the present study, five components have been empirically identified in teachers' evaluation concerns (Table 4). Perhaps the nature and the number of the evaluation components are context-dependent, and this is an important topic for future research.

The assumption of the stage-approach to studying teacher concerns regarding innovations is that there is a developmental progression of stages of teacher concern throughout the adoption and implementation processes. Because the missing link between the Indifference and Informational-Personal stages was one of the foci of the present study, respondents might have been forced to think about concerns that they perceived to precede the Informational-Personal stage. Is Evaluation really the second stage of concern? Does the Evaluation stage actually merge with the Informational-Personal stage? As Rogers (1962) noted, "In fact, the evaluation stage may not occur at one definite point in time in the case of certain innovations" (p. 112). The next step in the present research project is to create SoCQ items to measure a large sample of teachers' evaluation concerns about TAS and to apply Cheung et al.'s (2001) methodologies to test the developmental sequence of all the stages in a simplex.

Conclusion

Teachers will not adopt or implement an educational innovation just because it is new. To facilitate the process of educational change, change agents have to monitor and alleviate teachers' concerns about the advocated innovation. Hall et al. (1977) made a significant contribution to research on concerns of teachers adopting or implementing educational innovations when they characterized the change process with seven stages at the individual level of analysis. Unfortunately, there is no empirical evidence in the literature that the seven stages form a developmental hierarchy, nor is there any evidence of all their 35 SoCQ items having adequate reliability and validity. In this article, I have systematically addressed some research issues raised by Cheung et al. (2001) and presented findings from a Hong Kong study. The 5-stage model proposed by Cheung et al. (2001), which is a slight modification of Hall et al.'s original 7-stage model, was applied to investigate 290 teachers' concerns about TAS. Teacher concerns about TAS were of interest because the Hong Kong Government (Education and Manpower Bureau, 2001) and the Hong Kong Examinations Authority (Choi, 1999) had planned to expand it on a large scale. Results from the present study

have supported the 5-stage model; the five subscales demonstrated high reliability and teachers experienced intense stages of concern in a progressive sequence as predicted by the model. The findings are useful to the Hong Kong Examinations Authority for identifying problems of the current TAS and for designing concerns-based interventions (Cheung & Ng, 2000; Hall & Hord, 2001).

In the present study, a sample of 53 non-TAS teachers also participated in an open-ended survey. These teachers, when asked about their major concerns before they wanted to find out more information about TAS, expressed a wide range of worries. Cheung et al.'s (2001) 5-stage model was extended to include a stage of evaluation concerns between the Indifference and Informational-Personal stages. At the Evaluation stage, most teachers worried about the worth of TAS, the needs for change, and the support provided by the Education Department, the Hong Kong Examinations Authority, colleagues, or students. A few teachers at this stage were also concerned about the accessibility of information on TAS or the popularity of TAS as a component of public examinations.

Thus, from the investigation presented in this article, I would argue that there are at least six stages of teacher concern about TAS: (1) Indifference, (2) Evaluation, (3) Informational-Personal, (4) Management, (5) Consequence-Collaboration, and (6) Refocusing. The Hong Kong Examinations Authority and the Education Department must monitor teachers' concerns more closely in expanding TAS and provide support that targets toward the peak concerns expressed by TAS and non-TAS teachers. Without the cooperation of teachers, TAS will not work. The 6-stage model provides a useful framework for analyzing their concerns as they engage in the process of TAS adoption and implementation. What is needed as a next step is an empirical verification of the sequence of the six stages.

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