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**Goal Orientations, Study Strategies and Achievement of Hong Kong Teacher
Education Student¹**

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Abstract

This study examined the interrelationship among achievement goals, study strategies and achievement of 473 students in a Hong Kong tertiary institution by means of questionnaire survey. Correlational analyses showed that performance goal was significantly and positively related to both surface and deep strategies while learning goal was significantly and positively related to deep strategy but negatively related to surface strategy. However there was no significant relation between achievement and goals or achievement and study strategies held by the sample. The results validated the applicability of an adapted instrument developed in western countries to measure achievement goal orientations in the Hong Kong context. It also gave support to the western findings that students who hold learning goals usually adopt a deep approach of study while students who are performance goal orientated tend to be shallow in study approach. Nevertheless, it was interesting to find that achievement was not significantly related to either the goals or study strategies held by students in the sample. The results were in contrast to the usual assumption that students who are performance goal oriented and adopt shallow approach in study would score low in academic achievement. Further investigation would be necessary to verify the effects of these variables on achievement of students.

Introduction

Research has indicated that the motivational orientations and affective variables are important factors influencing learning achievement at tertiary level education (Harackiewicz, Barron, & Elliott, 1998; Harackiewicz, Barron, Carter, Lehto, & Elliott, 1997; Minnaert & Janssen, 1992). Possibly, there is a close relationship between motivation, the goals set by the students, the strategies they employ and their subsequent achievement. In other words, achievement is a function of both the “will” and “skill” to learn (McCombs, 1984, 1994; Pintrich & Schunk, 2000)

In terms of goals, two contrasting achievement goals are readily identifiable: learning goals and performance goals (Ames & Archer, 1988; Archer, 1994; Elliott & Dweck, 1988; Maehr & Braskamp, 1986). Learning goals refer to the goals by which

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individuals aim to increase their mastery of new tasks and further develop their competence. Learning goals are also known as tasks goals or mastery goals. Individuals who hold learning or mastery goals seek to develop their competence on a task or increase their understanding of a subject and attribute this to be achieved by hard work. Performance goals, on the other hand, are the goals by which individuals seek to prove their competence in a competitive manner. Individuals holding such goals are concerned primarily with demonstrating their ability (or concealing a perceived lack of ability) by outperforming others, particularly if success is achieved with little effort. Performance goals are considered ego incentives or ego involved (Dweck, 1986, 1999; Dweck & Leggett, 1988; Goudas, Biddle, & Fox, 1994; Maehr & Braskamp, 1986; Nicholls, Patashnick, & Nolen, 1985; Pintrich. & Schunk, 2000; Smith, Duda, & Hall, 2002). Dweck (1986, 1990, 1999) and Nicholls (1989) have argued that a learning goal orientation is more desirable than performance goal orientation, which concentrates on outperforming others.

Achievement goal orientations are expected to relate to motives and strategies of learning. The situation of how the achievement goal orientations relate to students' learning motive and strategies have been explored in a number of empirical studies (Ames & Archer, 1988; Elliott & Dweck, 1988; Greene & Miller, 1996; Kong & Hau, 1996; Meece, Blumenfeld, & Hoyle, 1988; Nolen, 1987b; Pintrich. & Schunk, 2000). Further, it has been demonstrated that orientations are related to situational constraints (Ames, 1992; Dweck, 1986). Nolen (1987a) investigated the developmental differences in learning goals, studying strategy beliefs and their inter-relationship among school graders and college students. The results indicated that of the three goal orientations, only task orientation was significantly positively correlated with belief in the value of deep-processing strategies. This was the case at all age levels.

Greene and Miller (1996) studied the relationships among college students' self-reported goal orientation, perceived ability, cognitive engagement while studying, and programme achievement. Results indicated that both perceived ability and learning goal scores were positively correlated with meaningful cognitive engagement that included self-regulation and deep strategy use. In addition, learning goals and perceived ability were positively correlated with each other and performance goals were correlated with shallow cognitive engagement. Roeser, Midgley and Urda's (1996) research illustrated the positive effects of learning goal orientations on academic achievement through the mediating variable of academic self-efficacy. Further, they reported a positive relationship between performance goal orientation and self-consciousness. These studies have suggested that learning goal orientation is positively related to the deep approach to learning and subsequently academic outcomes. However, more recent work suggests that performance goals may not be as

maladaptive as indicated above. For example a number of studies by Harackiewicz and her colleagues (Harackiewicz et al., 1997, 1998) have shown that performance goals were positively related to academic achievement. A similar finding also emerged from Cockle and Moore's (1999) research of university students studying aviation and flight training - the more performance oriented students not only performing academically better but also piloting their aircraft on their own earlier than those not reporting such an orientation.

Tao and Hong (2000) study demonstrated that both performance and learning goal orientations were related positively to academic efficacy in university students in Hong Kong. They argued that Chinese culture has greater emphasis on social rather than individual endeavours (e.g. American) and demonstrating one's performance, trying hard and achieving, in the Chinese context is akin to an obligation, even a moral obligation. Ng (2000) investigated Hong Kong students' achievement goal orientations. With anticipated rather than actual achievement as the outcome variable, Ng found positive paths from learning goals to deep and achieving approaches to learning (Biggs, 1987) and on to predicted achievement. By way of contrast, a complex set of relationships emerged from the performance goal data. Performance goals were positively related to the achieving approach and subsequently predicted achievement but they were also positively related to the surface approach (Biggs, 1987), which in turn was negatively related to predicted achievement. In other words, both adaptive and maladaptive outcomes emerged from performance goals. Ee's (1998) study of 6th graders in Singapore showed different patterns of relationships between goal orientations, knowledge and use of strategies and achievement. For the top band of students, both learning and performance goals positively predicted achievement (with stronger relationship with performance goals). For the middle band, this pattern was repeated. However, for the lowest band of students, performance goals played no role in the outcomes with learning goals positively impacting on achievement through knowledge of learning strategies. However, in another study of high-achieving students, Ee reported that students' goals were only weakly correlated with achievement goals (Ee, Moore & Atputhasamy, 2003) and she cautioned the interpretation of these weak relationships.

Recent work by Elliot (1997), McGregor and Elliot (2002) and Pintrich (2000b) showed that the dichotomy classification of motivation goals into learning and performance goals was a bit simple and that there should be further breakdown of the performance goals to account for the varied findings in studies of performance goals. Pintrich (2000a) modified the goal theory and proposed that there are two types of performance goals: the approach performance goals (outperforming others) and the avoidance performance goals (avoidance of looking incompetent).

Gender differences have also been reported in the literature on achievement goals. For example, Roeser, Midgley and Urdan (1996) reported a tendency for males to be more performance oriented than females, a finding replicated by Ee (1998). Ee also reported no significant differences between males and females on the learning goal measure. However, Ablard and Lipschultz (1998) showed a different result with males less oriented towards learning goals than females but no differences on performance goals. Finally, Pintrich's (2000b) longitudinal study of high school students demonstrated that the females who reported high levels of performance goal orientations early in the study had higher degrees of positive feelings towards learning in school but over the two years of the study, these females had the greatest drop in such positive affect.

In summary, the achievement goal literature has highlighted such goal orientations to be prominent determinants of students' motivation and achievement behaviour. Also the general emphases on learning (mastery) goals and performance (ego) goals that students perceive in schools and the goals they adopt appear to be important factors in students' school behaviour and may have broader implications for adaptive development. While the role of goals has been primarily demonstrated in the realm of learning and achievement, task and ego goals may also influence a wide range of action, thought and affect, including those associated with general well-being – general self-evaluations and patterns of behaviour, coping, and emotion (Kaplan & Maehr, 1999). For Chinese students, the notion of performance goals may vary from those held in some western cultures as noted by Tao and Hong (2000). They suggested that the motivation to exceed and outperform others may extend beyond competition for individual satisfaction to a deeper need to demonstrate their commitment to learning to others such as family. Given the current discussions in Hong Kong about the quality and professional development of pre-service teachers (Chan, 1999, 2000; Cheng, 2000; Tai & Cheng, 1994), it is worthwhile to examine the achievement goal orientations of prospective teachers who may carry their goal orientations into their own classrooms and thus influence their pupils' learning.

Research Questions

1. What are the achievement goal orientations held by the Hong Kong undergraduates? Are there any significant differences across gender, elective and programme groups?
2. What are the study strategies adopted by the Hong Kong undergraduates? Are there any significant differences across gender, elective and programme groups?
3. Are there any significant relations between the Hong Kong undergraduates' achievement goals, study strategies and academic achievement? If so, how are

they related?

Method

Two questionnaires were administered to 473 undergraduates of a Hong Kong tertiary institution for completion. The undergraduates were enrolled in a degree and sub-degree teacher education programmes. The first questionnaire was to examine their achievement goal orientations and the second study strategies. The first one was made up of 10 Likert-scale items (From 1 = strongly disagree to 5 = strongly agree), adapted from the instrument developed by Roedel et al. (1994). Roedel et al. (1994) reported respectable reliability of the scale (Cronbach alpha for learning and performance goal scales were .80 and .75 respectively). The second one consisted of 14 Likert-scale items (From 1 = never or only rarely true to 5 = always or almost always true), adapted from the surface and deep study strategy subscales of Biggs' Study Process Questionnaire (Biggs, 1987). The students were also requested to supply their demographic information such as sex, level of study and subject discipline chosen. Also, with the consensus of the students, their yearly academic results were obtained from the Registry for relational studies.

Results

Participants' Characteristics

Of those who attempted the questionnaires, 177 (37.4%) came from a degree programme (BEd.(Pri.)) and 296 (62.6%) a sub-degree (CE(Pri.)) programme. The degree and sub-degree programmes have the same admission requirement but differs in the duration of training. Excluding the missing case, there were 93 males (19.7%) and 379 females (80.1%). The subjects ranged in age from 18 to 32, mostly around 19 to 21 (accounts for 85.5%). The mean age was 20.52 (SD = 1.59). The electives taken by the students were categorized into five major groups including Language Subjects, Social Studies, Science and Mathematics, Cultural subjects, Technology and Computer.

1. Achievement Goal Orientations

Exploratory factor analysis (maximum likelihood and oblimin rotation) extracted two factors (loading value of .3 and above) accounting for 42.11 % of the accumulative variance. According to the nature of the loaded items, factor 1 was labelled performance goal and factor 2 learning goal. The internal consistency (alpha) of performance goal was .67 and that of learning goal was .58.

The computed mean score and standard deviation of learning and performance goals for the gender, elective and programme groups are given in Table 1.

Table 1 The mean score and standard deviation of learning and performance goals for gender, elective and programme groups

	Learning goal		Performance goal	
	Mean score	Standard deviation	Mean score	Standard deviation
Gender:				
Male N = 91	3.23	.56	3.40	.74
Female N = 368	3.34	.54	3.72	.60
Total N = 460	3.32	.54	3.66	.64
Elective:				
1. Language Subjects N = 215	3.32	.55	3.70	.64
2 Social Studies N = 18	3.48	.43	3.62	.43
3. Science and Mathematics N = 13	3.23	.50	3.74	.50
4. Cultural subjects N = 168	3.29	.56	3.59	.69
5. Technology & Computer N = 41	3.35	.55	3.70	.60
Total N = 460	3.32	.54	3.66	.64
Programme:				
BEd(P) N = 170	3.26	.56	3.67	.67
CE(P) N = 290	3.35	.53	3.65	.63
Total N = 460	3.32	.54	3.66	.64

MANOVA study shows significant difference in achievement goal orientations across gender groups (Wilks' lambda = .96, $F(4, 912) = 5.05, p < .05$). Univariate ANOVA shows significant difference in the performance goal between male and female students, $F(2, 457) = 9.98, p < .01$. The ANOVA for learning goal was nonsignificant between male and female students, $F(2, 457) = 1.46, p = .235$. MANOVA shows there is no significant difference in achievement goal orientations across elective or discipline groups at .05 level. (Wilks' Lambda = .99, $F(10, 906) = .57, p = .839$). MANOVA also shows no significant difference in achievement goal orientations between the degree, B.Ed.(Pri.) and sub-degree, C.E.(Pri.) programme groups at .05 level (Wilks' Lambda = .99, $F(2, 457) = 2.01, p = .135$).

2. Study Strategies

Exploratory factor analysis of the 14 items representing surface and deep strategy based on Biggs' conceptual framework yielded two factors (loading value of .3 and above) accounting for 33.9% of the accumulative variance. According to the nature of the loaded items, factor 1 was labelled as deep strategy and factor 2 as surface strategy. The internal consistency (alpha) of deep strategy was .70 and surface strategy .51

The computed mean score and standard deviation of surface and deep strategies for the gender, elective and programme groups are given in Table 2.

Table 2 The mean score and standard deviation of surface and deep strategies for gender, elective and programme groups

	Surface Strategy		Deep Strategy	
	Mean score	Standard deviation	Mean score	Standard deviation
Gender:				
Male N = 90	2.96	.49	3.33	.61
Female N = 366	2.95	.46	3.28	.54
Total N = 457	2.95	.47	3.29	.56
Elective:				
1. Language Subjects N = 209	2.94	.45	3.26	.56
2 Social Studies N = 209	3.11	.53	3.31	.77
3. Science and Mathematics N = 13	2.79	.22	2.96	.53
4. Cultural subjects N = 167	2.93	.47	3.35	.49
5. Technology & Computer N = 43	3.05	.46	3.28	.62
Total N = 457	2.95	.47	3.29	.56
Programme:				
BEd(P) N = 172	2.97	.44	3.29	.56
CE(P) N = 285	2.95	.48	3.29	.56
Total N = 457	2.95	.47	3.29	.56

MANOVA study shows no significant difference at .05 level in study strategies across gender groups (Wilks' Lambda = .99, $F(4, 906) = 1.10, p = .356$); elective or discipline groups (Wilks' Lambda = .97, $F(10, 900) = 1.52, p = .129$); and programme groups (Wilks' Lambda = 1.0, $F(2, 454) = .11, p = .897$).

3. Correlational Analysis

Pearson product-moment correlations among scores on goal orientations, study strategies and yearly _GPA are presented in Table 3. Significant positive correlations ($p < .01$) were found between scores on learning goal orientation and deep strategy ($r = .38$) as well as between performance goal orientation and surface and deep strategy ($r = .24$ and $r = .15$ respectively).

Table 3 Pearson correlations among achievement goal orientations, study strategies and yearly_GPA

	1	2	3	4	5
Learning Goal	1				
Performance Goal	.236**	1			
Surface Strategy	-.144**	.240**	1		

Deep Strategy	.442**	.146**	.023	1	
Yearly GPA	.089	.064	-.031	.044	1

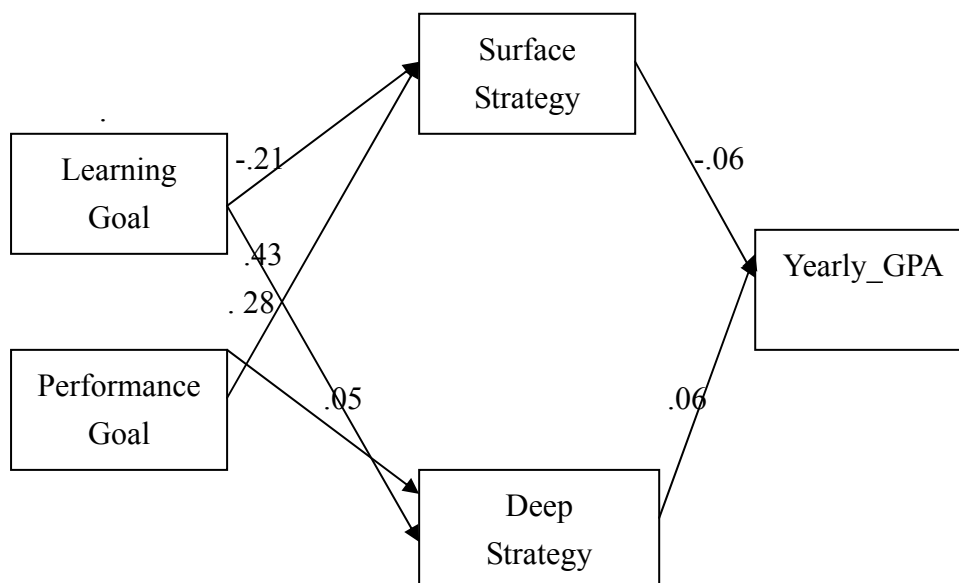
** Correlation is significant at .01 level (2-tailed)

4. Path Analysis

Table 3 shows the study strategies adopted by the undergraduates are significant related to their achievement goals. Learning goal is significantly and positively related to deep strategy (the relation was moderate) but negatively and significantly related to surface strategy (the relation was weak). Performance goal is significantly related to both deep and surface strategy, but the relations in both cases were weak. Achievement (in terms of Yearly_GPA) is negatively related to surface strategy but positively related to deep strategy and both learning and performance goals. However, all the relations were very weak and insignificant. It is also interesting to note that learning goal is significantly related to performance goal, the two have been thought to be independent of each other in the past. The relation of learning and performance goals was discussed in the next section, making use of the recent goal model put forward by Harachiewicz et al., 2002; Pintrich, 2000a.

Structural equation Modelling (SEM) using LISREL8.5 for windows was applied to further examine the relationships of academic goals, study strategies and achievement. A satisfactory goodness of fit index was obtained, confirming the proposed model of relations among academic goals, study strategies and achievement (GFI = .99, AGFI = .96, RMSEA = .06). The relations were illustrated by the path analysis diagram in Figure 1.

Figure 1 Path analysis diagram of academic goals, study strategies and academic achievement (yearly_GPA) of teacher education students



Discussion

Two factors were extracted in the measurement of achievement goal orientations of a sample of undergraduates, namely, the learning and the performance goals. The factor structure matched with the scale composition proposed by Roedel et al. (1994) but the alpha values of the two subscales were bit lower than the reported values in literature, possibly due to the reduced number of items used in the measurement. In general, the scale adapted from Roedel et al. (1994) in measuring achievement goal orientations was still acceptable in the present study.

Two factors were identified from the 14 items extracted from Bigg's SPQ. Based on the nature of the items, the first factor was labeled deep strategy and the second factor surface strategy. The distribution of the items into the two factors matched with Biggs' conceptual subscale of surface and deep strategies. The only difference was found among items which were intended to tap surface strategy: items 7 and 13 did not load with significant loading of .3 or above as other conceptual items into factor 2 (surface strategy). In general, the psychometric properties of the two subscales were satisfactory for research purpose except the alpha value of the surface strategy was a bit low (the problem has also been reported in literature).

The undergraduates under study have a higher tendency towards performance goals than learning goals as suggested by the relative mean values. MANOVA study indicated the statistical significant difference of achievement goal orientations within gender lay in performance goals of the gender groups whereas learning goals showed no significant difference across gender groups. Female students under study tended to be more performance goal orientated than male students. The motive to learn and outperform would be much stronger within a female if she wished to get educated and advancement in study and career.

Electives or disciplines seem not to be a determining factor on students' achievement goal orientations. The study of effect of electives/disciplines on achievement goal orientations by multivariate analysis was limited by the small number attached to certain categories of electives/disciplines such as social subjects, science and mathematics, technology and computer. Further research in this area with larger number of each category are required to confirm the electives/disciplines effect on goal orientations.

MANOVA study shows no significant difference in goal orientations across programmes (CE and BEd) at .05 level. The result is understandable as both programmes recruit students with similar entry requirements and in general, there might not be a wide variation in terms of abilities and motives/goal orientations among students of the degree and sub-degree programmes.

For the study strategies adopted by the students, while both surface and deep

strategies were prevailing, there is a greater tendency for the students of both groups to adopt a deep strategy than a surface strategy of learning as reflected by the greater mean score values of deep strategy. Despite the mean score of deep strategy of male students is greater than that of female students, it is interesting to find no statistically significant difference in the study strategies across gender groups.

MANOVA study shows that there is no significant difference in the study strategies across elective/ discipline groups. The result is in line with Biggs' suggestion that the study strategies adopted by students are dependent on classroom contexts such as teachers' instruction and assessment rather than the disciplines chosen by the students.

MANOVA study also showed no significant difference in the study strategies adopted by the degree, BEd (Primary) and sub-degree, CE (Primary) students. This is understandable as both programmes of students have completed secondary 7 and met similar requirements before admission, and they approximate each other in the age range and hence study strategies.

The finding of the present study that learning goal is significantly related to performance goal, differs from what Roedel et al. (1994) reported that the two scales were statistically independent and uncorrelated. The finding was contrary to the dichotomies goal theory which has traditionally viewed learning/mastery and performance goals in opposition to one another. The present finding resembles those reported by Gonzalez et al. (2002) who found that the learning and performance orientations were significantly correlated. In fact, conflicting results have been reported in literature lately on the correlation between these two goal orientations. Pintrich (2000a) had also concluded with results showing the two goal orientations to be negatively correlated, uncorrelated, or even positively correlated. Some of this variance in empirical results is due to methodological considerations such as use of different measures, designs, and age of participants (Pintrich, 2000a). The correlation between learning and performance goals may also be caused by some common or related nature of the two goals. The proposal of the approach and avoidance performance goals by Harachiewicz et al. (2002) infers that learning goals may be positively related to a host of adaptive outcomes and that some of the adaptive outcomes may be linked to approach performance goals. Such relations may be considered in explaining the significant correlations between learning and performance goals. In general, there is a need to clarify the relations between learning and performance goals in future studies, which help understand the nature of goals and further build up the goal theory.

Correlational analysis of the relationship between students' achievement goal orientations and their use of study strategies suggested that students who scored higher on learning goal orientation were more likely to be cognitively engaged in deep strategy.

Students who scored higher on performance goal orientation were likely to be engaged in both surface and deep strategies. Nevertheless, performance goal orientation was more positively related to surface strategy than deep strategy despite both correlations were significant at .01 level.

The result that learning goal orientation was significantly related to deep strategy in a positive manner is similar to those reported by Nolen (1988), Miller et al. (1993) and Kong and Hau (1996) that students who adopted a learning goal orientation tended to use deeper processing strategies. This is understandable as students holding learning goals emphasize self-improvement and real mastery. Their main concern in study is the complete understanding of the subject matter and self-satisfaction. This concern could be attained by the use of deep strategy in learning such as elaboration and organization (Albaili, 1998) which result in greater transformation of information and consequently require more cognitive activity and effort on the part of the learners.

However, the result that performance goal orientation was both positively related to surface and deep strategy was on one hand similar, and yet on the other hand, different from reported findings in literature. Researchers such as Dweck and Leggett (1988) suggested that students who adopted performance goal orientation tended to use surface-level cognitive process strategies such as memorizing and rehearsal. However the Hong Kong Chinese students, while holding performance goals, also tended to use both surface and deep strategies in learning. This is consistent with Biggs' arguments about the achieving approach and deep-memorization adopted by Hong Kong Chinese students in his previous studies (Watkins and Biggs, 1996). The result is also in line with the characteristics of students who endorsed performance goal orientation when students are more concerned with how they are being judged by others and try their best to outperform their peers with minimum effort. The concern could be accomplished by the use of surface strategy such as rehearsal and memorization of information as well as deep strategy which can also improve one's achievement depending on mode of assessment. The result implies that as far as Hong Kong Chinese students are concerned, performance goal orientation may not lead to surface strategy and considered undesirable as suggested in research studies in western countries. In other words, different cultural contexts may exert a different influence on the relationship between achievement goal orientation and study strategies adopted by students.

Academic achievement in terms of yearly_GPA of students was found to have no significant relationship with either goal orientations or study strategies among the students. However, there was a negative relation between surface strategy and academic achievement implying surface strategy was disadvantageous to academic achievement of the students. The result was comparable to the findings of Albaili (1998) of United Arab emirates college students in that no significant differences were

observed among groups of different GPA results on learning goal orientation scale. Nevertheless, path analysis conducted by Albaili (1998) suggested that performance goal orientation has a negative direct effect on GPA, while the learning goal orientation had a positive indirect effect mediated by both elaboration and organization strategies. Cultural and contextual differences might account for the difference in findings between the present study and that of Albaili (1998). Further investigation, however, would be required to examine the effect of goal orientations and study strategies on academic achievement with more samples of different cultures.

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