# Approaches to Study in Japanese Higher Education Students

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**Abstract**

The Lancaster Approaches to Studying Inventory (Ramsden 1983) was administered to a sample of 794 Japanese higher education students in order to compare their responses with students from countries of British origin and to test the applicability of the Inventory in this context. Furthermore, in view of the different sex role expectations of Japanese men and women we were interested in comparing their approaches to study and motivation for study. Discipline differences were also examined in a comparison of Humanities/Social Science students and Science/Technology students.

Factor analysis revealed a pattern of results which is broadly similar to previous studies with a meaning orientation factor emerging first followed by a reproducing orientation factor. The third factor was a negative attitudes to study factor. However, the meaning orientation factor was coupled with a cue seeking or strategic approach to study, the reproducing orientation factor was coupled with achievement motivation and the third factor was coupled with disorganised study methods.

Japanese students tended to display lower mean scores than all previously studied samples on the following subscales : deep approach, use of evidence, surface approach, syllabus-boundness, achievement motivation, strategic approach and operation learning. However they scored higher than all other groups on negative attitudes to study.

There were differences between males and females on approaches to study with females scoring higher than males on reproducing orientation and males scoring higher than females on meaning orientation. Females also expressed significantly higher levels of achievement motivation or competitive behaviour. There were discipline differences on these two scales as well but they were consistent with the higher proportion of males in the Science/Technology subjects and the higher proportion of females in the Humanities/Social Sciences subjects.

Achievement motivation seemed to be an important variable in mediating approaches to study, in that regardless of sex and regardless of discipline, an increase in achievement motivation

was accompanied by an increase in reproducing orientation to study.

Overall the results need to be interpreted with caution in view of the low reliability of some subscales of the Inventory and the fact that many subscale distributions were either highly skewed or bimodal.

# 1. Introduction

Research on approaches to study in academic settings has gained momentum over the past 15 years. During this time, two separate research streams have emerged. The first emphasizes small-scale, qualitative analysis of how students report their approaches to learning from particular study tasks, together with an examination of the relationship between approaches to study and quality of learning outcomes. The second research stream is more concerned with large-scale survey research on approaches to study in a wider academic setting.

However, descriptions of approaches to study derived from qualitative research have influenced survey design and interpretation of results.

Our research was based on the second research stream in that we surveyed a large sample of Japanese higher education students on their approaches to study, but in order to provide a context for this research we need to understand the contribution made by qualitative research. This will be reviewed briefly at the outset along with the relationship between approaches to study and quality of learning outcomes.

There are currently two self-report inventories which are used to assess approaches to study : the Biggs Study Process Questionnaire and the Lancaster Approaches to Studying Inventory. We examine these inventories, reporting on their application in a number of different academic and cultural settings.

As a prelude to reporting our research, we then outline some qualities of the Japanese higher education system which could be expected to influence the way in which students perceive their approaches to study.

The research to be reported involved a sample of 794 higher education students from five institutions in Japan. The Lancaster Approaches to Studying Inventory was used and results obtained are compared with those obtained in other countries using this instrument and the Biggs Study Process Question-naire.

## 2. Theoretical and methodological assumptions

The stated departure of research on approaches to study from previous research in Educational Psychology is that:

a. **Learning outcomes** are assessed, not quantitatively, but qualitatively in terms of level of understanding achieved.

b. **Learning processes** are assessed by requiring students to report on how they approach either particular or general study tasks.

c. **The objects of learning** are complex academic tasks rather than the simplified and highly structured tasks which frequently form the basis of experimental research.

These issues are discussed at length by Biggs (1979, 1980), Entwistle, Hanley and Ratcliffe (1979), Fransson (1977), Marton and Saljo (1976a, 1976b), Pask (1976a, 1976b), Saljo (1981) and Svensson (1976).

This body of research challenges the "study skills" concept with its implications that a collection of "good" study habits can be specified which will lead to academic success. Instead, study skills are seen as mediated by approaches to study.

In spite of agreement on the above principles between small-scale and large-scale researchers, there are important theoretical and methodological differences between the two research streams. These are best understood by comparing the perspective of Ference Marton of the Goteborg group in Sweden with that of John Biggs, formerly of Australia and now in Hong Kong. Marton represents the first qualitative stream and Biggs the survey research stream.

In a discussion of his theoretical approach, Marton (1981) makes a distinction between the "first order perspective" versus the "second order perspective" to present his own "second order perspective". He writes:

> In the first and by far the most commonly adopted perspective we orient ourselves towards the world and make statements about it. In the second perspective we orient ourselves towards people's ideas about the world (or their experience of it) and make statements about people's ideas about the world (or about their experience of it). (p.178)

Furthermore, when Marton speaks about examing learning processes and learning outcomes, his descriptions are always rooted in a particular learning context and deal with a particular topic of study. For Marton, process, outcome, context and content are inseparable.

He also rejects the notion that we can categorize individuals as possessing a given conception of reality. What he claims is that we can describe and classify conceptions of learning which are repeatedly expressed by individuals in a variety of learning contexts. He writes:

> This means that the same categories of description appear in different

situations. The set of categories is thus stable and generalizable between situations even if individuals "move" from one category to another on different occasions. (pp.194-5)

These categories of description are seen by Marton as being derived from a "collective intellect" or a "structured pool of ideas" or conceptions of reality which are part of a common social or cultural perspective on the world.

Hence Marton's theory does not assume that individuals will necessarily exhibit consistency in the way they describe their approaches to study as they move from one context to another. It is the conceptions of reality themselves that are of primary interest in his research.

Biggs and other researchers who use survey instruments to assess individual differences in approaches to study are clearly operating from what Marton calls a "first order perspective", while acknowledging that their research has been informed by the findings of Marton and his group.

Biggs (1979) clearly differs from Marton on the issue of individual differences in approaches to study. He writes:

> It is assumed, in the first or nomothetic tradition, that by tertiary level, students have developed fairly stable motives for learning and strategies for going about learning. It is usually assumed, further, that these motives and strategies arise both out of a variety of personal characteristics, and out of exposure to particular situational requirements, such as course contents, methods of teaching and examining, career opportunities, etc. ⋯ These assumptions underlie the use of self-report questionnaires for assessing study-related parameters, including the writer's Study Process Questionnaire. (p.382)

## 3. Descriptions of approaches to study

Research from a second order perspective has given rise to a number of descriptions of approaches to study which are outlined below, since they form the basis for self-report questionnaires. Basically these descriptions refer to learning strategies, though in questionnaire construction different types of motivation for learning are also considered.

**Deep approach:** implies the intention to understand the author's message, to relate information to known facts or previous experience, to integrate information and to reach one's own conclusions.

**Surface approach:** implies the intention to obtain facts and information and to memorize or learn by rote.

These categories are attributable to Ference Marton and his colleagues at Goteborg who use small-scale qualitative research in which approaches to study are inferred from interview data.

**Comprehension learning:** implies that learners build an overall picture of what

may be learned by making use of analogies and relating one area of knowledge to another.

**Globetrotting:** is a pathology resulting on over-emphasis on comprehension learning.

**Operation learning:** implies that learners are concerned with mastering operations and procedures related to a task.

**Improvidence:** is a learning pathology resulting from over-emphasis on operation learning.

**Versatile learning:** implies that both comprehension learning and operation learning are used and that both are necessary for full understanding of a topic.

These categories are attributable to the work of Gordon Pask in Britain. He used small-scale qualitative research and imposed on learners the requirement that a topic be understood. He was interested in mapping the processes by which this is achieved. "Conversational" techniques were used where in some cases the learner engaged in a dialogue with a human participant and in other cases talked to him- or herself within the framework of a computer-controlled learning situation.

## 4. Approaches to study and quality of learing outcomes

The approaches to study literature would have limited interest to educators if approaches were not linked to performance outcomes in some way. In their early research reports, Marton and his colleagues focussed specifically on the relationship between approaches to learning and quality of learning outcomes. See, for example, Marton and Saljo 1976a, 1976b. They identified four levels of outcome from analysis of students' replies to questions about passages of text which they had studied:

**Level A:** the answers contained statements about the intentional content of the author's argument and evidence.

**Level B:** the answers contained part of the author's intentional content.

**Level C:** the answers contained a highly simplified statement of the content and ignored the author's intention.

**Level D:** the answers merely restated the terms of the question.

Marton and Saljo (1976a) reported a close relationship between the quality of learning as defined above and self-reports of intentions to study the text in a certain way. For instance, none of the subjects who reported a surface approach to learning exhibited a level of outcome which indicated that they understood the meaning of the text while all of those who expressed a deep approach were in the top two levels of outcome.

Further research by the Goteborg group demonstrates that there is also a relationship between approaches to study and learning outcomes in everyday studies as well as in the context of the laboratory. For example, Svensson (1977)

found both that the majority of students reported using the same approach in everyday studies as in the laboratory task. Furthermore, approaches to study were closely related to whether the students passed the course of not.

Svensson's research also challenged the "study skills" concept in that he found that effectiveness of skills like regular study times, revision and elaboration of knowledge was mediated by approaches to study.

Saljo (1981) studied students' thinking about learning in everyday situations by interviewing students within an age range of 22 to 55 years. He also investigated the relationship between approaches to learning and quality of learning outcomes. He found that the distinction between memorizing and understanding that had appeared in the context of studying a particular text was also present in discussions of learning in a wider, more general sense. These conceptions of learning were not significantly related to performance on standardized ability tests (vocabulary test and Ravent's Standard Progressive Matrices). After reading three passages of text, students were given a retention test and a free recall test. On the recall test those students who reported a deep approach significantly outperformed those who reported a surface approach. Analysis of the free recall responses was made from the point of view of the quality as well as the quantity of recall. There was little difference between the two groups on the number of topics recalled but the deep approach group demonstrated more comprehension in recall in terms of making statements about the main ideas and the author's intention as opposed to facts and examples.

Thus there is an accumulating body of evidence to suggest that approaches to study expressed in laboratory studies are generalizable to the wider context of everyday studies and that these approaches are in turn related to quality of learning outcomes defined in terms of level of abstraction of information from complex textual material.

## 5. Approaches to study inventories

The two self-report inventories currently in use are:
a. The study Process Questionnaire (SPQ) (Biggs 1987), and
b. The Lancaster Approaches to Studying Inventory (Ramsden, 1983).
English version of The Lancaster Approaches to Studying is reproduced in full in Appendix 1.

### 5.1 Study Process Questionnaire

Biggs (1979) described the most recent version of the Study Process Questionnaire as follows:

> In the most recent version of the SPQ, three dimensions of study are distinguished, and each dimension has an affective (motivational) and a cognitive (strategy) component with the strategy involving the behavioural

realisation of the motive. The coincidence of motive and strategy are obtained from several second-order factor analyses (Biggs 1978), and are as follows:

1. *Utilising* Affectively, there are two inter-related motives: pragmatic reasons for being at university (such as to obtain a paper qualification and have a better job), with a more immediate negative motive of avoiding failure, seen in relatively high levels of test anxiety. In the absence of any more positive reasons for studying, study strategies are centred around avoiding failure, but doing as little work as possible. Hence the student becomes syllabus-bound: he studies only what he has to, and then with a view to fairly accurate reproduction, rather than transformation and internalisation of the original

2. *Internalising* The affective component is intrinsic: the student has chosen to go to university as his way of self-actualising, and he is interested in the subject matter of study for its own sake. He therefore reads widely, beyond set texts (indeed he may not even read the set text): he is syllabus-free. He attempts to inter-relate what he reads, placing it in an overall conceptual framework that is meaningful to him. Although this is the "academic" approach to study, it is likely to be successful only if there is reasonable overlap between the student's self-set learnings and those prescribed by the lecturer.

3. *Achieving* The motivational component revolves around winning, in a competitive context, and in general achieving the hallmarks of excellence. Cognitive strategies are therefore directed toward obtaining high grades for their own sake, and include high organisation, scheduling of study periods, ensuring assignments are completed on time, and in general a cool systematic approach to study. (pp.382-3)

The motivational states described by Biggs are based on existing research, for example by Atkinson and Raynor (1974), and the strategies involved in the utilising and internalising approaches resemble the surface and deep approaches described by Marton and his colleagues. What is new is the notion that motives and strategies coincide - that strategies are cognitive expressions of motivational states.

The most recent version of the SPQ has 42 items each with a five point scale. It has three main scales as described above with two subscales for each main scale, one motivation and one strategy.


## 5.2 The Lancaster Approaches to Studying Inventory

The Lancaster Approaches to Studying Inventory also attempts to capture the main motivational states and cognitive strategies. It is based on the work of Biggs, Marton, Pask and developed by Entwistle and colleagues at Lancaster

University in Great Britain. (See, for example, Entwistle, Hanley and Hounsell, 1979, Ramsden and Entwistle, 1981.) The main scales and subscales are shown below:

1. *Meaning orientation*

This is a composite scale consisting of 4 subscales. High scores indicate that students intend to understand what they study.

* Deep approach
* Relating ideas
* Use of evidence
* Intrinsic motivation

2. *Reproducing orientation*

This is a composite scale consisting of 4 subscales. High scores indicate that students intend to reproduce what they study.

* Surface approach
* Syllabus-boundness
* Fear of Failure
* Improvidence

3. *Strategic orientation*

This is a composite scale made up of three subscales. High scores indicate that students are studying to gain qualifications for employment and see academic study as a game they must win.

* Extrinsic motivation
* Strategic approach
* Achievement motivation

4. *Non-academic orientation*

This is a composite scale made up of 3 subscales. High scores indicate that students have little concern for academic requirements and are experiencing study difficulties linked to poor academic performance.

* Disorganised study methods
* Negative attitudes to study
* Globetrotting

Two further subscales are included in the inventory which do not seem to be linked consistently to the above scales:

*Comprehension learning*

and

*Operation learning.*

The Inventory consists of 64 questions, each scored on a five point scale.

Clearly there are certain similarities between the SPQ and the Lancaster Approaches to Studying Inventory : both try to account for motivational states and cognitive strategies which are linked together within scales. Biggs does not attempt to introduce the work of Pask into his Questionnaire whereas the

Lancaster group have done so. Even so, the styles of comprehension and operation learning do not seem to be incorporated into the Inventory scales though the pathologies associated with these styles are. There is no specific subscale to measure a versatile approach to study.

The self-report inventories share some of the methodological problems associated with interviews in that respondents may be assumed to strive for moderation and consistency in their answers and that they will "edit" these answers for purpose of self presentation (c.f. Fleming, 1986 ; Tourangeau and Rasinski, 1988).

## 6. Use of inventories in a variety of cultural contexts

In this section we will focus on research in which the two inventories described above have been administered in a number of different cultural and educational settings, paying particular attention to their internal consistency and applicability in these different contexts.

### 6.1 Reliability

SPQ : There have been several attempts to assess the internal consistency of

Table 1: Internal reliability of the SPQ

| | Cronbach alphas | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| *Utilising/surface scale* | (1) | (2) | (3) | (4) | (5) | (6) |
| Motivation items (N=7) | .53 | .60 | .61 | .51 | .51 | .61 |
| Strategy items (N=7) | .56 | .69 | .66 | .62 | .51 | .57 |
| All items (N=14) | .69 | .75 | .73 | .68 | .58 | .72 |
| *Internalising/deep scale* | | | | | | |
| Motivation items (N=7) | .64 | .67 | .65 | .63 | .57 | .66 |
| Strategy items (N=7) | .65 | .72 | .75 | .73 | .60 | .72 |
| All items (N=14) | .76 | .79 | .81 | .79 | .70 | .80 |
| *Achieving scale* | | | | | | |
| Motivation items (N=7) | .72 | .70 | .72 | .71 | .57 | .73 |
| Strategy items (N=7) | .73 | .74 | .77 | .75 | .57 | .76 |
| All items (N=14) | .78 | .77 | .78 | .77 | .68 | .79 |
| Surface-achieving items (N=28) | | | .77 | .74 | | |
| Deep-achieving items (N=28) | | | .85 | .85 | | |

(1) O'Neil and Chid (1984) : sample of 246 students at a British Polytechnic
(2) Hattie and Watkins (1981) : sample of 255 Australian university students
(3) Biggs (1987) : sample of 1,000 Australian university students
(4) Biggs (1987) : sample of 1,000 Australian College of Advanced Education students
(5) Hattie and Watkins (1981) : sample of 173 Filipino students from a College of Liberal Arts and Sciences
(6) Gow and Kember (1989) : sample of 1,043 students from Hong Kong Polytechnic

Biggs' SPQ scales, that is, to assess the extent to which items agree with each other as measures of the same motive or strategy. Australian, British, Filipino and Hong Kong students have been used and the results are encouraging for all but the Filipino sample. However, most authors have noted that the motivation subscale on the utilising scale generally shows at lower pattern of consistency than other subscales in the questionnaire. Data from six studies are reproduced in Table 1. Cronbach alpha is used as a measure of internal consistency of scales and subscales.

**Lancaster Approaches to Studying Inventory:** Data on internal consistency of this inventory has been reported less frequently than for the SPQ even though it has been used in a number of different contexts. Ramsden and Entwistle (1981) reported Cronbach alphas from a sample of 2,208 students from 66 academic departments in six disciplines in British universities and polytechnics. These are shown in Table 2. Although subscale reliabilities tend to be somewhat low,

**Table 2: Internal reliability of the Lancaster Approaches to Studying Inventory**

|  | Cronbach alphas |
| --- | --- |
| **Reproducing orientation** | |
| Surface approach items (N=6) | .49 |
| Syllabus-boundness items (N=3) | .51 |
| Fear of failure items (N=3) | .45 |
| Improvidence items (N=4) | .42 |
| All items (N=16) | .73 |
| **Meaning orientation** | |
| Deep approach items (N=4) | .56 |
| Relating ideas items (N=4) | .47 |
| Use of evidence items (N=4) | .38 |
| Intrinsic motivation items (N=4) | .72 |
| All items (N=16) | .79 |
| **Strategic orientation** | |
| Achievement motivation items (N=4) | .58 |
| Extrinsic motivation items (N=4) | .78 |
| Strategic approach items (N=4) | .32 |
| All items (N=12) | .67 |
| **Non-academic orientation** | |
| Disorganised study methods items (N=4) | .71 |
| Negative attitudes to study items (N=4) | .60 |
| Globetrotting items (N=4) | .36 |
| All items (N=12) | .70 |
| *Comprehension learning items* (N=4) | .65 |
| *Operation learning items* (N=4) | .49 |

alpha levels are satisfactory for the main scales,

## 6.2 Means and standard deviations

Means and standard deviations have no absolute meaning for these inventories. They can however form the basis of comparison between groups of students and be used in correlational studies with other variables.

**SPQ**: Biggs (1987) presented norms for the SPQ for several categories of Australian tertiary students. Scale and subscale means and standard deviations are presented in Table 3.

### Table 3: Normative data for the SPQ for Australian higher education students

**University Arts: Males (N=111), Females (N=294)**

| Utilising/surface scale | Males | | Females | |
|---|---|---|---|---|
| | Means | SD | Means | SD |
| Motivation items (N=7) | 21.42 | 4.90 | 21.19 | 5.26 |
| Strategy items (N=7) | 19.06 | 4.78 | 19.31 | 4.71 |
| All items (N=14) | 40.49 | 8.37 | 40.50 | 8.54 |
| *Internalising/deep scale* | | | | |
| Motivation items (N=7) | 23.81 | 4.64 | 23.24 | 4.85 |
| Strategy items (N=7) | 23.12 | 4.49 | 22.82 | 4.60 |
| All items (N=7) | 46.93 | 8.10 | 46.06 | 8.58 |
| *Achieving scale* | | | | |
| Motivation items (N=7) | 19.92 | 5.64 | 19.33 | 5.25 |
| Strategy items (N=7) | 20.06 | 5.60 | 21.83 | 5.52 |
| All items (N=14) | 39.98 | 8.36 | 41.16 | 8.73 |
| *Deep-achieving scale* (N=28) | 86.91 | 14.78 | 87.22 | 14.91 |

**University Education:Males (N=72), Females (N=135)**

| Utilising/surface scale | Males | | Females | |
|---|---|---|---|---|
| | Means | SD | Means | SD |
| Motivation items (N=7) | 21.61 | 5.05 | 21.23 | 4.86 |
| Strategy items (N=7) | 19.79 | 4.99 | 19.50 | 4.68 |
| All items (N=14) | 41.40 | 8.29 | 40.73 | 7.87 |
| *Intermalising/deep scale* | | | | |
| Motivation items (N=7) | 23.64 | 5.16 | 23.37 | 4.86 |
| Strategy items (N=7) | 22.26 | 4.25 | 22.98 | 4.89 |
| All items (N=7) | 45.90 | 8.55 | 46.55 | 8.81 |
| *Achieving scale* | | | | |
| Motivation items (N=7) | 18.32 | 5.47 | 18.71 | 4.89 |
| Strategy items (N=7) | 18.86 | 4.49 | 21.29 | 5.26 |
| All items (N=14) | 37.18 | 8.71 | 40.00 | 8.47 |
| *Deep-achieving scale* (N=28) | 83.08 | 15.09 | 86.35 | 14.33 |

**University Science:Males (N=139), Females (N=109)**

| *Utilising/surface scale* | Males | | Females | |
|---|---|---|---|---|
| | Means | SD | Means | SD |
| Motivation items (N=7) | 21.63 | 4.88 | 21.83 | 4.47 |
| Strategy items (N=7) | 21.87 | 4.54 | 21.09 | 3.74 |
| All items (N=14) | 43.53 | 8.12 | 43.72 | 6.80 |
| *Intermalising/deep scale* | | | | |
| Motivation items (N=7) | 21.93 | 4.84 | 21.65 | 4.06 |
| Strategy items (N=7) | 22.10 | 4.47 | 21.65 | 4.20 |
| All items (N=14) | 44.08 | 8.40 | 43.30 | 7.13 |
| *Achieving scale* | | | | |
| Motivation items (N=7) | 20.70 | 4.98 | 20.16 | 4.68 |
| Strategy items (N=7) | 20.42 | 5.32 | 22.48 | 5.52 |
| All items (N=14) | 41.12 | 8.69 | 42.63 | 8.27 |
| *Deep-achieving scale* (N=28) | 85.15 | 14.33 | 86.92 | 13.35 |

**College of Advanced Education Arts: Males (N=56), Females (N=40)**

| *Utilising/surface scale* | Males | | Females | |
|---|---|---|---|---|
| | Means | SD | Means | SD |
| Motivation items (N=7) | 22.57 | 4.17 | 20.50 | 4.85 |
| Strategy items (N=7) | 21.98 | 4.41 | 19.96 | 4.51 |
| All items (N=14) | 44.55 | 7.38 | 40.47 | 8.27 |
| *Intermalising/deep scale* | | | | |
| Motivation items (N=7) | 22.11 | 4.09 | 23.52 | 4.33 |
| Strategy items (N=7) | 22.18 | 3.95 | 22.85 | 4.22 |
| All items (N=7) | 44.29 | 7.08 | 46.38 | 7.64 |
| *Achieving scale* | | | | |
| Motivation items (N=7) | 21.29 | 4.96 | 19.45 | 5.91 |
| Strategy items (N=7) | 18.89 | 4.50 | 20.02 | 4.84 |
| All items (N=14) | 40.18 | 7.79 | 39.47 | 8.84 |
| *Deep-achieving scale* (N=28) | 84.46 | 12.94 | 85.85 | 14.65 |

**College of Advanced Education Education: Males (N=298), Females (N=673)**

| *Utilising/surface scale* | Males | | Females | |
|---|---|---|---|---|
| | Means | SD | Means | SD |
| Motivation items (N=7) | 22.59 | 4.79 | 22.55 | 4.37 |
| Strategy items (N=7) | 21.22 | 4.22 | 20.86 | 4.37 |
| All items (N=14) | 43.81 | 7.56 | 43.41 | 7.21 |
| *Intermalising/deep scale* | | | | |
| Motivation items (N=7) | 20.84 | 4.47 | 21.41 | 4.39 |
| Strategy items (N=7) | 21.52 | 4.42 | 22.18 | 4.19 |
| All items (N=7) | 42.40 | 8.12 | 43.59 | 7.62 |
| *Achieving scale* | | | | |
| Motivation items (N=7) | 20.13 | 5.24 | 19.91 | 4.75 |
| Strategy items (N=7) | 18.11 | 5.19 | 20.18 | 5.09 |
| All items (N=14) | 38.24 | 8.47 | 40.09 | 7.83 |
| *Deep-achieving scale* (N=28) | 80.60 | 14.54 | 83.68 | 13.36 |

Approaches to Study in Japanese Higher Education Students

**College of Advanced Education Science: Males (N=226), Females (N=247)**

| Utilising/surface scale | Males | | Females | |
|---|---|---|---|---|
| | Means | SD | Means | SD |
| Motivation items (N=7) | 22.49 | 4.78 | 22.83 | 4.66 |
| Strategy items (N=7) | 22.20 | 4.47 | 21.92 | 4.58 |
| All items (N=14) | 44.67 | 7.32 | 44.75 | 8.13 |
| *Intermalising/deep scale* | | | | |
| Motivation items (N=7) | 21.11 | 5.01 | 21.68 | 4.49 |
| Strategy items (N=7) | 21.90 | 4.55 | 22.01 | 4.29 |
| All items (N=7) | 43.01 | 8.64 | 43.70 | 7.85 |
| *Achieving scale* | | | | |
| Motivation items (N=7) | 19.91 | 5.44 | 19.10 | 4.97 |
| Strategy items (N=7) | 19.57 | 5.24 | 21.60 | 5.20 |
| All items (N=14) | 39.48 | 8.96 | 40.70 | 8.76 |
| *Deep-achieving scale* (N=28) | 82.49 | 15.50 | 84.37 | 14.79 |

Gow and Kember (1989) also obtained mean scores for the SPQ after administering this questionnaire to a sample of students at Hong Kong Polytechnic. These results are shown in Table 4 along with overall means for Biggs sample of Australian students for College of Advanced Education Arts and Science students which is the appropriate comparison. Gow and Kember observe that, contrary to anecdotal evidence about Hong Kong students, their sample did not appear to show more evidence of rote learning than their counterparts in Australian and British samples.

**Table 4: A comparison of mean scores for the SPQ**

| Department | Sex | n | SM | DM | AM | SS | DS | AS |
|---|---|---|---|---|---|---|---|---|
| Accountancy | M | 238 | 22.8 | 22.2 | 22.2 | 19.6 | 22.9 | 21.6 |
| | F | 271 | 22.5 | 21.7 | 22.2 | 20.5 | 22.5 | 22.6 |
| Diagnostic Sciences | M | 56 | 22.7 | 21.7 | 22.2 | 20.7 | 22.7 | 20.7 |
| | F | 34 | 21.9 | 21.1 | 21.5 | 20.9 | 22.8 | 21.9 |
| Language & Communication | M | 8 | 19.1 | 21.4 | 21.9 | 20.3 | 24.1 | 21.3 |
| | F | 30 | 19.8 | 23.7 | 20.3 | 17.4 | 24.1 | 23.5 |
| Rehabilitation Sciences | M | 39 | 20.5 | 23.8 | 21.3 | 19.7 | 25.4 | 23.5 |
| | F | 29 | 19.4 | 22.7 | 20.5 | 19.8 | 23.2 | 23.5 |
| Applied Social Studies | M | 8 | 21.3 | 23.4 | 18.2 | 19.1 | 24.7 | 23.3 |
| | F | 31 | 20.0 | 26.5 | 17.6 | 17.5 | 24.8 | 22.1 |
| Textiles & Clothing | M | 118 | 21.3 | 22.0 | 21.4 | 19.3 | 23.1 | 19.1 |
| | F | 181 | 21.2 | 21.2 | 20.4 | 19.4 | 21.8 | 19.9 |
| OVERALL | | 1043 | 21.8 | 22.0 | 21.4 | 19.8 | 22.8 | 21.4 |
| Australian CAE Science | M | 228 | 22.5 | 21.1 | 19.9 | 22.2 | 21.9 | 19.6 |
| | F | 247 | 22.8 | 21.7 | 19.1 | 21.9 | 22.0 | 21.6 |
| Australian CAE Arts | M | 56 | 22.6 | 22.1 | 21.3 | 22.0 | 22.2 | 18.9 |
| | F | 40 | 20.5 | 23.5 | 19.5 | 20.0 | 22.9 | 20.0 |

**Lancaster Approaches to Studying Inventory:** Ramsden and Entwistle (1981) present means and standard deviations for subscale scores on this inventory based on their sample of 2,208 British students in universities and polytechnics. Further data have been collected for Australia university and College of Advanced Education students and British Open University students. Means and standard deviations (in brackets) for five samples are shown in Table 5.

**Table 5: Means and standard deviations for Lancaster Approaches to Studying Inventory. (From Harper and Kember, 1986, p.216.)**

| Subscale | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Deep approach | 11.4(2.8) | 12.0(3.1) | 11.3 | 10.6(3.1) | 11.3(2.8) |
| Inter-relating ideas | 11.1(2.8) | 11.3(2.9) | 10.7 | 10.1(3.1) | 10.7(2.7) |
| Use of evidence | 10.3(3.0) | 10.9(2.9) | 9.8 | 9.6(2.9) | 10.0(3.1) |
| Intrinsic motivation | 9.3(3.8) | 8.9(4.2) | 9.5 | 8.3(3.9) | 10.5(3.1) |
| Surface approach | 14.2(4.4) | 14.5(4.7) | 12.3 | 13.1(4.3) | 14.6(4.5) |
| Syllabus-boundness | 8.7(2.3) | 8.8(2.5) | 7.8 | 8.3(2.7) | 8.7(2.5) |
| Fear of failure | 7.5(2.9) | 6.2(3.3) | 5.8 | 5.9(3.1) | 5.4(3.1) |
| Improvidence | 9.3(3.0) | 8.7(3.6) | 7.0 | 7.6(3.3) | 7.7(3.3) |
| Disorganised study methods | 10.2(4.2) | 9.3(4.5) | 9.6 | 9.5(4.2) | 9.4(4.5) |
| Negative attitude to study | 5.8(4.3) | 5.9(4.0) | 5.7 | 5.4(3.9) | 5.5(3.5) |
| Globetrotting | 8.2(3.1) | 7.9(3.6) | 7.3 | 7.7(3.1) | 8.4(3.3) |
| Achievement motivation | 9.7(3.3) | 10.0(3.4) | 7.9 | 9.7(3.6) | 8.9(3.5) |
| Extrinsic motivation | 8.2(4.3) | 9.3(4.4) | 6.4 | 5.9(4.4) | 4.9(4.3) |
| Strategic approach | 11.0(2.9) | 11.6(2.9) | 10.2 | 10.3(3.0) | 10.6(2.9) |
| Comprehension learning | 8.7(3.8) | 8.1(3.8) | 9.6 | 8.6(3.9) | 8.2(3.8) |
| Operation learning | 11.3(2.9) | 11.9(2.6) | 10.2 | 10.1(3.2) | 10.8(2.8) |

(1) Hamper and Kember (1986), sample of 450 Australian College of Advanced Education students.

(2) Hamper and Kember (1986), sample of 329 Australian College of Advanced Education students.

(3) Watkins (1982), sample of 540 Australian university students

(4) Ramsden and Entwistle (1981), sample of 2,208 British students in universities and polytechnics.

(5) Morgan, Gibbs and Taylor (1980), sample of 357 British Open University students.

Ramsden and Entwistle (1981) also provided a breakdown of mean scores by discipline for their sample of 2,208 British students in universities and polytechnics. These results are reproduced in Table 6 on page 217.

### 6.3 Factor analysis

**SPQ:** Gow and Kember (1989) summarize the results of factor analyses on the SPQ from four different studies: Biggs (1987) using separate samples of univer-

**Table 6: Breakdown of mean scores by discipline (Ramsden and Entwistle, 1981).**

| Sub-scale | English Mean | English Range | History Mean | History Range | Psychology Mean | Psychology Range | Economics Mean | Economics Range | Physics Mean | Physics Range | Engineering Mean | Engineering Range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Approaches to studying* | | | | | | | | | | | | |
| Deep Approach | 11.2 | 10.2–12.7 | 11.3 | 10.4–12.0 | 10.8 | 9.9–12.4 | 10.2 | 8.5–12.1 | 10.1 | 8.5–11.9 | 10.4 | 8.4–12.0 |
| Inter-relating Ideas | 10.5 | 8.6–11.5 | 10.1 | 9.6–11.2 | 10.9 | 10.1–12.0 | 10.1 | 8.9–11.8 | 9.3 | 8.2–10.9 | 9.6 | 8.2–11.8 |
| Use of Evidence | 9.4 | 9.1–9.6 | 9.5 | 8.9–10.6 | 9.6 | 8.5–11.0 | 9.4 | 8.7–10.4 | 9.8 | 8.6–10.3 | 9.9 | 9.0–11.0 |
| Intrinsic Motivation | 9.5 | 8.1–10.3 | 8.5 | 7.3–9.6 | 9.3 | 7.3–10.5 | 7.0 | 4.9–9.6 | 8.8 | 7.9–9.9 | 7.3 | 5.3–10.1 |
| Surface Approach | 12.9 | 11.0–14.7 | 12.4 | 11.2–14.0 | 12.8 | 11.7–14.1 | 13.8 | 12.8–15.0 | 13.2 | 10.9–14.7 | 13.2 | 10.8–16.1 |
| Syllabus-boundness | 7.0 | 5.4–8.1 | 7.6 | 6.4–8.7 | 7.7 | 6.4–8.6 | 8.8 | 7.5–9.5 | 8.6 | 7.6–9.9 | 9.2 | 8.5–10.1 |
| Fear of Failure | 5.8 | 4.5–6.9 | 5.7 | 5.0–6.4 | 5.9 | 4.8–7.0 | 6.0 | 4.6–7.5 | 5.5 | 4.9–6.2 | 6.2 | 5.0–7.4 |
| Extrinsic Motivation | 2.8 | 1.5–5.1 | 3.3 | 2.0–4.4 | 4.5 | 2.8–5.6 | 7.9 | 5.1–9.4 | 5.7 | 4.0–8.6 | 8.0 | 6.5–10.0 |
| Strategic Approach | 9.8 | 8.3–10.6 | 9.8 | 8.9–11.1 | 10.2 | 8.8–11.2 | 10.3 | 9.5–10.8 | 10.6 | 9.2–11.5 | 10.5 | 8.5–11.5 |
| Disorganised Study Methods | 9.2 | 7.8–11.4 | 8.2 | 7.1–10.6 | 9.9 | 8.7–13.0 | 9.4 | 8.1–11.0 | 9.6 | 8.1–10.9 | 9.8 | 8.0–11.7 |
| Negative Attitudes to Studying | 4.5 | 4.4–6.3 | 5.9 | 5.0–6.4 | 5.3 | 4.2–8.6 | 5.6 | 4.3–6.7 | 5.8 | 4.6–6.9 | 5.4 | 4.5–6.9 |
| Achievement Motivation | 9.0 | 8.0–10.0 | 9.0 | 8.0–10.0 | 8.8 | 7.3–9.9 | 10.0 | 9.2–11.0 | 9.8 | 8.5–11.5 | 10.7 | 9.4–11.4 |
| Comprehension Learning | 11.0 | 10.0–11.7 | 8.7 | 7.8–10.0 | 9.0 | 7.9–10.1 | 7.7 | 6.2–9.2 | 8.2 | 6.3–9.9 | 8.0 | 6.4–10.3 |
| Globetrotting | 7.8 | 6.8–8.9 | 7.2 | 6.3–8.5 | 8.2 | 7.4–9.3 | 7.8 | 6.9–8.5 | 7.4 | 6.3–8.2 | 7.5 | 6.6–8.6 |
| Operation Learning | 8.6 | 7.5–9.4 | 9.8 | 8.5–10.7 | 9.2 | 8.2–10.2 | 10.8 | 10.1–12.0 | 10.1 | 9.2–11.8 | 11.1 | 9.7–12.8 |
| Improvidence | 6.8 | 4.4–8.4 | 7.1 | 6.3–8.0 | 7.4 | 6.2–8.7 | 8.4 | 7.6–9.0 | 7.4 | 4.9–8.4 | 7.8 | 6.7–9.3 |
| *Perceptions of Courses* | | | | | | | | | | | | |
| Formal Teaching Methods | 3.3 | 2.5–5.3 | 2.7 | 2.1–3.6 | 6.7 | 3.8–9.1 | 6.7 | 5.5–7.8 | 12.0 | 9.6–13.5 | 12.1 | 10.0–16.2 |
| Clear Goals and Standards | 6.7 | 3.6–9.5 | 8.0 | 6.2–10.2 | 8.6 | 5.6–11.9 | 11.0 | 8.4–12.7 | 11.4 | 10.0–13.3 | 12.2 | 11.5–13.8 |
| Workload | 10.0 | 5.6–12.3 | 11.2 | 7.5–14.8 | 9.0 | 5.3–12.6 | 9.0 | 5.6–13.5 | 9.9 | 8.4–12.1 | 12.9 | 5.5–14.3 |
| Vocational Relevance | 3.9 | 3.1–4.7 | 4.8 | 3.5–5.6 | 6.5 | 4.7–8.4 | 8.2 | 6.2–9.0 | 8.9 | 5.3–12.6 | 13.4 | 9.0–15.1 |
| Good Teaching | 11.4 | 8.1–13.8 | 11.8 | 9.8–14.0 | 11.8 | 9.2–14.0 | 11.8 | 8.0–14.1 | 11.8 | 10.7–12.8 | 11.4 | 9.1–13.2 |
| Freedom in Learning | 11.7 | 7.4–15.8 | 11.2 | 5.0–13.2 | 9.7 | 7.9–12.6 | 10.4 | 7.4–12.6 | 8.2 | 6.3–11.3 | 8.1 | 5.8–11.7 |
| Openness to Students | 8.5 | 5.9–13.5 | 7.7 | 4.2–9.8 | 9.9 | 7.4–12.8 | 8.7 | 6.2–11.8 | 9.2 | 6.4–12.1 | 8.6 | 6.7–11.1 |
| Good Social Climate | 9.0 | 6.9–13.6 | 9.2 | 6.9–10.3 | 11.5 | 10.2–13.5 | 9.9 | 7.8–12.0 | 11.2 | 9.0–12.7 | 11.0 | 8.3–13.9 |

**Table 7: Factor analyses of SPQ items**

| Sub-scale | Question no. | Biggs'(university) | | | | | | Biggs'(CAEs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 6 |
| SURFACE | 1 | 655 | | | | | | 671 | | | | | |
| MOTIVE | 7 | | | | | | | | | | | | |
| | 13 | 608 | | | | 347 | | 607 | | | | 290 | |
| | 19 | | | | | | | | | | | | |
| | 25 | | 594 | | | | | | | −337 | | | |
| | 31 | 392 | | −476 | | | | | | −477 | | | |
| | 37 | 687 | | | | | | 686 | | | | | |
| SURFACE | 4 | | 678 | | | | | | 289 | | | | |
| STRATEGY | 10 | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | |
| | 22 | | 557 | | | | −329 | | | | | | |
| | 28 | | 268 | | | | | 514 | | | | | |
| | 34 | | | | | | | 723 | | | | | |
| | 40 | | | | | | | 714 | | | | | |
| DEEP | 2 | | | 578 | | | | | | 598 | 252 | | |
| MOTIVE | 8 | | | | | | | | | 304 | 268 | | |
| | 14 | | | 537 | | | | | | 447 | | | |
| | 20 | | | 597 | | | | | | 599 | | | |
| | 26 | | | 556 | 324 | | | | | 598 | | | |
| | 32 | | | | | | | | | | | | |
| | 38 | 272 | | | | | | | | | | | |
| DEEP | 5 | | | | 420 | | | | | | 650 | | |
| STRATEGY | 11 | | | | 683 | | | | | 352 | 510 | | |
| | 17 | | | 246 | 261 | | 283 | | | 268 | 385 | | 325 |
| | 23 | | | | 720 | | | | | | 708 | | |
| | 29 | | −304 | | | | 455 | | | 347 | | | 515 |
| | 35 | | −377 | | | | 355 | | | | | | 520 |
| | 41 | | | | 701 | | | | | | 650 | | |
| ACHIEVING | 3 | | | | | 724 | | | | | | 707 | |
| MOTIVE | 9 | | | | | 649 | 247 | | | | | 618 | |
| | 15 | | | | | 643 | | | | | | 699 | |
| | 21 | | | | | | | | | 366 | | 321 | |
| | 27 | | | | | | | | | | | 494 | |
| | 33 | | | | | 438 | | | | | | 706 | |
| | 39 | | | | | | | | | | | 399 | |
| ACHIEVING | 6 | | | | | | 540 | | | | | | 573 |
| STRATEGY | 12 | | | | | | 656 | | | | | | 474 |
| | 18 | | | | | | 676 | | | | | | 539 |
| | 24 | | | | | | 660 | | | | | | 677 |
| | 30 | | | | 315 | | 506 | | | | | | 559 |
| | 36 | | | | | | 649 | | | | | | 704 |
| | 42 | | | | | | 572 | | | | | | 447 |

Peciwal points and loadings .025 omitted

Approaches to Study in Japanese Higher Education Students

| O'Neil and Child | | | | | | Hong Kong Polytechnic | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 496 | | | | | | | | | | 367 | | | | | |
| | | | | | | | | | | | | 479 | | | |
| 437 | | | | 337 | | | | | | 517 | | | | | |
| | | | | | | | | | | | | 621 | | | |
| | | | | | | | | | 422 | | | | | | |
| 508 | | | | | | | | | | | | | | | |
| 559 | | | | | | | | | | 780 | | | | 269 | |
| | 606 | | | | | | | | | | 495 | | | | |
| | | | | | | | | | | | | 410 | | | |
| | 567 | | | | | | | | | | 600 | | | | |
| 342 | | | | | | | | | | | | | | 319 | |
| 261 | 248 | | −476 | | | | | | | | | | | 367 | |
| 401 | | | | | | | | | | | | | | 494 | |
| | | 634 | | | | 269 | | | 502 | | | | | | |
| | | 286 | 392 | | | | | | | | | 518 | | | |
| | | 400 | | | | | | | 382 | | | | | | |
| | | 625 | | | | | | | 547 | | | | | | |
| | | 549 | | | | | | | 264 | | | 378 | | | |
| | | 276 | 372 | | | | | | | | | 443 | | | |
| | | | 477 | | | | | 304 | | | | 279 | | | |
| | | | | | | | | 544 | | | | | | | |
| | | | 404 | | | | | | 316 | | | 272 | | | |
| | | | 480 | | | | | 616 | | | | | | | |
| | | | | | | 255 | | | 483 | | | | | | |
| | | 310 | | | | | | 283 | | | | | | | 474 |
| | | | 473 | | | | | 622 | | | | | | | |
| | | | | 455 | | | 361 | | | 298 | | | | | |
| | | | | 481 | 413 | | 764 | | | | | | | | |
| | | | | 585 | | | 676 | | | | | | | | |
| | | | | 376 | | | | | | | | | | | |
| | | | | 572 | | | 621 | | | | | | | 266 | |
| | | | | 327 | | | | | | 256 | | | | 445 | |
| | | | | | 393 | | | | | | | | | | |
| | | | | 683 | 560 | | | | | | | | | | |
| | | | | 625 | 613 | | | | | | | | | | |
| | | | | 536 | 689 | | | | | | | | | | |
| | | | | 270 | 377 | 286 | | | | | | | | | |
| | | | | | 452 | | | | | | | | | | |
| | | | | 587 | 479 | | | | | | | | | | |
| % variance explained | | | | | | 14.2 | 7.8 | 3.2 | 2.3 | 1.9 | 1.4 | 1.3 | 1.2 | 1.1 | 0.8  Total 35.3% |

sity and College of Advanced Education students, O'Neil and Child (1984) using British Polytechnic students and their own study using Hong Kong polytechnic students. All analyses involved principal factor analysis, with iterations to obtain an estimate of communalities, followed by varimax orthogonal rotation for factors with eigenvalues greater than one. O'Neil and Child obtained a thirteen factor solution but only report the six factors which they could interpret. Results of these studies are summarized in Table 7 on pages 218~219.

Hattie and Watkins (1981) used unrestricted maximum likelihood common factor analysis (Joreskog, 1969) to compare a sample of 255 Australian university students with 173 freshmen attending a College of Liberal Arts and Sciences in the Philippines. They report the results of their analysis as follows:

> The SPQ items were analyzed using unrestricted maximum likelihood common factor analysis (Joreskog, 1969). Given the certainty of non-linear relations between items, which is typical with such data, rather than use statistic criteria or other heuristics for choosing the number of factors, the decision as to the number of factors was made solely on the grounds as to whether the factors could be interpreted. For the Australian sample two, three and six factor solutions were interpretable. For the six factor solution, the six scales outlines by Biggs were clearly evident. For the three factor solution, the first factor related to internalising with some high loadings on utilising strategy ; the second factor related to utilising with off loadings on achievement motivation : and the third factor related to achievement strategy. With only two factors extracted, the first related to strategy and internalising motive, and the second to achievement and utilising motivation.

> The Filipino data clearly came down to a two factor solution : one factor relating to motivation and the other to strategy. The six and three factor solutions were not clearly interpretable. (pp.242-3)

Gow and Kember (1989) also report a different factor structure for Hong Kong students. They write:

> Factors 1, 2 and 3 correspond reasonably well with the sub-scales achieving strategy, achieving motive and deep strategy respectively. Factors 4 to 9, however, all contain items from two or three subscales. (p.7)

These authors asked five judges to try to attribute meanings to factors 4 to 9 and there was a high degree of consistency over attributed meanings as follows:

Factor 4 : motivated by pursuit of knowledge

Factor 5 : motivation for study related to future employment

Factor 6 : exam oriented only

Factor 7 : fear of failure - lack of confidence

Factor 8 : study to uncover life's meaning

Factor 9 : competitive but rely on evidence - external locus of control.

Taken together these findings seem to indicate that there are contextual influences in determining the factor structure of the SPQ.

**Lancaster Aproaches to Studying Inventory:** Factor analyses of the Lancaster

**Table 8: Summary of factor analyses for the Lancaster Approaches to Studying Inventory**

| | Ramsden and Entwistle (1981) | | | | Morgan Gibbs and Taylor (1980) | | | |
|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | I | II | III | IV |
| Deep approach | .70 | | | | .63 | | | |
| Relating ideas | .65 | | | | .61 | | | |
| Use of evidence | .54 | | | | | | | |
| Intrinsic motivation | .72 | | | | .64 | | | |
| Surface approach | | .57 | .36 | .30 | | .67 | | |
| Syllabus-boundness | −.41 | .58 | | | | .54 | | |
| Fear of failure | | .50 | .34 | | | .59 | | |
| Extrinsic motivation | −.25 | .38 | | .53 | | | | .43 |
| Strategic approach | .29 | | | .48 | | | .35 | |
| Disorganised study methods | −.25 | | .50 | | | .58 | .39 | |
| Negative attitude to study | −.39 | | .52 | | | .50 | | |
| Achievement motivation | | | | .45 | | | | .63 |
| Comprehension learning | .55 | | .30 | | .58 | | | |
| Globetrotting | | | .52 | | | .69 | | |
| Operation learning | | .62 | | .44 | | .42 | .38 | |
| Improvidence | | .68 | | .26 | | .64 | | |

| | Watkins (1982) | | | | Watkins (1983) | | | |
|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | I | II | III | IV |
| Deep approach | .66 | | | | .69 | .32 | | |
| Relating ideas | .67 | | | | .63 | | | |
| Use of evidence | .51 | | | | .48 | .30 | .35 | |
| Intrinsic motivation | .73 | | | | .76 | .37 | | |
| Surface approach | | .64 | .37 | | .32 | .46 | .43 | |
| Syllabus-boundness | .35 | .35 | .30 | | .58 | .38 | .38 | |
| Fear of failure | | .61 | | | | .48 | | |
| Extrinsic motivation | .38 | | | .75 | .47 | | | |
| Strategic approach | | | .43 | | | | .51 | |
| Disorganised study methods | | .57 | | | | .62 | | |
| Negative attitude to study | .42 | .54 | | | | .57 | | |
| Achievement motivation | | | | .33 | | | .34 | |
| Comprehension learning | .62 | | | | .52 | | | |
| Globetrotting | | .59 | | | | .52 | | |
| Operation learning | | | .73 | | | | .64 | |
| Improvidence | | | .51 | .42 | | | .45 | .43 |

| | Clarke (1986) | | | | Harper and Kember (1983) | | | |
|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | I | II | III | IV |
| Deep approach | .77 | | | | .67 | | | |
| Relating ideas | .74 | | | | .67 | | | |
| Use of evidence | .74 | | | | .66 | | | |
| Intrinsic motivation | .76 | | | | .56 | | | .35 |
| Surface approach | | .35 | .62 | | | .63 | | .44 |
| Syllabus-boundness | .43 | | .56 | | | .35 | .40 | .32 |
| Fear of failure | | ?? | | | | .64 | | |
| Extrinsic motivation | | | | .66 | .50 | | | .66 |
| Strategic approach | | ?? | .32 | | | | | |
| Disorganised study methods | | .72 | | | | .58 | | |
| Negative attitude to study | | .63 | | | | .42 | | .46 |
| Achievement motivation | | | | .75 | | | | |
| Comprehension learning | .59 | .36 | .39 | | .32 | | .49 | |
| Globetrotting | | .68 | | | | .58 | .32 | |
| Operation learning | | | .78 | | .41 | .32 | .52 | |
| Improvidence | | .32 | .70 | | | .63 | | |

Inventory are performed on subscale scores rather than item scores as is the case with the SPQ. Results of six different studies were summarized by Harper and Kember (1989) are shown in Table 8.

The results of these studies show consistency in the first two factors extracted: the deep approach is evident in all cases, though as Harper and Kember (1989) note, there are some differences in the nature of the second, surface factor between Ramsden and Entwistle's (1981) study and all the others: in all other cases, disorganized study methods, negative attitudes to study and globetrotting load highly on the surface factor. It begins to look more like a surface-confusion factor than a reproducing factor per se. As Harper and Kember comment, it appears to be a factor made up of learning pathologies, undesirable study traits and attitudes.

Watkins (1983) had previously commented on the high loadings for the learning pathologies of globetrotting and improvidence on this factor and noted a significant correlation between them. This seems to run counter to Pask's (1976b) model of two discrete learning styles of which globetrotting and improvidence are pathologies. Harper and Kember discuss three reasons why this correlation might occur:

(a) The items on the two subscales show some of the lowest reliability levels of the whole inventory suggesting that they might not be good measures of these subscales.

(b) It may be possible that students display both improvidence and globe-trotting : the boredom caused by learning in a step-by-step fashion may lead to diversion of interest to interesting but irrelevant material.

(c) Both pathologies may lead to poor study outcomes and the subscales may reflect that outcome or the students' perceptions of how that outcomes is achieved.

The third and fourth factors show more variability than the other two suggesting that they are more susceptible to contextual influences.

In considering the pattern of factor loadings shown above, Harper and Kember suggest that factors three and four may reflect a "narrow orientation" and an "achieving/goal orientation" respectively.

These authors also make a valuable point with regard to comprehension learning and operation learning. They write:

> The inclusion of the comprehension learning subscale in the deep factor suggests that it is not possible to employ a deep approach unless one is capable of utilising a comprehension learning style. If students do not look for the gist or overall meaning structure of the article they inevitably constrain themselves to atomistic learning.
>
> This suggestion should not be taken as implying that a preference for operation learning leads to a surface approach. A methodological, orderly and detailed building blocks approach is not the same as rote learning. The ideal student should be capable of a versatile approach, employing compre-hension or operation learning as appropriate. (p.73)

## 7. The Japanese higher education system

The Japanese higher education system reflects Japan's post World War II reconstruction. Hence it exhibits Western influences in terms of structures and philosophies, principally those of the United States. However, it also reflects the orientation of the Meiji restoration dating from 1868, with its emphasis on industrial development and the role of universities in meeting the manpower needs of the state.

In 1947 the Japanese school system underwent a major reform and the basic framework of the present 6-3-3-4 system was laid down. That is, a six year primary level (from age six), a three year middle stage, a three year higher stage and a four year university level. Postgraduate degrees add another five years to this system.

Under the new system, universities were started in 1949. The junior college system of two or three years was introduced provisionally in the following year and was made permanent in 1964. In 1962, technical colleges with five year courses were established to run parallel with high schools.

Currently the higher education system comprises 490 univesities, 571 junior

colleges and 62 technical colleges. Private and public institutions exist side by side with private institutions far outnumbering state institutions. However, the prestigious institutions are public universities like Tokyo University and places are eagerly sought in them. In 1988 the total enrollment in higher education was 2.6 million. (Ministry of Education, Science and Culture, Government of Japan, 1989b).

Most important of the changes associated with the post war reconstruction of education was democratization and removal of sex discrimination at the point of entry to higher education. This has not necessarily resulted in an even distribution of males and females in the various levels of higher education, however. Males outnumber females in the universities and females far outnumber males in the junior colleges. In 1987 the Japanese Ministry of Education, Science and Culture (1989a) reported a total university enrollment of 1,934,483 but only 24.7% (477,392) were women. In junior colleges the total enrollment was reported to be 437.641, 90.6% (397.274) of whom were women.

Having obtained a place in a prestigious institution, the student's employment following graduation is virtually assured. Hence competition is very great in the final year of secondary school. This contrasts with the situation in many Western countries where both the status of the institution and the quality of the students performance - say a good honors degree - is a determining factor in deciding employment opportunities.

At the point of exit from higher education the incentives for males to pursue a lifelong career path are immeasurably greater than for females. It is generally accepted that women will retire from employment after marriage.

El-Agraa and Ichii (1985) report that the employment rate of female graduates is lower than that of males, and of graduates going into doctoral programs females are under-represented.

## 8. Aims

Approaches to study among Japanese higher education students is a question that has not previously been explored within the framework of the research literature cited in this discussion.

There are sufficient cultural and educational differences between Japan and other countries of British origin that a comparison of the inventories examined above might well prove interesting, particularly in exploring further the issue of contextual influences on some of the factors so far reported.

There are also quite different sex role expectations in terms of long-term employment prospects for men and women in Japan and we were interested to ask whether this reflected back on approaches to study adopted by men and women.

The third issue of interest is whether students in different disciplines in

Japanese higher education report different approaches to study.

To summarize, we aimed to:

(a) compare the factor structure of one of that self-report inventories discussed above (The Lancaster Approaches to Studying Inventory) from a sample of Japanese students with previously cited studies for the Inventory with a view to further exploring the question of contextual influences. We were also interested in the pattern of mean scores for inventory subscales.

(b) to compare responses of men and women on the inventory.

(c) to compare responses of students from different disciplines on the inventory.

## 9. Method

### 9.1 Sample

A total of 794 students from five Japanese institutions formed the sample for our research study. Students were distributed by institution as follows:

| Institution | N | male | female |
|---|---|---|---|
| Chiba University | 117 | 51 | 66 |
| Tokyo University | 328 | 260 | 68 |
| Tokai Women's College | 59 | — | 59 |
| Gifu University | 104 | 25 | 79 |
| Hiroshima University | 186 | 136 | 50 |
| Total | 794 | 472 | 322 |

The sample was not randomly selected, but we attempted to obtain data from a range of institutions as shown above. Since the inventory was administered to whole classes by their lecturers under the guidance of our research team, 794 was the number of surveys distributed and returned.

The sample consisted of 472 males (59.4%) and 322 females (40.6%).

Mean age for the sample was 19.69 years with a standard deviation of 1.36. The age range was from 18 to 32 years. For males the mean age was 19.81 years, standard deviation 1.54, age range 18 to 32 years. For females the mean age was 19.52 years, standard deviation 1.03, range 18 to 23 years. However 97.8% of all students were within the age range 18 to 22 years.

Students from four levels of study were included, with 231 (29.1%) in the first year, 416 (52.5%) in the second year and 146 (18.4%) in years three and four. Information on grade was not available for one student.

Students were enrolled in two general categories of course: Humanities/ Social Sciences (N=496, 62.5%) and Science/Technology (N=298, 37.5%). Females tended to concentrated in the Humanities/Social Sciences course:

83.85% for Humanities/Social Sciences versus 16.15% for Science/Technology, whereas males were more evenly distributed over course types : 47.88% for Humanities/Sciences versus 52.12% for Science/Technology courses.

## 9.2 The Inventory

The Lancaster Approaches to Studying Inventory consists of 64 questions each scored on a five point scale with a score of 4 representing "agree strongly" and a score of 0 representing "disagree strongly". (See Appendix 1.) Before it was administered the questions were translated into Japanese by two of the researchers and rechecked against the English version by all researchers. The Japanese version is shown in Appendix 2.

In addition to the Inventory a number of general questions were asked in order to determine the student's sex, age, level of study, faculty and major course of study.

The Inventory was administered to all students between 15 June and 4 July 1989.

The method of scoring the Inventory is shown in Table 9.

### Table 9: Scoring of Lancaster Approaches to Studying Inventory

**Meaning orientation**

| Subscales | Questions | Maximum score |
|---|---|---|
| Deep approach | 24,10,5,34 | 16 |
| Relating ideas | 2,29,50,56 | 16 |
| Use of evidence | 38,33,54,61 | 16 |
| Intrinsic motivation | 39,47,55,64 | 16 |
| Total scale score | | 64 |
| **Reproducing orientation** | | |
| Surface approach | 16,41,30,48,19,36 | 24 |
| Syllabus-boundness | 9,25,52 | 12 |
| Fear of failure | 12,26,53 | 12 |
| Improvidence | 13,51,60,62 | 16 |
| Total scale score | | 64 |
| **Non-academic orientation** | | |
| Disorganised study methods | 1,14,17,28 | 16 |
| Negative attitudes to studying | 23,8.63,49 | 16 |
| Globetrotting | 3,40,46,57 | 16 |
| Total scale score | | 48 |
| **Strategic orientation** | | |
| Achievement motivation | 4,42,58,15 | 16 |
| Extrinsic motivation | 7,22,32,35 | 16 |
| Strategic approach | 20,18,37,45 | 16 |
| Total scale score | | 48 |
| Comprehension learning | 6,21,31,44 | 16 |
| Operation learning | 11,27,43,59 | 16 |

# 10. Results

## 10.1 Reliability

Cronbach alphas were calculated for all subscales and the four main scales of the inventory. Results are shown in Table 10 along with those items which produced questionable results in terms of their contribution to overall scale scores.

**Table 10: Cronbach alphas for Japanese sample.**

|  | Cronbach alphas | Questionable items* |
|---|---|---|
| **Meaning orientation** | | |
| Deep approach items (N=4) | 0.35 | |
| Relating ideas items (N=4) | 0.58 | 50 |
| Use of evidence items (N=4) | 0.33 | |
| Intrinsic motivation items (N=4) | 0.54 | |
| All items (N=16) | 0.74 | |
| **Reproducing orientation** | | |
| Surface approach items (N=6) | 0.28 | 30 |
| Syllabus-boundness items (N=3) | 0.40 | |
| Fear of failure items (N=3) | 0.45 | |
| Improvidence items (N=4) | 0.35 | |
| All items (N=16) | 0.67 | |
| **Non-academic orientation** | | |
| Disorganised study methods items (N=4) | 0.64 | |
| Negative attitudes to study items (N=4) | 0.61 | 49 |
| Globetrotting items (N=4) | 0.17 | 3,40,46,57 |
| All items (N=12) | 0.66 | |
| **Strategic orientation** | | |
| Achievement motivation items (N=4) | 0.61 | |
| Extrinsic motivation items (N=4) | 0.69 | 32 |
| Strategic approach items (N=4) | 0.36 | |
| All items (N=12) | 0.62 | |
| Comprehension learning items (N=4) | 0.60 | |
| Operation learning items (N=4) | 0.05 | 11,27,59 |

\* Questionable items were those which showed negative or zero correlation with their scales or which, if they were removed from the analysis would improve the Cronbach alpha.

The questionable items were as follows:

Relating ideas : item 50

"I need to read around a subject pretty widely before I'm ready to put my ideas down on paper."

Surface approach : item 30

"When I'm reading I try to memorize important facts which may come in useful later."

Negative attitudes to study : item 49

"I certainly want to pass the next set of exams, but it doesn't really matter if I only just scrape through."

Globetrotting : item 3

"Although I have a fairly good general idea of many things, my knowedge of the details is rather weak."

Globetrotting : item 40

"In trying to understand new topics, I often explain them to myself in ways that other people don't seem to follow."

Globetrotting : item 46

"I often get criticised for introducing irrelevant material into my essays or tutorials."

Globetrotting : item 57

"I seem to be a bit too ready to jump to conclusions without waiting for all the evidence."

Extrinsic motivation : item 32

"I generally choose courses more from the way they fit in with my career plans than from my own interests."

Operation learning : item 11

"I generally prefer to tackle each part of a topic or problem in order, working out one at a time."

Operation learning : item 27

"I prefer to follow well tried out approaches to problems rather than anything too adventurous."

As is the case with previous reliability studies of this Inventory, alphas for scale scores are satisfactory, but some subscales show unacceptably low reliability. In this case the scales for surface approach, globetrotting and operation learning in particular do not seem to be giving satisfactory results.

## 10.2 Means and standard deviations

Means and standard deviation for all subscales for the Japanese sample are shown in column (6) of Table 11 compared with results of previous studies using this Inventory. Means and standard deviation for the four main scales are also shown.

## Table 11: Comparison of means and standard deviations for Japanese sample and five other samples.

| Subscale | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Deep approach | 11.4(2.8) | 12.0(3.1) | 11.3 | 10.6(3.1) | 11.3(2.8) | 8.92(2.45) |
| Inter-relating ideas | 11.1(2.8) | 11.3(2.9) | 10.7 | 10.1(3.1) | 10.7(2.7) | 10.48(2.70) |
| Use of evidence | 10.3(3.0) | 10.9(2.9) | 9.8 | 9.6(2.9) | 10.0(3.1) | 9.23(2.39) |
| Intrinsic motivation | 9.3(3.8) | 8.9(4.2) | 9.5 | 8.3(3.9) | 10.5(3.1) | 10.60(2.84) |
| Surface approach | 14.2(4.4) | 14.5(4.7) | 12.3 | 13.1(4.3) | 14.6(4.5) | 11.87(3.16) |
| Syllabus-boundness | 8.7(2.3) | 8.8(2.5) | 7.8 | 8.3(2.7) | 8.7(2.5) | 7.35(2.42) |
| Fear of failure | 7.5(2.9) | 6.2(3.3) | 5.8 | 5.9(3.1) | 5.4(3.1) | 6.23(2.55) |
| Improvidence | 9.3(3.0) | 8.7(3.6) | 7.0 | 7.6(3.3) | 7.7(3.3) | 7.15(2.58) |
| Disorganised study methods | 10.2(4.2) | 9.3(4.5) | 9.6 | 9.5(4.2) | 9.4(4.5) | 9.38(3.53) |
| Negative attitude to study | 5.8(4.3) | 5.9(4.0) | 5.7 | 5.4(3.9) | 5.5(3.5) | 8.56(3.48) |
| Globetrotting | 8.2(3.1) | 7.9(3.6) | 7.3 | 7.7(3.1) | 8.4(3.3) | 7.21(2.28) |
| Achievement motivation | 9.7(3.3) | 10.0(3.4) | 7.9 | 9.7(3.6) | 8.9(3.5) | 6.97(3.21) |
| Extrinsic motivation | 8.2(4.3) | 9.3(4.4) | 6.4 | 5.9(4.4) | 4.9(4.3) | 5.34(3.48) |
| Strategic approach | 11.0(2.9) | 11.6(2.9) | 10.2 | 10.3(3.0) | 10.6(2.9) | 9.46(2.64) |
| Comprehension learning | 8.7(3.8) | 8.1(3.8) | 9.2 | 8.6(3.9) | 8.2(3.8) | 10.02(2.84) |
| Operation learning | 11.3(2.9) | 11.9(2.6) | 10.2 | 10.1(3.2) | 10.8(2.8) | 8.67(2.12) |
| **Scales** | | | | | | |
| Meaning orientation | | | | | | 39.21(7.60) |
| Reproducing orientation | | | | | | 32.65(7.60) |
| Non-academic orientation | | | | | | 25.15(6.61) |
| Strategic orientation | | | | | | 21.81(6.27) |

(1) Harter and Kember (1986), sample of 450 Australian College of Advanced Education students.

(2) Harper and Kember (1986), sample of 329 Australian College of Advanced Education students.

(3) Watkins (1982), sample of 540 Australian university students.

(4) Ramsden and Entwistle (1981), sample of 2,208 British students in universities and polytechnics.

(5) Morgan, Gibbs and Taylor (1980), sample of 357 British Open University students.

(6) Results of our Japanese study (N = 794 University students)

The Japanese students have lower means than any of the previously surveyed groups on subscales : deep approach, use of evidence surface approach, syllabus boundness, achievement motivation, strategic approach and operation learning.

On the other hand their scores were above other groups on the negative attitude to study subscale.

We were also interested in whether there was any indication of sex differences in the scale and subscale scores. A comparison of males and females is

**Table 12: Comparison of subscale and scale means and standard deviations for males and females.**

| Subscale | Males (N = 472) | Females (N = 322) |
|---|---|---|
| Deep approach | 9.15(2.42) | 8.60(2.45) |
| Inter-relating ideas | 10.64(2.73) | 10.26(2.63) |
| Use of evidence | 9.53(2.37) | 8.80(2.37) |
| Intrinsic motivation | 10.74(2.87) | 10.41(2.74) |
| Surface approach | 11.67(3.21) | 12.03(3.08) |
| Syllabus-boundness | 7.26(2.51) | 7.74(2.28) |
| Fear of failure | 5.80(2.39) | 6.86(2.64) |
| Improvidence | 6.70(2.53) | 7.82(2.50) |
| Disorganised study methods | 9.28(3.58) | 9.54(3.44) |
| Negative attitude to study | 8.75(3.57) | 8.27(3.32) |
| Globetrotting | 7.19(2.33) | 7.23(2.20) |
| Achievement motivation | 6.76(3.26) | 7.27(3.12) |
| Extrinsic motivation | 5.12(3.55) | 5.65(3.35) |
| Strategic approach | 9.29(2.64) | 9.71(2.63) |
| Comprehension learning | 10.33(2.82) | 9.56(2.79) |
| Operation learning | 8.52(2.13) | 8.88(2.08) |
| **Scales** | | |
| Meaning orientation | 40.00(7.51) | 38.07(7.57) |
| Reproducing orientation | 31.59(7.48) | 34.18(7.52) |
| Non-academic orientation | 25.23(6.86) | 25.02(6.23) |
| Strategic orientation | 21.22(6.44) | 22.67(5.92) |

and subscripts 1 and 2 indicate male and female groups respectively.

Females were observed to score higher than males on all subscales of the reproducing orientation but males score higher than females on the meaning orientation subscales and these differences are also reflected in the scale sores. Females also appear to be expressing higher achievement motivation than males. We will explore these findings further in analyses of variance.

Further analysis revealed that there were significant sex differences on particular item means. Among the 64 items of the Inventory there were 31 items that showed statistically significant differences between the sexes in means for the 472 males and 322 females in the sample. A test of statistical significance was conducted using $Z$ values, where:

$$Z = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}}$$

shown in Table 12.

A one-tail null hypothesis was rejected if $Z$ was greater than 1.65 at the 5% level of significance.

Sixteen items were rated more favorably by males students and 15 items were rated more favorably by female students. The remaining 33 items showed no significant differences.

Those items where significant differences occurred are shown in Table 13a, b.

**Table 13a: Items rated more favorably by male students.**

| Item | | Approach |
|------|---|----------|
| 2. | I try to relate ideas in one subject to those in others wherever possibe. | Relating ideas |
| 5. | I usually set out to understand thoroughly the meaning of what I am asked to read. | Deep approach |
| 6. | Ideas in books often set me off on long chains of thought of my own, only tenuously related to what I was reading. | Comprehension learning |
| 8. | Continuing my education was something which happened to me rather than something I really wanted for myself. | Negative attitude |
| 10. | I often find myself questioning things that I hear in lectures or read in books. | Deep approach |
| 16. | Lecturers seem to delight in making the simple truth unnecessarily difficult. | Surface apprtach |
| 21. | In trying to understand a puzzling idea, I let my imagination wander freely to begin with, even if I don't seem to be much nearer a solution. | Comprehension learning |
| 24. | I generally put a lot of effort into trying to understand things which initially seem difficult. | Deep approach |
| 31. | I like to play around with ideas of my own even if they don't get me very far. | Comprehension learning |
| 34. | When I'm tackling a new topic, I often ask myself questions about it which the information should answer. | Deep approach |
| 40. | In trying to understand new topics, I often explain them to myself in ways that other people don't seem to follow. | Globetrotting |
| 49. | I certainly want to pass the next set of exams, but it doesn't really matter if I only just scrape through. | Negative attitude |
| 54. | Puzzles or Problems fascinate me, particularly where you have to work through the material to reach a logical conclusion. | Use of evidence |
| 55. | I spend a good deal of my time in finding out more about interesting topics which have discussed in classes. | Intrinsic motivation |
| 56. | I find it helpful to "map out" a new topic for myself by seeing how the ideas fit together. | Relating ideas |
| 61. | When I'm reading an article or research report, I generally examine the evidence carefully to decide whether the conclusion is justified. | Use of evidence |

**Table 13b: Items rated more favorably by female students.**

| Item No. | | Approach |
|---|---|---|
| 9. | I like to be told precisely what to do in essays and assignments. | Syllabus-bound |
| 13. | I find it difficult to "switch tracks" when working on a problem:I prefer to follow each line of thought through as far as it will go. | Improvidence |
| 15. | It is important for me to do really well in the courses I study. | Achievement motivation |
| 18. | When I'm doing a piece of work, I try to bear in mind exactly what that particular lecturer seems to want. | Strategic approach |
| 20. | Lecturers sometimes give indications of what is likely to come up in exams, so I look out for what may be hints. | Strategic approach |
| 22. | My main reason for being here is that it will help me to get a better job. | Extrinsic motivation |
| 26. | A poor first answer in an exam makes me panic. | Fear of failure |
| 27. | I prefer to follow well tried approaches to problems rather than anything too adventurous. | Operation learning |
| 37. | If conditions aren't right for me to study, I generally manage to change them. | Strategic approach |
| 41. | I find have to concentrate on memorising a good deal of what we have to learn. | Surface approach |
| 43. | I find it better to start straight away with the details of a new topic and build up an overall picture in that way. | Operation learning |
| 51. | Although I generally remember facts and details, I find it difficult to fit them together into an overall picture. | Improvidence |
| 53. | Having to steak in tutorials is quite an ordeal for me. | Fear of failure |
| 57. | I seem to be a bit too ready to jump to conclusions withont waiting for all the evidence. | Globetrotting |
| 62. | Tutors seem to want me to be more adventurous in making use of my own ideas. | Improvidence |

Male students rated higher than female students on all four items of the deep approach subscale and on three out of four items on the comprehension learning subscale. Female students, on the other hand, rated higher on three out of four items of the strategic approach subscale and also rated higher on three out of four items on the improvidence subscale. Female students also showed a stronger concern with failing and more preferred an operation learning approach. Male students indicated a stronger concern about relating ideas and use of evidence. Male students expressed some negative attitudes to study whereas females said they wanted to do better in their courses.

## 10.3 Subscale and item statistics

In addition to means and standard deviations for each subscale we examined the distribution of responses over the scale, in particular to assess the properties of the distributions thus formed. With this type of response scale it is not

unusual to obtain skewed or even bimodal distributions which may have an effect on subsequent factor analyses. (c.f. Cureton and D'Agostino, 1983, p.2). The bimodal nature of the distributions in the case of the Lancaster Approaches to Studying Inventory may be accentuated by the fact that the mid-point of the 5 point scale (choice 2) is actually placed at the end of the choice possibilities not in the middle. (See Appendix 1.) So a score of 2 may well be an afterthought. In fact the students are instructed to choose this alternative only if they cannot answer the other alternatives - it is not truly a scale mid-point but a choice to be made only if all else fails. Yet it is scored as a mid-point choice.

Subscales showing varying degrees of skewness are shown in Table 14.

### Table 14: Skewness of subscale distributions

| Subscale | Skewness |
| --- | --- |
| Deep approach | −0.18 |
| Inter–relating ideas | −0.35 |
| Use of evidence | −0.12 |
| Intrinsic motivation | −0.50 |
| Surface approach | 0.02 |
| Syllabus–boundness | −0.21 |
| Fear of failure | 0.07 |
| Improvidence | −0.11 |
| Disorganised study methods | −0.21 |
| Negative attitude to study | 0.03 |
| Globetrotting | 0.10 |
| Achievement motivation | 0.06 |
| Extrinsic motivation | 0.34 |
| Strategic approach | −0.12 |
| Comprehension learning | −0.14 |
| Operation learning | −0.12 |

Most subscale distributions showed a tendency to be negatively skewed, particularly intrinsic motivation, while the subscale for extrinsic motivation was extremely skewed in a positive direction.

In addition, from examination of histograms, the following distributions were observed to have a tendency towards being bimodal: use of evidence, surface approach disorganized study methods, achievement motivation, strategic approach.

Skewness of item responses was also examined. As indicated in Figure 1, for all 64 items a very strong linear relationship was found between item means ($Y$) and skewness ($X$). A correlation coefficient of $-0.973$ was obtained between the two item statistics. The regression line $Y = -1.04X + 2.02$ indicates that if the
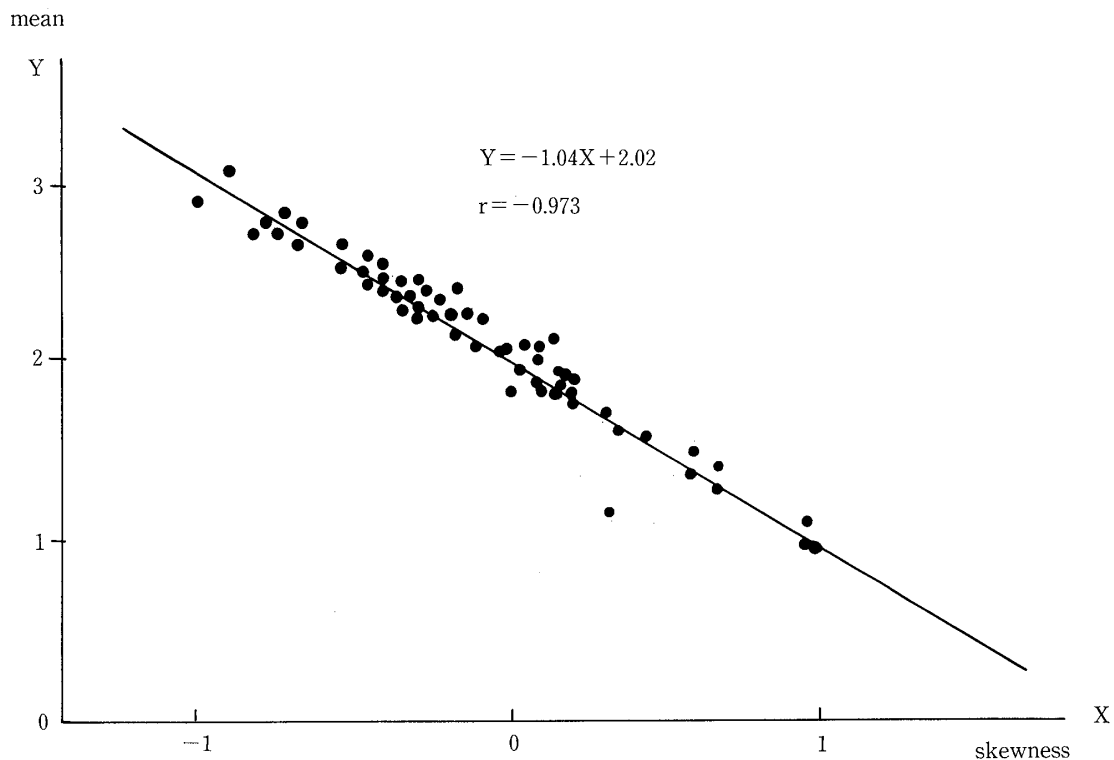
mean



Figure 1 : Relationship between mean and skewness of item responses
(total group N = 794)

mean is about 2 on the middle (neutral) point of the five point scale the skewness approaches zero, making the distribution symmetrical around the mean in most cases, and that if the means is greater than 2 the skewness becomes minus yielding a negatively skewed distribution. If the mean decreases below 2 the skewness becomes positive indicating a positively skewed distribution.

If two items having extremely skewed distributions in opposite directions are correlated, the range of correlations obtainable between two items would be considerably restricted, for example item 39 having the smallest skewness of $-1.01$ and item 48 having the largest skewness of 0.96 would be correlated between 0.72 and $-0.88$, given their marginal distributions. The general effect of skewness on correlation may not be clear and we must take this point into consideration and avoid including items of extreme skewness toward either or both directions.

## 10.4 Factor analysis

Factor analysis was performed on subscale total scores using the SAS package, Version 5.18. All analyses involved principal factor analysis, with iterations to obtain an estimate of communalities, followed by varimax orthogonal rotation for factors with eigenvalues greater than one.

According to the pattern of eigenvalues, three, four or five factor solutions could be considered as possibilities since the eigenvalues for factors 4 and 5 are

Approaches to Study in Japanese Higher Education Students

barely greater than 1.

| Eigenvalue | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 3.425450 | 2.544688 | 1.590416 | 1.090525 | 1.027773 |

Each of these factor solutions is shown in Table 15 a,b,c after varimax rotation.

**Three factor solution**

<div align="center">

**Table 15a: Three factor solution**

| | I | II | III |
|---|---|---|---|
| Deep approach | 0.73 | | |
| Relating ideas | 0.77 | | |
| Use of evidence | 0.64 | | |
| Intrinsic motivation | 0.66 | | |
| Surface approach | | 0.49 | 0.53 |
| Syllabus-boundness | | 0.56 | 0.32 |
| Fear of failure | | 0.37 | 0.54 |
| Improvidence | | 0.66 | |
| Disorganised study methods | | | 0.72 |
| Negative attitude to study | | | 0.67 |
| Globetrotting | | | 0.54 |
| Achievement motivation | | 0.63 | |
| Extrinsic motivation | | 0.56 | |
| Strategic approach | 0.60 | | |
| Comprehension learning | 0.67 | −0.43 | |
| Operation learning | | 0.58 | |

Variance explained by each factor:Factor 1:2.92 Factor 2: 2.51 Factor 3:2.13

</div>

The first factor to emerge is a meaning orientation factor with loadings on deep approach, relating ideas, use of evidence and intrinsic motivation and this is common to all previous studies using the Lancaster inventory. As is the case also in the studies by Ramsden and Entwistle (1981), Morgan Gibbs and Taylor (1980), Watkins (1982, 1983), Clarke (1986) and Harper and Kember (1986), the comprehension learning subscale also loads on this factor. However we also found that the strategic approach subscale loaded on the meaning orientation factor. So along with a tendency for students to seek meaning in their studies, or to try to understand what they learn, they are also report actively seeking information about assessment requirements and actively trying to impress their

teachers. Ramsden and Entwistle (1981) did report a modest loading of this subscale (0.29) on this first meaning orientation factor but no loading has been reported by other researchers. Moreover the loading we obtained was quite strong (0.60).

We call this a meaning-strategic-intrinsic motivation factor, Students are looking for understanding in this studies and seem to be interested in study for its own sake, but at the same time they are mindful of assessment requirements and are actively seeking to fulfill them.

The second factor is a reproducing orientation factor with loadings on the subscales surface approach, syllabus boundness fear of failure and improvidence. Extrinsic motivation also loads on this factor and these findings are in line with previous research studies. There is also an off-loading for comprehension learning which is consistent with a surface approach to learning.

Harper and Kember (1989) have previously reported that in most other studies, disorganized study methods and negative attitudes to study and globetrotting also loaded on the reproducing orientation factor making it look more like a factor made up of learning pathologies and undersirable study traits and attitudes. This is not entirely consistent with our findings, however. Improvidence loads on this factor but globetrotting does not. Also we found a loading for achievement motivation on the second factor which has not been previously reported. It is however consistent with Biggs reasoning that achievement motivation can lead either to a meaningful approach or a reproducing approach depending on the learning context.

We call this a reproducing-achieving-extrinsic motivation factor. These students appear to be using a surface approach though they also use operation learning which is not the same thing, they are extrinsically motivated in that they wish to qualify for a good job and they are also very competitive.

The third factor is clearly a negative attitudes to study factor combined with disorganized study methods, a surface approach and globetrotting. This is similar to the disorganized factor described by Harper and Kember (1989) though in our case it emerged as a third factor separate from the second reproducing-achieving-extrinsic motivation factor.

We call this a disorganized-negative attitudes-surface-confusion factor. Students express negative attitudes towards their university work, appear disorganized and afraid of failure, are given to globetrotting and adopt a surface approach.

**Table 15b: Four factor solution**

|                              | I    | II    | III    | IV   |
| ---------------------------- | ---- | ----- | ------ | ---- |
| Deep approach                | 0.73 |       |        |      |
| Relating ideas               | 0.78 |       |        |      |
| Use of evidence              | 0.67 |       |        |      |
| Intrinsic motivation         | 0.64 |       |        |      |
| Surface approach             |      | 0.47  | 0.54   |      |
| Syllabus-boundness           |      | 0.52  | 0.45   |      |
| Fear of failure              |      | 0.35  | 0.48   |      |
| Improvidence                 |      | 0.66  |        | 0.32 |
| Disorganised study methods   |      |       | 0.67   |      |
| Negative attitude to study   |      |       | 0.74   |      |
| Globetrotting                |      |       |        | 0.78 |
| Achievement motivation       |      | 0.65  |        |      |
| Extrinsic motivation         |      | 0.52  |        |      |
| Strategic approach           | 0.56 | 0.34  | -0.33  |      |
| Comprehension learning       | 0.69 | -0.40 |        |      |
| Operation learning           |      | 0.58  |        |      |

Variance explained by esch factor:Factor 1:2.90 Factor 2:2.41 Factot 3:2.13 Factor 4:1.21

## Four factor solution

The first factor to emerge is a meaning orientation factor with loadings on comprehension learning and strategic approach as in the case with the three factor solution.

For the second factor the pattern of loadings are identical to the three factor solution with the exception that a strategic approach loads on this factor as well as on the first factor. This is not unreasonable since seeking to impress could result in either type of approach depending on the assessment context as the student perceives it.

The third factor is a combination of negative attitudes to study, a disorganized approach, failure to adopt a strategic approach and surface learning combined with fear of failure and syllabus boundness. As such it is like the third factor described above, except that globetrotting does not load on it.

The fourth factor consists of the two learning pathologies improvidence and globetrotting.

## Table 15c: five factor solution

|                            | I    | II   | III   | IV    | V     |
|----------------------------|------|------|-------|-------|-------|
| Deep approach              | 0.73 |      |       |       |       |
| Relating ideas             | 0.79 |      |       |       |       |
| Use of evidence            | 0.68 |      |       |       | −0.36 |
| Intrinsic motivation       | 0.58 |      |       |       |       |
| Surface approach           |      | 0.56 | 0.38  |       |       |
| Syllabus-boundness         |      | 0.62 | 0.31  |       |       |
| Fear of failure            |      | 0.58 |       |       | 0.30  |
| Improvidence               |      | 0.65 |       |       |       |
| Disorganised study methods |      | 0.43 | 0.44  | −0.31 | 0.32  |
| Negative attitude to study |      |      | 0.79  |       |       |
| Globetrotting              |      |      |       |       | 0.83  |
| Achievement motivation     |      |      |       | 0.73  |       |
| Extrinsic motivation       |      |      | 0.40  | 0.69  |       |
| Strategic approach         | 0.54 |      | −0.37 | 0.34  |       |
| Comprehension learning     | 0.71 |      |       |       |       |
| Operation learning         |      | 0.67 |       |       |       |

Variance explained by each factor:Factor 1:2.84 Factor 2:2.31 Factor 3:1.71 Factor 4:1.53 Factor 5:1.29

## Five factor solution

Apart from the first factor which emerges in common with the three and four factor solutions, this five factor solution is difficult to interpret and either the three or four factor solutions appear to be more parsimonious.

There is very little to choose between the three and four factor solutions except that in the latter case the learning pathologies of improvidence and globetrotting emerge as a fourth factor.

It appears that the first two factors are subject to contextual influences. For instance, in the four factor solution, a strategic approach is present along with both an intrinsic-meaningful approach to learning and with a reproducing-extrinsic approach. Achievement motivation is clearly associated with a re-producing approach. It is this latter finding that is of considerable interest in our study since in previous studies this close association of achievement motivation with a reproducing orientation only has not been found. It seems that in the case of these Japanese students the desire to compete and to study for increased job opportunities leads inevitably to a narrow, reproducing approach.

## 10.5 Analyses of variance
### Sex differences

We were specifically interested in whether significant sex differences in approaches to study would emerge from our survey. In terms of mean scores we have already reported that females scored higher than males on all reproducing subscales but that they scored lower than males on all meaning orientation subscales. Also females express higher achievement motivation than males.

Analyses of variance were performed in order to explore these differences further.

A one way analysis of variance with sex as the independent variable and meaning orientation as the dependent variable revealed a significant difference between the sexes ($F = 11.98$, $p < 0.0006$, $df = 1$). Males scored significantly higher on the meaning orientation than females. Means: 39.97 versus 38.07.

Similarly females were found to score significantly higher on the reproducing orientation scale than males. ($F = 22.13$, $p < 0.0001$, $df = 1$). Means: 34.18 versus 31.63.

In terms of the non-academic scale there were no significant sex differences but on the strategic approach scale females scored significantly higher than males. ($F = 9.70$, $p < 0.0019$, $df = 1$). Means: 22.67 versus 21.26.

Thus we have a picture of the female students emerging as being higher in achievement motivation, extrinsic motivation and a strategic/cue seeking approach as well as being more inclined towards a narrow reproducing approach to learning. Males on the other hand are higher on a meaning orientation strategy.

### Discipline differences

Disciplines are distinguished as either Humanities/Social Sciences or Science/Technology. Given the technological orientation of Japanese employment, is it the case that students who are enrolled in courses in Science and Technology approach their study differently from those in the Humanities and Social Science?

In terms of meaning orientation there was a significant difference between these two groups. ($F = 7.82$, $p < 0.005$, $df = 1$) Science/Technology students scored significantly higher than Humanities/Social Science students on the meaning scale. Means: 40.16 versus 38.60.

Likewise there was a significant difference on the reproducing scale scores, but in the reverse direction ($F = 7.50$, $p < 0.006$, $df = 1$). Humanities/Social Science students scored higher on the reproducing orientation than the Science/Technology students. Means: 33.25 versus 31.73.

These differences are more likely to be attributable to the higher numbers of females than males in the Humanities/Social Sciences (54.44% versus 45.56%) and the higher number of males than females in the Science/Technology

courses (82.55% versus 17.45%).

There were no significant differences between discipline groups in terms of the non-academic orientation or the strategic approach scale.

**Achievement motivation**

We wished to explore the achievement motivation subscale scores further in view of the factor analysis results linking achievement motivation with a reproducing approach.

Students were divided into three groups of achievement motivation: high medium, low, according to their percentiles. There were no significant differences between the groups on the meaning scale or the non-academic approach sales but there were significant differences on the reproducing scale ($F = 31.76$, $p < 0.001$, $df = 2$). Means: 29.24 (low), 33.21 (medium), 35.19 (high).

Since females were significantly higher on achievement motivation than males, it is possible that this finding is attributable to sex differences. Accordingly we performed a two-way analysis of variance using sex and the three levels of achievement motivation as independent variables and reproducing scale scores as the dependent variable measure. There were significant main effects for sex ($F = 23.86$, $p < 0.0001$, $df = 1$) and for level of achievement motivation ($F = 29.25$, $p < 0.0001$, $df = 2$) but no interaction between these variables. For both males and females reproducing scale scores increased as level of achievement motivation increased as shown in Table 16.

This pattern of means holds up for both discipline areas as well as shown in Table 17.

**Table 16: Effect of sex and achievement motivation on reproducing orientation scale scores.**

| Sex | Achievement Motivation | Reproducing orientation Scores |
| --- | --- | --- |
| Female | low | 31.63 |
| Female | medium | 34.28 |
| Female | high | 36.15 |
| Male | low | 28.16 |
| Male | medium | 32.36 |
| Male | high | 34.47 |

Table 17: Effect of sex, achievement motivation and discipline on reproducing orientation scores.

| Sex | Achievement Motivation | Discipline | Reproducing Orientation |
|---|---|---|---|
| Female | low | Humanities/ | 31.98 |
| Female | medium | Humanities/ Social Sciences | 35.16 |
| Female | high | Humanities/ Social Sciences | 36.41 |
| Female | low | Science/Technology | 29.38 |
| Female | medium | Science/Technology | 29.81 |
| Female | high | Science/Technology | 34.92 |
| Male | low | Humanities/ Social Sciences | 28.13 |
| Male | medium | Humanities/ Social Sciences | 32.43 |
| Male | high | Humanities/ Social Sciences | 33.49 |
| Male | low | Science/Technology | 28.10 |
| Male | medium | Science/Technology | 32.27 |
| Male | high | Science/Technology | 35.12 |

## 11. Discussion

In this research study we aimed to test the applicability of the Lancaster Approaches to Studying Inventory with a sample of Japanese higher education students. In general terms our findings were in line with previous studies in Britain and Australia. However, there were some important contextual influences.

As is the case with previous studies, a deep approach or meaning orientation emerged as the first factor. However, this was coupled with a strategic, cue-seeking approach. Japanese students report looking for meaning and being intrinsically motivated, but they also are aware of assessment requirements.

The second factor to emerge was a surface-reproducing factor as is also the case with previous studies. However, this factor was linked with achievement motivation, that is, a competitive approach to study. We could hypothesize that, being highly motivated to compete and succeed, students adopt a reproducing approach in order to fulfill their goals.

The third factor represented a negative attitude to study coupled with a lack of organisation and some aspects of a reproducing approach.

There were clear differences in the level of responding of males and females on various scales, subscales and on particular items. Males were more inclined to report that they adopt a meaning orientation while females reported a high level of reproducing orientation to study. Females also reported high levels of

achievement motivation than males. At first glance this latter finding appears anomalous, given the lack of incentives for Japanese women to aspire to a lifelong career or to postgraduate study once they graduate from their first degree. Females would seem to be competing for its own sake, and it could be that achievement motivation means different things for men and women. They may both express the desire to do well and this is not surprising given the highly competitive nature of the secondary school system, but men may see this as a way to scure employment with a large company whereas women may find it socially advantageous to do well in their studies even though their long term career prospects are limited. This issue merits further investigation.

In all, where the reproducing orientation is concerned it seems that sex differences are mediated by level of achievement motivation when we examine the pattern of results for males and females taken separately. In both cases the higher the level of achievement motivation the stronger the tendency to report a reproducing orientation. This did not apply to a meaning orientation however, where differences seem to be determined by sex alone.

Discipline differences also emerged on both meaning orientation and reproducing orientation scales. Science/Technology students reported higher levels of meaning orientation while Humanities/Social Science students reported higher levels of reproducing orientation. We must remember, however, that most of the Science/Technology students were males (about 83%), whereas the majority of Humanities/Social Science students were females (about 55%).

We could not make statistical comparisons with previous studies in terms of level of responding to the various scales and subscales, but it seems that the Japanese sample expressed lower levels of preference for both deep and surface strategies and lower levels of achievement motivation and strategic orientation than was the case with previous samples in Britain and Australia. On the other hand, Japanese students expressed more negative attitudes to study than other groups.

In terms of strategies, it could be that the strategy descriptions did not fit with the way in which the Japanese students perceived their study behaviours or it could be that they do have the same level of awareness of adopting particular strategies in their academic work.

The applicability of the Lancaster Inventory was also examined in terms of subscale and scale reliability. Cronbach alphas were unacceptably low for the Globetrotting and Operation Learning subscales and these need to be interpreted with caution.

The distributions of items scores and subscales scores showed both skewness (in some cases extreme) and a tendency for some distributions to be bimodal, which could affect subsequent factor analyses.

In summary, this research confirmed that, with some reservations, the Lan-

caster Inventory has applicability in the Japanese context. It also raised issues concerning the differences between males and females in terms of both their desire to compete in their studies and the kinds of strategies that they report adopting. For the sample as a whole, it may be the case that there is a lower level of awareness of having a strategy for study or that there are other strategies used which the Inventory does not investigate.

## Acknowledgment

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# Appendix 1 : Lancaster Approaches to Studying Inventory (Ramsden, 1983)

1. I find it difficult to organise my study time effectively 4 3 1 0 2
2. I try to relate ideas in one subject to those in others 4 3 1 0 2
   wherever possible.
3. Although I have a fairly good general idea of many 4 3 1 0 2
   things, my knowledge of the details is rather weak.
4. I enjoy competition : I find it stimulating. 4 3 1 0 2
5. I usually set out to understand thoroughly the meaning 4 3 1 0 2
   of what I am asked to read.
6. Ideas in books often set me off on long chains of thought 4 3 1 0 2
   of my own, only tenously related to what I was reading.
7. I chose my present course mainly to give me a chance of 4 3 1 0 2
   a really good job afterwards.
8. Continuing my education was something which 4 3 1 0 2
   happened to me rather than something I really wanted
   for myself.
9. I like to be told precisely what to do in essays and 4 3 1 0 2
   assignments.
10. I often find myself questioning things that I hear in 4 3 1 0 2
    lectures or read in books.
11. I generally prefer to tackle each part of a topic or 4 3 1 0 2
    problem in order, working out one at a time.
12. The continual pressure of work-assignments, deadlines 4 3 1 0 2
    and competition-often makes tense depressed.
13. I find it difficult to "switch tracks" when working on a 4 3 1 0 2
    problem : I prefer to follow each line of thought through
    as far as it will go.
14. My habit of putting off work leaves me with far too 4 3 1 0 2
    much to do at the end of term.
15. It is important for me to do really well in the courses I 4 3 1 0 2
    study.
16. Lecturers seem to delight in making the simple truth 4 3 1 0 2
    unnecessarily difficult.
17. Distractions make it difficult for me to do much effec- 4 3 1 0 2
    tive work in the evenings.
18. When I'm doing a piece of work, I try to bear in mind 4 3 1 0 2
    exactly what that particular lecturer seems to want.

Approaches to Study in Japanese Higher Education Students

19. I usually don't have time to think about the implications   4   3   1   0   2
    of what I read.
20. Lecturers sometimes give indications of what is likely to   4   3   1   0   2
    come up in exams, so I look out for what may be hints.
21. In trying to understand a puzzling idea, I let my imagina-   4   3   1   0   2
    tion wander freely to begin with, even if I don't seem to
    be much nearer a solution.
22. My main reason for being here is that it will / help we   4   3   1   0   2
    to get a better job.
23. Often I find myself wondering whether the work I am   4   3   1   0   2
    doing here is really worthwhile.
24. I generally pout a lot of effort into trying to understand   4   3   1   0   2
    things which initially seem difficult.
25. I prefer courses to be clearly structured and highly   4   3   1   0   2
    organised.
26. A poor first answer in an exam makes me panic.   4   3   1   0   2
27. I prefer to follw well tried approaches to problems   4   3   1   0   2
    rather than anything too adventurous.
28. I'm rather slow at starting work in the evenings.   4   3   1   0   2
29. In trying to understand new ideas, I often try to relate   4   3   1   0   2
    them to real life situations to which they might apply.
30. When I'm reading I try to memorise important facts   4   3   1   0   2
    which may come in useful later.
31. I like to play around with ideas of my own even if they   4   3   1   0   2
    don't get me very far.
32. I generally choose courses more from the way they fit in   4   3   1   0   2
    with career plans than from my own interests.
33. I am usually cautious in drawing conclusions unless they   4   3   1   0   2
    are well supported by evidence.
34. When I'm tackling a new topic, I often ask my self   4   3   1   0   2
    questions about it which the new information should
    answer.
35. I suppose I am more interested in the qualifications I'll   4   3   1   0   2
    get than in the courses I'm taking.
36. Often I find I have to read things without having a   4   3   1   0   2
    chance to understand them.
37. If conditions aren't right for me to study, I generally   4   3   1   0   2
    manage to change them.
38. In reporting practical work, I like to try to work out   4   3   1   0   2
    several alternative ways of interpreting the findings.

39. My main reason for being here is so I can learn about the subjects which really interest me.   4  3  1  0  2

40. In trying to understand new topics, I often explain them to myself in ways that other people don't seem to follow.   4  3  1  0  2

41. I find I heve to concentrate on memorising a good deal of what we have to learn.   4  3  1  0  2

42. It's important to me to do things better than my friends, if I possibly can.   4  3  1  0  2

43. I find it better to start straight away with the details of a new topic and build up an overall picture in that way.   4  3  1  0  2

44. Often when I'm reading books, their ideas produce mind images which sometimes take on a life of their own.   4  3  1  0  2

45. One way or another I manage to get hold of the books I need for studying.   4  3  1  0  2

46. I often get criticised for introducing irrelevant material into my essays or tutorials.   4  3  1  0  2

47. I find that studying academic topics can often be exciting and gripping.   4  3  1  0  2

48. The best way for me to understand what technical terms mean is to remember the text-book definitions.   4  3  1  0  2

49. I certainly want to pass the next set of exams, but it does't really matter if I only just scrape through.   4  3  1  0  2

50. I need to read around a subject pretty widely befor I'm ready to put my iieas down on paper.   4  3  1  0  2

51. Although I generally remember facts and details, I find it difficult to fit them together into an overall picture.   4  3  1  0  2

52. I tend to read very little beyond what's required for completing assignments.   4  3  1  0  2

53. Having to speak in tutorials is quite an ordeal for me.   4  3  1  0  2

54. Puzzles or problems fascinate me, particularly where you have to work through the matemial to reach a logical conclusion.   4  3  1  0  2

55. I spend a good deal of my time in fivingout mor about interesting topics which have discussed in classes.   4  3  1  0  2

56. I find it helpful to "map out" a new topic for myself by seeing how the ideas fit together.   4  3  1  0  2

57. I seem to be a bit too ready to jump to conclusions without waiting for all the evidence.   4  3  1  0  2

58. I hate admitting defeat, even in trivial matters.   4  3  1  0  2

59. I think it is important to look at probems rationally and logically without making intuitive leaps.   4  3  1  0  2

60. I find I tend to remember things best if I concentrate on    4    3    1    0    2
the order in which the lecturer presented them.

61. When I'm reading an article or research report, I gener-    4    3    1    0    2
ally examine the evidence carefully to decide whether
the conclusion is justified.

62. Tutors seem to want me to be more adventurous in    4    3    1    0    2
making use of my own ideas.

63. When I look back, I sometimes wonder why I ever    4    3    1    0    2
decided to come here.

64. I find academic topics so interesting, I should like to    4    3    1    0    2
continue with them after I finish this coure.

---

4    means Definitely Agree

3    means Agree with reservations

1    means Disagree with reservations

0    means Definitely Disagree

2    is only to be used if the item doens't apply or if you find it impossible to given
a definite answer.

## Appendix 2: Japanese Version of Lancaster Approaches to Studying Inventory

### 学習態度に関する調査

> この調査は、あなたの大学での学習態度を調べるものです。これは、あなたがどれだけ知識を持っているかをテストするものではなく、課題への取り組み方や、一般的な学習の仕方を知るための調査です。

まず、次の各欄に必要事項を記入して下さい。

所属：　　　　　大学　　　　　学部　　　学年　　　　　学科　　　　　番

氏名：　　　　　　　　　　　　　　性別：　男　　女

生年月日：昭和　　　年　　　月　　　日　　　年齢：　　　歳　　ケ月

実施日：平成　　　年　　　月　　　日

〈回答の仕方〉
　つぎの1〜5ページまでの各項について、あなたに最も当てはまると思われる回答の番号を○で囲んで下さい。記入もれがないように注意して下さい。
　　　　　　4　全くその通りだと思う
　　　　　　3　大体その通りだと思う
　　　　　　1　余りそう思わない
　　　　　　0　全くそう思わない
　　　　　　2　どちらともいえない

もしも教科によって回答が異なるときには、あなたの専攻の場合について答えて下さい。

|  | 全くその通りだと思う | 大体その通りだと思う | 余りそう思わない | 全くそう思わない | どちらともいえない |
|---|---|---|---|---|---|
| 1．勉強時間を上手に使うのが苦手である。 | 4 | 3 | 1 | 0 | 2 |
| 2．ひとつの科目で学んだことを、できるだけ他の科目に関連づけようと心がけている。 | 4 | 3 | 1 | 0 | 2 |
| 3．多くの教科について一般的なことはよく知っているが、詳しい知識は持っていない。 | 4 | 3 | 1 | 0 | 2 |
| 4．競争は楽しく、励みになる。 | 4 | 3 | 1 | 0 | 2 |
| 5．先生から読むように言われた資料は、よく読んでその意味を理解するようにしている。 | 4 | 3 | 1 | 0 | 2 |
| 6．本で学んだ考え方から、それとは直接関係のないいろいろな考え方を引き出すことができる。 | 4 | 3 | 1 | 0 | 2 |
| 7．大学でこの専攻を選んだのは、卒業後よい仕事につきやすいからである。 | 4 | 3 | 1 | 0 | 2 |
| 8．大学に入学したのは、本当に来たかったからというよりは、なんとなく来たといった方がよい。 | 4 | 3 | 1 | 0 | 2 |
| 9．課題を与えられるときには、やり方を詳しく説明してほしいと思う。 | 4 | 3 | 1 | 0 | 2 |
| 10．講義を聞いたり本を読んだりしたときにいろいろな疑問がわいてくる。 | 4 | 3 | 1 | 0 | 2 |
| 11．ひとつの問題について系統的に勉強していくのが好きである。 | 4 | 3 | 1 | 0 | 2 |
| 12．課題、試験、提出期限、競争などは、私にとって非常に重荷である。 | 4 | 3 | 1 | 0 | 2 |
| 13．問題をやるとき、やり方を変えたり、いろいろな方向から考えたりするよりも、決められたやり方でやる方が好きである。 | 4 | 3 | 1 | 0 | 2 |
| 14．勉強をするのを後回しにするので、最後になってたまってしまうことが多い。 | 4 | 3 | 1 | 0 | 2 |
| 15．大学でよい成績をとることは、私にとって重要なことである。 | 4 | 3 | 1 | 0 | 2 |
| 16．先生がたは、講義の時、単純なことを必要以上にむずかしく話すようだ。 | 4 | 3 | 1 | 0 | 2 |
| 17．勉強のじゃまになることがたくさんあるので、夜は十分に勉強できない。 | 4 | 3 | 1 | 0 | 2 |
| 18．課題をやるとき、先生が何を求めているかを考えてしようとする。 | 4 | 3 | 1 | 0 | 2 |
| 19．本を読んでも深い意味についてゆっくり考える時間がない。 | 4 | 3 | 1 | 0 | 2 |

全くそう思う
だと思う

大体その通り
だと思う

余りそう思わない

全くそう思わない

いえない
どちらとも

| | | | | | |
|---|---|---|---|---|---|
| 20，先生がたは、ときどき、試験に出る問題についてヒントを与えることがあるので、それを聞きのがさないようにしている。 | 4 | 3 | 1 | 0 | 2 |
| 21．何かわからないことがあるとき、たとえそれが直接解決に結びつかないものでも、まず自由にいろいろ考えてみる。 | 4 | 3 | 1 | 0 | 2 |
| 22．大学に入学した主な理由は、卒業後よい仕事につくためである。 | 4 | 3 | 1 | 0 | 2 |
| 23．大学で勉強していることは本当に価値があるのか疑問に思うことがしばしばある。 | 4 | 3 | 1 | 0 | 2 |
| 24．むずかしいと思うことを理解するために多大な努力を払うことが多い。 | 4 | 3 | 1 | 0 | 2 |
| 25．構造が明確で系統的な科目の方が好きである。 | 4 | 3 | 1 | 0 | 2 |
| 26．試験の時、第1問ができないとパニックに陥る。 | 4 | 3 | 1 | 0 | 2 |
| 27．すでに試みられた解決法を用いる方が、新しいことに挑戦するよりも好きである。 | 4 | 3 | 1 | 0 | 2 |
| 28．夜すぐに勉強を始めるのはむずかしい。 | 4 | 3 | 1 | 0 | 2 |
| 29．何か新しい考え方を学ぼうとするとき、現実の状況と関連づけて考えようとすることが多い。 | 4 | 3 | 1 | 0 | 2 |
| 30．本を読んでいるとき、あとで役立つような重要なことがらを憶えようとすることがよくある。 | 4 | 3 | 1 | 0 | 2 |
| 31．私の専門に直接関係がなくても、自分自身の考えを持つのが好きである。 | 4 | 3 | 1 | 0 | 2 |
| 32．科目を選択するとき、自分自身の興味よりも、自分の生活設計にあったものの方を選ぶ。 | 4 | 3 | 1 | 0 | 2 |
| 33．しっかりした証拠がない場合は、なかなか結論を出せない。 | 4 | 3 | 1 | 0 | 2 |
| 34．新しいことを勉強するときは、最初に与えられた新しい情報によって何がわかるかを考える。 | 4 | 3 | 1 | 0 | 2 |
| 35．今勉強している科目よりも、卒業したときにもらえる資格のほうが魅力がある。 | 4 | 3 | 1 | 0 | 2 |
| 36．十分わからないままに本を読まなければならないことがよくある。 | 4 | 3 | 1 | 0 | 2 |
| 37．勉強する条件がよくないときは、勉強できるように条件をよくしようとする。 | 4 | 3 | 1 | 0 | 2 |
| 38．実験のレポートを書くとき結果をいろいろと解釈して考えるのが好きである。 | 4 | 3 | 1 | 0 | 2 |

| | 全くその通り<br>だと思う | 大体その通り<br>だと思う | 余り<br>そう思わない | 全く<br>そう思わない | どちらとも<br>いえない |
|---|---|---|---|---|---|
| 39. 大学で学んでいるのは興味をもっている学科を学ぶためである。 | 4 | 3 | 1 | 0 | 2 |
| 40. 新しいことを理解する場合はよく自分自身に納得させるようにしているが、他人に自分の考えを説明してもよくわかってもらえないことがよくある。 | 4 | 3 | 1 | 0 | 2 |
| 41. 多くのことを学ぶにはそれを憶えることに集中しなければならない。 | 4 | 3 | 1 | 0 | 2 |
| 42. できるかぎり友達よりもよくできることが、私にとって大切なことである。 | 4 | 3 | 1 | 0 | 2 |
| 43. 新しいことを考え始めるときは、まず最初に部分的なことを考え、そしてその話題の中心的な考え方に入っていく。 | 4 | 3 | 1 | 0 | 2 |
| 44. 本を読んでいるとき、いろいろな考えが浮かんできて時々その考えが一人歩きを始めることがある。 | 4 | 3 | 1 | 0 | 2 |
| 45. 勉強の本が欲しくなるとそれをどうしても求めようと夢中になる。 | 4 | 3 | 1 | 0 | 2 |
| 46. 論文やレポートに関係のない考え方を入れるといって、先生によく注意される。 | 4 | 3 | 1 | 0 | 2 |
| 47. 学問的な科目を勉強するのは非常にすばらしいと思う。 | 4 | 3 | 1 | 0 | 2 |
| 48. 教科書にでている定義さえ憶えておけば専門用語は理解できると思う。 | 4 | 3 | 1 | 0 | 2 |
| 49. 単位さえとれればよいと考えている科目もある。 | 4 | 3 | 1 | 0 | 2 |
| 50. 論文を書くまえにいろいろと関連したことを調べる。 | 4 | 3 | 1 | 0 | 2 |
| 51. 1つの科目を勉強するとき、事実や細かいことを憶えることはできるが、それらをまとめて1つの全体像を作り出すのが苦手である。 | 4 | 3 | 1 | 0 | 2 |
| 52. レポートを書いたり試験勉強をするときは、必要以上の本は読まない。 | 4 | 3 | 1 | 0 | 2 |
| 53. ゼミで発表することは頭痛のタネである。 | 4 | 3 | 1 | 0 | 2 |
| 54. 筋道を立てて考えると解けるような問題が好きである。 | 4 | 3 | 1 | 0 | 2 |
| 55. クラスで議論した面白いことについて時間をかけて考えることがある。 | 4 | 3 | 1 | 0 | 2 |

| | 全くその通りだと思う | 大体その通りだと思う | 余りそう思わない | 全くそう思わない | どちらともいえない |
|---|---|---|---|---|---|
| 56. 新しいことを勉強するとき、自分が知っていることとどんな関係があるか、そうした考え方とどのように結びついているかを知ろうとする。 | 4 | 3 | 1 | 0 | 2 |
| 57. 十分な証拠がなくても、すぐ結論を出そうとする傾向がある。 | 4 | 3 | 1 | 0 | 2 |
| 58. つまらないことでも負けるのが嫌いだ。 | 4 | 3 | 1 | 0 | 2 |
| 59. 結論を求めるには直観的な飛躍をせずに合理的、論理的に問題を検討することが大切だと思う。 | 4 | 3 | 1 | 0 | 2 |
| 60. 先生の講義の順序に注意を集中すると、一番よく憶えることができる。 | 4 | 3 | 1 | 0 | 2 |
| 61. 研究論文を読むときは著者の結論が正しいかどうか注意深く検討することにしている。 | 4 | 3 | 1 | 0 | 2 |
| 62. 先生はもっと自分の考え方を大胆にだすように求めていると思う。 | 4 | 3 | 1 | 0 | 2 |
| 63. 大学でやってきたことを考えると、ときどきなぜ大学に入ってきたのだろうと思うことがある。 | 4 | 3 | 1 | 0 | 2 |
| 64. 大学で勉強している科目で卒業してからもずっと勉強したい面白い科目がある。 | 4 | 3 | 1 | 0 | 2 |

※※この調査について気がついたことがあれば自由に書いて下さい。

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