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A study on motivational factors of students in German Language Teaching Department at Trakya University

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Abstract: There are many definitions, views and theories for motivation. This study aims to state expressly what type of motivation factors according to the students' grades affects the students of German Language Teaching Departments (Turkey) negatively or positively. How the external and internal factors affect the students of German Language Teaching Departments in terms of motivation will be determined in this study. A questionnaire has been given to the students (freshman, sophomore, junior and senior classes) of Trakya University German Language Teaching Departments (2008) to collect data for showing the motivation profile of these students. The questionnaire has been transferred to SPSS program except quantitative analysis. The frequency and the percentage distributions of the data have been calculated with the aim of determining the students' views. In conclusion, it is possible to state that German Language Teaching Department students have been affected by the positive and negative motivation factors and the achievements and failures of these students could vary depending on the different reasons. On the other hand, the students of German Language Teaching Department have attributed important roles to the lecturers. Many features of the lecturers have affected the students' motivation positively.

Key words: German Language Teaching Department; motivational profile; motivation theories in foreign language education; internal and external factors

1. Introduction

If the profile of the students in German Language Teaching (GLT) Departments in Turkey is taken into consideration, it can easily be seen that these students have shown differences according to the years. When the profile of the students in GLT Departments is considered, it has been seen that the recent studies have focused on the topics such as language skills, foreign language knowledge, their application in the classes and the use of second language. However, with the syllabi, courses and recent orientations many studies related to students in GLT Departments have been realized. How the students in GLT Departments show a motivation profile has not been considered. In this context, the study aims at indicating the motivation profile of the students in GLT Department at Trakya University rather than testing hypotheses related to motivation.

1.1 The term motivation in education, motivation theories in foreign language education and motivation variables

There are many definitions, views and theories for motivation. Since the term motivation has been handled

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and scrutinized according to the research contexts by various disciplines, it is difficult to define it only in one sentence. The questions “Does the motivation affect the success?” or “Does the success affect the motivation?” have not been completely answered yet. Motivation has significant roles in the learning process. Since the factors, which affect the motivation of the students in education, are changeable, the motivation process is not stable. There are many factors, which determine the students’ motivation level. According to the researches done, the factors affecting students’ motivation can be written as follows (Ceylan, 2003, p. 9; Gürkan & Gökçe, 1999, p. 168):

(1) Teacher factor: The knowledge and ability, method and technique, guidance and advisory skills the teacher has;

(2) Classroom climate and interaction: Interaction, communication and seating arrangement of the students in the classroom;

(3) School climate: Teacher-student relations and communication, school administration, climate and relations.

There are many views related to the motivation factors and theories in teaching foreign languages. When the motivation in teaching foreign language is considered, the socio-psychological theories of Gardner and Lambert had been important until 1990s. Two kinds of motivation form were determined (Gardner & Lambert, 1972):

(1) One is the use of foreign language as a tool for an aim access considering professional, economical or other needs (instrumental orientation);

(2) The other is the use of foreign language as a goal because of the interest in the language and culture of the country where the target language is spoken (integrative orientation).

This theory has changed via time and different views. The explanations of Riemer related to motivation concepts and theories are significant in teaching German as a foreign language. Riemer has stated that motivation changes according to individuals and classroom setting, besides, personal, social and emotional factors have important roles in motivation of learning a foreign language (Riemer, 2001).

Schlak and his colleagues have mentioned about the differences regarding the concepts and theories relating to the motivation of the students learning German in Germany in their studies and projects (Schlak, et al., 2002):

(1) Instrumental motivation: A foreign language has been taught by means of pragmatic aim;

(2) Integrative motivation: Learning the foreign language with the aim of adapting to the target culture;

(3) Travel-orientation: Motivation with the aim of tourism and travel;

(4) Friendship-orientation: Motivation aiming at developing friendship and communication;

(5) Knowledge-orientation: Developing cultural level by means of learning foreign languages and the wish of being received by the others in the society;

(6) Intrinsic motivation: The enjoyment of the students in the foreign language, being curious about and interested in the class, the motivation of learning a foreign language with the internal motivation;

(7) Extrinsic motivation: Extrinsic motivation of anxiety of exam and getting low marks;

(8) Group cohesion: Formation of learning motivation via the peers in the group and studying well and sincerely;

(9) Self-efficiency: The motivation of the students who think s/he has the ability to learn a foreign language;

(10) Need for achievement: Being motivated because of the achievement desire;

(11) Interest: Being interesting of the class affects the learning motivation negatively or positively;

(12) Relevance: Student becomes motivated if s/he thinks that the information given in the class is necessary

and important for him-/herself;

(13) Affiliation drive: Being motivated since the student wants to affect and impress the teacher positively.

Kirchner has divided motivation into two parts as internal and external motivation in her comprehensive research about motivation of the students learning German (Kirchner, 2004, p. 5). While the factors such as facilitating anxiety and debilitating anxiety, competitiveness, consciousness, effectiveness, locus of causality and biographical data include the internal motivation of the student learning a foreign language; social environment, learning environment, communication with the country where the target language spoken, interest and role of the student and also education system include the external motivation (Kirchner, 2004, pp. 5-10).

One of the most important points to be considered about motivation beside these views is that motivation can change during the learning process. "Motivation is a process whereby a certain amount of instigation force arises, initiates action, and persists as long as no other force comes into play to weaken it and thereby terminate action, or until the planned outcome has been reached" (Dörnyei, 1998, p. 118).

Before giving the findings and comments of the study considering all this information, it is important to deal with the potential of students at German Language Teaching Departments in Turkey.

1.2 A chronological view from past to today considering the profile of German Language Teaching Department students

If we have taken the profile of the students studying at GLT Departments into consideration from the past to now, we can see how the students studying at GLT Departments have become different. GLT curriculum has been reconstructed in terms of quality and quantity in parallel with this difference in certain times (Yücel, 2000). In reconstruction periods, the lectures of GLT departments made great efforts for preparing the syllabi adaptation and forming contents of the courses considering the needs and characteristics of the students (Hatipoğlu, 2007, pp. 279-291).

The students studying at GLT Departments between 1980s-1990s were the children of the families who came back from Germany throughout Turkey. Since these students were multi-faced regarding both language and culture, this situation had been utilized as a profit at GLT Departments (Polat & Tapan, 1995, pp. 93-107). Because of the decrease in the number of the people, these students could not fill returning to Turkey from Germany, the quota of GLT Departments. Thus, the students having low German-Language level have been enrolled GLT Departments of the universities between the years 1998-2000 (Yücel, 2001, p. 139). Due to the fact that the enhancement of multilingualism since the early 2000s, the efforts of Turkey for admission to EU, new directions and the filling the GLT Departments Quotas in universities are the most important reasons for the 11 GLT Departments out of 14 GLT Departments in Turkey have begun to accept not the students who have German Language points in university exam but English Language points (ÖSYM, 2007; Salihoğlu, 2005, p. 403).

The academicians have stated that after learning English, learning German at universities is well-rounded education. Especially in publications learning the second foreign language German after English is a profit for all (Serindağ, 2005).

It is an undeniable reality that students at GLT Departments have some problems especially in terms of future anxiety. According to Ilkhan, students at both GLT Departments and German Philology Departments have graduated without having a chance of performing their profession. For this reason, Ilkhan has emphasized that a quality reform should be formed in the departments mentioned above considering the needs of the society (Ilkhan, 2005, p. 211). While Genç has emphasized on the importance of proficiency tests and preparatory class syllabus for the students of GLT Departments who lack of essential language knowledge and skills (Genç, 1997, p. 315),

Zengin has specified that the precautions should be taken according to the goals and expectations of the students (Zengin, 1997, p. 331). Salihoğlu has questioned how the students at GLT Departments are ready for university education. He also thinks and criticizes that these problems have resulted not only from the low German language level but also from the deficiency of their high school quality and education (Salihoğlu, 2005, p. 401). Taking all these expressions into consideration, the student profile of GLT Departments can be summarized as follows:

(1) GLT Departments students have generally learnt English in high schools or others; German is the second foreign language at the university (environment). Even though English has great advantage and positive effect on learning German, the problems students encounter cannot be solved;

(2) GLT Departments students, in spite of the defects in their language level, have been trained as versatile by means of the high quality education they have and the supports of the lecturers;

(3) GLT Departments students can not be appointed as German teachers since the ministry of education does not have enough positions for permanent staff. That is why they have anxiety for finding a job and uncertainty for their future. On the other hand, graduates of GLT Departments can work in different fields as well as in their own field—teaching, both private and supplement teachers.

2. The topic and the aim of the study

In this study, it is not possible to deal with the concepts, theories and factors related to all the research topics of motivation. In accordance with the information given, this study has searched for the answers to the questions as “Why do the students study at GLT Departments?”, “Why do they choose this department?” and the most importantly “What kind of motivation profile do they express clearly?”. This study aims to state expressly what type of motivation factors according to the students’ grades affects the students of GLT Departments negatively or positively. How the external and internal factors affect the students of GLT Departments in terms of motivation will be determined in this study.

3. The method of the study

A questionnaire has been given to the students (freshman, sophomore, junior and senior classes) of GLT Departments at Trakya University to collect data for showing the motivation profile of these students. The questionnaire has been formed by making use of the questionnaire application named “motivation and communication in education” of Yeşilyaprak (Yeşilyaprak, 2004), motivation questionnaire of Schlak and his colleagues (Schlak, et al., 2002) and the questions about motivation of Kirchner (Kirchner, 2004). The questionnaire has been transferred to SPSS program except quantitative analysis. The frequency and the percentage distributions of data have been calculated with the aim of determining the students’ views.

4. Findings and comments of the study

Ninety-three students at GLT Department of Trakya University have been given a questionnaire. The following findings have been obtained in determining the students’ views and about their personal information.

4.1 Personal information of the students

Table 1 gives the distribution of the students who have taken part in the research according to their genders. When we consider the distribution of the students’ genders the 76.3% of students who have taken part in the

research are female and 23.7% of them are male. Shortly, the number of the female students far outweighs in the GLT Department.

Table 1 Distribution of the students who have taken part in the research according to their genders

Gender	f	%
Female	71	76.3
Male	22	23.7
Total	93	100

Table 2 gives the distribution of the students according to their grades (classes):

Table 2 Distribution of the students according to their grades

Class	f	%
Freshman	28	30.1
Sophomore	19	20.4
Junior students	25	26.9
Senior students	21	22.6
Total	93	100

When we consider the distribution of the students according to their classes, it has been seen that 30.1% (28 students) is freshman students, 20.4% (19 students) is sophomore students, 26.9% (25 students) is junior students and 22.6% (21 students) is senior students.

4.2 The time that the students taking part in the research have begun to learn German language

The time students have begun to learn German language are given in the Table 3:

Table 3 The time students have begun to learn German language

The time they have begun to learn German language	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
Preparatory class	14	50.0	9	47.4	9	36.0	13	61.9	45	48.4
High school	13	46.4	9	47.4	12	48.0	6	28.6	40	43.0
Secondary sch.	1	3.6	0	0	3	12.0	1	4.8	5	5.4
Germany	0	0	1	5.3	1	4.0	1	4.8	3	3.2
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

Table 3 shows that GLT Department students have stated that they have begun to learn German in the preparatory classes of the university. 43% of the students have learnt German as a second language in high school. There is not a considerable difference between the classes. However, both the views of the students and the results of the placement tests given show that the students passed the university exam and had a right to study in GLT Department do not know German well or they do not know at all. That is why 98% of these students have learnt German in the Preparatory Class which has two semesters in GLT Department then they have improved German language according to the skills (Yücel, 2004, pp. 143-150). Preparatory classes are very important for the students of GLT Department because, if a student cannot get the valid grade in the exams (minimum 70 out of 100) at the end of the academic year, s/he has to repeat the preparatory class for the next year again. If s/he cannot achieve the second year at preparatory class s/he will no longer study at GLT Department. This external functional motivation can be defined as “extrinsic motivation”. Because there have been a stress of grade function here. In

this context, the most important thing to mention is that the students at preparatory classes have a great fear and desire to pass the preparatory Class. Considering this, “facilitating anxiety” and “need for achievement” can be dominant as internal motivation (Kirchner, 2004, pp. 5-10).

4.3 The reasons why the students who have answered the questionnaire have studied at GLT Department

There have been views of the students about the reasons why they have been studying at GLT Department in Table 4.

Table 4 Reasons why students have been studying at GLT Department

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
Since they could not enter the ELT	18	64.3	14	73.4	18	72.	17	81	67	72
To learn a second language	5	17.9	1	5.3	1	4.	1	4.8	8	8.6
Since they like this department	0	0	0	0	3	12.	1	4.8	4	4.3
Since it is the most important foreign language after English	4	14.3	2	10.5	1	4	1	4.8	8	8.6
To become a teacher of German	1	3.6	2	10.5	2	8	1	4.8	6	6.5
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

Table 4 reflects the motivation profile of the students when they enter (begin to study) the GLT Department. Even though there have not been significant and considerable difference, the most considerable thing is that, no freshman and sophomores (0%) have chosen GLT Department willingly or eagerly. In the third year (juniors), this proportion is 12% while in the fourth year (seniors) it is 4.8%. 72% of the students state that they have studied in GLT Department since they could not enter the ELT Department and 8.6% of the students want to learn a second language and also 8.6% of the students think that German is the most important foreign language after English. Briefly, students have studied in GLT Department since they could not get enough points in the university entrance exam to study in ELT Departments. The number of the students who really want to study in GLT Department is 6 (6.5%). This situation has resulted from the education system of the country and it is an external factor affecting the students’ motivation negatively.

4.4 The views of the students about the German language

In Table 5, the views is shown by the students who have taken part in the research about German language.

Table 5 The views of the students who have taken part in the research about German language

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
I like learning German	24	85.7	16	84.2	23	92	21	100	84	90.3
I don't like learning German	4	14.3	3	15.8	2	8	0	0	9	9.7
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

Considering the views of the students according to their classes, seniors like learning German (100%). In the other classes, this proportion has changed between 85% and 92%. Namely, even though a vast majority of the students have not entered this department eagerly, their attitude towards German language is positive. Shortly, students have thought that they have the ability to learn a foreign language and they try to become motivated (self-efficacy).

4.5 The eagerness of the students studying at GLT Department when they entered the university entrance exam and now

In Table 6 and Table 7, considering intrinsic and extrinsic motivation, first when the students entered the university exam (Table 6) their studying desire in the GLT Department and now (Table 7) have been given according to their classes.

Table 6 How the students wanted to study in GLT Department when they entered the university exam

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
I never wanted	11	39.3	9	27.3	10	40	3	14.3	33	35.5
I wanted a little	9	32.1	5	16.7	7	28	9	42.9	30	32.3
I wanted	8	28.6	5	18.5	7	28	7	33.3	27	29
I wanted very much	0	0	0	0	1	4	2	9.5	3	3.2
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

Table 7 How the students wanted to study in GLT Department now

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
I never want	2	7.1	2	10.5	0	0	0	0	4	4.3
I wanted a little	2	7.1	2	10.5	5	20	1	4.8	10	10.8
I wanted	19	67.9	12	63.2	17	68	10	47.6	58	62.4
I wanted very much	5	17.9	3	15.8	3	12	10	47.6	21	22.6
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

When Table 6 and Table 7 have been examined, we can see that expectation and motivation can change via time process. When we compare the percentages regarding the given answers to the questions, it is seen that there are considerable differences. Freshman did not want to study in this department at all before beginning to study in GLT Department (39.3%), in the same class, this percentage has decreased to 7.1% after the students have entered this department. While 40% of the junior students did not want to study at GLT Department at all (Table 6), now 68% of the students want to study in this department. No students have answered that they do not want to study in this department. This is a reflection of the value given to the received education by the students. When Table 6 and Table 7 are compared to, it is seen the term motivation has changed. We can see what factors change this motivation situation from the results of the other Tables.

4.6 Situations affecting students' motivation

The answers and the frequencies of the question asked students: "Does your motivation situation show differences with the course of time?" are given in Table 8.

In Table 8, the determiners are grouped according to the answers given by the students. Considering the total, personal reasons are given in the first three situations 28.3% (psychology of the student, whether s/he slept well or not, is happy or unhappy, the class hour as being very early or late), being successful in the course, structure of the course as 16.7% (not interesting, difficult and not clear of the course). 12% future anxieties, 10.8% attitude of the teacher to the course and the student, 7.5% being interesting of the course and 6.7% being unsuccessful follow the situations mentioned before. The changes in the motivational situations of the students differentiate individually; on the other hand, common features are not less. The findings in Table 8 indicate that the motivation of the

students in GLT Department is affected by both internal and external factors.

Table 8 The frequencies of “Does your motivation situation show differences with the course of time?”

Situations in which motivation situations are affected	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
Attitude of the teacher to the course and the students	3	8.1	2	8.3	3	8.8	5	20.0	13	10.8
Anxiety of future	4	10.8	6	25.0	2	5.9	3	12.0	15	12.5
Structure of the course	8	21.6	3	12.5	6	17.6	3	12.0	20	16.7
Personal reasons	10	27.0	5	20.8	9	26.5	10	40.0	34	28.3
Being unsuccessful in the course	4	10.8	4	16.8	-	-	-	-	8	6.7
Success in the course	6	16.2	2	8.3	10	29.4	3	12.0	21	17.5
Being interesting of the course	2	5.5	2	8.3	4	11.7	1	4.0	9	7.5
Total	37	100.0	24	100.0	34	100.0	25	100.0	120	100.0

In the next Table 9 and Table 10, the situations in which the students feel themselves most and least motivated are given.

Table 9 The time at which the students feel most motivated

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
When I study for the course	0	0	0	0	4	16	1	4.8	5	5.4
When I am successful in the course	10	35.7	8	42.1	7	28	4	19	29	31.2
When the course topic is interesting	5	17.9	1	5.3	6	24	4	19	16	17.2
When I have the opportunity of being appointed as a teacher	1	3.6	3	15.8	3	12	0	0	7	7.5
When I am comfortable physically and psychologically	8	28.6	5	26.3	5	20	6	28.6	24	25.8
When the lecture is positive	3	10.7	2	10.5	5	0	6	28.6	11	11.8
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

Table 10 The time at which students feel least motivated

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
When I am unsuccessful	11	39.3	3	15.8	10	40	3	14.3	27	29
When I am not comfortable physically and psychologically	12	42.9	2	10.5	8	32	10	47.6	32	34.4
When I don't study for the course	1	3.6	0	0	0	0	3	14.3	4	4.3
Negative attitude of the teacher	2	7.1	3	15.8	2	8	1	4.8	8	8.6
Hardness and boredom of the class	0	0	6	31.6	3	12	4	19.	14	14
Employing and future anxiety	2	7.1	5	26.3	2	8	0	0	9	9.7
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

In Table 9, for the time at which students feel most motivated, while freshman, sophomores and juniors classes answer as “When I am successful in the class”, the senior classes answer as “When the lecture is positive” and “When I am comfortable physically and psychologically”. Being motivated by the success is an internal factor while being positive of the lecturer is an external factor. In other words, students have stated that their motivation profiles have changed positively both in accordance with their efforts (intrinsic) and the attitude of the lecturer

(external).

When we consider Table 10, in general students have stated that the time at which they feel least motivated are: “When they are uneasy” (34.4%) and “When they are unsuccessful” (29%). Namely, they think that the negative motivation depends on them. Significantly, sophomores state that they feel least motivated with “the hardness and boredom of the class” (31.6%) and “the anxiety of future” (26.3%). Thus, the reasons are extrinsic.

4.7 Students’ views about success and the reasons they think success depends on when they are successful in the classes

In Table 11, students have been asked as: “How important is achievement to you?”.

Table 11 Students’ answers to “How important is achievement to you?”

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
Very important	22	78.6	12	63.2	14	56	10	47.6	58	62.4
Less important	0	0	0	0	0	0	0	0	0	0
Important	6	21.4	6	31.6	11	44	11	52.4	34	36.6
Not important	0	0	1	5.3	0	0	0	0	1	1.1
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

When we consider the findings of Table 11, students generally take the achievement into consideration and also we can say that the value given to achievement is high. The students of GLT Department (62.4%) have proposed that the achievement is very important and 36.6% of the students have proposed achievement is important. There are not considerable differences between the classes in this context. We can see in the following Table 12 that what reasons students think that achievement depends on.

Table 12 The proportion of the students’ agreements with the statements related to “the reasons of the achievement in the classes when they are successful”

Reasons	Gender	f %	Not effective	Minor effective	Moderately effective	Effective	Very effective	Total
Easiness or harness of the course	Female	f	5	9	5	35	17	71
		%	7.0	12.8	7.0	49.3	23.9	100.0
	Male	f	3	3	2	11	3	22
		%	13.6	13.6	9.1	50.0	13.6	100.0
	Total	f	8	12	7	46	20	93
		%	8.6	12.9	7.5	49.5	21.5	100.0
Personal abilities	Female	f	-	2	6	36	27	71
		%	-	2.8	8.5	50.7	38.0	100.0
	Male	f	-	1	4	12	5	22
		%	-	4.5	18.2	54.5	22.7	100.0
	Total	f	-	3	10	48	32	93
		%	-	3.2	10.8	51.6	34.4	100.0
Individual effort	Female	f	1	1	3	16	50	71
		%	1.4	1.4	4.2	22.5	70.4	100.0
	Male	f	-	-	1	7	14	22
		%	-	-	4.5	31.8	63.6	100.0
	Total	f	1	1	4	23	64	93
		%	1.1	1.1	4.3	24.7	68.8	100.0

(to be continued)

A study on motivational factors of students in German Language Teaching Department at Trakya University

Chance factor	Female	f	13	16	24	14	4	71
		%	18.3	22.5	33.8	19.7	5.6	100.0
	Male	f	4	10	6	2	-	22
		%	18.2	38.5	27.3	9.1	-	100.0
	Total	f	17	26	30	16	4	93
		%	18.3	28.0	32.3	17.2	4.3	100.0
Attitude of the lecturer to you and the topic	Female	f	-	-	2	8	61	71
		%	-	-	2.8	11.3	85.9	100.0
	Male	f	-	-	-	8	14	22
		%	-	-	0	36.4	63.6	100.0
	Total	f	-	-	2	16	75	93
		%	-	-	2.2	17.2	80.6	100.0

4.8 Attitude and encouragement of the lecturer

In Table 13, students have been asked about to what extent the lectures motivate themselves.

Table 13 Is the encouragement of the lecturers effective to motivate you?

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
Not effective	0	0	0	0	0	0	0	0	0	0
Minor effective	0	0	0	0	1	4	0	0	1	1.1
Moderately effective	0	0	2	10.5	1	4	1	4.8	4	4.3
Effective	10	35.7	6	31.6	11	44	5	23.8	32	34.4
Very effective	18	64.3	11	57.9	12	48	15	71.4	56	60.2
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

According to the findings in Table 13, we see that there are not considerable differences between the classes. Additionally, 60.2% of the students state that the encouragement they get from the lecturer is very effective and 30.4% of the students think that it is effective. The encouragement that a Yeşilyaprak state is an extrinsic directive, which is used to increase the students' motivation (Yeşilyaprak, 2004, p. 90). In this context, students of GLT Department see the encouragement of the lecturers as very important directive in motivation.

In Table 14, the students have been asked the question "What features of the lecturer motivate you and how much?". With the findings in Table 14, 81.7% of the students state that if the lecturer uses an understandable and fluent language, it is very effective on motivation. This fact has been followed by the 76.3 % of the students think that the performance of the lecturer in the course/class and having a smiling face are very effective. Then 63.4% of them think that if the lectures attaching importance to us as individuals in and outside the class, this is very important. That the lecturers creates on arguable setting and attaching importance to our thoughts cover 48.4% of the students who think that is effective and 41.9% think it is very effective. In other words, students consider that it is very important to generate motivation when the lecturer attaches importance to and cares for the students. It is not important for the students whether the lecturer likes them or not as much as others. Students generally attach importance to the attitude of lecturer, the language s/he uses and his/her performance in terms of motivation more than the others.

Table 14 The agreement percentage of the students about what features of the lecturer motivates them and how much

	Genders	f %	Not effective	Minor effective	Moderately effective	Effective	Very effective	Total
Attaching importance to our thoughts and creating on arguable setting in the class	Female	f	-	2	4	35	30	71
		%		2.8	5.6	49.3	42.3	100.0
	Male	f	1	1	1	10	9	22
		%	4.5	4.5	4.5	45.5	40.9	100.0
	Total	f	1	3	5	45	39	93
		%	1.1	3.2	5.4	48.4	41.9	100.0
Attaching importance to us as a person in and outside the class	Female	f	1	1	1	22	46	71
		%	1.4	1.4	1.4	31.0	64.8	100.0
	Male	f	-	-	2	7	13	22
		%			9.1	31.8	59.1	100.0
	Total	f	1	1	3	29	59	93
		%	1.1	1.1	3.2	31.2	63.4	100.0
Having a smile face	Female	f	1	-	5	10	55	71
		%	1.4	-	7.0	14.1	77.5	100.0
	Male	f	-	-	-	6	16	22
		%				27.3	72.7	100.0
	Total	f	1	-	5	16	71	93
		%	1.1	-	5.4	17.2	76.3	100.0
Loving/liking me	Female	f	4	5	9	24	29	71
		%	5.6	7.0	12.7	33.8	40.8	100.0
	Male	f	3	3	5	4	7	22
		%	13.6	13.6	22.7	18.2	31.8	100.0
	Total	f	7	8	14	28	36	93
		%	7.5	8.6	15.1	30.1	38.7	100.0
His performance in the class	Female	f	-	1	-	12	58	71
		%		1.4		16.9	81.7	100.0
	Male	f	-	-	-	9	13	22
		%				40.9	59.1	100.0
	Total	f	-	1	-	21	71	93
		%	-	1.1	-	22.6	76.3	100.0
Using an understandable and fluent language	Female	f	-	1	-	10	60	71
		%		1.4		14.1	84.5	100.0
	Male	f	-	-	1	5	16	22
		%				4.5	22.7	2.7
	Total	f	-	1	1	15	76	93
		%	-	1.1	1.1	16.1	81.7	100.0

In this context, the situation related to the students' achievement is questioned.

When we have a close look at Table 15, we can see that the student achievement differs according to the grade point average and the classes. While freshmen think that they show moderate achievement (64.3% moderate), 47.4% of the sophomores think they are successful and 52.6% of them think they are moderate. 84% of junior classes think they are moderate. When we consider the senior students, half of the senior classes students think that they are successful while the other half of the senior classes students think they are moderate. When the overall total is considered, we see that percentage of the failure for all the students is low (4.3%).

Table 15 Considering your own grade point average, determining your achievement situation in school

	Freshman		Sophomores		Juniors		Seniors		Total	
	f	%	f	%	f	%	f	%	f	%
Successful	7	25	9	47.4	4	16	10	47.6	30	32.3
Moderate	18	64.3	10	52.6	21	84	10	47.6	59	63.4
Unsuccessful	3	10.7	0	0	0	0	1	4.8	4	4.3
Total	28	100.0	19	100.0	25	100.0	21	100.0	93	100.0

5. Discussion and conclusions

By the application of the questionnaire to the students of GLT Department, the factors related to their motivation have been indicated. The obtained findings of the study can be summarized as follows:

First, when the students of GLT Department at Trakya University have begun to study at this Department not because of liking this department but for their university entrance exam points were sufficient for this department. In other words, they have begun to study at this department because of the incentive goals of the extrinsic factors (education system, enthusiasm for studying at university). This fact has shown that when the majority of the students begin studying in GLT Department, they have low motivation. However, from the interviews with the students and given questionnaires, we can see that motivation situation has changed by the help of positive contributions and encouragements of the lecturers and also the performance and the enthusiasm of the students. Briefly, students' motivations have changed positively during their education.

Second, the situations affecting the motivations of GLT Department students are divided into two factors as intern/intrinsic and extern/extrinsic. While the attitude of lecturers both to the class and to students, future anxiety, hardness and the boredom of the class are external factors; the efforts and the abilities of the students and also personal reasons are internal factors.

This study has shown that both GLT Department students have been affected by what kind of motivation factors positively and negatively and the achievements and failures of these students could vary depending on the different reasons. On the other hand, the students of GLT Department have attributed important roles to the lecturers.

Many features of the lecturers have affected the students' motivation positively. For example, using an understandable language, his/her performance in the class, having a smiling face and attaching importance to students.

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Curiosity-based learning (CBL) program

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Abstract: This paper describes a series of experiential educational exercises developed to better engage and more effectively educate master degree students in the necessary foundation skills that comprise a true scholar. It was developed from the atmosphere of viewing the initial disengagement of my students while at the same time recalling, as a student, my own boredom and frustrations with traditional educational methods. As a Chulalongkorn University instructor with over 23 years of classroom experience, the author would like offer the colleagues this effective program that has been fine-tuned over the last 6 years. The program is a 6 step process that includes multi-modes of student self-expression and processes. They are expected to represent their ideas orally, in writing and diagrammed visually while learning the effectiveness and appropriateness of each. The example described in this paper was developed to prepare students entering Chulalongkorn's ethnomusicology program on anthropological theories, but its core activities were already generalized and easily applicable to most subject areas.

Key words: co-learner; curiosity-based learning; educational methods; facilitator; inquiry-based learning; learning methodology; teaching methods

1. Introduction

Human newborns have a strong natural curiosity towards their surroundings. As a non-verbal infant, they explore objects interactively physically, paying attention to the cause and effect relationships as they play. Instinctively it is human nature to ask a question when one wants to know something, but as a toddler, it will be some time before they are able to ask verbal questions about their world. When they are a bit older, they listening and asking questions to their parents is a natural form of learning as it is independently observing a phenomenon and then positing as to how or why it occurred.

As society grew larger and more specialized, the education of children was formalized into a public system away from the family with a separate school and teacher. Due to the number of students per instructor along with the traditional model of respect for authority, they together put restrictions on the original child-to-parent question and answer educational relationship. This model resulted in an essentially one-way transfer of knowledge pattern from the instructor to the student with the resulting effect of diminishing the students natural curiosity. The emphasis was on memorization from "chalk and talk" lectures. In this regard, Albert Einstein wrote, "It is a miracle that curiosity survives formal education".

2. Why curiosity?

While learning is even more important in today's intensely competitive and complex society, it is curiosity

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that provides the motivational fuel for learning at each step of the educational process. When students have curiosity, they learn more and more about their world and as a result, are closer connected to it. They have a deeper understanding of the interactions and the relationship between the various elements. Furthermore, the more one knows, the more one has to be curious about. Maria Mitchell wrote, “We have a hunger of the mind which asks for knowledge of all around us, and the more we gain, the more is our desire; the more we see, the more we are capable of seeing”.

Curiosity is defined as a disposition to inquire, investigate or seek after knowledge. It is simply the frame of mind in which you want to learn more about something. It also provides the source of internal motivation that comprises the foundation of education. The profound benefit of internal motivation is that it avoids the insidious problem of rebellion caused by externally applied motivators, i.e., parents, instructors, peer groups and society.

The author’s own motivation for developing the curiosity-based learning program was a multifaceted combination of some of her negative experiences as a student and later as a fresh college instructor 23 years ago.

As a student, the author found the traditional classroom was not very engaging. The teacher would talk and students were expected to absorb and memorize. In Thai society, the teachers are respected authority and role model figures which the students are obligated to obey. As a student, the author profoundly remembers her teacher responding as if deeply insulted when she asked a question in class. She surmised that the teacher must have viewed himself as a failed instructor if any student ever needed to ask a question about his presentation. At that time, student participation was neither expected nor desired. This is in contrast to western classrooms where instructors routinely ask students for questions. In the old traditional Thai classroom, the students were conditioned over their educational years to be just receivers of knowledge as opposed to active participants.

Then early on, as a new instructor, the author was bothered by the disengagement of her students and queried them about the qualities of their ideal teacher. They responded with the following list of desirable characteristics: sense of humor, energetic, cheerful, easy to understand voice (clearly audible and projects well), and creativity in presentations.

In a research article titled *College Teachers Who Stimulate Curiosity* by Stewart R. Jones, he examined the characteristics of 30 University of Illinois college teachers judged to be best at stimulating student curiosity based on interviews and results of student evaluations of teacher performance. The commonly stated characteristics ascribed to these teachers by students to open-ended questions on course evaluation questionnaires were: humor, enthusiasm, willingness to listen, ability to stimulate student thinking, and questioning techniques.

There is a match of humor and enthusiasm or energy levels factors. The Jones study further stated that the single key feature that the students held as very important was regarding questions in the classroom, specifically, “the teachers’ encouragement of students’ questions and the instructor’s use of rhetorical questions in their lectures”.

Although a rhetorical question is a figure of speech often posed for its persuasive effect without the expectation of a measurable or concrete answer, it can also be used as a thought provoking technique. For instance, “This is not just an ice cream stick, is it?” relates to the example of curiosity-based learning described later in this paper. Rhetorical questions can be used to stimulate the discussion further by “widening” the topic or in other words, increasing the level of curiosity in the classroom. “Rhetorical questions encourage the listener to reflect on what the implied answer to the question must be” (Wikipedia.com). The Jones study found that the best teachers’ used, “... teaching methods (which) emphasized problematic content that stimulated curiosity, thought, and interest”. The term “problematic” can describe any new idea, concept or one that produces a measure of cognitive

dissonance for the students. It could be something viewed as controversial, a challenge to a previously held understanding (belief) or in contrast to their personal experience. Additionally, from Ken Bain's book *What the Best College Teachers Do* (Harvard Press, 2004), an effective use of questions was described in this manner. "Rather than telling students they are wrong and then providing the 'correct' answers, they often ask questions to help students see their own mistakes". He also highlighted the point that, "Knowledge is constructed, not received", which corresponds to the fact that education should support the building of students internal models that accurately depict the external real world (see constructivism).

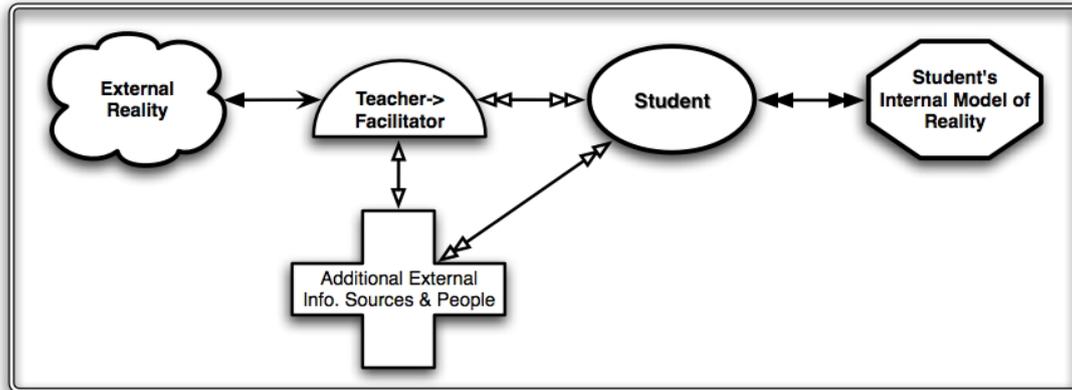


Figure 1 External reality to internal model of reality via education

Many years ago as a beginning instructor, the author recalled her own sleepless struggles in what she termed the "death" classrooms along with the feedback from her students regarding their preferred instructor's characteristics was inspired to create a new model of education (see Figure 1). This new model would activate her students to be happy, more curious and personally involved in the discussions. After reviewing a collection of learning theories (inquiry-based, problem-based, student-centered, etc.), it was clear that curiosity is the foundation that provides the internal motivation fuel for learning and in that regard it has been said that it is a leading indicator of intelligence.

Curiosity is the fuel that provides the motivational energy for functional learning and understanding. Curiosity is the source of internal motivation Internal motivation avoids the problem of rebellion caused by externally applied motivators, i.e. parents, instructors, peer groups and society.

Consequently, the author was both inspired and determined to host a classroom where her students' education would be born in an atmosphere full of energetic participation. It would be a class where students' curiosity appetite would grow large and the tools to satisfy that hunger were bestowed.

However, the formal education system in Thailand has conditioned most students into being unresponsive receptors of "chalk and talk" rather than encouraging a self-initiated series of inquires. The author asked herself, what would be needed for students to create their own questions and enjoy the process? It is clear that a question comes from what one wants to know or in other words, what one is curious about? But before one can formulate a question, they must have a working concept in their imagination of how something an entity or phenomenon in the real world functions. On the subject of imagination, Albert Einstein wrote, "Imagination is more important than knowledge. For while knowledge defines all we currently know and understand, imagination points to all we might yet discover and create".

When the author was thinking about all those things not yet discovered or created, her focus was directed to the issue of how could one discover and create if one has no curiosity at all? The author believes that higher education pedagogies should incorporate and encourage teaching methods that increases students curiosity while the instructor fosters the motivation and inspiration for it to continue to grow within them.

The author's innovation in developing the curiosity-based learning program was to focus on building up the students' own curiosity level in order to help focus their attention on the courses' subject matter from the beginning through its completion.

3. Curiosity-based learning objectives

3.1 Introduction of curiosity-based learning

With the realization of the need to develop students' curiosity and classroom involvement paired with the key qualities of a scholar the core learning objectives of the curiosity-based learning took shape. The importance of scholarship in a country's leadership was emphasized by President John F. Kennedy who reminded Americans in the following quote: "Remember that our nation's first great leaders were also our first great scholars".

This curiosity-based learning consists of a simple series of exercises focuses on experiences to increase the students investigative curiosity, critical thinking and skills of self-expression. Its initial activity draws the students' attention to their own baseline of self-limiting preconceptions and then with that motivational awareness, guides them progressively into developing the key skills of a scholar. The main qualities of a scholar are that one can read, listen, think and communicate well. With the addition of the role change of the instructor from a director to a facilitator, the overall curiosity-based learning objectives are as follows:

(1) Read well and listen well—informational input: comprehension and understanding of information.

This objective includes comprehension and understanding of information from all available sources, not just journals, books and the internet, but leaders in the field, industry or market place.

(2) Think well—informational processing: analysis, problem definition and multiple solution generation.

This is an important goal for increasing understanding by using analysis along with additional modes such as visual diagramming or brain storming techniques, testing problem definitions and multiple solution or hypothesis generation.

(3) Communicate well—informational output: This end-process goal consists of verbal self-expression, multiple explanatory methods and skills as well as audience awareness, appropriate feedback techniques and rapport building.

3.2 A Comparison of inquiry-based learning and curiosity-based learning

When reviewing the various learning theories from the west which have been adopted for use in the Thai educational system, such as: student-centered learning, student-based learning, project-based learning, constructivism, problem-based learning and inquiry-based learning, etc. the closest related theory to curiosity-based learning is inquiry-based learning with its common characteristic of the teacher as a facilitator and (see Figure 2).

3.2.1 General characteristics of inquiry-based learning

(1) The teacher does not communicate knowledge, but assist students to learn for themselves;

(2) The topic, problems to be studied and methods used to answer this problem are determined by the student, not the teacher;

(3) Inquiry-based learning emphasizes the constructivism framework of learning, i.e. knowledge is built in a step-wise fashion or “assembled from parts”;

(4) Learning process works best in group situations.

3.2.2 General characteristics of curiosity-based learning (see Figure 2)

(1) Students initiate their direction in the course’s topic based on their own interests;

(2) Teacher and students assist each other acquiring knowledge from various sources;

(3) The teacher assists the students in learning a general educational model that can be easily applied to their future study in any topic;

(4) Students learn to explain as well as defend their research and positions verbally, visually and in writing via a peer review process;

(5) Teachers are afforded the opportunity to gain more knowledge as a result of their students’ research.

3.2.3 Unique and common elements of curiosity-based learning

(1) Common elements of inquiry-based and curiosity-based learning:

(a) Student centered;

(b) Instructor as a facilitator;

(c) Investigative and explorative;

(d) Requires an interactive group.

(2) Unique additions of curiosity-based learning:

(a) Activities designed to make the students aware of their initial self-limiting baseline of curiosity;

(b) Activities designed to increase the student’s self-awareness of the importance of curiosity;

(c) Activities designed to increase the student’s level of curiosity;

(d) Experience with multimodal methods of representing and defending ones research findings;

(e) Experience with a model method of research that can be generalized for later use with any subject.

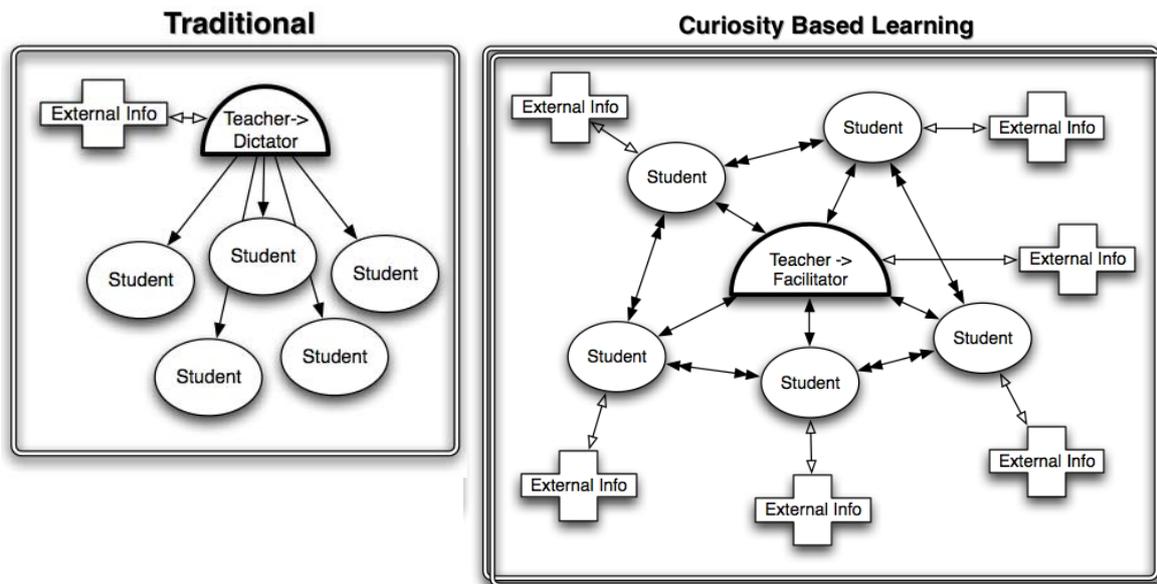


Figure 2 Charts comparing traditional and curiosity-based learning

3.3 Instructor as a facilitator, peer and co-learner

A key shift in curiosity-based learning is in the role of the teacher. The instructor changes from the traditional role of director/dictator to one as a facilitator of the students' learning process. Additionally they function as a peer and consequently as a co-learner in the group sessions (see Figure 3).

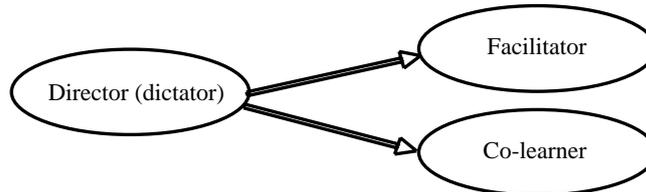


Figure 3 Instructor as a facilitator and a co-learner peer

3.4 The 6 steps of the curiosity-based learning program

The 6 general steps of the curiosity-based learning program are as follows: observe and examine, investigate, acquire, categorize and visualize, communicate, and review and discuss (see Figure 4).

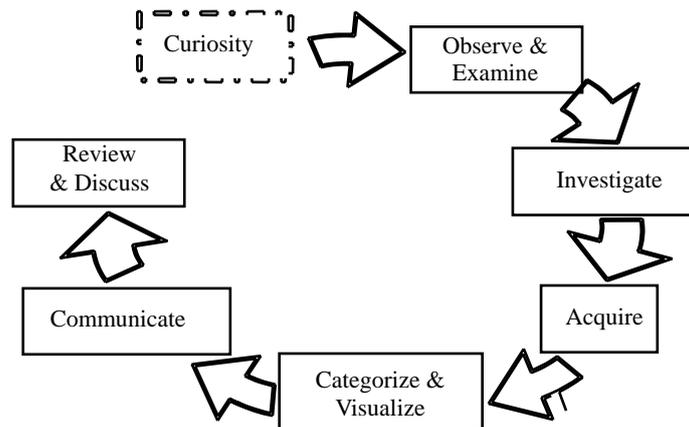


Figure 4 The 6-steps of curiosity-based learning

The program is a 6 step process that includes multi-modes of student self-expression and processes. They are expected to represent their ideas orally, in writing and diagrammed visually while learning the effectiveness and appropriateness of each. They also receive practice in explaining and justifying their views/positions as well as fielding questions from the floor in a peer-review forum as a micro-society of real world presentations. The core issues related to independent work and responsibility is an unstated focal point throughout. Furthermore, the true objectives of this experiential exercise are only disclosed to the participants and expounded upon after their final exercise.

- (1) The 6 steps of the curiosity-based learning program
 - (a) Observe and examine the object; then compose a written description;
 - (b) Investigate others responses; then review the differences and similarities;
 - (c) Acquire more knowledge of the object from additional sources;
 - (d) Categorize and visualize: create a diagram of knowledge data;
 - (e) Communicate verbal and visual presentation with peer review;
 - (f) Review and discussion: instructor discloses the program's true intent.
- (2) Example of the curiosity-based learning program (see Figure 5)

Session 1: Observe and examine the object

Activities: Compose a written description of the object (15min). Then exchange with another student and interview to learn about their awareness differences.

The class chooses one of the everyday objects around them. It can be any object that the students have experienced before such as a ruler, toothpick, candy, pen or cell phone, etc. In this example, an ice cream stick was selected.

Goals: Become aware of ones own baseline level of curiosity. Become aware and motivated by the fact that they missed areas found by classmates and that a simple common item can have areas of complex interrelatedness.



Figure 5 The ice-cream stick is placed on the table and then the students observe and write their own descriptions

Session 2: Investigate—Review another student responses for differences and similarities

Activities: Students explore statements made by others by exchanging their written description with a fellow student. List what they left out and interview their partners to find out why the other students included the points and factors they did.

Goals: Develop thinking, inquiry and writing skills; notice their own personal habits of omission.

Session 3: Acquire—Search for additional information and areas of relatedness

Activities: Students search for additional information from other sources, i.e. books, documents, periodicals, internet sources and leaders in the field, then compose a new more inclusive and “wider” observation paper.

Goals: Students stretch their research range by acquiring more knowledge of this object from other sources. The instructor also assists in acquiring more new information from various sources about the object to share with students.

Session 4: Categorize and visualize—Create diagrams of the knowledge and data

Activities: Students categorize all their research data into different approaches such as appearance approach, philosophical approach, historical approach, environmental approach and usage approach, etc.

Goals: Students gain a capability in the visualization of information and consequently knowledge utilization for more in-depth understanding of the object (topic). Students are “stretched” to practice changing their personal observational habits in seeing different aspects of the object.

Session 5: Communicate—Verbal and visual presentation with peer review

Activities: Students make an individual verbal and visual presentation (diagrams created in session 4) on

their ice cream stick research.

Students make a comparison to their first observational paper and the increase in knowledge gained after more research and diagramming. Students compose a few self-response paragraphs to internalize what are the benefits of a wider awareness and other items they have learned. The instructor and each student are expected to ask a minimum of one question of each presenter.

Goals: Students gain experience in public speaking with the use of visual aids along with building audience rapport, fielding questions and handling feedback. Specifically they are explaining, persuading, defending their findings, hypotheses and conclusions.

Session 6: Review and discuss—Instructor discloses the program’s true intent

Activities: The instructor explains that the program’s purpose was to increase the students’ curiosity level, an awareness of self-limiting habits of assumptions, gain experience and comfort with visual and verbal methods of representing thoughts and data, a greater personal responsibility and independence for their own education and problem solving.

Goals: Instill both an awareness of the importance of curiosity and a learning methodology that can be generalized to any subject area the students pursues.

Functionally, the students are now personally acquainted with the benefits of a wider awareness or increased curiosity.

The tactic of not disclosing the purpose of the previous 6 sessions till the end in of itself increases the curiosity maintained by the students. Then by surprising them with the real purpose during the last session it creates a higher emotional impact which in turn increases the retention of the method and their related experiences so that they will be readily available for future use.

Throughout all the sessions, the author was conscious to not tell or teach, but only to involve the students so that they will not forget this experience nor the importance of curiosity for the remainder of their life.

Tell me and I forget. Teach me and I remember. Involve me and I learn. (Benjamin Franklin)

3.5 How does curiosity-based learning increase the students’ curiosity?

In the very beginning by not informing the students about the true intention of the curiosity-based learning program and maintaining not disclosing it along the way encourages the student to wonder what is really going on and how do these exercises (on an ice cream stick in this example) relate to the course’s main subject? Thai students and students in general, can pick up a self-defeating habit or a survival technique of trying to guess what the teacher “wants” and cater their work to respond and match the hypothesized instructor’s expectations. Some of these students have consequently, lost the real focus of their own education. The non-disclosure of the curiosity-based learning program serves as to increase both the students’ focus on the process of the program (true learning as opposed to guessing what the teacher wants) as well a general increase in curiosity. By being in a simple situation of not knowing its purpose increases curiosity much like placing a child in a hid and seek game. The students know the answer is out there, but where is it? Furthermore, it is human nature to try to explain things that are not initially or readily understood. An unanswered question sits in the subconscious and periodically reminds the consciousness it has not yet been answered.

During the last session, the student will be presented with the answer as to the purpose of the previous 5 sessions. This delay in knowing the answer increases the emotional activation and such activation has been associated with better long term retention. During the final presentation, the students compare their initial

description of the ice cream stick to their full research findings showing the complex inter-relatedness of what at first was seemingly such a simple object. This unexpected result adds additional personal impact to their learning process. They internalize the comparison of their own progress from the first session to the last. Each session is built upon asking questions and building up layers of information like climbing the steps of a ladder.

3.6 Curiosity in a flow state

From the author’s own early learning experience she had a dream to be happy in the classroom without feeling remote from the teacher or falling asleep from boredom. The concept of “flow” from Dr. Mihaly Csikszentmihalyi inspired her to aware of creating a learning atmosphere where each step would engage all students at the appropriate level so that they maintained at state of “flow”. “Flow” is the state where one’s skills are a good match to the difficulty of the task at hand. If the task is too easy, one is bored; too hard one is overly stressed which in turn may result in depression or a student giving up (see Figure 6). The way to increase a student’s skill level is to challenge the student in incremental amounts while keeping them within the “flow channel”. Again see below, where the student would progress in skill level from A to E. At the E level, their skill level has increased to handle tougher tasks without experiencing the frustration created by a task too difficult or conversely bored. This is analogous to a runner progressing from 1km to 2km over the space of 10 weeks by increasing the distance just 1/10km per week.

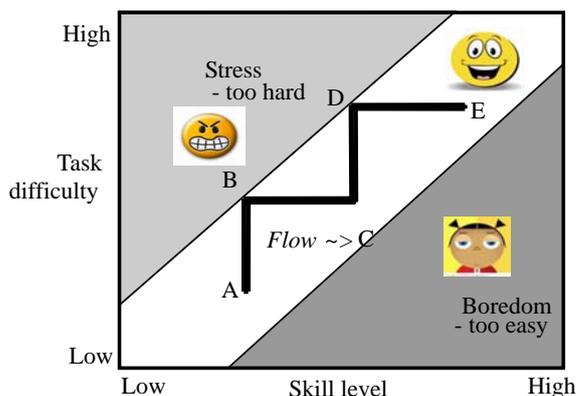


Figure 6 The “flow channel” in relationship to the skill and task levels

Each step of the curiosity-based learning program has been designed carefully to avoid the hardship of stress or the boredom of being too simple. The instructor plays a crucial role in maintaining this balance.

3.7 Student feedback

The student feedback after the curiosity-based learning program experience reflects a high level of satisfaction and increases in their scholarly self-confidence. Several former students that are now college instructors, have mentioned that they felt that the CBL program was so worthwhile that they are repeating in their own classes. Additionally, those in the workplace reported using parts of the CBL program’s methodology in their professional life as a research and presentation tool.

4. Conclusion

4.1 Elements of the curiosity-based learning methodology

The curiosity-based learning model can be adopted and applied for use in most subjects. The example of the ice cream stick is just a simple object that can be utilized by students over the 6 sessions to learn about an objects

inter-relatedness to the world, society and culture, etc., in an academic manner. In the beginning session, the students' initial papers contained only 2 to 10 sentences and only 2 students over the last 6 years of have even bothered to come up and touch and turn over the selected object for closer physical examination. Most students in the first session were self-limited by assuming they already knew all about the object and did not need to touch it or turn it over to see what was on the bottom, etc.

The elements of the curiosity-based learning methodology are: (1) increases curiosity; (2) shared curiosity; (3) categorization of information; (4) searching for additional information; (5) internalize the changes through self-reflection awareness; (6) compose articles and create visual diagrams of interrelatedness; and (7) oral presentation—the act of defending ideas solidifies the meaning for the student.

4.2 Benefits of increased curiosity

Students gain knowledge and direct experience with the curiosity-based learning model impart to the significant role change they have underwent (see Figure 7). The student's role has changed in two ways. They have changed from passive receptor of "chalk and talk" to an active participant in their educational process as well transformed from a follower to a problem solver. Furthermore, the curiosity-based learning program provides the students the experience to model, practice and acquire (refresh) a new mind habit of curiosity and exploration. Then it gives them the experience with verbally as well as visually explaining and defending their research.

There is also a role change for the instructor as well. The instructor shifts from being a director to a facilitator while functioning as a peer when not actively facilitating. A rewarding side benefit of the curiosity-based learning program is that the instructors learn from the students with the information their research brings into the classroom. This helps keeps them fully engaged throughout the program.

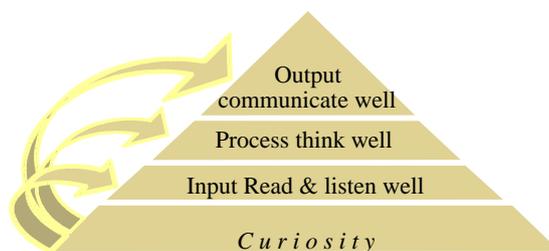


Figure 7 Curiosity is the foundation for the 3 qualities of a scholar

4.3 Curiosity is the foundation

Curiosity-based learning is a tool of learning that applies to everyday situations and is a great method for knowledge research in students' future life since they will never see a simple object in the same way. They instead will have questions about its world's inter-relatedness come to mind.

(Edited by Nicole and Lily)

Improving the teaching of the arts: Pre-service teacher self-efficacy towards arts education

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Abstract: Arts education is an essential component of a comprehensive education, requiring highly skilled teachers to achieve quality arts integration (Andrews, 2004). It equips students with skills necessary for the 21st century workforce, allowing nations to develop the human resources necessary to tap their cultural capital (UNESCO, 2006). A world trend however suggests that arts teaching by pre-service teachers is subject to lack of confidence, motivation and knowledge (Henessy, Rolfe & Chedoy, 2001; Russell-Bowie, 2004). Greater recognition of confirming and disconfirming experiences that shape pre-service teachers' self-efficacy beliefs for arts education is necessary. This paper provides insights into a research project that attempts to contribute towards filling this void in order to improve teacher effectiveness in the arts domain. After the first semester of teacher training, pre-service teachers completed a questionnaire based on their personal teaching beliefs for instructional design, student engagement and classroom management in arts education. Findings provide a greater understanding of how pre-service teachers regulate their own behaviour for teaching the arts, acting as validation beliefs of capabilities.

Key words: teacher self-efficacy; pre-service teachers; motivation

1. Introduction

Many beginning generalist teachers are responsible for the delivery of integrated arts education as part of their curriculum for students aged 10-15 years. This responsibility is dependent on their own beliefs about their competence, school context, pressures of the curriculum and benefits of the arts for students. Within Australia, arts education is considered as a key learning area endorsed by the *Hobart Declaration* (MCEETYA, 1988) and more recently in the *National Education and the Arts Statement* (MCEETYA, 2005). It is comprised of music, drama, dance, visual arts and media. Research in Australia (Russell-Bowie, 1993; 2004) and around the world (Henessy, Rolfe & Chedzoy, 2001; Oreck, 2001, 2004; Smithrim & Upitis, 2001; Upitis, Smithrim & Soren, 1999), however, highlight problems of lack of confidence, motivation and knowledge faced by generalist teachers in delivering arts education. Subsequently, these problems lead to avoidance behaviour, and result in limited teaching and learning of arts education within the classroom for students. One of these problems is also found in science teaching by generalist teachers who exhibit low self-efficacy (Plourde, 2002; Tosun, 2000).

It is accepted that confidence, motivation and self-knowledge inform a teacher's self-efficacy beliefs system. These beliefs operate as a key factor in a generative system of human competence (Bandura, 1997), leading to the assumption that they are powerful influences on the overall teachers' effectiveness with students. The higher the

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sense of self-efficacy, the greater the perseverance and the higher the chance that the pursued activity will be performed successfully. Moreover, teachers' beliefs in their efficacy "affect their general orientation toward the educational process as well as their specific instructional activities" (Bandura, 1997, p. 241). Teachers who do not expect to be successful with certain students are less likely to put forth effort into planning and teaching, even if they know of strategies that could help students.

Teacher self-efficacy is still forming within the beginning years of teaching and once developed according to theory, is resistant to change (Bandura, 1997). During this beginning phase, teachers create their own self-knowledge through their efficacy beliefs as they reflect on teaching arts. Subsequently, efficacy beliefs determine how environmental opportunities and impediments are perceived (Bandura, 2006a). Teachers therefore set goals, anticipate outcomes and monitor their actions as they reflect on their personal efficacy when teaching the arts. From this assumption, the developmental self-efficacy beliefs of beginning teachers are important for investigation for recognition of confirming and disconfirming experiences that shape this motivational construct.

Few studies in Australia however have investigated the impact of teacher self-efficacy on the overall effectiveness of the teacher with students, especially within individual subject areas. An understanding of teacher self-efficacy in different subject matters is increasingly important during the middle grades, and as academic content grows, it becomes more complex (Woolfolk Hoy & Davis, 2006). Research suggests that in science teacher efficacy, beginning teachers who felt lacking in content knowledge tended to avoid teaching topics they did not know well for the fear that they would be asked questions by their students they could not answer (Rice & Roychoudhury, 2003; Tosun, 2000). Furthermore, pre-service teachers lacking in confidence for teaching science deemphasized or avoided teaching science, or taught using transmissive as opposed to inquiry methods (Plourde, 2002). These findings highlight the low level of pedagogical variety used by the teachers if low self-efficacy for that teaching area exists.

2. Arts education in Australia

The expectation of arts education was made in public by the Australian Ministerial Council on Education Employment, Training and Youth Affairs (MCEETYA) releasing a statement entitled the *National Education and the Arts Statement* (2005). The statement was designed to foster a culture of creativity and innovation in Australian schools. It acknowledged that an education rich in the creative arts maximises opportunities for learners to engage with innovative thinkers and learners. Three key principles underpinned the statement to drive change by laying a foundation for stronger co-ordination between educational institutions and also to guide arts and education leaders to ensure that the Australian education system helps children and young people to achieve. These were (MCEETYA, 2005, p. 5): (1) All children and young people should have a high quality arts education in every phase of learning; (2) Creating partnerships strengthens community identity and local cultures; and (3) Connecting schools with the arts and cultural sector enriches learning outcomes.

In particular, it acknowledged that arts experiences enhanced all phases of schooling. All students, irrespective of their location, socio-economic status or ability should have equal opportunities to participate in arts-rich schooling systems (MCEETYA, 2005). School-based arts experiences should be diverse, based on models of effective practice, and embedded from the early years through to graduation in order to unlock the creative potential of young people (MCEETYA, 2005). In order to foster this crucial change in arts education, the statement acknowledges the necessity to foster the skills and knowledge of teachers through pre-service training and professional development.

3. Beginning teachers' self-efficacy

As yet, limited research has explored the development of teacher self-efficacy that is formed during the beginning phase of teaching, created from the four sources of efficacy. Of importance however, is the theoretical assumption that once these beliefs are formed during this beginning phase, they are resistant to change (Bandura, 1997). Research suggests that personal teaching efficacy tends to increase during teacher education and student training (Hoy & Woolfolk, 1990; Wenner, 2001), but decrease during the end of teacher training to the end of the first year of teaching (Woolfolk & Hoy, 2000). This may be caused by the removal of support given to teachers to develop efficacy during the beginning phase of teaching (Tschannen-Moran & Woolfolk Hoy, 2007). Subsequently, while beginning teachers often enter the profession with high hopes about the kind of teachers they would like to be for students, they often encounter a "reality shock", when they realise their hopes may be harder to achieve than anticipated (Weinstein, 1988). Alternatively, beginning teachers exposed to doubts may be more motivated for continued growth and learning to maintain the belief of future success (Wheatley, 2002).

A theoretical understanding of the development of beginning teacher self-efficacy within different contexts is necessary to provide a better understanding of the suitable sources of efficacy necessary to sustain and develop self-efficacy and negate the effect of negative contributors. While research had provided segregated views of beginning teacher self-efficacy by exploring the impact of different sources, a holistic view that encompasses the development of efficacy through all sources is needed. A holistic view of development allows the identification of key stages that impact upon a beginning teacher's effectiveness with students.

4. Hypothesis

The purpose of this study was to investigate perceived levels of pre-service teachers' self-efficacy for arts education. It is hypothesised that pre-service teachers generally exhibit high self-efficacy for arts education (context specificness) during their pre-service teacher training, consistent with personal teaching efficacy research (Tschannen-Moran & Woolfolk Hoy, 2007).

5. Method

15 pre-service teachers completed an adapted version of the "teachers' sense of efficacy scale" (Tschannen-Moran & Woolfolk Hoy, 2001) after their first semester in teacher training. 10 participants were female and 5 male. All were enrolled in the graduate diploma teacher education programme for middle years school teaching (able to teach year 4-10 in Queensland schools). These participants were between 20 and 45 years. The questionnaire was adapted to the context of arts education within the Queensland curriculum. It consisted of the three 4-item sub-scales for efficacy for student engagement, efficacy for instructional strategies and efficacy for classroom management. Sample items include the following:

When teaching arts education to students aged 10-15 years;

(1) Efficacy for instructional strategies: How well can you implement alternative arts strategies in your classroom?

(2) Efficacy for classroom management: How much can you do to manage disruptive behaviour in the classroom?

(3) Efficacy for student engagement: How much can you do to motivate students who show low interest in

the arts?

The full scale has been reported with reliabilities of 0.92 to 0.95 and 0.86 to 0.90 for each of the sub-scales (Woolfolk Hoy, Hoy & Kurz, 2008).

6. Results

The demographic profiles of the pre-service teachers compared to the Australian population of teachers are presented in Table 1. Major difference was the mean age of the beginning teachers compared to the average age of 43 years for teachers in Australia.

Table 1 Comparison of sample pre-service teachers to Australian teachers

Teacher characteristic	Sample	Teachers in Australia (ABS, 2003; 2007)
Male/female ratio	33%/66%	31.3%/68.7%
Mean age (years)	25-29	43
Teaching experience	1yr	n/a

Since the “teachers’ sense of efficacy scale” was adapted to the context of the arts within Queensland (Australia), reliability was tested. Alpha reliabilities in this study were 0.89 for the full scale. Reliabilities for the subscales for classroom management, instructional strategies and student engagement were 0.82, 0.86, and 0.80 respectively.

Means and standard deviations for the full scale and subscales are presented in Table 2. Pre-service teachers generally rated their overall teacher self-efficacy as 6.31 out of a 9 point scale, with a standard deviation of 1.36 when they commenced the start of their teacher education.

Table 2 Means and standard deviations of efficacy and support variables for pre-service teachers

Variables	Mean at beginning of teacher education	SD
Teacher sense of efficacy for arts education	6.31	1.36
Instructional strategies	6.56	1.45
Classroom management	6.49	1.61
Student engagement	6.42	1.55

Note: Scores range from 1 to 9, the higher the score, the greater sense of efficacy or perceived support.

Pre-service teachers concluded:

I feel confident to teach any subject area, given the opportunity to research the content of the field and plan the lessons according to the curriculum. (Pre-service teacher 7)

If I put the effort into learning how to teach it, I will be able to gain the confidence for it. (Pre-service teacher 9)

This suggests that the pre-service teachers exhibited high self-efficacy during teacher education towards arts education. Results are discussed below.

7. Discussion

In examining the self-efficacy beliefs for arts education of pre-service teachers, a somewhat high mean for overall self-efficacy beliefs was found. This higher assessment is quite surprising, considering all of the pre-service teachers were not trained in arts education during their teacher training. These pre-service teachers

realize however that they are expected to engage in arts education (as a key learning area) in their classrooms.

It is possible that these pre-service teachers may have overstated their teacher self-efficacy for arts education as they were yet to begin teaching within the schooling context. This may impact on cognitive processing of teacher self-efficacy beliefs for the arts. This is consistent with the model of teacher self-efficacy proposed by Tschannen-Moran, Woolfolk Hoy and Hoy (1998), where cognitive processing determines how the sources of information will be weighed and how they will influence the analysis of the teaching task and the assessment of personal teaching competence.

It is interesting to note that in numerous inquiries into arts education in Australia (National Senate Inquiry in Arts Education, 1995; National Review of Music Education in Australia, 2005), generalist teacher confidence for teaching arts education is low, with teachers often marginalizing the arts in their teaching. If this is true and future research confirms that pre-service teacher self-efficacy for arts education is high, it may suggest that teacher self-efficacy for the arts starts high, but decreases as teachers begin teaching and continue teaching. Similar findings in the United States of teacher self-efficacy suggest personal teaching efficacy tends to increase during teacher education and student training (Hoy & Woolfolk, 1990; Wenner, 2001), but decrease during the end of teacher training to the end of the first year of teaching (Woolfolk Hoy, 2000). It is suggested that this may be caused by the removal of support given to teachers to develop efficacy during the beginning phase of teaching (Tschannen-Moran & Woolfolk Hoy, 2007). While beginning teachers may enter the profession with high hopes about the kind of teacher they would like to be for students, a “reality shock” sets in when they realise their hopes may be harder to achieve than anticipated (Weinstein, 1988). Beginning teachers may simply “recalibrate” the meaning of quality teaching, lowering their standards in an attempt to avoid self-assessment of failure (Tschannen-Moran & Woolfolk Hoy, 2007). Previous research has further suggested that teachers who leave the profession have significantly lower self-efficacy beliefs than teachers who remain in teaching (Glickman & Tamashiro, 1982).

Of interest was the closeness of results in the individual sub-scales for “instructional strategies, classroom management and student engagement”. All areas were self-reported as high for perceived capabilities surrounding the teaching of the arts. No sub-scale appeared more important than the other in regard to perceived teaching capabilities. Common wisdom would suggest that instructional strategies may have appeared low given the pre-service teachers had not been taught arts education strategies in their teacher training. This was not the case. Again, this may be reflected by the fact that the pre-service teachers had not undergone practical experience in the classroom where current teacher self-efficacy beliefs for the arts may be reassessed. It could also be suggested that pre-service teachers may be drawing on teacher self-efficacy from similar subject domains with similar sub-skills. The findings from this study begin to lend some evidence to the predictions that teacher self-efficacy for arts education is initially high during teacher training. The question remains however, if teacher self-efficacy for the arts does decline after this time period, greater support structures are necessary to sustain teacher self-efficacy.

8. Conclusion

The results in this small study invite further exploration into the antecedents of confirmatory and disconfirming beliefs of teachers’ self-efficacy. More research into pre-service teacher self-efficacy in different contexts and subject domains would be of great value as we learn how to better train and facilitate teachers for their complex teaching tasks. For example, improving the effectiveness of generalist teachers with arts education. This study provides some insights into filling the void.

Greater longitudinal designs are necessary that allow researchers to observe periods of stability and flux of pre-service and beginning teachers' self-efficacy beliefs during teacher training and the beginning phase of teaching. Some of these studies are starting to appear (Woolfolk Hoy & Burke-Spero, 2005; Tschannen-Moran & Woolfolk Hoy, 2007), but from a more generalised perspective of the teaching context. Greater research is also needed into self-efficacy beliefs at different career stages (including mid and experienced stages within teaching). Through such research, it is hoped the quality of arts teaching can improve.

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A model formative assessment strategy to promote student-centered self-regulated learning in higher education *

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Abstract: Adult learners are already involved in the process of self-regulation; hence, higher education institutions should focus on strengthening students' self-regulatory skills. Self-regulation can be facilitated through formative assessment. This paper proposes a model formative assessment strategy that would complement existing university teaching, and can be used in higher education to promote student-centered self-regulated learning with minimal effort and time input from teachers. Based on this model, a real-world teaching example on writing an essay as a challenge task has also been developed. This model strategy incorporates Nicol and Macfarlane-Dick's seven principles of good feedback practice that promotes self-regulation.

Key words: formative assessment; feedback; self-regulated learning; essay writing

1. Introduction

Learning is an active process whereby students construct their own knowledge and skills (Barr & Tagg, 1995; DeCorte, 1996) by interacting with subject content, transforming and discussing it with peers, teachers, parents and the public, in order to internalise meaning and make connections with existing knowledge. In this process, there is considerable evidence that feedback has unquestionable influences that lead to better understanding and desired learning outcomes (Black & Wiliam, 1998; Hattie & Timperley, 2007). Most of the researchers concentrated on either the nature of the feedback (e.g., formative vs. summative, time and structure of feedback; Dohrenwend, 2002; Hattie & Timperley, 2007) or a particular feedback strategy (e.g., two-way fast feedback (Bateman, et al., 1995) or web-based peer assessment (LIN, et al., 2001a; 2001b)). However, those studies failed to consider formative feedback strategies that could enhance self-regulation in higher education. Hence, the aim of the present paper is to propose a model formative assessment strategy that integrates external (e.g., computer, peer, teacher) and internal feedback (e.g., self-reflection) in order to promote self-regulated learning with minimal time input from teachers.

2. Rationale: Do students consider feedback to be useful?

At the University of Western Australia (UWA), there is a definite mismatch between teaching staff and

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students in their opinion about the adequacy of feedback (UWA NSSE and FSSE surveys, 2005). In fact, one third of students felt that feedback was less than adequate. Similar scenario is common in all higher education institutions (Bienstock, et al., 2007) because of two main reasons:

(1) The workload of the teachers in higher education increases as student numbers and class sizes become larger and students come from a greater variety of backgrounds (Yorke & Longdon, 2004);

(2) The feedback given by a teacher fails to reduce discrepancies between current understanding, performance and desired learning goals of students (Hattie & Timperley, 2007).

Further, higher education teachers feel that giving useful feedback individually for the whole batch of students is time-consuming and often repetitive. Hence, teachers are reluctant to give individual feedback. On the other side, students want more individual feedback because it allows them to gain information about what they do or do not understand, find directions and strategies that they could take to improve their knowledge and skills, and seek assistance to understand the learning goals (Hattie & Timperley, 2007). Differences in the opinions on feedback between teachers and students are further exacerbated by concerns associated with the conventional feedback, such as feedback being too late, of limited value, without explanation, of “one-off” nature, and non-progressive. Moreover, teachers usually do not get regular feedback about their own teaching from students and peers, and thus have little chance to understand and meet students’ expectations. Hence, to enhance student learning, feedback to students from peers and teachers needs to be tailored in a way to generate a basis for self-regulated learning.

3. Formative assessment and self-regulated learning

Self-regulated learning refers to a degree to which students can regulate aspects of their own thinking, motivation and behavior during the learning process (Pintrich & Zusho, 2002). Self-regulated learners set up their own learning goals and form strategies by generating more internal feedback, responding to external feedback, using resources and increasing efforts to achieve learning goals and produce outputs that can be compared and assessed (Nicol & Macfarlane-Dick, 2006). To promote student-centered self-regulation, all the assessments need to be restructured as formative assessments (Sadler, 1989; Nicol & Macfarlane-Dick, 2006). Formative assessments are specifically aimed at generating feedback, both internal and external, on performance to improve and reinforce self-regulated learning (Sadler, 1998).

4. Do students have adequate self-regulatory skills?

Adult students already possess some of the evaluative skills to compare actual performance against standards (Sadler, 1989). Further, research showed that students can learn to be more self-regulated through formative feedback (Pintrich, 1995; Zimmerman & Schunk, 2001). Thus, higher-education teachers should focus on strengthening students’ self-assessment skills (Boud, 2000; Yorke, 2003) in order to enhance their learning. There is support for this view, as self-regulated students are able to produce better feedback internally or are more able to use the feedback they generate to reach their desired goals and become high achievers (Butler & Winne, 1995).

Based on these assumptions, this paper proposes a model formative assessment strategy which can be used in any teaching and learning environment to promote self-regulation among students with minimal effort and time input from the teachers. This paper will evaluate this strategy against seven principles of good feedback practice that develops self-regulated learning (Nicol & Macfarlane-Dick, 2006).

5. The model formative assessment strategy

In general, formative feedback needs to address the task or process of learning that fills a gap between what is understood and what is aimed to be understood (Sadler, 1989). Although students can generate internal feedback through a number of affective processes, such as increased effort, motivation or engagement, they need control over their learning to advance further. To provide formative feedback, teachers should structure their teaching in a way that encourages a number of different cognitive processes, including restructuring the understandings, confirming to students whether they are correct or not, indicating whether more information is available or needed, pointing to directions students could pursue, and/or indicating alternative strategies to understand particular information (Hattie & Timperley, 2007). With this view, a model formative assessment strategy (Figure 1) is proposed in order to amalgamate students' internal and external feedback and promote self-regulation as a student proceeds from large class teaching to teacher's assessment.

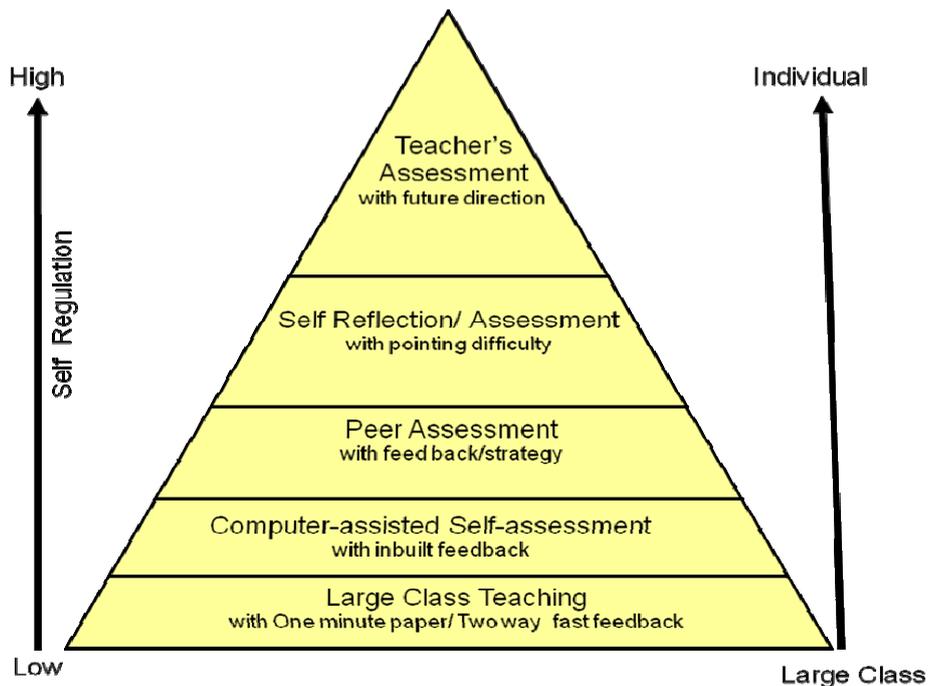


Figure 1 A model formative assessment strategy

5.1 Large class teaching

University teaching tries to promote the growth of the individual students, encouraging them to become independent, creative, self-motivated as well as critical thinkers and learners. Large class teaching in higher education is frequently at odds with the above intention. However, because of growing education needs and a burgeoning number of students in some courses, the universities are forced to continue with large class teaching (Newstead, 2000).

Lack of information about effectiveness of students' learning and teachers' teaching is the primary concern in large class teaching. The "one-minute paper" (Angelo & Cross, 1993) or "two-way fast feedback" (Bateman, et al., 1995) are useful approaches in this situation to maintain teaching standards by knowing more about the students' level of learning and clarifying their misunderstandings. Both methods use simple timesaving surveys to get

immediate feedback from students about the effectiveness of teaching. Then, the students' feedback can be used by the teacher to respond (orally or in writing) to the students' need. The advantages are that the teachers gain knowledge about what should be considered while teaching; it encourages the students to recollect what was taught in a particular session; moreover, it establishes communication between students and the teacher, it saves time on individual feedback and ultimately leads to continuous improvement of teaching and learning (Bateman, et al., 1995).

5.2 Computer-assisted self-assessment

In large classes, it is often difficult to provide feedback to individual students. However, it is not always necessary for a teacher to give feedback individually if another option is available, for example online self-assessment (Ramsden, 1982). Once the web based self-assessment is created, it can be used continuously over the years with minimum updates. The online self-assessment materials should be structured (Gibbs & Simpson, 2004) in a way to offer students various opportunities to test their understanding and to identify their cognitive working levels, without the need to seek face-to-face assistance from the teacher (Edwards, 1989; Zakrzewski & Bull, 1998). This approach is particularly useful to the students who need extra opportunities to enhance their sense of control over their learning. Further, it provides feedback immediately after the performance, can be accessed any time or place, and as often as students wish (Nicol & Macfarlane-Dick, 2006).

5.3 Peer assessment

Peer assessment has been widely practiced across diverse fields of higher education (Falchikov, 1995; Freeman, 1995; Strachan & Wilcox, 1996; Rada, 1998). Most students benefit from formative peer assessment because of two important reasons. Firstly, students are taking the teachers' role of an assessor and feedback provider, in addition to being active learners (Roth, 1997; LIN, et al., 2001b). This feedback demands a series of cognitive activities like reviewing, summarising, clarifying, giving feedback, error diagnosing, and identification of missing knowledge in comparison to ideal standards (LIN, et al., 2001b) and paves the way for actively constructing and refining students' own knowledge on a desired learning outcome. Secondly, just learned students are often far better than teachers in providing alternative strategies and tactics to their classmates in an accessible language (Nicol & Macfarlane-Dick, 2006).

There are some studies (LIN, et al., 2001a) that have documented the negative effects of peer assessment, such as competitor view and ego-related issues, if it prompts marks/grades from peers. Thus, peer assessment should focus on lower order assessment criteria without marks/grades. Peer reviewing has to be monitored by the teachers.

5.4 Self-reflection/self-assessment

Self-reflection is the heart of self-regulation. Students are less likely to be defensive if they judge themselves. Hence, an effective way to impart self-regulation among students is to provide them opportunities to reflect on their own performance (Boud, 1995; McDonald & Boud, 2003). Further, it gives the teacher insight into weaknesses that students have realised, as well as those that students have not yet recognised (Bienstock, et al., 2007). By knowing students' strengths and weaknesses, teachers can offer specific feedback against the learning outcomes.

5.5 Teacher's assessment

Teachers by virtue of their discipline knowledge and experience are more effective in identifying errors or misconceptions in students' work compared with peers or the students themselves. Usually, students believe that only teachers have the ability and knowledge to assess and provide critical feedback about their performance

(ZHAO, 1998). Without feedback from teachers, students' mistakes go uncorrected and good performances are not reinforced, and this might adversely affect student motivation. Hence, teachers form a crucial source of external feedback and play a central role in developing self-regulation among students (Nicol & Macfarlane-Dick, 2006).

Adult learners welcome task-specific feedback from teachers when it is based on their performance and tailored to their learning goals (Hewson & Little, 1998). Further, teachers should consider the "feedback sandwich" technique which begins with positive feedback, then focuses on problematic behaviour and provides suggestions or strategies for improvement, and closes with a positive note in order to maximise the students' performance overall (Dohrenwend, 2002).

(1) How does the model formative assessment strategy incorporate Nicol and Macfarlane-Dick's (2006) seven principles (listed in Table 1) of good feedback practice?

Table 1 Seven principles of good feedback practice

Good feedback practice: 1. Helps clarify what good performance is (goals, criteria, expected standards); 2. Facilitates the development of self-assessment (reflection) in learning; 3. Delivers high quality information to students about their learning; 4. Encourages teacher and peer dialogue around learning; 5. Encourages positive motivational beliefs and self-esteem; 6. Provides opportunities to close the gap between current and desired performance; 7. Provides information to teachers that can help in shaping the teaching.

Source: Nicol and Macfarlane-Dick (2006).

Principle 1: One-minute paper or two-way feedback in large class teaching help the students to recollect what is taught; computer-assisted self-assessment and peer assessment help students to clarify what good performance is by clarifying goals, criteria and expected standards.

Principle 2: As students progress from a large class to self-assessment or reflection stage, they get gradually progressing through various levels of assessment, thus to be more familiar with the link between the assessment and learning. By doing this, students have been trained to self-assess their own work, as well as peers' work.

Principle 3: Almost in all the stages of this model strategy, students can get high quality information either from a teacher or a computer or peers to shape up the cognitive process.

Principle 4: Large class teaching, peer assessment and teacher's assessment stages of this model encourage the teacher and peer dialogue around the learning.

Principle 5: This model provides adequate support to understand the expected standards and enough opportunities to close the gap between current performance and the expected standards. This helps the students to build positive motivational beliefs and self-esteem.

Principle 6: Each step of this model increases students' understanding of their current learning level, thus making the gap between the current and desired performance obvious, at last translating into clear goals to be achieved to reach the desired performance.

Principle 7: One-minute paper and a student's self-reflection provide information to the teacher that can be used to help shape the teaching.

(2) How would the model formative assessment strategy work in the real-world teaching and learning situations?

Table 2 demonstrates how this model formative assessment strategy may work in real teaching using the example of an essay writing task.

Table 2 Example of how the proposed formative assessment model may work in a real-world and teaching situation

Large-class teaching The teacher delivers lectures about essay writing, covering topics such as length, structure, critical thinking, use of evidence, problem analysis, information synthesis, referencing and plagiarism—any misunderstanding on learning can be addressed using one minute paper/two-way fast feedback strategy.		
Computer-assisted self assessment Online learning modules covering topics such as essay structure, referencing and plagiarism, with self-assessment using information and communication technologies like WebCT—to clarify the elements of good practice in essay writing.		
Peer assessment Peers who learned essay writing during the lecture and through computer-assisted self-assessment can correct low-order assessment criteria by sharing explanations, alternative tactics and strategies.		
Assessment criteria		Feedback
<input type="checkbox"/> Length 1000 words <input type="checkbox"/> Structure (abstract, introduction, etc.) <input type="checkbox"/> Clear argument <input type="checkbox"/> Referencing		e.g., Structure, referencing and argument are clear. Long sentences can be simplified to improve the clarity. There are a few spelling errors which can be easily corrected by using a SPELL CHECKER.
Self reflection/Assessment and teacher feedback These two steps can be combined to evaluate higher order assessment criteria		
Assessment Criteria	Student's self reflection	Teacher's feedback
<input type="checkbox"/> Analytical /Reasoning skills <input type="checkbox"/> Clarity of presentation <input type="checkbox"/> Factual accuracy	e.g., I struggled to find reasons to support my arguments	e.g., I am pleased with your clear presentation skills. You can improve your reasoning skills if you read the handouts/ reference materials against essay questions. I like your factual accuracy.

6. Summary

Formative assessment is the key component in promoting self-regulated learning. The proposed model strategy takes into account existing university teaching practices like large class teaching, computer aided self-assessment, peer assessment, self-reflection and teacher's assessment with specific formative feedback strategies. This model strategy allows students to clarify their learning goals, encourages learning conversation among teachers, peers and students, helps teachers modify their teaching approaches, actively involves students in their own learning, and finally provides timely formative feedback in order to hone students' learning skills. All the specific feedback strategies (one-minute paper or two-way fast feedback, computer-assisted self-assessment peer assessment and self assessment) are less time consuming from teachers' point of view, and will bring beneficial outcomes when these feedback strategies tailored together. Thus, teachers are encouraged to focus on restructuring their teaching/assessments to fit in this model strategy.

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Social and communicational skills in upper secondary vocational education and training

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Abstract: This article presents the methodology used by the Finnish Education Evaluation Council in the national evaluation of social and communication skills in vocational education and training. The evaluation concentrates on key competences such as learning-to-learn skills, communication skills, social skills and entrepreneurship (Implementation of Education and Training 2010, 2004; Winterton, Delemare-Le Deist & Stringfellow, 2005; Recommendation of the European Parliament and of the Council of December 18, 2006 on key competencies for lifelong learning, 2006). The evaluation focuses particularly on skills required in the labour market. These competences are included in all vocational study programmes as a part of accompanying with other key competences. The authors' approach follows the principles of developmental and participative evaluation, applying the Common Quality Assurance Framework (CQAF) model, which has been accepted by the European Commission for the quality management and quality assurance framework for vocational education and training in Europe. Additional methods such as interview and statistical data gathering were used to acquire comprehensive data and ensure extensive participation of each partner involved has key competences. The evaluation material was collected from vocational education and training providers by sector (n=8) and by qualification (n=53). Every sector and type of examination was included in the evaluation. The evaluation was based on a sample (n=130). The evaluation data were collected from multiple sources by using multiple methods. The material included written self-evaluation reports by vocational education and training providers (n=130 which equals 95% of VET providers), quantitative information, interviews organized by the National Board of Education and an evaluation seminar for providers as focus groups. Educational administrators, teachers, students, employers and workplace instructors participated in the self-evaluation of the vocational education and training establishments (multi-professional evaluation).

Key words: vocational education and training (VET); evaluation of education and training; evaluation; social skills; communication skills; key competences

1. Introduction

In recent years, the structure of vocational education and training in Finland has been reorganised, the amount of on-the-job learning has increased and skills demonstration has been introduced in all sectors and for all qualifications. The importance of general key competences as part of vocational competence has also been emphasized. These key competences will be further highlighted in the new national requirements for upper

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secondary vocational qualifications now being prepared. Key competences in lifelong learning will be developed according to the recommendations given by the European Parliament and Council (Recommendation of the European Parliament and of the Council of December 18, 2006 on key competencies for lifelong learning, 2006).

This evaluation was a national evaluation project commissioned by the Ministry of Education. The purpose of the evaluation was to analyse the teaching of social and communication skills for working life as part of the three-year vocational education and training programmes. As specified by the Ministry, the evaluation was to concentrate on the following skill areas: (1) social skills (e.g., ability to work with others and to cope with work-related social situations); (2) communication skills (e.g., presentation skills, language skills and customer service skills required in the job); (3) learning-to-learn skills (e.g., learning capacity, self-improvement, self-evaluation of work performance); and (4) entrepreneurship skills and skills for functioning as an independent professional.

The evaluation focused both on the activities designed to develop these skills and on the actual results of this by the end of the education and training. The evaluation considered how education and training providers and educational institutions have taken the need of these skills into account in their curricula, teaching, on-the-job learning, student assessments, teacher training and their overall activities as education and training providers, and the results achieved were also evaluated. The skills acquired through education and training were assessed in the light of learning results data from vocational skills demonstration. The national core curriculum and teacher training were also evaluated.

2. Methodology of the evaluation

The evaluation followed the principles of developmental, participative and collaborative evaluation (e.g., Patton, 1997; O’Sullivan, 2004) and applied the Common Quality Assurance Framework (CQAF) model (i.e., Vocational Education and Training). The data for the evaluation was collected from multiple sources by using multiple methods. The materials included self-evaluation reports written by providers of vocational education and training, statistical information, and interviews with teachers, education administrators and teacher education units.

One of the greatest challenges was conceptually defining the key competences of lifelong learning. This involved referring to the literature on the subject, examining interpretations emerging in the drafting of curricula and qualification requirements, and practical experiences in working life. The concepts were pragmatically defined by a multi-professional team. The concept of entrepreneurship was divided into three sub-categories: “self-motivated entrepreneurship”, “internal entrepreneurship” and “external entrepreneurship”.

The material was collected separately for each qualification to facilitate exploration of special features in and differences between sectors and qualifications. The evaluation involved all sectors and qualifications except for the “circus” sector (n=52). Two education and training providers were chosen to represent each qualification. The evaluation also covered different types of training (training for young people, adult education, apprenticeship training, both Finnish and Swedish speaking education and training and special needs education). The responses covered 127 qualifications (response rate: 93.4%).

Qualification-specific working groups wrote descriptions and generated quantitative data, illustrating the state of the sector at the time of evaluation. After the collating of data and the writing of descriptions, the organizers held an evaluation session, with representatives of teachers, management, workplace instructors and

students participating.

Good practices were compiled from the qualification descriptions written by the education and training providers.

The external evaluation was performed by a multi-professional evaluation group (six members). At the first stage, the qualification-specific materials and best practices were analysed and subjected to criteria-based evaluation. The criteria were based on the CQAF model and target analysis. The main focus was on systematic operations (goals, operations, evaluation and monitoring, continuous improvement, plus results corresponding to goals). The interpretive analysis was carried out both numerically (on a scale from 0 to 5) and verbally. The highest possible point score was 140, and the score components were shown in Table 1 below:

Table 1 Evaluation targets and points

Needs of working life emphasized in education and training	0-20 points
Planning	0-25 points
Teaching and studying	0-30 points
Monitoring and assessment	0-10 points
Improvement and development	0-15 points
Results and effectiveness	0-20 points
Training policy and policy of the education or training provider	0-20 points

The evaluation also set a threshold value for high-quality operations. The evaluation group set the score of “3” as the threshold value: “some clear evidence that operations are consistent with the goals, both in planning and in practice, and some clear evidence that the results match the goals”. This was converted into an overall quality threshold: 57% of the maximum point score. On the basis of this, the education and training providers and qualifications were divided into two main groups: those exceeding the quality threshold and those falling short of the quality threshold. In addition to the scoring, each evaluator analyzed the quality of the results and the action, and wrote a report based on his or her own interpretive analysis. The national evaluation was compiled on these analyses, and the results were interpreted together during the evaluation sessions (n=9).

At the second stage, further evaluation information was sought. Learning results data compiled by the National Board of Education was used, representatives of authorities and teacher training institutions were interviewed, and the revised national requirements for upper secondary vocational qualifications were analysed (using the vocational qualification in construction as an example). A survey was also circulated to teacher training institutions, and an evaluation seminar (focus group discussions) was held to education and training providers to analyse the evaluation results together with teachers. The material supplied by the education and training providers was also used to create a new “in-depth analysis” focusing on the integration of social and communication skills into other areas of teaching and studying (see Figure 1). The extent of this integration was judged using the following criteria: (1) integrated pedagogy (e.g., profound awareness of the key competences of lifelong learning; implementation shared between various teachers and workplaces; inclusion of social skills in student assessment); (2) semi-integrated pedagogy (e.g., responsibility for these competences rests with one teacher); and (3) non-integrated pedagogy (e.g., no-one consciously takes responsibility for the key competences).

The external evaluation was organized in a multi-professional network by the Finnish Education Evaluation Council. It was carried out by an evaluation group, the members of which represented education and training providers, the employers’ national federation, experts of the Finnish National Board of Education and researchers

from various universities.

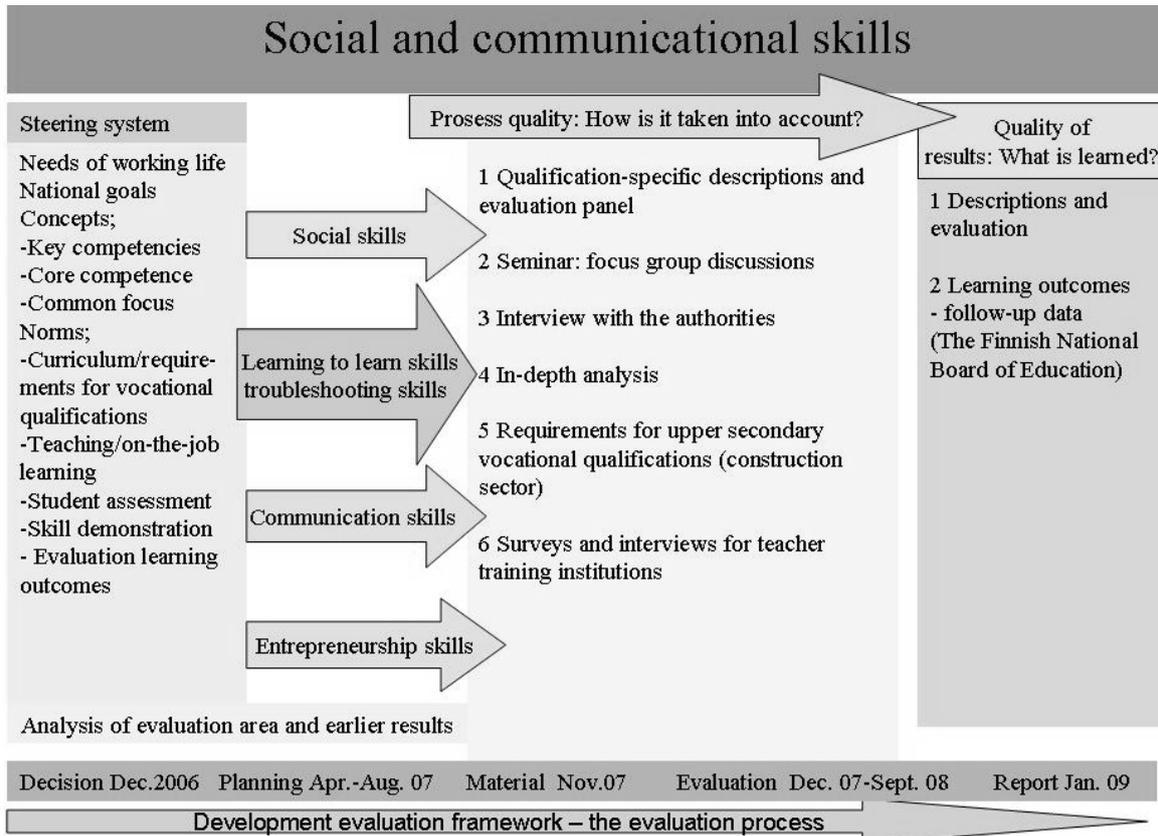


Figure 1 The evaluation framework and process

3. Results and discussion

3.1 Education and training are advancing in line with the goals

The evaluation results show that the general goals regarding social and communication skills have already been attained, and that vocational education and training is progressing according to these goals. However, development challenges still remain.

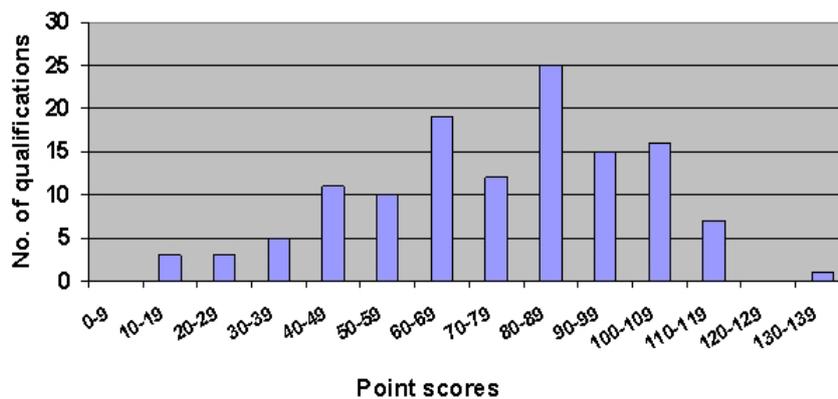


Figure 2 Distribution of scores for social and communication skills in upper secondary vocational qualifications

Figure 2 shows that the most qualifications are to be found at the average point score levels of 80 to 89 (n=25) and 60 to 69 (n=19). None of the qualifications reached the maximum point score (140), though on the other hand none of the qualifications received the minimum score either.

(1) About half of the qualifications in the evaluation (50.4%) attained the quality threshold, set at 57% of the maximum, or 79.8 points out of 140 (Table 1);

(2) 24% of the qualifications (n=30) passed the quality threshold in all sections and 45% (n=57) in some sections;

(3) 32% of the qualifications did not pass the quality threshold in any evaluated section.

Table 1 Quality level by evaluation area

Evaluation area	(a) Education or training provider falls short of quality threshold		(b) Education or training provider exceeds quality threshold	
	N	%	N	%
Needs of working life	59	46.5	68	53.5
Planning	76	59.8	51	40.2
Implementation of teaching and studying	66	52.0	61	48.0
Monitoring and assessment	64	50.4	63	49.6
Improvement and development	73	57.5	54	42.5
Results and effectiveness	61	48.0	66	52.0
Policy	75	59.1	52	40.9
Total score	63	49.6	64	50.4

3.2 Activities aimed at teaching social and communication skills are of fairly even quality, but generally they fail to reach the threshold level

Figure 3 shows that the quality of activities aimed at teaching social and communication skills is fairly even between the various areas evaluated, but they almost consistently fail to reach the threshold level of quality.

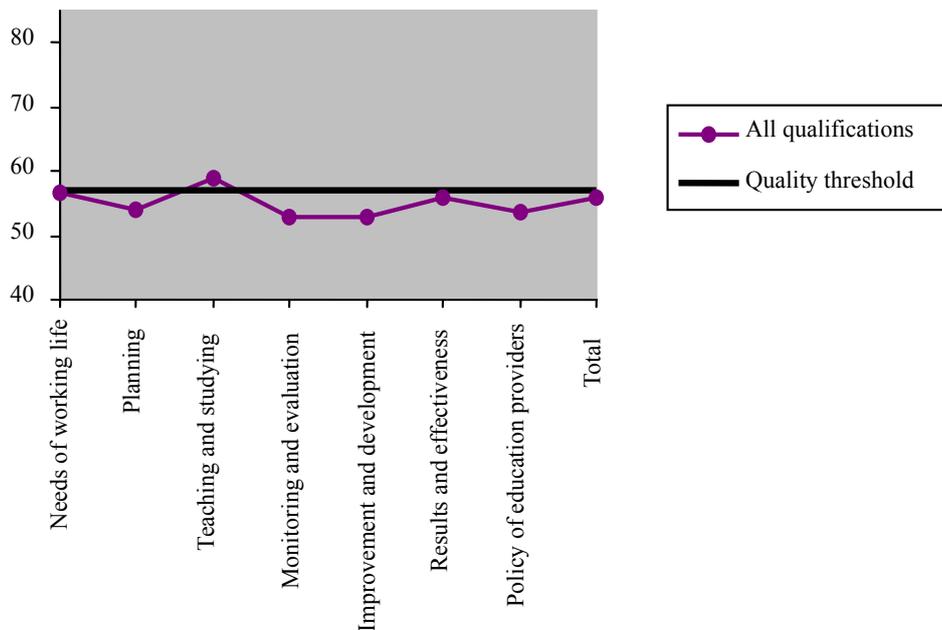


Figure 3 Level of quality for the areas evaluated

The best results were observed in anticipating and adapting to the needs of working life and in activities related to results and effectiveness. The lowest scores were observed in planning, education and training provider policy, improvement and development.

Sector- and qualification-specific differences were significant. In “technology and transport” and “natural resources and environment”, the point scores fell below the quality threshold in every area. Special educational institutions put a great deal of emphasis on social and communication skills, while apprenticeship training focuses least of all on these. The differences were distinct in different educational fields. It is a common idea that the social and communication skills in adult education and apprenticeship education are considered skills acquired and improved during the lifetime, and therefore they are not paid any attention to during the training. There were only negligible differences between Finnish-language and Swedish-language training.

3.3 Interpretive analysis revealed some factors and development needs related to the quality of the action

According to the interpretive analysis, many providers had set a goal for social and communicational skills and lined up activities connected to them. Many providers were lacking definitions of policy and orientation, in which case planning and implementation accumulated on individual teacher’s responsibility. The problem was, that providers’ policy did not always meet reality in educational institutions, and guidelines in an individual qualification did not come true. The distance between the educational or training institution and the education or training provider causes the problem of not seeing each other’s needs. It is a cultural question.

Education providers and educational institutions are aware of working life demands, although their anticipation methods are fairly undeveloped. The most critical point in the planning was related to the aims which for many were unclear, and partly totally missing. A major problem was also, that the social and communicational skills were not specified but taken as a whole. This highlighted, among other things, the need to define the concepts.

In pedagogical activity was emphasized both the significance of printed curricula and student assessment and vocational skills demonstrations. In educational institutions, very little attention was paid to the connection between printed and realized curriculum. The significance of the hidden curriculum turned out to be notable.

The cooperation between different teacher groups is unusual. Confusions occurred in responsibilities in teaching social and communicational skills. In some qualifications, the teachers of vocational studies had this responsibility, in some others, it was on the teachers of the core subjects (mother tongue and foreign languages among others), whereas in some studies the whole responsibility was shifted to the on-the-job-training. Relatively common opinion seems to be, that the social and communicational skills develop naturally along with teaching/training and other communal activity as well as learning on the job, without special investments.

The teachers orientated themselves to teach social and communicational skills through the teaching methods and the subject. Teaching supports group work and teamwork and emphasizes cooperational methods and customer service, on-the-job-learning and student assessment. A closer look at teacher’s work brought out a problem of a single teacher: Vocational studies teachers teach also core studies, such as mother tongue, foreign languages and mathematics.

Student assessment was a great pedagogical challenge. Social and communicational skills are evaluated at the workplace more often together with on-the-job-learning and vocational skills demonstrations than with other student assessment. Usually there are no common assessment criteria but the assessment is teacher-specific. Assessment of social and communicational skills was more formative than summative.

Many providers and educational institutions had rather organized evaluation and follow-up systems, but only a few included in them the follow-up and evaluation connected to the social and communicational skills. In some cases, the evaluation and follow-up procedures were totally lacking. The most essential matter was the feedback from workplaces. The most critical point was the evaluation of the learning outcomes. In great part of the qualifications, learning outcomes are not at all evaluated, yet in spite of that, the teachers were able to present results concerning students' knowledge (=insight). The problem in learning outcome evaluation was also, that the fields related to the social and communicational skills are not specified at all, but are understood as one unity. Besides the student assessment, different qualifications also needed improvement of the evaluation methods which would support teachers work (such as peer evaluation), and also deepening the culture of learning from others.

There was great variation between qualifications in quality improvement and developing. Some qualifications had separate development projects related to social and communicational skills, and some had connected social and communicational developing potentials to be a part of general improvement. Only little evidence of pedagogical innovations could be seen in the data. The problem here was, that development operations are not seen as a vision but as actions, such as development projects. The future development trends were quite narrow and technically oriented.

Although economical and other resources were estimated rather good, more resources are needed for the cooperation between different teacher groups and concerted teaching, for the training of teachers and workplace instructors, for integrating teaching in different special fields, and especially for developing student assessment. Pedagogical leadership (process management) was brought out to be a central development object.

Social skills were emphasized more than other special fields. Language teaching was especially seen a support in building up communicational skills. In practice, learning-to-learn skills were most often entrusted to individual teachers and students. Entrepreneurship was considered important, though students of vocational upper secondary education and training were regarded too young and inexperienced to study entrepreneurship. Some thought that education provides good basic skills for entrepreneurship.

Several critical comments were submitted to national steering and development interests were brought out. Accuracy in national guidelines and objectives, support in developing new methods and culture and teacher training were especially wanted.

3.4 Considerable differences in the extent of integration of social and communication skills into other areas of teaching that is of great importance for the development of these skills

Teaching of these skills was found to be integrated in less than 30% of the qualifications, semi-integrated in less than 40% and non-integrated in more than 30%. Integration was best achieved in the "humanities", "education" and "science" fields, and least well achieved in the "technology and transport", "natural resources and the environment", and "tourism, catering and domestic services" fields. The largest number of qualifications with no integration was found in the "natural resources and the environment" field. Integration was better achieved in special needs teaching than in other forms of education, and the lowest integration rate was found in apprenticeship training.

3.5 The need for social and communication skills in working life is greater than what the education and training system can cater for

Social and communication skills are highly important in working life, but in education and training they are not given as much weight as they deserve. Learning-to-learn and social skills receive the most focus, while the least focus is given to communication skills and entrepreneurship. The results, i.e. the level achieved through

education and training, are estimated to be some 20 percentage points lower than the needs of working life. The entrepreneurship results fall below the quality threshold.

The greatest gaps between the needs of working life, the focus in education and training, and the results achieved were found in qualifications where the pedagogy approach was non-integrated. By contrast, greater focus is placed on the needs of working life in qualification groups with an integrated pedagogy approach (see Figure 4).

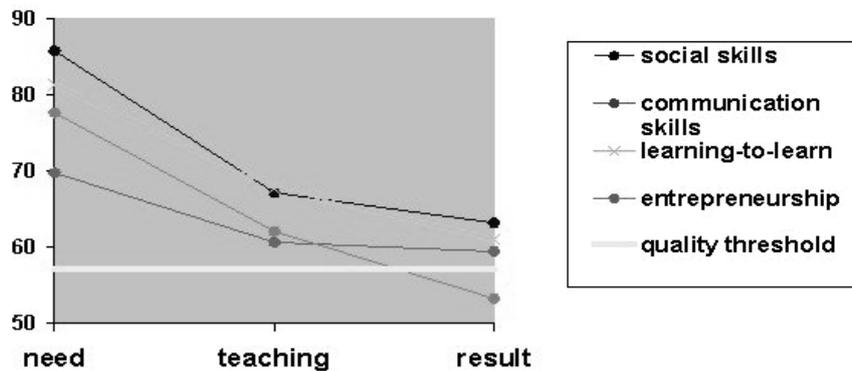


Figure 4 Need for social and communication skills in working life, the emphasis given to them in education and training, and how their point scores relate to the quality threshold

3.6 The learning results are good

In educational institutions, the social and communicational skills of the students are considered to be very good. Easily getting a job, small amount of dropouts and positive feedback from employers were also regarded good indicators of social and communicational skills.

The National Board of Education monitors and evaluates the learning results of vocational education and training (Räkköläinen, M., 2005). The evaluation data is generated directly from vocational competence tests, without national tests, and evaluation data is also generated on lifelong learning skills. The evaluation shows too good learning results: The most common point score in lifelong learning skills is 4 (out of a maximum of 5). There are great differences from one qualification to another in terms of the mastery of key competences. Women generally score better in these skills than men.

3.7 Teacher training is not very systematic in preparing teachers to take social and communication skills into account in vocational education and training

Teacher training institutions vary greatly in their awareness of the growing need for social and communicational skills teaching in vocational education and training. There are also widely differing views on the needs of working life. Procedures for anticipating those needs vary from one institution to another, and differences between sectors were considered great.

There is much variation in the extent to which the needs of working life and vocational education and training institutions are taken into account in teacher training curricula. There is also variance in the extent to which teachers are instructed in how to take social and communicational skills into account in their future jobs. In continuing education for teachers, the focus on social and communicational skills also differs greatly from one teacher training institution to another.

Educational institutions and education providers adopted a very critical attitude towards teacher training in their self-evaluation. The sharpest criticism was focused on the scientific training methods and abstracting the

training from the needs of daily work and life of young people.

3.8 The new national requirements for upper secondary vocational qualifications do not sufficiently clarify the inclusion of social and communicational skills in vocational education and training

In the new national requirements for upper secondary vocational qualifications, great changes have been made to the structure and content compared with the earlier national core curriculum and requirements for qualifications regarding social and communicational skills (Basic qualification in building trade, 2008). The harmonization of concepts achieved with this reform will clarify the vocational qualification system, for instance with regard to its relationship to the needs of working life.

However, key competences in lifelong learning have not been unambiguously defined in the new framework, and it may therefore turn out to be difficult to identify the essential features of each of those competences. The anticipated threats are that key competences in lifelong learning: (1) are understood as one package and not addressed separately; (2) will continue to be left for a single teacher to handle; and (3) are too complicated for people in working life to evaluate.

4. Conclusion

The evaluation demonstrated that vocational education and training is in fact progressing in line with the goals of lifelong learning and the needs of working life. Social and communication skills form part of vocational education and training, and greater importance is being attached to them in revisions to the framework for qualifications. Vocational education has become and will continue to become increasingly dependent on the needs of working life, through on-the-job learning and competence tests. Learning environments have become increasingly oriented towards working life.

The evaluation raises implications how the key competences affect learning methods and outcomes. It also shows a tension between espoused aims and plans to cover these competences and the reality of teaching and assessment practices. In this paper we argue that teachers need better integration of aims and practices as well as clearer pedagogical strategy in order to take responsibility for training in all different skills.

The major challenges concern the great differences observed between education and training providers, sectors and qualifications. There are differences related to operating practices and occupational traditions. The challenges are particularly apparent in the technology, transport, natural resources and environment sectors. The depth of integration in the pedagogical approach is an important challenge in changing operating practices. A further issue is that the special features of social and communication skills are not analysed and itemized; instead, these skills are often considered to be one package. Clarifying the concept of entrepreneurship is the greatest development challenge in this area.

The evaluation group also presented improvement proposals in its report. These refer to education and training providers, qualifications, teacher training, national policies and official supervision.

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Hong Kong students' approaches to learning: Cross-cultural comparisons

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Abstract: Anecdotal evidence abounds in Hong Kong to the effect that students entering tertiary education are predisposed to a “rote” learning approach. With the internalisation of higher education in many countries, there is still insufficient understanding of how Chinese students approach their learning. Except few studies were conducted locally, there have been no systematic studies undertaken and there is a tendency to rely on anecdotal statements about Hong Kong students' approaches to learning. This study was designed to see if Hong Kong Chinese students who enrolled into a 3-year undergraduate programme in occupational therapy predisposed to a surface or deep approach to learning react differently when moving progressively from one stage to the next stage in their curriculum. The study adopted a longitudinal design method and measured students' changes in their approaches to learning using the Biggs' Study Process Questionnaire (SPQ). The internal consistency reliability estimates for SPQ scales for samples of Hong Kong, Australia and UK were compared. The results of this study indicated that Hong Kong Chinese students demonstrated a higher mean for the deep approach learning and a lower mean for the surface approach, similar to other Hong Kong studies conducted in other tertiary institutions in Hong Kong and Australia.

Key words: Chinese learner; approaches to learning; occupational therapy students; cross-cultural comparisons

1. Introduction

Approaches to learning have been the subject of a great deal of research over the past few years. There is now a substantial literature which describes the various ways, in which the learning environment and particularly assessment procedures and teaching methods affect the quality of student learning (Biggs, 1989, 1994b; Ramsden, 1992; Laurillard, 1997; Entwistle, 1998; Kember, 1998; Scouller, 1998; Trigwell, Prosser & Waterhouse, 1999; Kember, 2000; Entwistle, McCune & Walker, 2001). Deep learning and attributes of autonomy, responsibility and critical analysis are championed in Western countries. They are also valued in traditional Confucian belief, which places great value on education both in terms of learning and as a process itself. Unfortunately, Confucian traditional belief appears to be contradicted by reports of Asian students as “rote learners” who are passive and complaint (Samelowicz, 1987; Kember & Gow, 1991; Watkins & Biggs, 1996; Kember, 2000). The research on student learning has shown the importance of shifting the focus from learning approaches to learning conceptions in developing and improving the outcomes of student learning.

An approach to learning was first described by Marton and Saljo (1976) as essentially a way of handling a task, in order to achieve a desired end. In their initial study, the task was reading a text, which students went about in basically two different ways, called “surface” and “deep” approaches. A student adopting a surface approach intended to meet requirements minimally, on the other hand, a student adopting a deep approach intended

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precisely to comprehend content, seeing the facts and details as there to help to arrive at that meaning. To these two approaches, Biggs (1987a), Entwistle and Ramsden (1983) added an “achieving” approach where a student’s motivation is to obtain the highest possible grades and so strategies are adopted which he or she believes would maximise those grades.

According to Biggs (1987a), there are two components in a student’s relationship to academic learning: his or her motive for learning and ensuing strategies for going about learning. Students’ motives influence their strategies of learning (Biggs, 1992), but teaching and learning environment (or context) also influences their choice of strategy. The students’ overall approach to learning thus depends upon two factors: students’ motivation and the learning/teaching environment (Kember, et al., 1997). Students’ preferred approach to learning and preferred learning environment are two important components of classroom learning to consider before learning takes place (Biggs, 1992). Motives and strategies tend therefore to be congruent with each other, besides, they combine to form approaches to learning.

In developing his Study Process Questionnaire (SPQ), Biggs (1976) drew his descriptions of contrasting learning processes from work on cognitive psychology. Factor analysis of this inventory suggested the existence of distinct study processes, which have subsequently been identified as “deep” and “surface” approaches to learning. A qualitative research by Marton and his colleagues (1976) in Gothenburg helped to clarify the meaning of this distinction, and introduced the term “approach to learning”. Subsequent quantitative and qualitative research within the everyday university context has been developed further by other studies (Biggs, 1987a, 1993; Tait & Entwistle, 1996; Marton, Hounsell & Entwistle, 1997).

There have been a number of qualitative investigations of the learning approaches and conceptions of Chinese learners in China Hong Kong and mainland (Kember, 1996, 1999; Kember & Gow, 1991; Watkins & Biggs, 1996; Smith, 2000; Wong, Wen & Marton, 2002). These studies have partially supported the conceptual validity of the constructs underlying the SPQ for Chinese students, as deep, and surface approaches to learning were clearly identifiable in their descriptions of how they went about tackling actual learning tasks. However, it is also clear that memorisation and understanding are more closely interwoven in the experience of learning of many more Chinese than Western students where these concepts are often seen virtually as opposite. Indeed, Kember (1996) has proposed that a new approach to learning may be needed for Chinese students involving an intention to both memorise and understand. With Chinese students, the main difference is between memorisation and memorising with understanding (Watkins & Biggs, 1996).

The literature review also revealed some more studies involving Chinese students. Gow, et al (1989) suggested that a “narrow” approach characterises Hong Kong tertiary students, on the basis of a second order factor analysis of a group of Hong Kong Polytechnic students’ responses to the ASI (Entwistle & Ramsden, 1983), which has aspects both deep and surface. This approach is characterised by the sequence “understand—memorise— understand—memorise ...” on tasks that are clearly defined by the lecturer. In another study, Tang (1991) based on her study carried out with Hong Kong Polytechnic students on the effects of two modes of assessment on students’ approaches to studying concluded that deep and surface approaches used by her students were in much the same way as they are in Sweden, UK, or Australia. Furthermore, while some “deep” students stressed the importance of both understanding and memorising as Gow, et al (1989) also found.

1.1 Hong Kong students

Since this study is concerned with the Hong Kong Chinese students, it is appropriate to ask whether the construction of conceptions of and approaches to learning at the heart of the student approaches to learning

position, which is the theoretical basis for the SPQ (Biggs, 1987a, 1993), are relevant to this group of students, and to other non-Western cultures and is the SPQ reliable and valid for use in such cultures?

To understand fully the Hong Kong student, it may be appropriate to consider learning from a Confucian perspective (Figure 1). When it comes to learning, Chinese learners are more pragmatic, taking in every detail such as personal ambition, family values, peer support, material reward and other interests (Kember & Gow, 1990; Salili, 1996).

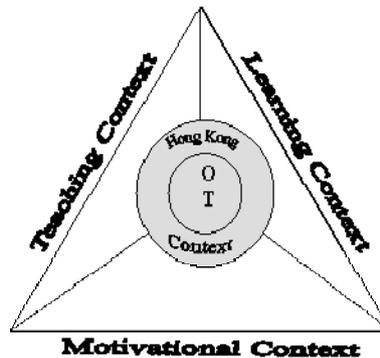


Figure 1 The Hong Kong context

According to Biggs (1991), Asian students were perceived by someone as relentless rote learners—syllabus dependent, passive and lacking in initiative. Such comments were also endorsed the stereotype of Asian students studying in Australia (Ballard & Clanchy, 1997; Bradley & Bradley, 1984; Samuelowicz, 1987). It was also reported that Hong Kong students enrolling in the tertiary institutions would exhibit tendencies to passivity and non-participation. There is also some evidence that, in common with other countries like Australia and United Kingdom, the tertiary educational environment in Hong Kong may encourage the adoption of inappropriate approaches to learning. Interview data from Tang (1991), Kember and Gow's (1990) research showed that Hong Kong students do not simply have a rote learning unprocessed information but attempt to understand the new information in a systematic step-by-step fashion first. Once each part of the task is understood, they memorize the "deeply processed product" (Biggs, 1991). "Deep memorising" as a means towards understanding (Tang, 1991) might seem to be equivalent to a surface approach. However, since students' reliance only on the memorisation may be appropriate and even necessary in some situations, and it should not be equated with rote learning of unprocessed information.

1.2 Occupational therapy students

The student cohorts for this study comprised of 80 occupational therapy students who enrolled for the study at the end of their first year of the three-year undergraduate (Honors) degree in occupational therapy programme, having satisfied the minimum requirements for entry into the Bachelor's programme of the Hong Kong Polytechnic University (PolyU), where the medium of instruction is English. The average age of the group is 18, and all are native Cantonese speakers (The Hong Kong Polytechnic University, DCD, 1999).

With regard to the admission procedure, 85% students enter into the programme via JUPAS (Joint University Polytechnic Admission System) and the remaining 15% students join via non-JUPAS as mature or other category students and these are clearly stipulated in the PolyU prospectus. Students are usually aged 19 or 20 years except mature students who are above 26 years old. It is PolyU policy that encourages students to speak in English in classroom situations at all times.

In relation to Hong Kong students' family structure, the Hong Kong Polytechnic University students tend to live at home with their parents and families during their years of study. Family expectation for success in study is very high. In Hong Kong as in most Chinese societies, there is a cultural responsibility to the family (Bao, 1998). In Hong Kong society, parents attach greater importance to taking a collective decision when deciding a course or a career of their children. This may be a causal factor in the determination of high motivation for performance for students in the Hong Kong school system (Salili, 1996).

It is suggested strongly that changing the learning environment, in particular the task students are required to engage in, can have a major influence on how and what students learn. In the next section, the importance of situations in which learning occurs and the Hong Kong students perceptions of the academic environment, that is, how students respond to the context of learning defined by the teaching and learning contexts.

(1) The teaching context

Teaching style is one of the contextual variables, which affects approach to studying (Entwistle & Ramsden, 1983; Biggs, 1996). The interview data by Entwistle and Ramsden (1983) show that, in addition to course structure, the quality of teaching and attitudes of lecturers influence students in their approaches to studying. Occupational therapy students through their Students Feedback Questionnaire in fact echoed this factor, which is one of the most important feedback mechanisms being used in the PolyU at present. The students also reported other factors as most important categories during researcher's interview with occupational therapy students, such as commitment to teaching and relationship with students, which emerged from focus group interviews.

Observation by the researcher of this study suggests that occupational therapy students tend to work cooperatively in small group situations but do not respond to direct questions in lecture situations. However, their study behaviour tends to be collaborative and cooperative in seeking understanding. This in a way endorses the constructivist beliefs of the Confucian tradition. In the Confucian tradition, there is a belief in skill development prior to exploration, allowing for creativity to be based on foundation. It is in the student-centred scale that students may be engaged collectively in the academic environment on task-oriented problem solving in a warm social atmosphere/learning climate where there is an emphasis on student activity and where high cognitive level outcomes are expected (Salili, 1996).

According to Biggs and Watkins (1996), students are used to a hierarchical relationship with the teacher, but this does not exclude a warm and caring approach. It incorporates respect and acceptance. Students are not passive learners as reported earlier but use receptive learning skills in the classroom and elaborative learning with peers outside the classroom. Students appear to view their teacher as the "expert" and prefer the teacher to provide the "best" solution.

(2) The language context

Hong Kong students like any other Asian students who are studying in a second language frequently face considerable challenges and occupational therapy students are no exception. Hong Kong students not only have to master the content and concept of their discipline, as well as do so through the medium of a language which they may not fully command, but also have to do this within an educational and cultural context quite different from their own. Occupational therapy students who in particular face another problem need to develop not only their own awareness of personal values but also approaches to dealing complex healthcare issues in the light of their experience of disability. These personal, cognitive, linguistic and cultural challenges may interact to restrict, or at least modify the nature of learning.

There is clear evidence in the literature that students learning in a second language are likely to encounter a

number of sources of difficulty, above and beyond those inherent in the materials that they are studying. Biggs (1990) investigated the effect of the language medium of instruction (LMI) in the way students typically approach their learning and addressed the question of whether teaching academic content in second language (L2) medium lead students to adopt a rote-reproductive approach to learning. There are two possible explanations for the strengthening of Biggs (1990) findings:

The first concern is about the English language ability of the students. As reported, the first language of the sample is almost invariably Cantonese. From the researcher's experience, occupational therapy students' use of English is very much restricted to formal interaction within the classroom. As the population of Hong Kong is almost all Cantonese speakers, English is used outside of class so little that few students have acquired the level of fluency in the language, which qualifies it as a second language. Rather, the limited use of English in Hong Kong in general means it is effectively as auxiliary language (Luke & Richard, 1981) rather than a second language.

The second explanation is that as a result of schooling and/or cultural tradition, the Hong Kong students have a high regard for authority and are therefore comfortable with a regulated approach to study (Ho, 1986; Murphy, 1987; Dunbar, 1988; Tobin, et al., 1989).

One factor of note however, is that learning in a second language may lead to a surface approach as students have to focus on well-defined "important" topics, though this may be debated as the findings of this study demonstrated that the student cohort of this study, who are Hong Kong Chinese, scored higher on deep approaches to learning than Australian students did (Biggs, 1990; Salili, 1996). Biggs (1990) also reported that although intuitively one would expect that the use of English would encourage a surface approach, that much depends on the language competence of the student. Kember and Gow (1990) explained this phenomenon as a survival strategy, noting that Chinese students learning in a second language are highly focused and selective in their learning.

(3) The motivational context

The context of learning as an important determinant of motivation and learning from a Confucian perspective has a complex character that goes beyond motivation in the Western culture. The Chinese learners are more pragmatic about learning, taking into account personal ambition, family face, peer support, material reward and interest (Ho, 1991; Biggs, 1996; Yang, 1996).

The negative picture of Southeast Asian learners provided in the literature contrasts sharply with evidence from university statistics which indicates that when English language proficiency is not an issue, Asian students tend to obtain better results in their courses than local students. Many academic staff may explain the high academic achievement of Asian students in terms of stronger achievement motivation and extremely hard work compared with local students. But research in Hong Kong has revealed that there is more to explanation than simply motivation and hard work, and that the assumption about Chinese students' learning in Hong Kong (Biggs, 1991; Kember & Gow, 1990; Watkins, Regimi & Astilla, 1991) and of Singaporean students enrolled at a Western Australian university (Volet & Kee, 1993; Volet, Renshaw & Tietzel, 1994; Volet & Renshaw, 1995) have challenged the stereotyped view of Asian students as reproductive and surface learners, excessively focused on isolated facts and details, and lacking the experience and skills for interacting in group discussions.

2. Methodology and study design

2.1 Sample selection

This study adopted a longitudinal research design. The student cohort of this study were composed of a class

of 80 occupational therapy students who enrolled at the end of their first year of the three-year Bachelor of Science (Honours) Degree in Occupational Therapy programme. The average age of the group was 18 years, and all were native Cantonese speakers. Students had satisfied the minimum requirements for entry into the bachelor's programme of The Hong Kong Polytechnic University, where the medium of instruction is English. The Study Process Questionnaire (Biggs, 1987c) was used pre- and post-clinical education placements.

2.2 The Study Process Questionnaire (Biggs, 1987c)

The SPQ, like the Learning Process Questionnaire (LPQ), was developed to reflect the findings of both quantitative and qualitative research into how students study (Biggs, 1987b). Both research paradigms have confirmed the two most basic approaches that students tend to utilise which were first identified in qualitative research by Marton and Säljö (1976). As reported discussed earlier, students who are learning because of extrinsic motivational factors or fear of failure tend to adopt superficial strategies, and students who are interested in what they are studying are likely to adopt strategies, which help their understanding of the material. These contrasting ways of studying are known as the “surface” and the “deep” approach, respectively. While students tend to be relatively consistent in terms of which of these approaches they adopt, they also modify their approach depending on their perceptions of course requirements and other factors (Biggs, 1987a; Entwistle & Ramsden, 1983).

The SPQ contains 42 items equally and systematically divided among the three approaches to learning (deep, surface and achieving) into six motive and strategy scales as shown in Table 1 below. Each response to an item is to be answered on a five point Likert scale that describes the match with the respondent's behaviour: 1= never or only rarely true of me; 2= sometimes true of me; 3= true of me about half of the time; 4= frequently true of me; 5= always or almost always true of me.

Table 1 Description of subscales with corresponding item numbers of Study Process Questionnaire (SPQ)

SPQ subscale		Description	Item Number
Surface approach	Surface motive (SM)	Motivation is utilitarian: main aim is to gain qualifications at minimum allowable standard.	1, 7, 13, 19, 25, 31, 37
	Surface strategy (SS)	Strategy is to reproduce bare essentials often using rote learning.	4, 10, 16, 22, 28, 34, 40
Deep approach	Deep motive (DM)	Motivation is interest in subject and its related areas.	2, 8, 14, 20, 26, 32, 38
	Deep Strategy (DS)	Strategy is to understand what is to be learnt through interrelating ideas and reading widely.	5, 11, 17, 23, 29, 35, 41
Achieving approach	Achieving motive (AM)	Motivation is to obtain highest possible grades.	3, 9, 15, 21, 27, 33, 39
	Achieving strategy (AS)	Strategy is highly organized and designed to achieve high marks by being a 'model' student, e.g. being punctual, doing readings, etc.	6, 12, 18, 24, 30, 36, 42

Source: Adapted from Biggs (1987c).

The SPQ has many research uses and its scale and subscale scores can be used either as independent variable, for classifying subjects, or as dependent variables, for assessing outcomes. There are many examples of classroom research where it is important to know what kinds of students are affected, or are unaffected, by an intervention; or where it is important to be able to find out which approaches to learning are significant or not, performing a particular task adequately.

2.3 Research design

This study adopted a longitudinal non-experimental (descriptive) design documenting conditions, attitudes, or characteristics of a group of trainee occupational therapy students (Portney & Watkins, 2000; Trochim, 2001). This study adopted a non-experimental design because the investigations are generally descriptive in nature and as

such they do not exhibit direct control over the studied variables (Portney & Watkins, 2000; Trochim, 2001). The study adopted the longitudinal design method which followed a cohort of 80 occupational therapy students over two years and performed repeated measurements at different stages of their clinical development. Because the same sample of subjects was tested through the study at intervals, personal characteristics remained relatively constant, data collected on the same individuals and differences observed over time could be interpreted as developmental change. This study is termed as a descriptive type of research because investigator describes students' development over a period of time. This method is educationally important in the sense that this research is concerned with development of clinical reasoning abilities of individual students over a period of time.

3. Results

3.1 Learning approaches of the student population

Table 2 (below) shows the total number and percentage of students in each approach (surface, deep and achieving) between pre-and post-test SPQ questionnaires.

The data from the above results indicated that there was no significant movement in the deep approach between pre-and post-tests over the period of two years ($p=1.00$, McNemar's test). From the post-test results, it was observed that two more students appeared to be using deep approach, which is a positive shift. The results further confirmed that 5 (6.5%) more students moved towards achieving approach. These findings are in agreement with Biggs (1987a) in that students change from one approach to another over time because of contextual variations.

Table 2 Comparison of learning approaches of the sample population

Learning approach	Pre-test (n=80)		Post-test (n=80)	
	Numbers	%	Numbers	%
Deep-biased	24	30%	26	32.5%
Surface-biased	34	42.5%	27	33.75%
No-biased	22	27.5%	27	33.75%

3.2 Reliability of the Student Process Questionnaire (SPQ) scales and subscales.

Like any measuring instruments, the scales and subscales of the SPQ instrument were assessed for reliability. The following Table 3 shows the comparison of the internal consistency reliability estimates alpha for the SPQ scales for samples of Hong Kong, Australian and British university students and compared their alpha estimates with the present study.

The Australian norms are for 2365 students at 10 Australian colleges of advanced education and five Australian universities, reported in Biggs (1987a).

From the results shown below in Table 3, it can be noted that:

(1) Alpha estimates of this study (a) varied from 0.56 to 0.75 and compares favourably with other studies reported in Hong Kong, Australia and UK (for example, O'Neil & Child, 1984; Hattie & Watkins, 1981; Biggs, 1987a; Biggs, 1992; Chan & Watkins, 1995; Watkins & Biggs, 1996).

(2) What Alphas reported in the present study are considered adequate for research purposes by Biggs (1987a, 1992), Biggs and Watkins (1996) in their SPQ tertiary norming sample in Hong Kong (d), which ranged from 0.53 to 0.77, as well as in Australia, which ranged from 0.61 to 0.77 for college of advanced education students (g).

(3) Alpha estimates of the present study and compares favourably with the alphas reported by O'Neil and Child (1984) for their British undergraduate students whose alpha values ranged from 0.53 to 0.77 (i).

(4) Alpha estimates between this study and a study reported by Chan and Watkins (1995) with their Hong Kong Nursing students' revealed favourable results in which alpha estimates ranged from 0.56 to 0.77 (h). This is an important observation in that occupational therapy and nursing are closely related health care professions and they follow a curriculum in which clinical education forms an important and integral part of their curriculum.

Table 3 Internal consistency reliability coefficient alpha of SPQ scales and subscales

SPQ scales and subscales	Hong Kong students					Australian students			British students
	N=80	N=2338	N=1043	Alpha range	N=190	N=2365	N=823	N=255	N=245
Sub-scales	a	b	c	d	e	f	g	h	i
Surface motive (SM)	0.56	0.53	0.61	0.53-0.56	0.56	0.51	0.61	0.60	0.53
Surface strategy (SS)	0.65	0.65	0.57	0.55-0.65	0.55	0.62	0.66	0.69	0.56
Deep motive (DM)	0.64	0.60	0.66	0.60-0.67	0.67	0.63	0.65	0.67	0.64
Deep strategy (DS)	0.70	0.75	0.72	0.68-0.75	0.76	0.73	0.75	0.72	0.65
Achieving motive (AM)	0.71	0.74	0.73	0.71-0.77	0.71	0.71	0.72	0.70	0.72
Achieving strategy (AS)	0.75	0.69	0.76	0.69-0.77	0.77	0.75	0.77	0.74	0.73

Notes: a. Present study; b. Biggs (1992); c. Kember and Gow (1990); d. Biggs and Watkins (1996); e. Chan and Watkins (1995); f. Biggs (1987a); g. Biggs (1992); h. Hattie and Watkins (1981); i. O'Neil and Child (1984).

Source: The HK norms are derived from the survey of over 5000 students in degree level courses at five institutions in Hong Kong, reported in Biggs (1992).

4. Discussion

4.1 Cross-cultural differences in students' approach to learning

With the internationalization of higher education, tertiary institutions in many countries such as Australia, USA, UK and Canada, have now become extremely diverse. Despite this diversity and the implications for teaching and learning, there is insufficient understanding of how students from diverse backgrounds approach their learning, or how they may differ in their learning behaviour. This section reports on the findings of this study that investigated learning diversity using the Biggs' Study Process Questionnaire (SPQ) in a sample of 80 Chinese undergraduate occupational therapy students in the Department of Rehabilitation Sciences at the Hong Kong Polytechnic University. Furthermore, this section also focuses on cross cultural learning behaviour of the study cohort in relation to other students from other countries because of a pressing need to understand the learning styles, needs and expectations of these students based on the results of this study which supports the findings of some other studies in the literature on cross cultural learning and refutes others. This section also serves to question some of the anecdotal evidence relating to the learning approaches of Asian students, particularly Chinese students, and discusses implications for teaching, learning and diversity management within tertiary institutions' classrooms.

There are conflicting stereotypes existing in the literature about Asian students; this was discussed at length in the literature review. As noted earlier, anecdotal evidence also abounds in Hong Kong to the effect that students entering tertiary education are predisposed to a "rote" learning approach, the cause of which is identified either with innate abilities, their school experiences or some mixture of these. However, until the research studies at City Polytechnic of Hong Kong and Hong Kong Polytechnic (Balla & Stokes, 1989; Gow, et al., 1989; Kember & Gow, 1991; Davies, Sivan & Kember, 1994), there have been no systematic studies performed locally that actually look at the learning styles and approaches exhibited by students emerging from the secondary system, nor of any modifications that might occur as a result of their tertiary experiences.

Analysis of the data in this study indicated that, contrary to some anecdotal evidence cited in the literature (Biggs, 1987c; Kember & Gow, 1991), the Hong Kong Chinese students in this study demonstrated a higher mean for the deep approach to learning (47.3 in Year 1 and 46.3 in Year 3) and a lower mean for the surface approach (42.7 in Year 1 and 42.4 in Year 3), similar to other Hong Kong students from other tertiary institutions in Hong Kong and Australian students from CAE (College of Advanced Education) courses. However, when comparing the findings of this study to Hong Kong nursing Year 2 students, a reverse trend was observed in which nursing students displayed a lower mean for the deep approach to learning (43.48) and a higher mean for the surface approach to learning (44), a trend similar to Australian students with higher mean scores on the surface approach as reported by Biggs (1990), Kember and Gow (1991). To what extent the fact that these findings may be influenced by the large sample population needs to be further investigated. The overall scores for Hong Kong students for achieving approach are higher than the CAE scores, suggesting that Hong Kong students use well motivated strategies, take a keener interest in their studies and are more competitive. Overall, the results of this study were consistent with the research conducted in Hong Kong by Biggs (1992) and others (Balla & Stokes, 1989; Gow, et al., 1989; Kember & Gow, 1991; Dasari, 2006), which challenge much of the anecdotal literature on overseas students' learning. The findings of this study have not only confirmed Biggs' studies, but also supported other studies of the learning approaches of Chinese students at Polytechnics in Hong Kong (Gow, et al., 1989; Kember & Gow, 1991) which found no support for the notion of students from Asian backgrounds adopting essentially surface rote approaches to learning.

When comparing the above results of this study with other cross-cultural studies involving Asian students at universities in the Northern Territory (Niles, 1995) and New South Wales (Ramburuth, 1997), and Singaporean students at Western Australia (Volet & Renshaw, 1996), it is not surprising to note that the learning approaches of Hong Kong students were not vastly different from other Asian students from Northern Territory, New South Wales and Singapore. Furthermore, on the basis of the evidence gathered from this research, it is reasonable to conclude that Chinese students show no difference in their patterns of adaptation to academic demands and that their approach to study was, like that of other Asian students, influenced by their perceptions of course requirements rather than any "typical" personal or cultural characteristic. To sum up, based on the findings of this current study and some other evidence in the literature, the stereotypic description of Asian learners being more prone to rote learning than western students is not supported.

Despite its limitations in terms of sample size, this study draws attention to "the gap" in on-going perceptions of the learning behaviour of cross-cultural students and their actual practices. This study confirmed that the cross-cultural students in fact engage in deep learning, as identified by Biggs (1987a, 1987b, 1987c), perhaps even more than their Australian counterparts. Consequently, it could serve to dispel the myths and generalizations relating to cross cultural learning behaviour. For the Health and Social care professions, this study provides useful data and information that could enable staff to understand more clearly the learning behaviour of their students and differences that exist, and on the basis of this understanding, to reconsider misplaced perceptions. Furthermore, the findings of this study clearly suggest combined usage of the deep and surface approaches by cross cultural students. However, the extent to which these approaches are influenced by cultural factors, as in the practice of memorization, or by learning context and environmental factors, as suggested by Volet and Renshaw (1996) and Niles (1995) also needs further investigation.

5. Conclusion

This study offered the resolution to one of the most central and baffling problems in the field of approaches to learning, namely whether students from Hong Kong or other parts of Asia are more prone to rote learning than their western counterparts; or alternatively whether there is a similar balance of students with propensities towards surface and deep learning approaches, and similar tendencies to be influenced by their learning context. The cultural differences identified in this study support the assertion by Biggs (1996) that the misconceptions that some western observers have reported in relation to the learning of Asian students “exist only by taking too narrow and a systematic view of the components in classroom learning” (p. 196). Furthermore, the author of this paper also believes that the anecdotal observation of rote learning in Chinese learners may also be explained by the nature of curriculum and the teaching environment rather than as an inherent characteristic of the student. The findings suggest that although students from different countries may differ in their ways of learning, the difference would be more subtle than those represented by their dichotomies (surface, deep and achieving) that many educators express. Moreover, the requirements of learning tasks, whether or not assessment is involved, plays a crucial role with the behaviours of teachers in determining whether and how often students use certain learning behaviours.

One of the note-worthy observations made about this problem is that learning in a second language may lead to a surface approach as students have to focus on well-defined “important” topics, though this may be debated as the research literature including the findings of this study showed that Chinese learners in Hong Kong scored higher on deep approaches to learning than Australian students did (Salili, 1996). Kember and Gow (1990) explained this phenomenon further as a survival strategy, noting that Chinese students’ learning in a second language, and they were highly focused and selective in their learning.

Based on this study, it is reasonable to assume that trainee students need critical thinking skills and the ability to organize knowledge in a meaningful way. A student adopting a deep approach relates the content to meaningful contexts, theorizing about what is learned and how it relates to understanding the client’s problems. The findings also supported a view that the achieving approach is different from the deep and surface approaches and according to Biggs (1991), the former refers to arranging the context for carrying out the task that is not to handle the content of learning, as surface and deep learners do, but to manage its context: organizing time, working space and syllabus coverage in the most-effective way (study skills). Students need these skills in order to gain specific learning outcomes. The results indicate that novice students use theories and frames of reference for understanding clinical problems for planning and implementing treatment relevant to the patients/clients needs. From the study findings, it is also realistic to conclude that learning through experience calls on deep learning, that is learning for understanding and meaning rather than rote learning of facts and principles.

From the results, it is also noticeable that some scales, subscales and particularly, surface strategy, deep motive, deep approach and achieving approach were not found to be correlated with students’ academic grades. Although, it would be expected that students’ approaches to learning would influence their academic performance and findings of this study, however, do not fully support this. The results may, however, suggest that it may be due to the fact that the correlations are a reflection that university grades are often not a true indicator of the quality of learning outcomes (Tang & Biggs, 1996). It would seem logical that students who do well in their academic studies would do well in their clinical performance. However, results of this study do not fully support this evidence and are in agreement with other studies (Mann & Banasiak, 1985). While SPQ is a quite useful predictor of academic achievement, it is evident from other research studies that there may be differences in teaching styles of faculty and their relationship with GPA scores (Kember & Gow, 1994; Watkins, 1996; Watkins & Biggs, 1996).

This study has provided evidence that Biggs’ Study Process Questionnaire (SPQ) can be used validly to

assess student learning in a number of countries differing in terms of cultural values, ethnicity and educational systems. Even for Hong Kong students, for whom the extensive SPQ reliability and validity evidence is encouraging, further work is needed to fully justify cross-cultural comparisons of student learning and if appropriate extend the use of SPQ and other instruments measuring approaches to learning as an evaluation strategy for educational innovation in other locations.

Overall, the findings of this study reinforced previous research and support the proposition that the move from stage one of study to the next higher stage can increase students' preference for independent thinking and thus promote deep learning in all three types of students, surface, deep and no-bias approach. It is important to recognize that different students may perceive a learning environment differently, based on their learning preferences and styles, understanding the learning behaviour may provide insights into students' learning across cultures and into individual students' learning needs. Therefore, educators should pay more attention in determining how students' learning preferences and styles affect their attitudes and study skills (Gow, et al., 1989; Entwistle, McCune & Walker, 2000; Coffield, et al., 2004; Entwistle & Peterson, 2004).

6. Limitation

While the SPQ provides a useful evaluation of the learning outcomes consistent with the deep approach construct, whether the nature of the evaluation can be generalized to a wider context outside Hong Kong is open to debate since the studies were conducted in a naturalistic style in a limited setting. It certainly does, though, seem to be appropriate to extend the use of SPQ and other instruments measuring approaches to learning as an evaluation strategy for educational innovations in other countries.

7. Future research

While SPQ offers a tool for directly assessing the quality of students' learning processes which are known to have a strong impact on the quality of learning outcomes, further research is needed to fully justify cross-cultural comparisons of student learning, in particular the possibility of cross-cultural differences in social desirability and context. Furthermore, even the extensive SPQ reliability and validity evidence are encouraging for Hong Kong students; it may be possible to tailor the items to reflect differences from Western students in terms of both motives for learning and the use of memorizing and understanding strategies. The author of this paper hopes to investigate the culture/learning approach more thoroughly through the administration of SPQ scales representing a range of Hofstede's (1997) cultural dimensions such as individualism-collectivism and masculinity-femininity.

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(Edited by Jean and Nicole)

A comparative study of history interests between American and Chinese college students*

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Abstract: The purpose of this study was to compare the history interests between American and Chinese college students. Research studies have consistently shown that American students have very limited knowledge on their country's history. American college students usually do better than K-12 students, but their scores are still low. To address the issue, it is important to understand their history interest. By conducting a cross-nation comparison between American and Chinese college students, the authors found that American students had lower history interest than their Chinese counterparts, but the difference only existed on their positive feeling toward history. Suggestions have been made on how to increase American students' involvement in the history subject.

Key words: history interest; positive feeling; interest field; historical legacy

1. Introduction

Results from the surveys and tests show that American students' history knowledge level about their country is very low (Wineburg, 2004). Since interest in a domain has a powerful facilitative effect on learners' cognitive functioning (Hidi & Harackiewicz, 2000, p. 152), it is necessary to examine students' history interest. However, it is clear that just measuring American student history interest cannot address the issue thoroughly. An effective approach is to compare their history interest with another country that has possible higher level of history interest. We selected Chinese students as counterparts because of the historical background of China. China is a country with at least 4,000 years of history and rich legacies, while the US is relatively young, the total period since the USA independence only dates back 233 years. Going back to the establishment of Jamestown in 1607, the first England colony, the American history is about 400 years¹.

The purpose of this study was to compare history interest levels between the two countries' college students as well as to explore the reasons contributing to the difference.

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¹ People may argue that American history goes back to Native American history. The social forms for Native American history in North America were primitive without word records. On the other hand, Native American history is not the ancient history of modern America.

2. Literature review

2.1 American students' low history scores and possible explanation

Tracing back to 1915-1916, a large-scale test was administered to measure factual knowledge of the United States history that history teachers said American students should know. The result was disappointing: The overall score was 16% at elementary level, 33% at high school, and 49% in college (Bell & McCollum, 1917). Later surveys and tests showed little deviation from this trend:

During the World War II period, the New York Times reported a test result about college freshmen's history knowledge, showing that they were ignorant of the most fundamental aspects of their country's past (Fine, April 4, 1943).

In 1976, the Educational Testing Service conducted a survey examining college students' history knowledge. The outcome indicated that young people's knowledge about their country's history was limited (Fiske, May 2, 1976).

Ravitch and Finn (1987) reported the result of the first national assessment of 17-year-old students' knowledge of history and literature, revealing that students' overall performance on American history was "extremely weak".

In 2001, NASP (National Assessment of Educational Progress) US history test indicated that the majority of grade 12 students scored below the basic knowledge level (National Center for Education Statistics, 2001).

To explain the survey and test results, Wineburg (2004) believed that the students' achievement in the last century provided no evidence for the "gradual disintegration of cultural memory" or a "growing historical ignorance" (p. 1405). He attributed the low score to the assessor, who tried to guarantee the result would be a symmetrical bell curve. The normal curve ensured that the majority of students could not score very good credit.

However, this explanation requires further examination, since the surveys and tests intended to measure students' fundamental knowledge, and they were conducted by different institutions but the results were consistent. The results may reflect that American students possess limited knowledge on the national history.

2.2 Interest and its relationship with students' achievement

"Interest" refers to people's liking and willful engagement in an activity (Schunk, Pintrich & Meece, 2008, p. 210). "Interest" is an interactive relation between an individual and his/her environment, relating to specific topics, tasks, or activities (Hidi & Harackiewicz, 2000; Schiefele, 1991). Researchers commonly sorted the situational interest and the personal interest. The former refers to a temporary, situation-specific attention, and the latter represents a relatively stable disposition. Both of them influence students' cognition and achievement (Krapp, Hidi & Renninger, 1992).

Stevens (1980) investigated the relationship between higher ability students' topic interest and reading comprehension. In the study, Stevens distributed to 5th and 6th grade students a series of reading tasks varying on interestingness and then tested their comprehension ability. The data demonstrated that higher interest materials were significant factors for students with higher ability, but not for lower- and middle-ability readers. Stevens suggested that providing interesting materials to higher-ability students would increase their performance.

Furthermore, Ainley Hidi and Berndorff (2002) investigated how personal and situational interests might influence students' science and text learning. They investigated 8th and 9th grades students from Australia and Canada using self-report and interactive computerized methods. The results revealed that both personal and situational interests influenced students' topic interest, which positively related to students' persistence in learning

the texts.

In Europe, Corbiere, Fraccaroli, Mbekou and Perron (2006) assessed the relationship between students' academic self-concept and their academic interest. More than one thousand students from France and Italy participated in the survey. They concluded that there were positive correlations between students' self-concept, academic interest, and their school achievement.

At the college level, Schiefele, Wild and Krapp (Krapp, 1999) reported a research on the influence of interest on college students' attitude towards learning strategies. One hundred and forty-four students from different majors were recruited to attend the study. During the semester, they filled in a questionnaire assessing their attitude on interest in the course topic, motivation to learn for good grades, per week learning time devoted to course-related work, and general use of learning strategies. After 3 months, students were asked to introduce their strategies in preparing the final exam. The research found that students' study interest affects their adoption of learning strategies.

Schiefele, Krapp and Winteler (1992) did a meta-analysis of the former research on the relationship between students' interest and their academic achievement. After reviewing the 121 independent correlation coefficients, they found that for the subject area (excluding biology and literature), the correlation coefficients are above 0.30, explaining 9% of the variance. There was a significant difference between male and female students: interest explained 12% of the variance for males, but only 6% of the variance for females.

2.3 Constructs of interest

Schiefele (1991) adopted two components of the personal interest: a feeling-related and value-related. The former refers to an association with a topic or topic related activity with positive feeling, especially enjoyment and involvement; and the latter with personal significance to a topic. Hidi and Harackiewicz (2000) adopted three components—knowledge, value, and the positive feeling. They added knowledge as a component to increase people's attention to an activity. Iran-Nejad (1987) argued that interest and liking serve different functions and that the situational interest is not necessarily accompanied by positive feeling.

In the present study, we aimed at investigating the history interest differences between American and Chinese college students. Three questions guided the research: Were there differences of the history interest levels between the two countries' students? What were the reasons? What were the implications of the results in increasing American students' history interest?

3. Method

3.1 Study design

The researcher used quan-QUAL sequential confirmatory mixed methods design, with priority of analysis placed the QUAL stage (Teddlie & Tashakkori, 2006). The rationale for mixing both types of data was that quantitative data could only examine history interest differences, but failed to give the explanation. Consequently, qualitative data would be used to explain and confirm the quantitative results.

We adopted within-strategy mixed methods data collection in which both quantitative and qualitative data were collected by the survey. Data analyses were conducted with two phases. In the first quantitative phase, we hypothesized that American students had lower history interests than Chinese students. T-test was conducted to compare students' interest levels. In the second phase, qualitative data were analyzed in exploring the reason of differences.

3.2 Participants

Eighty-five undergraduate students from a university in the US and 116 undergraduate students from a matched university in China attended the survey. Both universities are public institutions and enjoy similar ranks in their respective countries. The possible influence of different majors on students' history interest was taken into accounts. In both countries, we sampled students in majors that have the same distance to history. Chinese students came from majors of physics, psychology and human resource management; American students mainly came from majors of physics, education and philosophy. After data screening, we kept 79 surveys in America and 113 surveys from China for data analysis.

3.3 Instrument

We developed the History Interest Inventory (HII) to measure college students' history interest. Reliability, Cronbach's $\alpha = 0.95$; concurrent validity, $r = 0.52$, $p = 0.001$.

The inventory included two constructs: the positive feeling and value, which generally conformed to the theory of Schiefele (1991). The construct of the positive feeling reflected students' passion level toward history, including 9 items, such as "I am interested in history" and "I like watching history movies and videos". The construct of value measured students' perception of the value of history, including 14 items, such as: "History let us understand our culture and identity" and "History knowledge can be used to solve present problems" (see Appendix).

Although the inventory was developed with American students, the items and constructs measured students' general history interest. Thus, they can be applied to students from countries of different historical backgrounds.

3.4 Procedure

For American students, HII surveys were distributed to students in class time, and students answered the surveys with paper and pencil. For Chinese students, the Chinese edition of HII was sent to a teacher in the specified university, who printed and distributed to students in class time. After the student answered the questions, the instructors inputted the data into Excel and emailed back to the principal researcher. Students from both countries were told that the inventory was to test their history interest, and no mention was made about the comparative purpose.

4. Results

4.1 Quantitative phase

Descriptive statistics showed that, for the general history interest (general interest), which was the sum of the two constructs, the total possible score was 161. The average score of American students was 111.16, $SD = 26.74$; Chinese students was 123.57, $SD = 22.39$. For the construct of the positive feeling (positive feeling), the total possible score was 63. American students had the mean of 39.90, $SD = 13.57$ whereas Chinese students, 47.08, $SD = 11.19$. For the construct of value (value), the total possible score was 98. American students averaged 71.26, $SD = 16.61$; Chinese students, 76.49, $SD = 13.73$ (see Table 1).

Independent sample t-test was conducted to compare students' general history interest and the two constructs, namely positive feeling and value respectively. We set α at 0.05 (two tails). Because we ran three times comparisons, to control type I error, we reset α at the 0.025 divided by 3 or 0.008 using the Bonferroni method. The results showed that, for the general history interest, the scores of American students were significantly lower than their Chinese counterparts, $t_{(148.36)} = -3.38$, $p = 0.001$. The effective size was small, $\eta^2 = 0.05$, and the 95%

confidence interval ranged from -19.67 to -5.15. For the two constructs, American students' positive feeling to history was significantly lower than Chinese students, $t_{(146.79)}=-3.87$, $p<0.001$. The effect size was medium, $\eta^2=0.07$, and the 95% confidence interval ranged from -10.84 to -3.51. But for the perception of value of history, there was no significant difference between the students (see Table 2).

Table 1 Group statistics

Countries	General interest		Positive feeling		Value	
	M	SD	M	SD	M	SD
America	111.16	26.74	39.90	13.57	76.49	13.73
China	123.57	22.39	47.08	11.19	71.26	16.61

Table 2 Independent sample t-test

Interest	t	df	Sig. (2-tailed)	Mean difference	η^2	Confidence interval (95%)	
						Lower	Upper
General interest	-3.38	148.36	0.001*	-12.41	0.05	-19.67	-5.15
Positive feeling	-4.00	146.79	0.000*	-7.18	0.07	-10.84	-3.51
Value	-2.38	190	0.018	-5.23	0.03	-9.56	-0.90

Note: * $p\leq 0.001$.

4.2 Qualitative phase

The quantitative results showed that the American students scored significantly lower than their Chinese counterparts on the general history interest, but the difference only existed on the construct of the positive feeling. Qualitative data analysis explored the possible reason contributing to the difference. We adopted modified grounded theory in data analysis. Students' answers were broken into units that expressed positive feelings or the perception of value, with the analysis focusing on themes of the positive feeling.

Two themes emerged that might explain students' difference on the positive feeling were "interest field" and "richness of a country's legacy".

4.2.1 Interest field

The inventory measured the general history interest without specifying historical fields or phases. However, students' responses demonstrated that they had different emphases of interest. American students concerned both their country and other countries. In contrast, Chinese students mainly focused on the Chinese history. Even if Chinese students talked about the world history, the intention was to define the position of china in the world.

(1) American students' expression of interest on both their country and other regions

(a) It is also important to know and understand history, particularly that of my own country and culture.

(b) Looking back at history we can see how other countries and civilizations lived and what their structure was for government, social status, education, and their economy. We can tell that the US is like the Roman Empire, if we actually look into detail and compare and contrast our histories! The Roman Empire fell and hopefully the USA will not follow in their footsteps.

(c) History is also useful for learning about the growth of one's society, the mistakes of the society, and the perspective that influenced the people of the past.

(d) It (history) represents all of knowledge that has been passed down through the ages—all history.

(2) Chinese students mainly showed interest on their own country

(a) Chinese history let me more clearly understand people's life, behavior, and psychology in the past; therefore, more understand China.

(b) If a nation lacks detailed historical records, people's national dignity and confidence in striving for success will be weakened. Therefore, to stimulate our people's patriotic spirit, we have to carry forward our nation's inherited patriotic spirit and study our history.

(c) I am interested in history because history can allow me to increase my national responsibility and not to forget national humiliations suffered. At the same time, history let me more understand our country's position in the world and the capability of influence.

(d) History let us know our roots and resources. History makes us unite and stimulates patriotism.

It is clear that American students view history with the concept of the world history, concerning both the USA and others. But for Chinese students, history is perceived as the national history conceptually, featured by a strong sense of nationalism. In terms of history concepts, we may say that American students embrace a world history orientation whereas Chinese students hold a national history orientation.

4.2.2 Richness of a country's legacy

Similarly, both groups of students expressed a theme that learning history was an interesting and enjoyable experience. In addition, both groups attributed the textbooks and classrooms to making the subject dull and ponderous. However, Chinese students demonstrated another reason for their interests due to the richness of Chinese legacy, which did not appear in American students' responses.

(1) Chinese history is centuries-old

(a) History is Chinese development process of five thousand years, including many excellent cultures and thoughts. By history, we can know the steps of Chinese progress, summarize experiences and lessons, and pass the essence of Chinese cultures.

(b) Our nation has many centuries' history, which is like an extensive space, full of diverse stories and human experiences. There are too many things that we can learn and refer to.

(2) Curiosity about the past

(a) I am curious on ancient life styles and ancient people.

(b) There are a lot of mysteries that are very attractive. I am curious on revealing these mysteries.

Long history leaves rich historical legacies, including "cultures", "thoughts", "experiences and lessons", and "human experiences". "Curiosity" closely relates to "many centuries' history". Stories that happened long time ago seem mysterious to students. Thus, these expressions reflect the influence of Chinese rich heritages.

5. Discussion

The results confirmed our hypothesis that American students had significantly lower history interests than Chinese students, but the difference only existed on the positive feeling to history. Based on students' explanation of why they were interested in history, we tentatively analyzed the reasons as following:

(1) American students show interest in both of their countries and other regions, but Chinese students' history interest field is mainly about China. If students perceive themselves as part of a distinct ethnicity, such an identity can be emotionally powerful (Barton & Levstik, 1998, p. 500).

(2) The richness of a country's legacy influences students' history interest. China is an ancient country with plenty of heritages, such as legends, stories, artifacts, and buildings. Historical topics permeate in media,

magazines, and books. In contrast, America is a young country, and such a historical atmosphere is not as strong as in China.

The two reasons may relate to each other. American students are more interested in other countries and cultures because they have less historical heritages. Furthermore, interest field orientations reflect two countries' population components: Chinese population is homogeneous, recognizing the same tradition. American populations are heterogeneous, with people coming from different countries and regions in the world. That may explain why American students wish to know not only their country's history but also other regions'.

American society is technological in nature, but history is still very important. History application and usage exist everywhere, from scientific study to humanities. To increase students' history interest, some suggestions are made below:

(1) Include more history topics for young students in the media, magazines and books. A historical program for children and young people may be opened in public TV channel.

(2) In consideration of American students' expression of interest to other countries and cultures, schools may include more history from other cultures and regions.

As indicated by Schiefele and his colleagues (1992), interest only played part role in explaining students' achievement; therefore, other factors need to be explored in order to better understand and increase American students' history achievement, such as quality of instruction and student learning strategies.

6. Conclusion

This study examined the history interest difference between American and Chinese college students. Students in both countries recognized the importance of history, but expressed different positive feelings to history. To increase the history interest of American students, more historical topics should be included both in schools and public cultural environments; furthermore, to incorporate more materials concerning other countries and cultures may make up the weakness of American history.

A limitation of this study was that we did not do a follow-up interview in order to deeply understand students' history interest, interest field, and their reason. Another limitation was that this study only inspected the general history interest without specifying interest fields. American students may be more interested in world history, and Chinese students more interested in national history. More investigations are needed to answer these questions.

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(Edited by Nicole and Lily)

Appendix:

History interest inventory (college students)

This questionnaire adopts a linear scale 1 to 7, 1 represents disagree, and 7 represents agree.

First construct, positive feeling

- (1) I am interested in history.
- (2) I like history.
- (3) I like listening to history stories.
- (4) I like reading history books.
- (5) I enjoy reading history stories.
- (6) I like watching history movies and videos.
- (7) Sometimes I think why a history event happened.
- (8) I like discussing history with friends.
- (9) I like touring history sites.

Second construct, perception of the value of history

- (10) Learning history is important.
- (11) History increases people's judgment.
- (12) History makes people clever.
- (13) History involves analysis and understanding.
- (14) History would help me and others to be informed citizens.
- (15) History training increases people's ability in argument, presentation, and data selection.
- (16) Learning history broadens my vision.
- (17) To understand today better, we should know yesterday.
- (18) History knowledge is useful in my major/career.
- (19) History offers models of successfully and morally good persons.
- (20) History helps locate our place in contemporary time.
- (21) History let us understand our culture and identity.
- (22) History knowledge can be used to solve present problems.
- (23) Sometimes I think why a history event happened.

The choice of traditional vs. simplified characters in US classrooms

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Abstract: Which form of Chinese characters should be taught in Chinese language classes: traditional or simplified? The results of a questionnaire distributed to sections at the University of Florida show the reasons for students' preferences for one or the other form. In view of the students' awareness that traditional characters are more beneficial to understanding Chinese culture, and of revaluations in China of the traditional form as a carrier of culture, the author maintains that the prevalent practice of teaching simplified characters in US classrooms should be modified. Various other linguistic and historical considerations contribute to this recommendation. Finally, the author offers some suggestions regarding methods of teaching.

Key words: traditional characters; simplified characters; cultural literacy; pedagogy

1. Why should we raise this controversy again?

There has been a continuing debate regarding the use of Chinese traditional vs. simplified characters in US schools. In recent years, the teaching of simplified characters has become more prevalent paralleling the economic development of mainland China. On the other hand, many teachers at the university level—perhaps especially those who specialize in pre-modern Chinese literature—insist that students learn traditional characters.

Through my experience teaching at an American university, I have come to realize the importance and complexity of this issue. First year college students learn the kind of characters that the teacher requires. In the second year, using only one kind of character becomes problematic due to the varying background of students: Some students have returned from study in mainland or Taiwan. Instructors are forced by circumstance to use separate textbooks. This situation is detrimental both to the student and to the teacher. Ideally, Chinese language teachers should come to a consensus on this question and decide how best to meet the needs of both students and teachers.

A second reason of this question that is important is that the debate has spread beyond disputes among mainland and become an international concern. As early as 1956, Some Chinese scholars had initially put forward objections and expressed the opinion that the use of simplified characters was detrimental to the preservation of traditional Chinese culture. After the reform and opening-up policy of China in the 1980s, contacts between mainland and Taiwan increased. The subsequent return of Hongkong and Macao to China, along with the expanded use of Chinese characters in Korea, Vietnam and other countries, sharpened the debate¹.

In October, 2007, at the *Eighth Session of the International Chinese Character Seminar* held in Beijing, a proposal was made by the South Korean attendees to compile a *Comparative Research Dictionary* and the “standard characters” would primarily be traditional form. In 2008, twenty-one commissars of the Chinese

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¹ Traditional characters are used in Hongkong and Macao. In addition, Chinese communities in Malaysia and Thailand use both traditional and simplified characters. Most of the local presses use both traditional and simplified characters.

People's Political Consultative Conference submitted a joint proposal entitled *Setting Traditional Character Education in Elementary Schools*, which suggested beginning the instruction of traditional characters in elementary school².

Considering the recent concern in mainland China with writing as a carrier of culture, the attention of international scholars, and the dilemma faced by teachers of Chinese in US classrooms, we cannot ignore the Chinese character issue. Should we ponder how to make the two kinds of characters equal in status? Is it necessary to adopt an instructional approach of teaching both forms and if so, what particular and methods should be used?

I maintain that it is insufficient to limit discussion to theoretical arguments by politicians, teachers and scholars.

How about the situation of those who study Chinese as a second language? What do they think of traditional or simplified characters? What are the effects on their scholastic progress of studying one or the other form? We need answers to all of these questions.

2. A survey of American students learning and using Chinese characters

2.1 The object of the survey

In order to understand students' perspectives, I conducted a survey during Fall 2007 and Spring 2008 at the University of Florida. Responses to 55 questionnaires were returned. Among the informants, of whom none were Chinese heritage students³, 9 had studied Chinese for one year, 26 for two years, 13 for three years, 5 for four years and 2 for over five years. Among the 55 students, 30 used traditional characters and 25 used simplified characters.

2.2 A simple analysis of the survey data

To ascertain students' opinions of the two forms of characters, and students' willingness to learn the other form, the survey included 8 questions.

(1) Why do you study Chinese? (Multiple choice)

20 students wanted to work in mainland China in the future, 24 wanted to do business with Chinese in the mainland, 19 wanted to do something related in the mainland, 3 planned to teach Chinese in the US, 5 wanted to be diplomats, 10 planned to research Chinese language and culture, 17 were curious, 3 thought it was interesting to study Chinese. Regarding the students' motivation to study Chinese, the data show that about 67% choose the first three items, indicating goals directly related to mainland China.

(2) Why would you choose to use traditional characters or simplified characters?

Among the 30 students who were using traditional characters, 16 students said it was because of a teacher's request, 19 made the choice personally, 1 student was influenced by his (her) parents, 4 students thought traditional characters are more useful. Among the 25 students who use simplified characters, 18 of them made the choice personally, 2 were influenced by parents, 16 thought simplified characters were more useful. Obviously, most students make the choice traditional characters or simplified characters by themselves. But in general, use of traditional characters is directly attributable to a teacher's request.

² According to a report in the *South Metropolis Newspaper*, March 13, 2008.

³ The survey excludes Chinese heritage students in order to reflect truly the actual situation of Chinese study for learners outside of the Chinese cultural milieu.

(3) What advantages and shortcomings do you think traditional and simplified characters have?

Regarding the advantages of traditional characters, 22 students thought they were beneficial to comprehending Chinese culture, 27 thought they were more beautiful, 19 thought they were helpful in learning Chinese, 33 thought they were beneficial to reading traditional books. As to the shortcomings of traditional characters, 31 students thought they were difficult to write and remember, 40 thought there were few opportunities for their use in mainland China, 19 said they require more time to learn.

As for the advantages of simplified characters, 43 students thought they were used by more people, 39 thought they were beneficial to working in Mainland China, 28 thought they were easy to write and remember, 15 thought they were beneficial to quickly learn Chinese well. However, 32 students thought they were not beneficial when reading traditional texts, 30 thought they can not be used outside of the mainland, 15 thought they were disadvantageous when studying Chinese and Chinese culture.

(4) Do you want to switch to studying the other style of characters?

Among the 55 students, 30 identified themselves as users of traditional characters and 20 of them answered that they would persist in using this form. Their reasons included: being accustomed to using traditional characters, considering traditional characters to be more useful and so on. Among the 25 users of simplified characters, 23 students would continue the practice. They said they were accustomed to using simplified characters and they thought simplified characters are more useful.

(5) Can you read the style of characters that differ from the form with which you are most familiar?

Among the 30 traditional character users, 13 could read simplified characters, 16 could read some of them, 1 could not read simplified characters. Among the 25 simplified character users, 7 could read traditional characters, 17 could read some traditional characters, 1 could not read them at all.

(6) What kind of characters is more important to future study and work?

15 students said traditional characters are more important and 34 students thought simplified characters are more important. 6 students did not reply. Obviously, most students thought simplified characters are more important.

(7) Do you hope that in the future, mainland China will return to the use of traditional characters?

Among the 55 student respondents, 27 hoped that in the future mainland China will return to using traditional characters and 27 students gave a contrary reply. Almost all of the traditional character users hoped the Mainland would return to using traditional characters.

(8) Do you think that the Chinese program at this university should require the study of traditional characters?

21 of the 55 students thought that the university should have a requirement to study traditional characters. 26 gave a negative response and 8 thought that the university should have a requirement to study both styles of characters. But most of the respondents hoped to study only one kind of characters.

2.3 Contrast of grades between users of the two styles of characters.

(1) Grades

The following is a list of average final general grades of 96 students in Chinese classes of 4 intermediate sections and 5 advanced sections for Fall 2007 and Spring 2008⁴ (see Figure 1).

⁴ Because the numbers of classes and students vary from semester to semester, the semester is taken as the time unit although I have tracked students' Chinese study for a year.

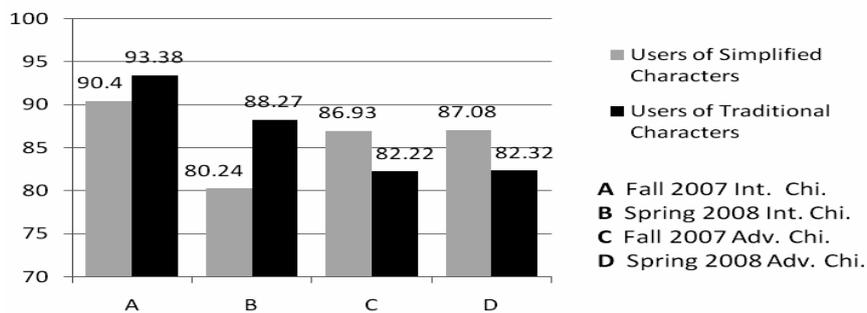


Figure 1 Comparison of grades

(2) Analysis of grade differences

The traditional character users' grades in Advanced Chinese sections are a little lower than those of the simplified character users. We believe the probable reason is that most of the simplified character users studied intermediate Chinese in study-abroad programs in mainland China. Their listening and speaking abilities were better than the others. In the 4 intermediate Chinese sections, the traditional-character users' grades are higher than these of simplified-character users. An important factor was that several simplified-character users were "problem students" whose very poor performance lowered the average grades.

2.4 Brief summary

We can conclude from the above analysis:

- (1) Simplified characters are attractive because they are used in mainland China. Most students think that simplified characters are more important because of their practical application;
- (2) Students choosing traditional characters attribute their choice directly to a teacher's request and their interest. Students choosing simplified characters attribute their choice to pragmatism;
- (3) Generally, students think that traditional characters are tied to Chinese culture and that studying traditional characters facilitates understanding Chinese culture and history;
- (4) Once students are accustomed to using one kind of character, they feel it is very difficult to change. Their basic opinion toward styles of characters is influenced by their established habit of using a particular style. Therefore, almost all of the traditional character users hope that mainland China will return to using of traditional characters;
- (5) There are more students who use traditional characters can read simplified characters than students who use simplified characters can read traditional characters;
- (6) Choice of traditional versus simplified characters appears not to affect the level of success of studying Chinese.

3. Which kind of character is better: The traditional or the simplified?

Since, according to my survey data, there are few differences in the learners' perceived levels of difficulty, efficiency and the impact on learning between the users of two kinds of characters, it is difficult to come to a definite conclusion on which style of character is better. What other factors can bring us to a relatively firm conclusion?

We know that each mature style of characters has its own historical tradition, cultural value, scientific basis and social identity. Therefore, we may review traditional and simplified characters from these aspects without reference to individual taste, habit, and other subjective factors.

The first perspective is the historical tradition. Since inscription on animal bones and tortoise shells appeared in the Shang Dynasty, the written vocabulary of Chinese characters has developed through more than 3000 years and formed a character system which gives priority to the phonogram although it has both ideographic and phonographic components. After the appearance of Regular Script (Kaishu) during the Wei-Jin Period, the Chinese character system has not markedly changed. The Chinese written vocabulary has recorded several thousand years of Chinese national history and the achievements of Chinese civilization. Until now, traditional characters are universally used in Hong Kong, Taiwan, and among overseas Chinese. Traditional characters continue to show an exuberant vitality.

Certainly, no style of character has remained unaltered since coming into being. For instance, the style of the Chinese character evolved from the bronze inscription to the running script. However, character transformation generally follows the order of nature and depends on its own internal unforced adjustment. In the 1950s, Chinese character reform was put forward in response to the demands of popularization of education. It was reasonable to a certain extent. But some decision-makers blindly assumed that the Chinese character's future was an inevitable evolution into alphabetic writing. Thus, they positioned themselves in support of phoneticism and took simplified Chinese characters to be the forerunner to a subsequent transition to alphabetic writing.

From the promulgation of simplified characters in 1956 to now, the history of simplified characters is much shorter than that of the traditional characters and, thus, its tradition is also frail. In this new century, China faces the recent surge in the development of science and technology, more widespread interaction with other nations and more frequent communication between the Mainland and Taiwan. Today the reality surrounding character usage has changed. Many flaws of simplified characters have been increasingly revealed. A call to examine carefully Chinese character reform and to restore partly the use of traditional characters is unceasing. This should be seen as a natural request for character adjustment that conforms to the logic of history.

A second perspective focuses on cultural traits. The written character is not only a record of language. A character system is, in effect, the cultural genetic code. Chinese characters follow six categories of methods of transmission of meaning. Many characters have abundant connotative meaning and reflect an accumulated legacy of cultural information. Several succinct examples of such characters follow: the character “亲” (close) includes the meaning of meeting frequently and thus connotes familiarity and mutual intimacy. “麵” (flour) tells us that flour comes from wheat. “尧” (Yao) is the earth-god. A common example is the character “爱” (love) which explains that only wholehearted love is real love. These are just a few of thousands of examples. Today we can still discover information of Chinese social, material, and spiritual life from numerous age-old characters. Unfortunately, many simplified characters have lost some symbolic, ideographic and pictographic-phonetic mark symbols. Simplified character users do not know who is “尧” (Yao), or where the bread flour comes from (面 flour), and love without sincerity is not real love (爱 love). The cultural implication of Chinese characters has been weakened greatly as a result of simplification.

Traditional characters are stable and have changed little over several millennia. Consequently, every educated person was able to read ancient books. Values of Chinese culture are preserved in traditional characters and are beneficial to subsequent generations. After simplification of the characters was carried out, the ability to read ancient books was lost. Consequently, all the magazines and books published before the mid-20th century became essentially inaccessible antiques. Simplification blocked the natural and beneficial transmission of Chinese culture.

Again, the Chinese characters impart a special cultural cohesive force. Traditional characters have continuously sustained the Chinese nation's self-identity through several millennia. Regardless of how many

speakers of Chinese are separated in all parts of the world, Chinese characters can form a kind of spiritual homeland. Since the simplification of characters was carried out, the young generations' self-identity as Chinese and sense of ascription to their native culture has consequently declined.

A third perspective is the logical development of Chinese characters. A character's development and evolution always follow an internal and objective regularity. The majority of simplified characters show a reduction in the number of strokes, a change that facilitates learning but has destroyed some basic rules of traditional character system. The main problems occur in three aspects:

(1) Homophone borrowing: Simplified characters include many different words using the same character, so that the so-called the phenomenon of "one for many" occurs. For instance:

发(fā): 頭髮(hair), 发展(development); 历(lì): 历史(history), 年曆(calendar);
后(hòu): 后来(later), 皇后(queen); 干(gān): 干戈(arms), 才干(ability), 乾淨(clean), 樹幹(trunk)

This kind of simplification has violated the discriminative rule of Chinese characters. It also causes difficulty in converting traditional characters from the corresponding simplified characters. Statistics have indicated that homophone replacement has led to the formation of approximately 106 groups of "one for many" characters⁵. These characters have been developed into a kind of mark that neither records sound nor expresses meaning accurately.

(2) Symbol substitution: For example, the mark "又" (yòu, again) has replaced the original different phonetic notations of characters 汉(Chinese), 邓(a surname), 凤(phoenix), 戏(drama), 雞(chicken), 对(right), 劝(persuade), 圣(saint), which have been changed into 汉(Chinese), 邓(a surname), 凤(phoenix), 戏(drama), 鸡(chicken), 对(right), 劝(persuade), 圣(saint). The original phonetic notations are different and their pronunciations are respectively different. All of them are rewritten into "又" (yòu, again). Consequently, now we do not know their original pronunciations. Although the strokes have been reduced, students have to remember the characters one by one when they study, without reference to the originally varying pronunciations indicated by varying phonetic notations.

(3) Confusion among radicals: In a group of characters that originally used the same radical, some characters were simplified but some were not simplified. For instance, in the group of characters 拥(cuddle), 壅(obstruct), 臃(overstaffed), 囔(stop up), 癰(ulcer), 饗(cook), 甕(jar), 薙(tuft), only 拥(拥, cuddle), 癰(癰, ulcer), 甕(瓮, jar) were simplified. In the group of characters 还(return), 环(loop), 寰(extensive region), 鬟(bun of hair), only 还(还, return) and 环(环, loop) were simplified. This kind of simplification has violated the correspondence principle of simplification: the traditional style and simplified style must correspond mutually so that students can rapidly know the character analogically.

The simplifications exemplified above not only have failed to strengthen the phonetic function of Chinese characters, but also have attenuated the original function of characters to show their meaning and source. This is disadvantageous to maintaining the Chinese characters' configuration and structural principles.

The fourth perspective is social identity. As soon as a character passes into circulation, there is inevitably a certain social norm to restrict its use. In Chinese history, the standardization of characters generally depended on a natural accommodation. For example, *Annotations of Chinese Characters (Shuo Wen Jie Zi)* written by XU Shen in the Han Dynasty was accepted by the masses because it reflected a natural adjustment of characters acceptable to society. Chinese traditional characters obtained stable social acceptance through a long-term natural adjustment and widespread use. In the mid-20th century, the stage of history required that character usage be adapted to

⁵ LI Xiang-he. (1995). Discrimination of traditional form and simplified form of a Chinese character, standard form and variant form of a Chinese character. *Language Construction*, 1.

popularization of education. Therefore, the readjustment and the new standardization of Chinese characters were understandable. However, a new contradiction has appeared in the 21st century. In mainland China, people yearn to understand the value of traditional culture again. Therefore, there is more focus on the question of the Chinese written characters. More and more publishing houses return to print books by using traditional characters. Numerous books and magazines by using both traditional and simplified characters are exchanged among mainland China, Taiwan, and Hongkong. Many transnational enterprises print their product instruction booklets using both kinds of characters. In such a situation, people require temporization and adjustment to the body of Chinese characters again. This is precisely an inevitable development in the social acceptability of particular forms of characters.

4. Write traditional characters and read simplified characters or the reverse?

The above analysis has focused upon traditional characters' cultural authority, implications, and upon its aesthetic value. However, traditional characters generally have more strokes. Simplification of characters reduced the number of strokes, but the principles applied lack rationality and consistency. Simplification also undermines the inheritance of traditional Chinese culture. We hope that Chinese government will re-standardize Chinese characters in order to reduce the artificial burden to study and use.

I believe that the ideal means to carry out a standardization of characters is to organize experts to study earnestly the two kinds of characters and then to improve and optimize traditional characters which truly need simplification. Simultaneously the authorities will correct wrong-headed simplification. After that, the new standard characters can be used in formally written and printed writing, and simplified characters can still be used in daily handwriting. After one or two generations' adjustment, the new standard Chinese characters can be restored to wide acceptance.

However, we must face the reality of the people's usage of characters before we re-standardize Chinese characters: Simplified characters are still the legal characters form in mainland China. Facing this reality, there are only two options for Chinese teaching overseas. They are "write simplified characters and read traditional characters" versus "write traditional characters and read simplified characters".

I think that the latter is an ideal approach. It is not only advantage when learning Chinese; it is also helpful when adapting to different situations of character usage in the future. At present, the former is more popular because many students think that the simplified characters have more practical application and are easier to learn. In fact, it is relatively easier for a traditional character user to become a simplified character user. However, the reverse is quite difficult. This should be made explicitly clear to the students from the beginning.

After we have accepted the principle of "write traditional characters and read simplified characters", the next question is how to bring it into effect. The traditional pedagogical theory holds that the learner should proceed from easy to difficult. However, some research has shown that sometimes it is advantageous for language teaching to move from difficult to easy. An example is an experiment conducted by Eckman Bell and Nelson, who taught students to learn English relative clauses. They began instruction with the most difficult subordinate clauses; then they taught easier clauses. The researchers' conclusion was that students who first studied difficult clauses (with more markers) could easily grasp the easy clauses (with few markers). The reason is the clauses with more markers subsume instances with fewer markers⁶.

(to be continued on Page 80)

⁶ ZHU Yong-ping. (2004). Forecast of difficulty to study a second language and teaching strategy. *Language Teaching and Research*, 4.

Teaching and learning how to write proofs in *Concepts of Geometry**

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Abstract: This paper concerns my experience teaching *Concepts of Geometry*, an inquiry-based course that emphasizes discovery learning, analytical thinking, and individual creativity. The author discusses how to guide the students to recognize the connections among different mathematical ideas; to select the types of reasoning and methods of proof that apply to the problem; to organize their mathematical thinking through communication; to make their own mathematical conjectures; and to analyze and evaluate each other's mathematical arguments and proofs. In particular, the comments and the feedback from students are included.

Key words: inquiry based teaching; discovery learning; constructivist based approach

The Mathematics Association of American's Committee on the Undergraduate Program in Mathematics (CUPM) made recommendations to guide mathematics departments in designing curricula for their undergraduate students. The following statement is quoted from the CUPM Curriculum Guide 2004:

Recommendation 2: Develop mathematical thinking and communication skills.

Every course should incorporate activities that will help all students' progress in developing analytical, critical reasoning, problem-solving, and communication skills and acquiring mathematical habits of mind. More specifically, these activities should be designed to advance and measure students' progress in learning to:

- (1) State problems carefully, modify problems when necessary to make them tractable, articulate assumptions, appreciate the value of precise definition, reason logically to conclusions, and interpret results intelligently;
- (2) Approach problem solving with a willingness to try multiple approaches, persist in the face of difficulties, assess the correctness of solutions, explore examples, pose questions, and devise and test conjectures;
- (3) Read mathematics with understanding and communicate mathematical ideas with clarity and coherence through writing and speaking.

In responding to the CUPM Curriculum Guide, the author started a project to use an inquiry-based teaching style in *Concepts of Geometry*, a junior- and senior-level college geometry class. This class emphasizes discovery learning, analytical thinking and individual creativity. The goal was to guide the students to recognize the connections among different mathematical ideas; to select the types of reasoning and methods of proof that apply to the problem; to organize their mathematical thinking through communication; to make their own mathematical conjectures; and to analyze and evaluate each other's mathematical arguments and proofs.

In this report the author present the results of a study investigating the effectiveness of teaching proof writing via an inquiry-based teaching style in his *Concepts of Geometry* class during a two-year period, Fall 2006-Fall 2007.

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The study involved developing inquiry-based teaching/learning material, a set of survey questions for the students, and the analysis of the answers received. According to the survey, the author found a wide variation in the responses from the students during the period of the study with the trend toward favoring an inquiry-based teaching approach.

This study suggests that using an inquiry-based teaching approach does indeed improve learning, in particular, learning to write proofs.

1. Introduction

Geometry is an important component of the K-12 curriculum and is required by the Department of Education. As part of the requirements to complete their undergraduate degrees, pre-service secondary mathematics teachers (PSMTs) complete many mathematics courses, including a geometry course. The textbook we use is *Roads to Geometry* by Wallace and West. This book is for an upper-level class, and it clarifies, extends, and unifies concepts discussed in basic high school geometry courses. Topics include axiomatic systems, axiom sets for geometry, neutral geometry, Euclidean geometry of the plane, analytic and transformational geometry, non-Euclidean geometries and projective geometry. A key characteristic of the book is proof writing. Writing proofs is an extremely difficult mathematical concept for students. Studies such as Senk (1985), Moore (1994), and Weber (2001) have shown that many students who completed the proof-oriented courses, such as high school geometry, introduction to proof, and abstract algebra, are unable to construct anything beyond very trivial proofs. Moreover, they cannot determine whether a proof is valid or not.

After teaching *Concepts of Geometry* via traditional lecture for four years, the author noticed that most of the time when the author introduced proof writing or constructed proofs, the students passively copied the lecture notes without really understanding the material. They did not learn how to reason; therefore, they did not know how to construct a proof by themselves. Furthermore, the students had great difficulty in following the proofs written in the textbook. The author began to wonder whether or not an inquiry-based teaching approach would have a positive effect on students' learning of proof writing in geometry class.

Seymour wrote, "You can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it". Discovery or inquiry-based teaching has proven to be far more effective than the traditional lecture approach in the classroom according to the current research in learning theory. The concept of discovery learning has appeared numerous times throughout history as a part of the educational philosophy of many great educators. Discovery learning has shown that if provided a personal and constructive learning environment, students will lead themselves to discover the truth through learned experiences and prior knowledge.

However, the traditional lecture approach plays a key role in all classes in the department of mathematics at the author's university, Southeast Missouri State University (Southeast). Although most faculty members in the department are aware of the inquiry teaching method, it has not received overwhelming acceptance due to many obstacles. The major obstacles are: (1) lack of experience; (2) lack of supporting material; (3) lack of administration support; and (4) lack of peer interest.

The Educational Advancement Foundation (EAF) is an organization that supports the development and implementation of inquiry-based learning at all educational levels in the United States, particularly in the fields of mathematics and science. Moreover, the Center for Scholarship in Teaching and Learning at our institution offers

assistance and small grants to faculty to study how their pedagogy is linked to learning. In the year 2006, the author was awarded a grant to establish a pilot project for an inquiry-based learning mentoring program in the Department of Mathematics at Southeast Missouri State University. We developed inquiry-based learning material (a problem sequence) suitable for the three-credit-hour *Concepts of Geometry* course in the summer of 2006 and used the material in the Fall 2006 *Concepts of Geometry* class. The author taught the *Concepts of Geometry* class for the first time in Fall 2006. In Spring 2007, the author was awarded the Center for Scholarship in Teaching and Learning (SoTL) grant and became a SoTL fellow, which allowed me to continue the pilot project in the *Concepts of Geometry* class through the Fall 2007. This project was designed to investigate the effectiveness of using an inquiry-based teaching approach to enhance students' learning proof writing.

2. Method

First, before the fall semester started, we developed inquiry-based teaching-learning material and a problem sequence, including material in both Euclidean and non-Euclidean geometry. This material was designed to help all students develop a deep understanding of mathematical concepts and how to apply them. It also prepares them for using their newfound skills to further their education or the jobs. Each section of the material starts with basic definitions and examples, then moves to lemmas, theorems, and corollaries, and ends with exercises and reflection questions. It challenges students to explore open-ended situations actively. The aim of using the material is to help students understand basic background knowledge, routinely investigate specific cases, look for and articulate patterns, and make, test, and prove conjectures. The problem sequence was provided to the students free of charge at the beginning of the semester.

Second, the author discussed his teaching progress with his mentor in Fall 2006, attended SoTL fellow monthly meetings, and communicated with mentors and other SoTL fellows to exchange teaching experience and ideas to improve his teaching in the classroom in Fall 2007.

Third, in my daily classroom teaching, the author arranged opportunities for student presentations, observed students' performance and recorded their progress. The purpose was to enable the students to learn more by discovering more for themselves. Typically, a lesson would begin with the giving definitions; then the students would explain the meaning of the definitions, draw the geometric figures, and provide examples. Then, the students built the rest of the body of knowledge as problems and proofs were assigned. Collaboration with classmates was encouraged. Students with mixed abilities were teamed together to work on group activities; each group made its own group work report. As the teacher, the author was available to assist students, providing hints to the problems or the proofs.

Fourth, the author provided classroom activities and projects that use hands-on learning. In particular, the author assigned a project that required the students to construct geometric objects, explain the geometry involved in their constructions, make appropriate conjectures, and possibly prove their conjectures.

Fifth, the author gave periodic survey questions to obtain students' feedback and to monitor their learning. Moreover, the author used answers to the survey questionnaires to analyze the effectiveness of his teaching and their learning. the author compared the final examination score, the numerical course average, and the course letter grade for each student in the experimental section with the average final examination score, course average, and course letter grade of students in the section taught with the traditional lecturing approach. However, the author did not use the test scores for statistical analysis for significant differences between the different teaching approaches since he had only eight students.

3. Observations on students' progress

Throughout the semesters, the author observed the students' progress. First, the author identified the students with different mathematical backgrounds, and the author identified the level of their understanding of proofs.

At the beginning of each semester, the students did not understand the statement of a theorem; they did not know the condition or the conclusion. In particular, the students had great difficulty in identifying the meaning of equivalence, and if and only if. They did not know what was given, and what should be proved. It was very common for the students to construct a proof with flaws in logic, and sometimes they could not even follow the proofs in the textbook.

After the first five weeks, the students started to pick up material on their own regarding Euclidean geometry. According to the author's observation, and also from the survey, they felt comfortable with Euclidean geometry since they learned the basics in high school, and were familiar with the material. During the six-week study on Euclidean geometry, the author noticed that even the weaker students could prove some theorems of moderate difficulty. Although their approach was lengthy, they were able to convince their fellow students with their logic. On the other hand, the stronger students were able to provide a shorter and more concise proof. These students were able to communicate their mathematical thoughts clearly to one another. The weaker students contributed more and more in the group discussions and activities compared to their involvement during the first five weeks. This resulted in their homework and test grades being greatly improved. One difficulty that students encountered in Euclidean geometry was to construct auxiliary lines for more complicated problems. Although, sometimes, the stronger students could come up with some ideas, all students felt overwhelmed by these constructions.

The last six weeks of study were focused on non-Euclidean geometry. This new topic was not well received by the students at first, but as time went by they gradually understood the material and were able to solve problems and prove theorems in this setting.

Also in the last six weeks, the students presented their projects during the class period. Some of these class projects were good enough to be presented in the Annual Show Me Undergraduate Math Conference which was held by the Mathematics Department at Southeast and supported by the Mathematics Association of America in November 2006 and 2007. Some of the projects were quite good. For example, in Fall 2007, two students made individual presentations on soccer goalkeeping and pool shooting with respect to geometry and angles. Both of the students studied basic principles that lead to more efficient goalkeeping. Another student designed a fractal similar to the Sierpinski triangle, formulated a conjecture on the area of the triangle, and used mathematical induction to prove her conjecture. Also, one student studied projective geometry, did some undergraduate research independently, and submitted his research paper to a journal to be considered for publication.

4. Summary of survey questions

Assessment data was obtained from students in *Concepts of Geometry* in Fall 2006 and Fall 2007. The survey questions that were designed for the class were answered by each student in class. A summary of the students' responses to the reflective questions designed for this project are presented below:

(1) Question 1: Classify all the theorems you learned and indicate the percentage of the theorems you feel were: (a) very difficult, (b) difficult, (c) average, (d) easy, (e) very easy.

Answer 1:

There are different percentages according to students' background, but in general, students considered 35% of the theorems very difficult, 10% difficult, 40% average, 5% easy, and 10% very easy.

(2) Question 2: What is the most difficult thing about this class?

Answer 2:

- (a) The most difficult thing is deriving the proofs on your own.
- (b) Struggled greatly with proofs, how to get from one point to another point.
- (c) Determine what strategy to use in the beginning, whether it should be a proof by cases, contradiction, or start off with a new construction.
- (d) Applying previously learned theorems when proving new ones.
- (e) Getting a picture of the theorem and knowing what theorems should be used in the proof.
- (f) Abstract thinking in Neutral Geometry.

(3) Question 3: Which is easier, neutral geometry or Euclidean geometry? Indicate your reasons.

Answer 3:

(a) Mostly Euclidean geometry is easier since it is most familiar geometry. But some theorems and proofs are difficult.

(b) Triangles and circles in Euclidean geometry can be easily visualized and drawn. The hardest the theorems are the ones about quadrilaterals because it seems like there are more things to look at while trying to figure out what part of the information is the most useful to proving the theorems or problems.

(c) Neutral geometry was a new concept and it is more difficult. To prove theorems without using Euclid's Parallel Postulates is difficult, but it is interesting.

(4) Question 4: How much did you learn in all aspects such as understanding the definition, knowing what the given is, knowing what the conclusion is, starting a proof, choosing direct proof or contradiction, constructing lines to assist proofs, etc.? List the most difficult one and the easiest one, and indicate why so.

Answer 4:

(a) Learned a great deal in this class. Understanding the definitions and difference between the three geometries, I have learned a lot and find this the easiest.

(b) I understand the general underlying concepts, but do not understand how to apply the known theorem to prove a new theorem. The hardest is starting the proof and finding where to begin without helpful hints.

(c) The easiest thing is knowing what is given and what is the conclusion. Although I know what I need to prove, I do not know how to get there.

(d) I learned the most when it comes to identifying theorems. Constructing lines to assist proof was the most difficult thing.

(e) Choosing direct or indirect proof was easiest. I am beginning to fully understand proofs. In each proof, I first indicate what is given and what I am trying to conclude to give the proof direction.

(f) Sometimes starting a proof is difficult in deciding whether to use a direct proof or one by contradiction, but once I get started, I can usually figure out a way to finish the proof. I am having fewer problems now that I have become more familiarized with the theorems.

(5) Question 5: How do you like the course materials we used? Does the sequence of the material aid your learning? Can you use the previous theorems to prove the next theorems?

Answer 5:

(a) The class material is very helpful. The material is in a good order. We can use the previously learned

material to prove the theorems later. The book is sometimes hard to understand.

(b) The sequence does help when we are learning the proofs.

(c) The course material is very helpful. The lists of theorems and definitions helps when proving new theorems because I can look back on what has already been proven or defined to assist in the new proof.

(d) I am starting to like the handouts more because they are in a logical sequence.

(6) Question 6: As a student, do you feel you learned in this class? If you were a teacher, what would you have done differently?

Answer 6:

(a) I did learn a lot from this class. I never thought about geometry in an abstract frame of mind. It is difficult, but I am learning.

(b) It is definitely the class in which I learned the most new things. It was the only class that I took this semester which I have never taken before in Germany. And therefore I learned some new theorems and I even learned a complete new geometry that I have never heard of before.

(c) As a student, I have learned a lot from this class. Once you break down all the theorems to prove them, it makes you look at other proofs in another way. I think this class will help me in the long run when I become a teacher, because we proved every theorem.

(d) I am satisfied with the knowledge that I am building through thinking through the proofs assigned for homework. I become familiar with the theorems of geometry and can apply them to real life situations.

(7) Question 7: If you were the teacher of this class, what instructional style would you use?

Answer 7:

(a) I enjoy the instructional style used in this course. It keeps the student engaged in learning by requiring the student to complete proofs on his own with definitions and examples given in class. It allows the student to be inspired to complete proofs on his own and gain experience with the material.

(b) I would use repetition. I like when I do things over and over to truly understand them.

(c) Using manipulative would aid my learning. It is beneficial to my study habits.

(d) Although it takes time to go through the proofs, it forces me to think through the theorem myself and gain a better understanding of each theorem.

5. Conclusion

In the author's traditional lecture style geometry class, the students simply memorize the proofs without clear understanding. In this inquiry-based class, the student either solved problems by himself/herself, or was guided by the instructor without being provided with the explicit method. This strategy is very demanding on the instructor, as the instructor must know the material extremely well in order to guide the students to a solution and effectively correct missteps along the way. It is very demanding for the students as well. It is significantly different from instructional strategies that students have typically encountered in their mathematics classes as it requires them to be much more active learners. This certainly moves students away from their "comfort zone" in the short term, but it has long-term benefits in that the students develop their own proofs and solutions and have truly experienced the manner in which mathematicians work. This helps the students to become mathematically independent.

Based on the material and data collected, the following conclusions can be made for students in this *Concepts of Geometry*:

- (1) Students enjoy the lively classroom activities;
- (2) Students feel that they were challenged and stimulated to learn;
- (3) Students gain confidence in their own problem solving ability;
- (4) Students make progress in becoming independent learners;

(5) From this project, the author concludes that the inquiry-based teaching approach is suitable for students who have: (a) good mathematical background; (b) good reading and comprehension ability; (c) independent learning ability; (d) logical thinking ability; and (e) persistence.

As an instructor, the effect of this project to the author is that he learned to be open to different teaching approaches, and to be committed to apply appropriate teaching approaches to meet the needs of his students.

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(Edited by Nicole and Lily)

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We can find a similar situation in teaching Chinese: Students who have learned simplified characters feel it is difficult to study the equivalent traditional characters. On the other hand, students who have studied traditional characters can readily and easily learn simplified characters. My investigation shows that among the students who studied Chinese for more than two years, 43% can “write traditional characters and read simplified characters”, 28% can “write simplified characters and read traditional characters”. Thus it can be seen that the former is easier than the latter. This is because the strokes of traditional characters in the majority of cases already include the strokes of simplified characters. We may try the following concrete methods to teach students how to “write traditional characters and read simplified characters”:

First, teachers request strictly, especially in the beginners’ class, if teachers do not put forward unambiguous requirements, no matter whether “writing traditional characters and reading simplified characters” or the reverse, not all students will comply.

Second, it is important to motivate students to like traditional characters through developing their interest in calligraphy and in other cultural aspects. Evidence is that gradual promotion of an interest in culture and art is a good way to stimulate students’ interest in traditional characters.

Third, emphasizing the phonetic and ideographic aspects as well as sources to show the functions of traditional characters will promote students’ understanding of the structural principles of Chinese characters and enhance their ability for logical memorization.

Fourth, the instructor should introduce the experience of freely converting between traditional characters and simplified characters using computer input methods, in order to minimize students’ dread of traditional and simplified characters transformation.

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Library user education under the circumstance of network*

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Abstract: Based on the concept of user education, this paper discusses the necessity of user education in library under the circumstance of network, describes the contents and forms of user education and puts forward the problems that should be paid attention to during education.

Key words: library; user education; information literacy instruction

User education is an educational activity of the library and information organization, which is carried out intentionally and systematically to increase users' information awareness and retrieval skills (ZHANG Qi-yu, 2000). It can enable them to make full use of the library and information resources. For library, the main task of user education is to guide library users to maximize the use of library resources, including collection resources and human resources, as well as training their proficiency in the use of library resources. Strengthening user education is an important duty of the librarians. With the rapid development of information technology, applications in the library become more and more common, such as computer technology, network technology and multimedia technology. The big change has happened in constitution of library information resources, information retrieval, approaches to the provision of services, as well as information dissemination methods. Therefore, library user education is also facing higher education requirements.

1. Significance of user education in library

Library is an important part of social education system. User education becomes an effective way for library to exert social educational functions, make self-advocacy, and improve the utilization of literature. Only by conducting user education can readers master the library technologies, information resources and literature retrieval skills, so as to improve users' ability to access information. Conducting user education, we can deal well with the relationship between collection and utilization of information resources, strengthen the close tie between users and library, absorb more members of the society to make use of library, thus ensuring the best use of library resources. At the same time, user education can help popularize library knowledge, enhance users' awareness and cause general attention and support for library from the society, then promote the use of library, improve library's social status and develop its multiple functions, so as to promote the development of library cause.

2. Contents of library user education

2.1 The basis-oriented education

Widespread application of automation in libraries has benefits for both library personnel and library users. Those who are able to use the automated systems that provide access to online public access catalogs, CD-ROM

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products, and on-line databases have access to a significantly larger number of information sources. One of the central problems inherent with automated systems, however, is reduced access to information for those who are unable to use the technology. In an information-rich environment, those unable or unwilling to use library technology become increasingly information poor. The purpose of this content is to enable users to understand the basic overview of the library and master library's basic common sense and skills, with an initial capacity of intelligence, specifically including: the introduction of nature, functions and internal system of organization of the library; brief introduction about library and its services; basic knowledge of literature classification and the uses of the system of library catalog; the rules and regulations about borrowing books and their using methods (ZHAN De-you, 2004).

2.2 Information literacy education

Information literacy is a kind of competence to use information, study information technology, and mold information solutions to problems (Davied V. Loertsue, 1999). In the information society, information literacy is not only the basis for self survival, but also the basic qualities and conditions for starting businesses and lifelong learning under the background of the adoption in information society and rapid development of high-tech industry. Information literacy education mainly includes education about information awareness and information capacity. Among them, information awareness education aims to educate users' sensitivity of information and conscious awareness of capture, analysis and absorption of information, including information needs awareness, access to information awareness, information limitation awareness, information in advance awareness, information innovation awareness and others. Information capacity refers to the ability of people to access information, process information, absorb information and create new information. The greater information capacity a user owns, the higher efficiency of access and use of information he has. Therefore, training the ability of users' information capacity is an important aspect of user education (WANG Xiao-li, 2009).

2.3 Information technology education

With the development of information society, computer technology and foreign language proficiency have become important tools and means in information retrieval and exchange. Multimedia technology, CD-ROM technology, database technology and network technology provide great conveniences for our information storage, extraction, development and exploration, as well as increasing users' dependence on technology. In the information society where computers and network technology are widely applied, the crowd who cannot get full access to the information might be reduced to vulnerable groups in a relative sense, thus technological progress helps form a new vulnerable group. It is essential to conduct users' information technology education. For library, it should allow users to master the use of network functions and methods; learn how to use Chinese and foreign language bibliographic database in collection and inquiry system of thematic literature database; learn the use of electronic document collections, as well as subject guilds.

3. Patterns of library user education

The modern library has become a dynamic integration of information and technology. The amount of information and the various means to access it have added new dimensions to the understanding of the library patron. The growth of the amount of information on the web has affected information seekers' use of the web. As Internet resources become more integral to users' lives and work, the information environment is becoming more complex. The aim of library user education is to strengthen library users' awareness to understand the layout of

the library facilities, to help them maximize the use of the library. Therefore, the contents of library user education under the information society should educate users' information awareness and capacity through various forms as well as the use of oriented library.

3.1 Strengthening oriented education, paying attention to practical training

The main way of oriented education is leading a guided tour to the users. The library staff introduced different departments of library and led them to visit. So, the daily regulations, characteristic services, reference tools, catalog of library are introduced to the users. Through practical training is another effective way in user education. Consultants provide targeted counsels by various forms to the users in their work, encouraging the users to master the basic knowledge about the use of literature information. In addition, compilations and guides can be made to provide guidance materials and answers to certain questions.

3.2 Holding training course, topical lecture and seminar

Various forms of user training are important methods of training users. Through the organization of training courses, satisfactory results can be obtained in a short period of time. This approach is particularly applicable to users in universal education. In addition, inviting experienced experts and professors, holding a variety of seminars which users participated to exchange experiences and solve certain problems, so as to improve the users' ability to access to and use of critical information. Next, the library should gratify the information needs of users to the largest extent by way of providing them with mobile libraries, literature searching services and telephone consulting services, and develop their information awareness and information capacity with the aid of tours, seminars, lectures, classes, training courses and other forms of user training. In the meantime, the libraries can make use of modern information technologies for online learning and distance education, as well as for education services.

3.3 Setting up literature retrieval course in colleges and universities

Information seeking is a complex information and communication activity requiring access to diverse sources of information to deal with personal, social, and work-related problems. The proliferation of personal computer, the growth of the Internet, and the accompanying development of information and communication services provide users with access to many new services and potential new channels of information access. Generally setting up *Document Retrieval and Utilization* course in schools has become a major route for library user education (TANG Jin-hua, 2006). Information retrieval course is the backbone of the education curriculum in library and information science education, and also should become a required course for school students. Opening information retrieval course allows users to grasp a variety of search theories, methods, strategies and technologies, providing the basic knowledge of the use of library. Current information retrieval courses should be based on user-centered teaching and learning activities, fully encourage students' potential and learning initiative, make use of advanced teaching techniques, improve education means and develop teaching courseware or learning platform which fit the characteristics of user learning and retrieval course.

3.4 Web-based information literacy education

Nowadays many libraries have established their own web page, which generally include the main overview of the library, services introduction, web navigation and user training. Through these, the users can have a more complete and systematic understanding about library. At the same time, they can make full use of collection resources through it and enjoy the various services. Online information literacy education is web-based information literacy education, which makes full use of computer and network technologies. It is in terms of traditional library users and becomes a trend of library user education. To develop the depth and expansion of

library user education and make library close to readers, introducing the e-mail, BBS forum, videoconference and even online chat to library user education will be effective methods. At the same time, the use of sophisticated digital video technology counseling program can also help improve the skills of user information and retrieval of complex issues.

4. Issues that should be paid attention to during education

Firstly, conducting it in planned way. User education is a long-term work with stability; it must be done planned and step-by-step. We must make plans according to the users' basic structures, needs and situations of information work. In the information age, it is the essence of information literacy education to enhance users' information awareness and information capacity, so as to enable them to form a daily habit of obtaining information.

Secondly, combining the groups and the individuals. Training on groups can save time and financial resources. On the other hand, this work can also be organized and planned, but at the same time, we can not ignore the role of individual counseling.

Thirdly, contacting closely with practice. User education is not only an education based on books and theories, it is also necessary to integrate into the actual work actively. Literature retrieval course is a highly practical curriculum; only in practice can it perform a better result. The libraries must strive to get multi-supports, strengthen self-construction, and carry out educational activities of various forms and with different contents to improve their information literacy.

Fourthly, grasping the characteristics of different users, that is, the arrangements for user training should be targeted. For example, different users have different information needs, they have different levels of computers, as well as some other characteristics, the training should accord with users' careers, responsibilities, and operational levels as far as possible. Information education should be purposely.

At last, taking into account the potential users, that is, user training should have the popularity to ensure both real users and potential users to have opportunities to participate in information training.

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