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# Chinese Mainland Students' Experiences of Teaching and Learning at a Chinese University: Some Emerging Findings

Paper presented at the BERA 2004 Conference, UMIST, Manchester, 15<sup>th</sup> –18<sup>th</sup>, September 2004.

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## Abstract

Though there has been much interest in students' learning from the perspectives of students studying at various educational levels in dozens of countries and regions, there has been little research into the perspectives of Chinese mainland tertiary students. This paper provides an overview of some preliminary findings from an in-depth study designed to understand how Chinese mainland tertiary students in Economics go about their learning, and the ways in which this is influenced by their perceptions of different aspects of their teaching-learning environments.

As is common in research into students' learning in higher education, quantitative instruments and semi-structured interviews were used in conjunction to provide insights into the students' learning. As the study is not due to finish until the end of 2005, it is only possible at this stage to concentrate on the initial findings, mainly from the quantitative data analyses. The questionnaire used in the study (CETLQ: Chinese ETLQ) is a revised version of the Experiences of Teaching & Learning Questionnaire (ETLQ), which was specifically developed for the UK-wide Enhancing Teaching-Learning Environments in Undergraduate Courses (ETL) Project<sup>1</sup>. The questionnaire was completed by 552 Chinese Economics students across four academic years in an Economics Department of a Chinese mainland university.

Analyses of the questionnaire data reported in this paper were intended to provide initial insights into Chinese students' approaches to studying and their perceptions of their teaching-learning environments by looking in more detail at the underlying structure of the CETLQ. This is of interest, partly because this is the first time that the ETLQ (though in its revised form), which was developed for Western contexts, was completed by university students from a different culture, and partly because the ETL Project analyses to date show that the questionnaires could provide useful perspectives not only on students' learning but also on their perceptions of their teaching-learning environments. The preliminary findings reported in this paper help to establish the structural validity of the inventory used in this study, while suggesting some interesting points that might be worth further exploration, such as the trend of development in students' orientation to learning and approaches to studying across four years.

## Introduction

This paper focuses on the quantitative part of an in-depth study on how Chinese mainland tertiary students in Economics go about their learning, and the ways in which this is influenced by their perceptions of different aspects of their teaching-learning environments. Since there has been little research into the perspectives of Chinese mainland tertiary students, the study as a whole is an attempt to venture into relatively unmapped territory. It intends to provide a context for a series of reflections on the ways in which current teaching-learning practices in the Chinese higher education system might be improved by keeping students and teaching-learning environments at the centre. The similarities in the research interest and the theoretical bases between the ETL Project and the present study make it logical for this study to set up a constructive relationship with the project.

This beginning section of the paper provides a brief overview of the literature, which is intended to illustrate the importance of this study and the concepts and theories on which it is built. As the general principle has been to investigate the ways that different parts of the teaching-learning environment work in combination to influence the

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<sup>1</sup> There are two questionnaires in the ETL Project, one is the ETLQ, the other is the Learning and Studying Questionnaire (LSQ). The CETLQ used in the present study also include the learning orientation section of the LSQ. For more information about the ETL Project and its instruments, please visit the ETL Project web site at <http://www.ed.ac.uk/etl>.

quality of the students' learning, two interrelated strands in the previous research have been identified as relevant. One is the literature describing high-quality learning in higher education, the other is the research on the aspects of teaching-learning environments that students may perceive more directly, and which therefore affects their learning. In addition, a disciplinary- and a cultural-specific dimension are introduced to help to provide contextualisation for the setting involved in this study.

### ***High-quality learning***

Different stakeholders, such as students, teachers, parents, educational managers and educational researchers, may have different views of what high-quality learning means to them respectively. Of the stakeholder groups, the student perspective seems particularly worthy of studying because of the central status of students in the whole issue of high quality learning (Gibbs, 1994). Besides, student learning research has created a strong evidence base, not only providing a distinctive contribution to the understanding of students' learning, but also raising practical implications for possible improvements (Entwistle & Ramsden, 1983; Biggs, 1989; Gibbs, 2002). The ETL Project also has the student voice as a main source for its conceptualization of high-quality learning (McCune, 2003).

The literature on approaches to learning and studying, as an important starting point for understanding student learning, helps us to understand the qualitative differences in students' learning processes in relation to different learning contexts and learning tasks (Ramsden, 2003). Generally speaking, approaches to learning emphasize three inextricably mixed aspects: what the learner is trying to achieve; how the learner is carrying out the learning task; and, how the learner monitors his/her learning processes (Vermunt, 1998; Biggs, 2003). Though it is fairly common to find varying expressions of differences in approaches, the ETL Project's conceptualization provides a framework which encapsulates much of the relevant literature (McCune, Hounsell & Nisbet, 2003). As exemplified in Table 1, approach to learning is a multidimensional concept that contains some of those recognized aspects of students' learning processes that have been demonstrated meaningful in telling the differences in the ways in which students go about their learning tasks. The deep approach, in combination with organization, effort and students' monitoring of their learning, might be regarded as a 'partial proxy for high-quality learning' in higher education (McCune, 2003, pp.2).

Table 1 Aspects of approaches to learning and studying

<b>Deep approach</b> The intention to understand ideas for yourself Making links between topics Relating what is learned to the wider world Looking for patterns and underlying principles Checking evidence and relating it to conclusions Examining logic and argument cautiously and critically Becoming actively interested in the course content	<b>Monitoring studying</b> Keeping your studies well focused Monitoring understanding and addressing any problems Monitoring and developing generic skills Monitoring and enhancing the quality of work produced
<b>Surface approach</b> The intention to cope minimally with course requirements Studying without reflecting on purpose or strategy Treating the course as unrelated bits of knowledge Memorising without understanding Accepting ideas without questioning them	<b>Organisation and effort in studying</b> Organising your studies Managing time and effort effectively Maintaining concentration

High quality learning process might be expected to lead to high quality learning outcomes, and learning is commonly taken to refer to a variety of academic or cognitive gains. Learning outcomes reflect what students learn through engagement in studying processes, and might include what students were taught to or absorbed during their days in higher education. There is a shift from defining gains as academic or specialist skills to operational or transferable competence both in literature and in official documents (Bowden & Marton, 1998; Bennett et al., 2000). In spite of differences in terminology, there is a high degree of commonality in literature in terms of the desirable generic capabilities that students are expected to gain across disciplines (Bennett et al., 2000). However, a further developed description of the desirable learning outcome might also include some personal attributes, as colleges and universities are regarded by some researchers and practitioners as a place where students should grow not only intellectually, but also morally, socially and personally (Abdullah, 2004).

It is a real challenge to suggest a conceptualization which could fully capture the rich diversity of students' learning processes and their learning outcomes as discussed above. The concept of approach to learning and studying, though powerful, is constrained by its original foci on the intentional and processual aspects of students' studying. The ETL Project team has adopted the phrase *ways of thinking and practising* (WTP) to describe the richness, depth and breadth of student learning, and define it as a concept that 'might include anything that was explicitly taught to, or tacitly absorbed by, students as they approached graduate-level mastery of a subject area', and 'could encompass aspects of approaches to learning and studying' (McCune, 2003, pp. 3). WTP, therefore, is a concept taking into account both how students go about their studying and what they gain from their engagement in their study processes, and the gains encompass not only knowledge and understanding but also skills, values and attitudes.

The literature suggests that the lack of a disciplinary dimension in some student learning research has seriously weakened its plausibility for practical use (Becher, 1994). Economics was chosen as the focus for this study to provide the disciplinary dimension. The choice of Economics was made firstly because Economics is one of the largest social science disciplines that has continually ranked among the top 10 'hot' majors since the early 1990s in mainland China, which reflects the influences of social development on people's educational attitudes (Statistics in Chinese Higher Education 2002). In addition, the author has a Master's degree in Economics and has taught Economics at university level for three years, and therefore has a secure grounding in the discipline. The Economics department involved in this study was where the author formerly worked and still has a good relationship with its current staff. All those aspects in combination help to implement the research design efficiently and completely. Furthermore, since Economics is one of the four majors studied in the ETL Project, choosing to study a same subject in a different context using similar methods might provide the basis for fruitful comparison (the ETL Project Proposal, 2001). Finally, a study focusing on Economics students might also contribute to the relative lack of research into student learning in this area (Reimann, 2003).

Official documents and literature concerned with teaching and learning in Economics signal a number of potential aspects of ways of thinking and practising (WTPs) in Economics as summarized in Table 2 (Becker & Watts, 1995, 2001; Quality Assurance Agency 2002). However, all those aspects are only used to aid a grasp of the high-quality learning as understood by students instead of giving a full account of the WTP in Economics. Threshold concepts, introduced by the Project team members (Meyer & Land, 2003), seem to suggest a closer focus on high-quality learning in Economics. There seem to be inherent difficulties in certain concepts, such as 'opportunity costs' and 'elasticity', which, 'if understood, open up new and previously inaccessible ways of thinking for students' (Entwistle, 2003b, pp.6). Misunderstanding of such concepts has been demonstrated to have negative impact on students' learning approaches and learning outcomes in Economics study (Meyer & Land, 2003).

Table 2 Desirable learning in Economics

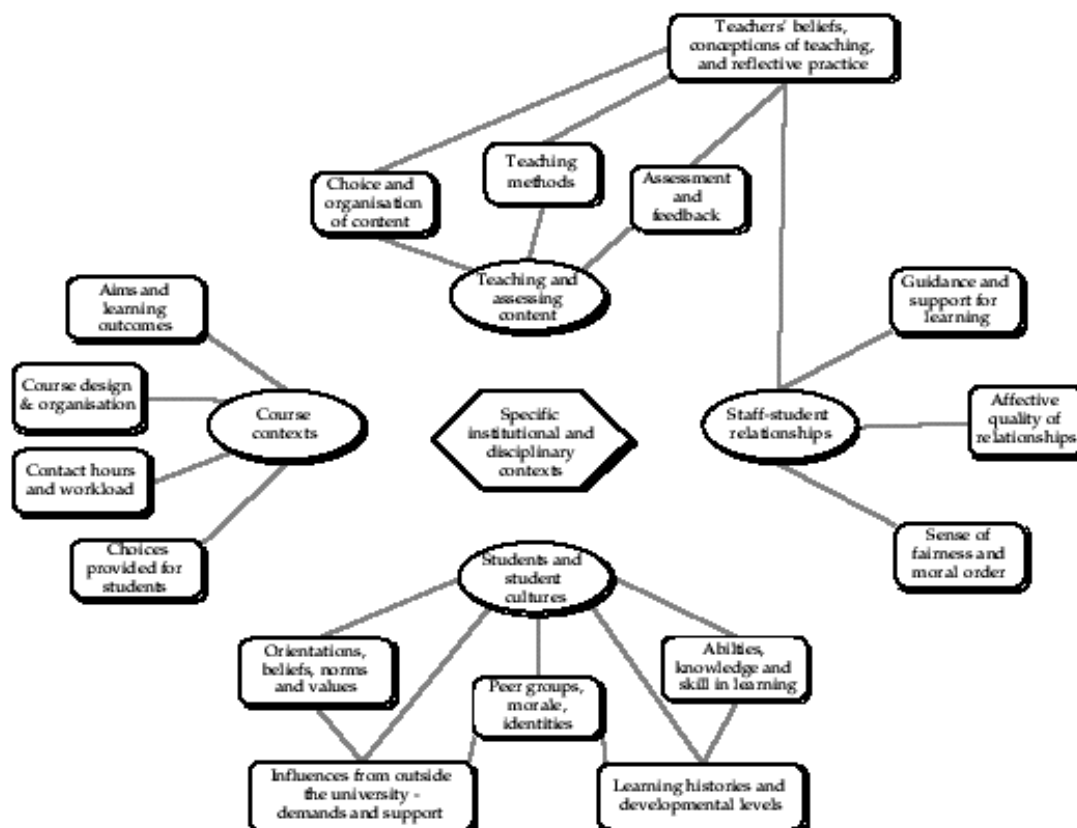
Category	Description
Academic competence	Understanding of economic concepts and principles
	Understanding of economic theory and modelling approaches
	Proficiency in quantitative methods and computing techniques for solving a range of economic problems
	Knowledge and appreciation of economic data and evidence
	Application of appropriate the concepts, principles, theories, models, and methods to the analysis of economic problems
Operational competence	Capability to abstract and simplify
	Capability to analyse and reason
	Capability to communicate results
	Capability to think critically
	Capability to create new knowledge

### Teaching-learning environments

Given the nature of this study, it makes sense to focus the review of the literature on teaching-learning environments in everyday course settings that students can more directly experience as they go about their everyday studies at university. Such a level of focus is referred to as the 'inner' teaching-learning environment by the ETL Project, in contrast with the 'outer' array which includes aspects that are part of the teaching-learning environment, but either have less direct impact on learning, or are less easy for students to perceive (Entwistle, McCune & Hounsell, 2002; Entwistle, 2003a).

Shown as Figure 1 below, the ETL Project map of the 'inner' teaching-learning environment focuses on four key themes in this literature: the quality and quantity of assessment and feedback practices; teaching provision; relationship between staff and students; and, course contexts. Findings from numerous studies on classroom teaching suggest that enthusiastic, emphatic, well-organized and open teaching with good explanations and appropriate challenge, can have a strong positive effect on students' learning (Marsh, 1982; Patrick & Smart, 1998). Assessment has been identified as possibly the single most potent influence on student learning. It is likely to encourage a deep approach to learning, if it has the following characteristics: clarity about requirements, balance in content, appropriateness in amount, requiring understanding, fairness in evaluation, and timeliness/timeousness in feedback (Thomas & Bain, 1984; Tang, 1991; Scouller & Prosser, 1994; Tang & Biggs, 1996). Studies generally suggest that interesting content, appropriate workload, well organized in rational order with clear standards and goals are vitally important for effective educational experiences (Hounsell & McCune, 2002).

Figure 1 Overview model of the 'inner' teaching-learning environment of a course unit



Furthermore, the map as a whole reflects a more salient but relatively inexplicit character that may account for more of the impact of the teaching-learning environment on students' learning than any individual part of the environment does: **alignment**. Biggs (1996a) outlined his idea of constructive alignment from teacher's perspectives to draw attention to the importance of ensuring that teaching, assessment and every aspect of the teaching-learning environment are aligned to constructivist principles of learning. The notion has been further developed by the ETL Project Team to take into account a more complex set of interactions between staff, students, academic content, institutional context, and the realities of current university life (Entwistle, 2003b). The popularity of this notion makes itself more like a proxy that could be used to refer a more complex set of interactions between those environmental components that have been found to be influential on students' learning experience.

Within all these environmental factors that have been recognised as influential on students' learning, teaching and assessing practices in Economics education have been studied most, relatively speaking, and the findings could be concluded as yielding two 'surprises'. The first surprise is caused by the vivid contrast between the diversity in theory and the commonality in practice of Economics teaching, though there are sufficient reasons for anticipating the diversity in Economics teaching (Becker, et al. 2001). The general practices in Economics teaching as described in these surveys are summarised in Table 3. Even more surprising is the obvious gap between the attitudes towards change held by the different stakeholders. As a group, academic economists in these two nations continue to stick to their customary teaching methods (Becker & Watts, 2001; Economics LTSN Departmental Survey 2001, UK), whereas, both the researchers and students highlight and appreciate appropriate improvements (e.g. Becker et al., 1998; Economics LTSN Student Survey 2002, UK). What such a contrast implies might be the lack of research-based practice in Economics teaching that could help to convince academic economists of the value of breaking with the present consensus and making desirable improvements (Reimann, 2003).

Table 3 Practices in Economics Teaching in the USA\* and the UK\*\*

Teaching	Chalk and talk lecturing as the main teaching method Most of the time devoted to the use of the chalkboard for writing text and graphs during class
Assessment	Single-dimensional, multiple choice question Less emphasis on short-answer and essay questions Lack of feedback
Curriculum	Learning material: textbook Learning task: instructor-developed problem sets rarely based on current, real-world data

\*The 1995 and 2000 Surveys carried out by Becker, W.E. and Watts, M. in the USA.

\*\*Economics LTSN Departmental Survey 2001, UK

### ***Research into Chinese students' learning***

As shown above, the understanding of the processes of teaching and learning has come a long way in recent years, and there is now a much clearer picture of the factors which influence students' learning outcomes. However, much of the research has a strong Western influence, and this might restrict its applicability when such an understanding is used to explain students' learning in other cultures (Markus & Kitayamma, 1991; Biggs, 1996b; Watkins, 2000).

There has not been substantial amount of work done on Chinese students' learning, especially for that research following the student learning research tradition. Even less is the research into Chinese mainland tertiary students' perspectives focusing on the interrelationship between students' engagement in studying and their perceptions of their teaching-learning environments. The work that has been done has centred around what has been referred to as 'the paradox of the Chinese learner', that is, Chinese students seem initially to prefer passive learning (i.e. rote memorisation) which is apparently at odds with evidence of their high levels of achievement (Kember & Gow, 1991; Biggs, 1996b). Efforts to explain this 'paradox' seem mainly concentrate on how they actually carry out their learning and how it can be explained from their views of a series of concepts and of the teaching-learning environment, which have both been shaped (or at least influenced) by the Confucian Heritage Culture (CHC) (Watkins & Biggs, 1996).

Seeing a Chinese student memorising can make a Western-observer think he/she is rote learning. However, a closer look reveals a *much richer* world of Chinese students' views of understanding and memorising (Kember, 1996). Both Chinese teachers and better students do not see memorising and understanding as separate but rather interlocking

processes (Watkins, 2000). It is believed that high quality learning outcomes usually require both processes which can complement each other. Wang Yang-ming, a philosopher of the Ming dynasty, said 'if you simply want to memorize, you will not be able to understand; if you simply want to understand, you will not be able to know the source (of truth) in yourself (cited by Lee, 1996, pp.228).' In this sense, memorizing should by no means be equated with rote learning, as Wang's words show clearly that in CHC memorising has never been regarded as an end in itself. As a result, compared with the Western students who saw understanding as usually a process of sudden insight, the Chinese students typically thought of understanding as a long process that required considerable mental effort (Kember & Gow, 1994; Watkins, 2000).

This helps to throw light on that Chinese students were much more likely to attribute academic success primarily to effort rather than to both effort and ability (Salili, 1996), and prompts deeper inquiry into culturally specific aspects of Chinese settings and Chinese students (Watkins & Biggs, 1996, 2001). In general, CHC seems to suggest a two-sided 'coin' of education. One places emphasis on the intrinsic significance of education, where the fundamental value of education lies in ultimate human perfection. The other places emphasis on the utility of education, as there is always a correlation between a person's internal talents and external performance. The civil examination system together with the ideas of human perfectibility and educability make it possible to obtain a higher social status through education, and therefore contribute to the unification of intrinsic self-realization and extrinsic utilitarianism in CHC (Watkins, 2000).

Such a view of education helps to shape students' views of themselves. To many Chinese students the causes of academic success/failure were those internal and controllable factors, such as efforts and study skills (Salili, 1996), so it might not be a surprise to find Chinese students were more autonomous in their learning. In other words, Chinese students could learn effectively without the constant presence or intervention of a teacher by being self-responsible, self-reliant and/or self-organized (Watkins & Biggs, 1996).

The pressure to succeed academically is even higher when to succeed is very much a matter of 'family face' (Ho, 1993) instead of just a matter of 'self-esteem'. This means the notion of success needs to be reinterpreted in a collectivist framework which may involve significant others, the family, peers, or even society as a whole (Holloway, 1988; Salili, 1996). Such a discussion has been linked to the dimension of individualism-collectivism, which has frequently been used to explain the kinds of collaborations on studying that have been found among Chinese students (Tang, 1993, 1996, 1998). Since study after study of cooperative learning and small group learning shows the efficiency and effectiveness of collaborative learning in relation to deeper learning strategies and outcomes (Slavin, 1991; Meloth & Deering, 1992; Tang, 1998), the relationships between students that are more likely to take on a somewhat collectivist character have become a popular topic in research into Chinese learners.

However, it has been found that Chinese students were more active in groups in an informal environment, i.e. outside of the classroom, than in the group discussions that take place inside classrooms, and the situation might be even worse when students were asked questions in the classroom (Tiong & Yong, 2004). Chinese students' reserve in in-class activities and questioning may be partly due to their view of the role of the teacher and classroom teaching shaped by the CHC. A lecturer in China maybe seen as an authority figure transmitting truth to students, the Chinese students, therefore, preferred the teacher to have deep knowledge and be able to answer questions, preferred 'talking of the known rather than talking to know' (Jin & Cortazzi, 1998).

What the research discussed above suggests is a complex picture of the Chinese learner which interweaves cultural and contextual influences and individual differences. All education in mainland China is based on Confucian principles which include the high value placed on education by society; that learning involves reflection and application; that hard work can compensate for lack of ability; that the teacher is a model of knowledge; and, that learning is a moral duty and studying hard is a responsibility to the family. However, this is not, of course, to claim that all Chinese students are exactly same as described above, as students differ from each other despite their shared Confucian cultural heritage. It is just to draw a brief picture of what Chinese students might look like when they are studying as suggested by the existing literature. It helps to pinpoint a number of basic concepts of Western educational thought that need to be reconsidered in Chinese settings.

## Method

Though it is still not unusual to find a sharp distinction made between qualitative and quantitative enquiry in student learning research on the basis of epistemology, the majority of student learning research typically follows a mixed research methodology, that is to use quantitative and qualitative methods in combination to provide useful perspectives on and rich insight into the context under study (Biggs, 1993; Watkins & Biggs, 2001). What is behind the marriage of quantitative and qualitative methods in the present study is an etic and emic mixed approach to doing cross cultural research. An etic approach is adopted where Western learning process questionnaires are used to compare correlates of approaches to learning and learning outcomes in a diverse range of countries, while an emic approach, in contrast, uses only concepts that emerge from within a particular culture (Watkins, 1996, 2001). Though it is a mixed methodology that is adopted in this study, only the quantitative method is described in more detail below.

### *Instrument development*

The CETLQ used in this study is a revised version of the ETLQ, which was specifically developed for the ETL Project. The main reason to use this inventory instead of the many other inventories that could be found in this research field is that it embodies many years of inventory development experience and a recent review of the current literature on student learning (Entwistle et al., 2002). The ETLQ focuses on the ways students have actually studied the target module and on their perceptions of the course environment they experienced. There are five sections in it. The first section contains a short version of the ALSI (Approaches to Learning and Studying Inventory) (Entwistle & McCune, in press), in which student are asked to describe how they had actually been studying within the course unit. The second section is the longest section containing 40 items that covers the students' experience on the module. The third section asks about the demands that students felt the course unit made in terms of knowledge requirements and learning processes, while the fourth section paralleled those aspects in relation to what they felt they had actually gained from the unit. These two sections, together with the final section with one question asking students how well they had done in the course unit they had just been taking, are used as indicators of students' self-rating of their university achievement.

The modifications made to the ETLQ were based on considerations of the cultural- and disciplinary-specific context of the present study. A principle that has been firmly adhered to during the revising process is to avoid any change to the composition of the main scales of the original ETLQ that might corrupt the defining features of its original construct. For the original five sections in the ETLQ that have been included in the CETLQ, some item-level changes had been made. Some CETLQ scales contain less items because several ETLQ items are not relevant to Chinese settings, some scales contain more items which have been adapted from the LSQ to strengthen a few one-item scales or sub-scales, while others contain newly written items which serve the particular research interest of the present study both in Chinese students' ways of studying and in the disciplinary specific aspects of the teaching-learning environment. All of those changes are summarised in Table 4. Besides the five sections in the ETLQ, the instrument used in this study contains two more sections to produce variants suitable for some of the culture and disciplinary-specific considerations expressed by this study. One covers students' expectations on their higher education experience, which is copied from the same section in the Learning and Studying Questionnaire (LSQ). The other is a section that concentrates on students' learning with peers outside of the classroom. Figure 2 shows the structure of the questionnaire used in this study. Because learning is considered to take place in an interactive system, all components affect all others, so the arrows flow in both directions.

### *Setting, sample and data gathering*

#### *Setting*

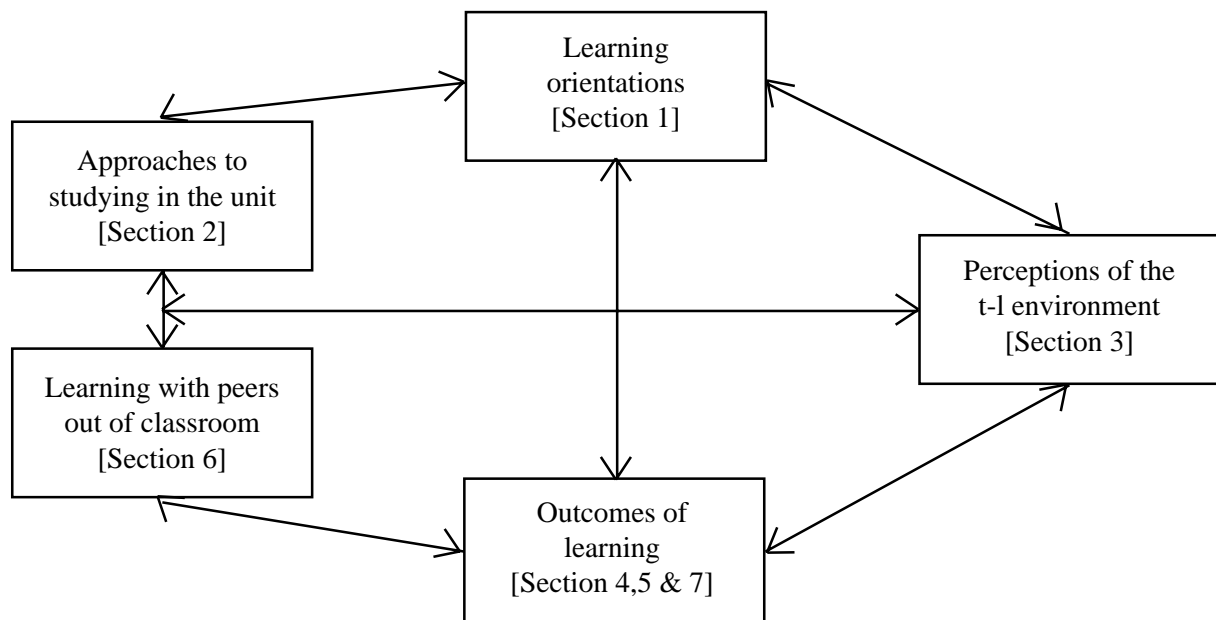
The sample for the study is drawn from the Economics Department in the Business School of a Chinese mainland University located in a city in a dynamic education zone on China's eastern coast. The university is a comprehensive higher education institution consisting of eighteen schools and fifty majors. It has more than 16,000 full-time undergraduate students and 2200 teaching staff. At present, its main task is to provide undergraduate courses, while in the long run, it plans to become a centre of research and post-graduate education in its region. Among all of the 1396 universities in mainland China (data of 2002), this university belongs in/to the top 30%, who all have the right to recruit new students in the first round of admission immediately after the annual national college examinations. Such priority rights are authorised by the Ministry of Education (MOE) based on overall teaching quality as assessed by expert groups assigned by the MOE every five years. The Business School is the largest school in this university with more than 2000 undergraduate students across four academic years and around 70 teaching staff. The Economics department in this School has 712 students and 21 teaching staff. Students in Economics have typically scored much higher on the selective entry examinations than students enrolled by the university in other majors.

Table 4 Questionnaire items modification summary

Deleted items	
ETLQ (section 2) 9	The handouts and other materials we were given helped me to understand the unit.
ETLQ (section 2) 14	The different types of teaching (lectures, tutorials, labs, etc.) supported each other well.
ETLQ (section 2) 20	The web pages provided by staff helped me to understand the topic better.
Adapted items	
LSQ (section 2) 5	When I've finished a piece of work for this module, I've checked to see it has met the requirements.
Lsq (section 2) 23	In order to keep my work well focused, I've thought about what I want to get out of this module.
LSQ (section 2) 16	I've carefully prioritised my time to make sure I could fit everything in.
LSQ (section 2) 28	Whatever I've worked on, I've generally pushed myself to make a good job of it.
Newly written items	
CETLQ (section 2) 7	Before I could understand a new topic, I've often had to commit key terms and details to memory.
CETLQ (section 2) 20	When I've been preparing for an exam, I've focused on understanding the materials as that I won't forget it.
CETLQ (section 2) 24	Unless I've understood something well, there has been no point in my trying to memorise it.
CETLQ (section 2) 9	Whenever possible, I've just memorised what has been taught without trying to understand it.
CETLQ (section 2) 14	Whether I've understood has mattered less than getting what we're studying firmly fixed in my memory.
CETLQ (section 3) 9	You need to work especially hard to do well in this module.
CETLQ (section 3) 19	Compared with other modules, this one has had a particularly high workload.
CETLQ (section 3) 31	The explanations teachers gave on this module were often in mathematical or statistical terms.
CETLQ (section 3) 40	Unless you're good at Math or Stats, it would be difficult to do well in this module.

Figure 2 The structure of the CETLQ

(based partly on Entwistle, 2004, pp.1)



### Sample & Data-gathering

A compulsory course in Economics was selected to administer questionnaires to each academic year, as students are more likely to attend in such courses. In fact, 669 students in the Economics Department were involved, and 582 of them returned a completed questionnaire. A quick visual checking of all those questionnaires returned made it possible to pick out some spoiled/invalid ones, such as those with more than three sections either blank or completed by following obvious patterns. The profile of the final sample, by year and course unit, is provided in Table 5.



Table 5 Profile of students completed questionnaires

Year	1 <sup>st</sup>		2 <sup>nd</sup>		3 <sup>rd</sup>		4 <sup>th</sup>		
Course unit*	E11	E12	E21	E22	E23	E31	E32	E41	E42
Political Economics	88	55							
Macroeconomics			34	73	51				
Econometrics						93	58		
Develop economics								37	63
									Total: 552

\*: Each course is given a code. E for Economics, while the first number refers to the academic year and the second number refers to the class involved in that year.

## Analyses

Initially, individual items (variables) were checked by various means to make sure whether they worked well individually and were suitable to be used in parametric statistical techniques. First, back-translation was done by several people who know this research field to check whether items had been translated into Chinese keeping faith with their original meaning in English, and only one item was recognized as problematic in its translation. Histograms for each item were produced to assess the normality of the distribution of scores, and a visual comparison between the shape of the distributions for each of the CETLQ variables and those from the ETL Project indicated that the shapes were generally similar. Later, all items were subjected to factor analyses, and the factor structures obtained from the Chinese samples and the British samples for each part of the questionnaire were found to be broadly similar<sup>1</sup>. Of course, the analyses also suggest some items that seem to have multiple meanings either in Chinese or British context or in both, and therefore either go with the scale other than the one it is written for, or go with two or more scales. All problematic items revealed from the above steps were omitted in the exploratory factor analyses reported below, as suggested by two experts in this research field.

Table 6 presents the result of a maximum likelihood factor analysis of all the CETLQ items relating to students' way of studying. It indicates the broad domains within which the items were presented to the students with the sub-groups (scales) of items indicating the conceptual basis of the item. The 26 items relating to approaches to studying and learning scales were subjected to factor analyses, and a three-factor solution was chosen mainly because it provided the most interpretable pattern matrix. The three-factor solution seems to suggest three different approaches to studying explaining 34% of the variance. The newly written items and the adapted items are shown in italics.

As Table 6 indicates, the analyses suggested five main scales each divided into sub-scales. For the *deep approach* scale, the sub-scales were 'intention to understand for oneself', 'relating ideas' and 'use of evidence'. For the *surface approach* scale, the sub-scales were 'intention to memorize without or with limited understanding' and 'fragmented knowledge'. Three sub-scales (i.e. monitoring studying effectiveness, monitoring understanding and monitoring skills) were included in the *monitoring studying* scale, while another three (i.e. organizing studying, time management and effort) constitute the *study and effort management* scale. All above scales and sub-scales are ETLQ's original scales. There is one newly emerging scale, *unquestioning approach*, which contains two ETLQ sub-scales, unreflective studying and unthinking acceptance.

The Cronbach's Alphas for each scale were above the minimum acceptable value of .50, except for two. One was the 'surface approach' scale whose alpha was only .47. However, though it was lower than .50, it could be a value high enough for accepting the reliability of the 'surface approach' scale as far as the general level of the alpha value for this scale that have been reported in published works is concerned. Wong and Lin found that the alpha values that have been reported in published works with large Chinese samples ranged from .35 to .55. (1996). The other problematic scale was the newly emerging scale temporarily named '*unquestioning studying*' with two items at present. These two items were initially supposed to go with other 'surface approach' items, but kept standing out in factor analyses as a separate scale and seemed to suggest a different approach. It is, therefore, suggested to leave these two scales in factor analyses. For both these two scales with alpha problems, more items will be added during the second round of data collection in order to enhance their internal reliability.

<sup>2</sup> More detailed discussion on the structure similarity are presented in the Finding and Discussion section of this paper. And, in order to reduce the length of this paper, the factor structure of the ETL Project sample is omitted. But they can be found in the publications of the ETL Project on the ETL Project web site at <http://www.ed.ac.uk/etl>.

Table 6 Factor analysis of the CETLQ items relating to approaches to studying

Scales (in bold), Sub-scales (in bold and italic) & Items	Factor		
	I	II	III
<b>Deep approach [.66]</b>			
<i>Intention to understand for oneself</i>			
3. I have usually set out to understand for myself the meaning of what we had to learn.	.40		
7. <i>Before I could understand a new topic, I've often had to commit key terms and details to memory.</i>	.37		
20. <i>When I've been preparing for an exam, I've focused on understanding the material so that I won't forget it.</i>	.35		
23. In reading for this course unit, I've tried to find out for myself exactly what the author means.	.38		
<i>Relating ideas</i>			
8. In making sense of new ideas, I have often related them to practical or real life contexts.	.53		
10. Ideas I've come across in my academic reading often set me off on long chains of thought.	.62		
<i>Use of evidence</i>			
12. I've looked at evidence carefully to reach my own conclusion about what I'm studying.	.53		
16. It has been important for me to follow the argument, or to see the reasons behind things.	.37		
<b>Surface approach [.47]</b>			
<i>Intention to memorize without / with limited understanding</i>			
1. I've often had trouble in making sense of the things I have to remember.			.31
9. <i>Whenever possible, I've just memorised what has been taught without trying to understand it.</i>			.38
14. <i>Whether I've understood has mattered less than getting what we're studying firmly fixed in my memory.</i>			.39
<i>Fragmented knowledge</i>			
6. Much of what I've learned in this course seems no more than unrelated bits and pieces in my mind.			.55
<b>Unquestioning approach [.38]</b>			
<i>Unreflective studying</i>			
25. I've just been going through the motions of studying without seeing where I'm going.		.44	
<i>Unthinking acceptance</i>			
17. I've tended to take what we've been taught at face value without questioning it much.		.35	
<b>Monitoring studying [.59]</b>			
<i>Monitoring studying effectiveness</i>			
4. <i>In order to keep my work well focused, I've thought about what I want to get out of this module.</i>	.48		
11. <i>When I've finished a piece of work for this module, I've checked to see it has met the requirements.</i>	.30	.34	
<i>Monitoring understanding</i>			
2. I've been over the work I've done to check my reasoning and see that it makes sense.	.33		
26. If I've not understood things well enough when studying, I've tried a different approach.	.36		
<i>Monitoring generic skills</i>			
13. When I've been communicating ideas, I've thought over how well I've got my points across.	.46		
19. I've tried to find better ways of tracking down relevant information in this subject.	.30		
<b>Study &amp; effort management [.75]</b>			
<i>Organised studying</i>			
27. On the whole, I've been quite systematic and organised in my studying.	.31	.55	
<i>Time management</i>			
18. <i>I've carefully prioritised my time to make sure I could fit everything in.</i>		.57	
15. I've organized my study time carefully to make the best use of it.		.71	
<i>Effort</i>			
5. I have generally put a lot of effort into my studying.	.40	.30	
22. <i>Whatever I've worked on, I've generally pushed myself to make a good job of it.</i>		.34	
<i>Concentration</i>			
21. Concentration has not usually been a problem for me, unless I've been really tired.		.36	
	I	II	III
<b>FACTOR I Integrated orientation to studying</b>	1.00	.34	-.18
<b>FACTOR II Organized studying</b>		1.00	.01
<b>FACTOR III Fragmentation</b>			1.00

Factor loadings above .30 are shown in Table 6. Factor I picked up the items describing the *deep approach* to studying, *monitoring study*, and two items related with *study organization and effort*. This factor seems to suggest a kind of 'integrated orientation to studying' which is more likely to be related to high quality learning outcomes. Factor III, in comparison, loaded only on items related to *surface approach*. In contrast with the integrated approach described by factor I, this factor is named 'fragmentation', as it seems to reflect a kind of studying that relies on memorizing fragmented knowledge without much effort in understanding it as a whole. Factor II picked up two *unquestioning* approach items and all of the items related to *study and effort management*. This factor suggests a different, unanticipated, but interesting grouping that is worthy of further exploration, because it might be interpreted as a way of studying that derived from the reverence for teachers or authorities, and which, in turn, requires no questioning but hard work to intake what has been taught. However, with such a factor, the factor structure of the CETLQ might be thought to differ from that of the ETLQ, for there was no such a factor for the ETLQ data. This point is discussed in detail in the Finding & Discussion section of this paper.

Table 7 Factor analysis of the CETLQ items relating to perceptions on the teaching-learning environment

Scales (in bold), Sub-scales (in bold and italic) & Items	I	II	Factor III	IV	V
<b>Clarity &amp; organization [.64]</b>					
1. It was clear to me what I was supposed to learn in this course unit.				.42	
2. The topics seemed to follow each other in a way that made sense to me.				.54	
4. The course unit was well organized and ran smoothly.				.58	
6. What we were taught seemed to match what we were supposed to learn.				.55	
30. It was clear to me what was expected in the assessed work for this course unit.				.37	
<b>Cohesion [.67]</b>					
7. We were encouraged to look for links between this unit and others.	.46				
14. Plenty of examples and illustrations were given to help us to grasp things better.	.51				
17. How this unit was taught fitted in well with what we were supposed to learn.	.49				
33. I could see how the set work fitted in with what we were supposed to learn.					.41
<b>Teaching for understanding [.68]</b>					
10. On this unit, I was prompted to think about how well I was learning and how I might improve.	.44				
13. The teaching encouraged me to rethink my understanding of some aspects of the subject.	.48				
16. The teaching in this unit helped me to think about the evidence underpinning different views.	.70				
<b>Staff enthusiasm and support [.80]</b>					
12. We weren't just given information; staff explained how knowledge is developed in this subject.	.41	.34			
22. Staff tried to share their enthusiasm about the subject with us.	.33	.40			
23. Staff were patient in explaining things which seemed difficult to grasp.		.59			
24. Students' views were valued in this course unit.		.44			
25. Staff helped us to see how you are supposed to think and reach conclusions in this subject.	.37	.38			
<b>Choice [.59]</b>					
3. We were given a good deal of choice over how we went about learning.				.49	
5. We were allowed some choice over what aspects of the subject to concentrate on.				.46	
20. This course unit provided plenty of opportunities for me to discuss important ideas.				.43	
<b>Interest, enjoyment and relevance [.74]</b>					
8. I can imagine myself working in the subject area covered by this unit.	.31				
11. I could see the relevance of most of what we were taught in this unit.	.63				
15. This unit has given me a sense of what goes on 'behind the scenes' in this subject area.	.64				
18. This unit encouraged me to relate what I learned to issues in the wider world.	.48				.41
21. I found most of what I learned in this course unit really interesting.	.59				
<b>Support from other students [.63]</b>					
27. Students supported each other and tried to give help when it was needed.			.31		
28. Talking with other students helped me to develop my understanding.			.23		
<b>Assessment for understanding [.62]</b>					
34. You had to really understand the subject to get good marks in this course unit.			.42		
36. Doing the set work helped me to think about how evidence is used in this subject.			.30		
38. To do well in this course unit, you had to think critically about the topics.	.25		.18		
39. The set work helped me to make connections to my existing knowledge or experience.			.26		
<b>Guidance &amp; Feedback on assessment [.74]</b>					
32. I was encouraged to think about how best to tackle the set work.					.45
35. The feedback given on my work helped me to improve my ways of learning and studying.					.71
37. Staff gave me the support I needed to help me complete the set work for this course unit.					.40
41. The feedback given on my set work helped to clarify things I hadn't fully understood.					.51
<b>Challenge &amp; difficulty [.59]</b>					
9. The explanations teachers gave on this module were often in mathematical or statistical terms.			.30		
19. Unless you're good at Maths or Stats, it would be difficult to do well in this module.			.41		
31. You need to work especially hard to do well in this module.			.56		
40. Compared with other modules, this one has had a particularly high workload.			.48		
<b>FACTOR I Engagement</b>	1.00	.19	.21	.45	.44
<b>FACTOR II Supportiveness</b>		1.00	.01	.15	.26
<b>FACTOR III Understanding, Challenge &amp; Support</b>			1.00	.27	.22
<b>FACTOR IV Clarity &amp; Choice</b>				1.00	.37
<b>FACTOR V Assessment focus</b>					1.00

Table 7 presents the result of a maximum likelihood factor analysis of all the CETLQ items relating to students' perceptions of the teaching-learning environment. The 39 items were subjected to factor analyses, and a five-factor solution was chosen because it provided the most interpretable pattern matrix explaining 44% of the variance. Again, factor loadings above .30 are shown, except for those few items which did not load above .30 on any factor. Cronbach's Alphas were computed to measure the degree of internal reliability of each of the scales, and they all exceed the minimum acceptable requirement of .50. As well, the newly written items and the adapted items are shown in italic.

The scales suggested by the analyses were almost the same as those of the ETLQ data, except for two scales, namely *cohesion* and *challenge & difficulty*. It was thought more appropriate to name the scale '*cohesion*' than '*alignment and integration*', the name used by the Project, for this scale contained fewer items than the original ETLQ scale because some of the original items were not suitable in the Chinese setting. The other new scale, *challenge & difficulty*, was the one that derived from the newly written items reflecting the disciplinary specific characteristics of the teaching-learning environment. Factor I picked up all of the items relating to *teaching for understanding, interest, enjoyment and relevance*, and *cohesion*. The items relating to *staff enthusiasm and support* also loaded to some extent to this factor. This overall suggests a kind of teaching-learning environment that might contribute to students' feeling of engagement in their studying contexts. Factor II clearly and strongly loaded on *staff enthusiasm and support*, which in students' eyes might mean 'supportiveness' from the staff. Factor III, by interestingly bringing together almost all items relating to *support from students, assessment for understanding, and challenge and difficulties in Economics studying*, probably suggests that perceived challenges derived from the difficulties in Economics studying might induce more mutual support among students. Factor IV loaded on items which seem to relate to the *organization and structure* of the course, and the *choices* provided by the course. The last factor brought together the items referring to *guidance and feedback on assessment*.

Table 8 reports the sub-scale factor analysis using the two sub-scales relating to approaches to studying reported in Table 6 and the seven sub-scales relating to perceptions of the teaching-learning environment of a course unit reported in Table 7. The aim was to provide some initial insights into possible inter-relationship between different aspects of the students' learning. Factor I brought together positive perceptions of the teaching-learning environment and the deep approach. Factor II brought together surface approach, negative learning orientation, perceived high demands made by the course and gains across a range of skills. Factor III loaded on intrinsic orientation, deep approach, perceived high demands on assessment for understanding and made by the course, and high gains in knowledge and across a range of skills both as perceived and measured by the exam scores.

Table 8 Factor analysis of selected CETLQ items and subscales

[loadings below .20 were omitted]

Factor	I	II	III
Intrinsic orientation	.19		.30
Lack of purpose		.20	
Deep approach	.25		.35
Surface approach		.32	
Clarity & choice	.61		
Teaching for engagement in studying	.84		
Staff enthusiasm & support	.88		
Student support			.26
Assessment for understanding	.39		
Guidance & feedback on assessment	.71		
Difficulties & challenges	.25	.47	
(heavy) knowledge and understanding demands perceived		.71	.20
(heavy) demands for skills perceived		.46	.48
Perceived gains in knowledge and understanding			.53
Perceived gains across a range of skills		.25	.60
Self-rating of attainment on the unit			.38
	I	II	III
Factor I	1.00	.26	.45
Factor II		1.00	.02
Factor III			1.00

The subscales included in the above factor analysis were subjected to Spearman's correlation analysis and the statistic output is shown in Table 9. Both the patterns of relationship that have been demonstrated by factor analyses and correlation analyses are similar not only to what has been suggested by the literature, but also to the patterns got from the analyses based on the ETL Project samples.<sup>2</sup>

Table 9 Correlation between subscales

	a	b	c	d	e	f	G	h	i	j	K	l	m	n	o	p
a	1.00															
b		1.00														
c			1.00													
d				1.00												
e					1.00											
f						1.00										
g							1.00									
h								1.00								
i									1.00							
j										1.00						
k											1.00					
l												1.00				
m													1.00			
n														1.00		
o															1.00	
p																1.00

a: intrinsic orientation to studying

b: lack of purpose

c: deep approach to studying

d: surface approach to studying:

e: Clarity & choice

f: Teaching for engagement in studying

g: Staff enthusiasm & support

h: Student support

i: Assessment for understanding

j: Guidance & feedback on assessment

k: Difficulties & challenges

l: (light) knowledge and understanding demands perceived

m: (light) demands for skills perceived

n: Perceived gains in knowledge and understanding

o: Perceived gains across a range of skills

p: Self-rating of attainment on the unit

## Some preliminary findings & Discussion

### 1. Cross-cultural validity

In any etic type of research, the first step is to demonstrate the equivalence of the measures of interest in the culture involved. This is a complex task as there are various levels of equivalence which need to be established depending on the aims of the particular study (Hui & Triandis, 1985). Generally speaking, cross-cultural validity is established by showing that the factor structure of the inventory and the pattern of relationships with other variables (like attainment) are closely similar to that obtained in other cultures. Further evidence of cultural validity can come from the back translation by someone who knows the area. From this perspective, the analyses that have been represented above seem to be sufficient to establish the cross-cultural validity of the inventory used in this study, despite a possible dissonance caused by the newly emerged 'unquestioning approach to learning and studying'. To clarify this point, it seems necessary to return briefly to the quantitative directions that the student learning research literature has proceeded.

The impetus for the student learning research approach, adopted in this paper, was a paper by Marton and Säljö (1976). By 'qualitative analyses of students' reports of their own study processes' (Entwistle & Waterson, 1988, pp.258), the researchers reported qualitative differences in learning outcomes depending on the approach to reading that had been used. The intentions and methods in reading the text were called the *deep* and *surface* approaches, respectively. The surface and deep approaches terminology, firstly derived from article reading in a naturalistic experiment, has greatly influenced the quantitative approach in student learning research founded by Biggs (1987) in Australia and Entwistle (Entwistle & Ramsden, 1983) in the United Kingdom, which generally uses inventories to ask students what they usually do while learning and studying.

In developing SPQ/LPQ (Biggs, 1987) and ASI (Entwistle & Ramsden, 1983), they both added a third approach, *achieving or strategic approach*, that was adopted by students to achieve the highest possible grades by strategies

<sup>3</sup> In order to reduce the length of this paper, the similar analyses carried out by the ETL Project are omitted. But they can be found in the publications of the ETL Project on the ETL Project web site at <http://www.ed.ac.uk/etl>.

such as working hard and efficiently and being cue conscious. Because of the ‘pedagogical fertility’ of the deep and surface terminology and the availability of inventories that can rapidly and accurately assess at little cost how student learn’ (Watkins, 2001, pp.166) , the quantitative student learning research approach has been widely applied to subjects both from Western and non-Western cultures. However, what factor analysis of responses to the SPQ, LPQ and ASI has generally supported is the underlying structure of surface and deep approaches to learning for Western and non-Western students, instead of the surface, deep and achieving approaches structure (Biggs, 1993, Watkins, 2001; Entwistle & McCune, in press).

Studies focused on the learning approaches and conceptions of Chinese learners in Hong Kong and mainland China (Kember, 1996; Kember & Gow, 1991, Watkins & Biggs, 1996) only generally confirmed the two basic factors of deep and surface approaches, and the achieving scales did not load consistently on one factor as expected, but rather were associated with the approach that was more likely to succeed in that context (Biggs, 1993; Wong, Lin & Watkins, 1996). Furthermore, Watkins (2001) pointed out that, though the construct deep and surface approaches to learning are generally comparable between Western and non-Western cultures, there might also be culturally specific aspects that render the constructs of Western theories and instruments only partially appropriate. The expressions of deep and surface constructs in different cultures might take into account those aspects (Biggs, 2001). However, what the above discussions pointed out should be fairly concluded as the relevance of the (deep and surface) constructs of approaches to learning to non-Western cultures at a relatively general level, and the likely culturally different aspects of these constructs. Such a conclusion meets with the lowest level of cross-cultural equivalence, the conceptual equivalence, for using the above instruments in cross-cultural research.

The inventory used in this study is the most recent version of the ASI (Entwistle & McCune, in press), and the cross-cultural applicability of the ASI has been demonstrated with non-Western learners (Ma, 1994; Richardson, Landbeck, & Mugler, 1995). With the understanding on cross-cultural validity as discussed above, the present study suggests the conclusion that both the instrument and the conceptual constructs it adopts are valid from the cross-cultural perspective based on its factor analyses. In addition, the internal consistency reliability assessed by the Cronbach’s Alphas, and the pattern of relationships between variables demonstrated by factor analyses and correlation analyses, together, contribute to the appropriateness of using the CETLQ in the present study.

## II. Some interesting points suggested by the quantitative analyses for further exploration

### a. Orientation

#### *Intrinsic vs. Extrinsic*

Intrinsic and extrinsic motivation are more likely to be treated as a bipolar construct in Western psychology books, and the intrinsic end is considered the more desirable by Western educators (Watkins, 2000). Whereas for Western students intrinsic motivation is a precursor of the desired deep learning strategies (Biggs, 1987), Watkins and Biggs (1996, pp.283) argue that for Chinese students the adoption of deep strategies ‘may be activated by a head of mixed motivational steam: personal ambition, family face, peer support, material reward, and, yes, possibly even interest’.

Table 10 Factor analyses of the CETLQ items relating to orientations to learning

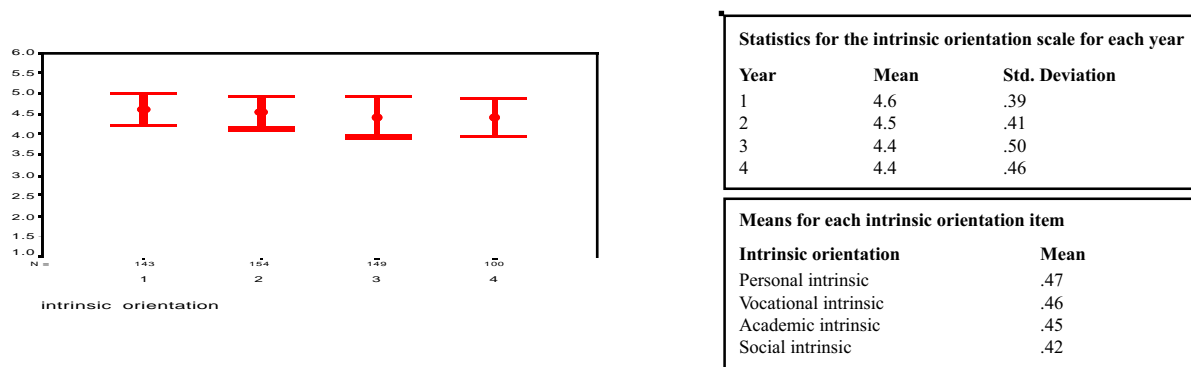
Item		Factor	I	II	I	II	III	IV
Vocational intrinsic	I want to develop knowledge and skills I can use in a career.		.46			.75		.59
Personal intrinsic	I hope the things I learn will help me to develop as a person and broaden my horizons.		.60		.32	.41		.59 .36
Academic intrinsic	I want to study the subject in depth by taking interesting and stimulating courses.		.44		.20	.33	.38	.32
Social intrinsic	I want to learn things which might let me help people, and/or make a difference in the world.		.59		.52		.87	
Vocational extrinsic	I mainly need the qualification to enable me to get a good job when I finish.			.74		.69		.69
Personal extrinsic	I want an opportunity to prove to myself or to other people what I can do.			.52		.53		.54
Academic extrinsic	I'm mainly here because it seemed the natural thing: I'd done well academically in the past.			.36		.41		.40
<b>Social extrinsic</b>	I'm focused on the opportunities here for an active social life and/or sport.		<b>.35</b>		<b>.45</b>			<b>.50</b>
<b>Independence</b>	I hope the whole experience here will make me more independent and self-confident.		<b>.57</b>		<b>.58</b>			<b>.43</b>

Table 10 above shows two to four factor solutions to the data from the 552 Chinese mainland tertiary students involved in this study. The ‘social extrinsic’ and the ‘independence’ orientations to studying were both more likely to go with the ‘intrinsic orientation’ items, and therefore seem to go along well with what have been found in the existing literature on Chinese students. What is more interesting is that a closer examination of the factor solutions from the ETL Project data reveals that the ‘social extrinsic’, ‘personal extrinsic’ and ‘independence’ orientations were also likely to go with some ‘intrinsic orientation’ for those British samples. Correlation analyses (the statistical output is omitted here for the reason of space/to save the length) also confirmed the correlations between some intrinsic and extrinsic items both for the Chinese sample and the British sample. Might this means that British students’ orientations to studying nowadays also take on some of the characteristics of their Chinese counterparts?

#### *The trend of development in orientation to studying across the four years*

Figure 3 below suggests at least two observations: one is the relatively high scores on the intrinsic orientation across the four years among the Chinese samples. This is explainable for Chinese culture generally signifies the intrinsic significance of education. Furthermore, it is not surprising to find that the ‘personal intrinsic’ orientation scored higher than the other three intrinsic orientations, as in CHC learning means self-cultivation: ‘to cultivate oneself as an intelligent, creative, independent, autonomous, and what is more, an authentic being, who is becoming more fully human in the process of learning’ (Tu, 1985, pp.55-57). The other observation to be made is the clear, but not substantial, declining trend in the means of the intrinsic orientation from the first year to the third year, and no improvement when students enter their final year. This might suggest some kind of negative influence of the teaching-learning environment on students’ orientations to studying, and therefore, merits further exploration.

Figure 3 Error Bar: Intrinsic orientation

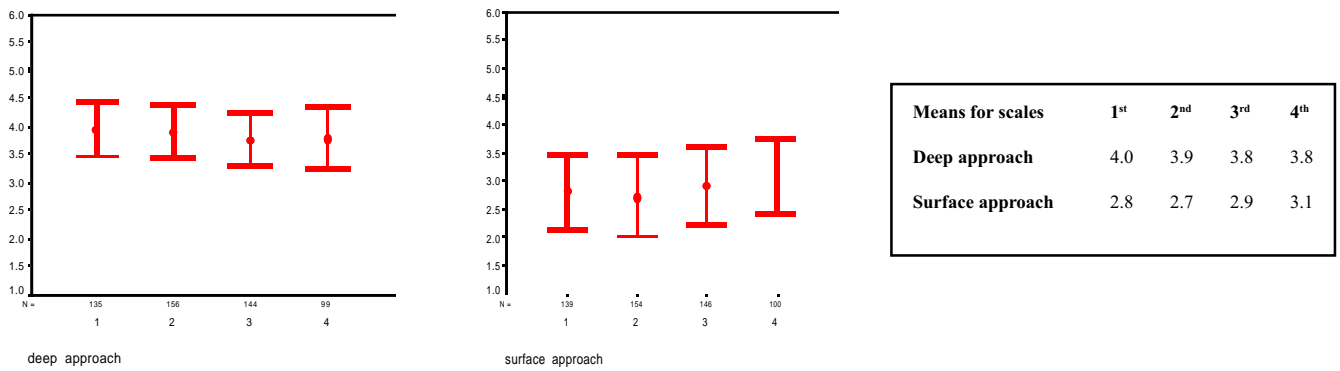


#### b. Approaches to studying

##### *Trend of development in approaches to studying across the four years*

Perry described Western students’ cognitive growth in development stages which generally represent a move from the dualistic to the relativistic reasoning over their undergraduate years (1970). However, Zhanf and Watkins (2001) carried out research on Chinese students’ cognitive development based on Perry’s findings but found that the development patterns for their Chinese samples were not as that suggested by Perry. The rank order from the least dualistic to the most dualistic was not from first year through second and third year to final year, but first-year, fourth-year, second-year, and third-year. The order became first-year, second-year, fourth-year and third-year when ranked from the most relativistic to most relativistic. What their research challenged was the regression development pattern suggested by the Western students during their university studies. In the present study, the trend of development suggested by the way that the deep and surface approaches change across the four years, as shown in Figure 4, seems to offer some confirmation of the non-standard pattern of development in students’ learning, for the deep approach seemed to decline while the surface approach increased (though not substantially) across the years. Quantitative data do not provide more information that could be used to explain such an incompatible trend, but would suggest something that might be worth studying in greater depth.

Figure 4 Error bars: Deep/Surface approach to studying



### *A possible new scale: unquestioning studying*

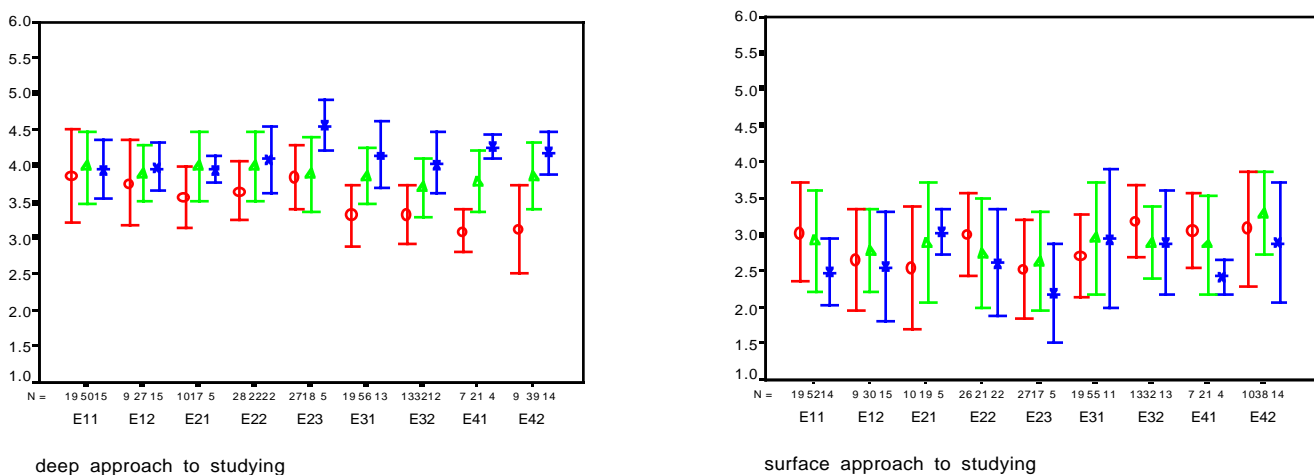
The ‘unthinking acceptance’ item and the ‘unreflective studying’ item, which were originally supposed to sit with/ envisaged as closely linked to the other four surface approach items, kept standing out together as a separate scale in the factor analyses. Their close relationships with an academic extrinsic orientation and study and effort management (both significant at  $<.001$  level in Spearman correlation analysis) suggest it might be more appropriate to treat them as items describing an approach different from the deep and the surface one. Though the present data are insufficient to give a clear picture of what this approach might be and would really mean to students in their teaching-learning processes.

### c. ‘Dissonant’ patterns of relationship

#### *Relationship between approach to studying and academic achievement*

Figure 5 shows comparisons between students with different levels of academic performance measured by exam scores on their approaches to studying. In each error cluster, the first error is for low achieving students, the middle one is for the medium achieving students, while the last one is for the high achieving students. In general, the pattern is clear, for those students with high exam scores also scored higher in deep approach and lower in surface approach. However, there are still some ‘dissonant’ patterns, such as the high achievement samples in unit E11 and E21 (the error bar in the left hand) who scored slightly lower on the deep approach than the medium or low achieving samples, and the low achieving samples in unit E21 and E31 (the error bar in the right hand) who scored slightly lower on surface approach than their high achieving classmates. What made the situation even more interesting was that the low achieving samples in E21 and E31 also scored lower on the deep approach. Could this suggest that those samples might provide more information on the newly emerged unquestioning approach to studying?

Figure 5 Error Bars: Comparisons between sub-groups on Deep/Surface approach to studying for each course unit





### *Relationship between approach to studying and perceived demands made by the course unit*

With the ETL Project, a working assumption is that difference in approach may be associated with the relative intensity of the perceived demands being made by the course unit. However, in this Chinese setting at least, no straightforward pattern emerged. As shown in Table 7, perceived high demands went with both surface approach and deep approach, and those adopted surface approach seemed to perceive much higher demands than those who adopted deep approach to studying.

There are more other interesting points that have been suggested by the quantitative analyses to date. Here, only some of the most important ones have been illustrated. However, all those that have been described above are solely based on the quantitative analyses made of the questionnaire data. They can therefore be used to make some preliminary conclusions, e.g. concerning the structural validity of the inventory and what items are likely to cluster together, but they cannot clarify why they are together and what it means when they are together. All the above analyses and conclusions, therefore, need further substantiation from other sources of data, such as the interviews with students and staff. The conclusions which can be stated with some confidence at present include the cross-cultural validity of the inventory adopted in this study in the relatively broad sense, and the study's potential to provide some interesting insights into how Chinese students' learn and react to their teaching-learning environments.

## **Acknowledgement**

The ideas presented in this paper were developed not only through the work of the ETL Project team, but also through the guidance of my two supervisors, Prof. Dai Hounsell and Dr. Velda McCune. Besides their contributions to the ideas and the structure of the paper, they have advised me on my use of English.

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