GPHE 31022—5/7/2003——77014

Pharmacy Education, 2003 Vol. not known (not known), pp. 1–8

Achievement Motivation and Self-efficacy Perception Amongst Portuguese Pharmacy Students

A. CAVACO[a,b,*], V. CHETTIAR[a] and I. BATES[a]

[a]*The School of Pharmacy, University of London, 29/39 Brunswick Square, Bloomsbury, London, WC1N 1AX, UK;* [b]*Sub-Grupo de Sócio-Farmácia, Faculdade de Farmácia, Universidade de Lisboa, Av. Prof. Gama Pinto 1649-003, Lisboa, Portugal*

(Received ????; In final form ????)

Portuguese pharmacy education is undergoing a process of change and the present curriculum of the Lisbon Faculty of Pharmacy (FFUL) is under active discussion. Programs can be better developed to simultaneously achieve learning objectives and students' success. Previous research has found students' goal orientation to be consistent with their beliefs about how success is achieved. This work aimed at measuring dimensions of Achievement Motivation (Task Orientation, Ego Orientation and Work Avoidance) and Self-efficacy Perception amongst a sample of 1st and 5th year Portuguese pharmacy students, including those from a private college (ISCS). Both scales, previously used for educational research in Portugal, confirmed the three motivational dimensions and the self-efficacy construct, through Principal Component Analysis and internal consistency testing. Preliminary analysis showed behavioural differences between first and final year students within FFUL and ISCS. These results suggest that a curriculum reform needs to entail not only the update of subject content but also the customisation of teaching and learning methods according to years of academic experience.

Keywords: Achievement; Motivation; Pharmacy; Self-efficacy; Students

INTRODUCTION

Students in an academic setting are expected to acquire knowledge in a fashion known as self-regulated learning, i.e. they should be able to organize competent learning strategies, to dedicate adequate time and to fully master a wide range of topics. Lecturers, staff and colleagues provide guidance and support, but it is the student who must choose how and where their time is spent studying. A successful pharmacy graduate will have passed the examinations in an eclectic subject range, stored and maintained the skills and knowledge obtained and moved towards the domain of a healthcare professional.

McKeachie *et al.* (1985) showed that knowledge of learning strategies does not always lead to better academic performance. It is necessary for students to develop the motivation to use these strategies; thus, to understand and facilitate the self-directed learning behaviour required to reach academic and other life goals, one must understand the combined influences of motivation and cognition on these processes.

Bandura (1986) pioneered the social-learning approach. A central part of this theory is the "self-efficacy" perception that describes an individual's sense of their abilities (and knowledge) and of their capacity to deal with particular sets of conditions that life puts before them. An individual's sense of self-efficacy influences their perceptions, motivation and performance in many ways. Although self-efficacy is not the same as self-confidence and self-esteem, it can affect behaviour in situations that differ from those where it was generated because once established, positive expectations can generalize to new situations (Bandura, 1977). In addition to influencing our choice of activities, tasks, situations and companions, self-efficacy judgments also influence how much effort one expends and how long one persists when faced with difficulty. How vigorously a student pursues an academic task depends more on his or her sense of self-efficacy than on their actual

*Corresponding author. Address: Sub-Grupo de Sócio-Farmácia, Faculdade de Farmácia, Universidade de Lisboa, Av. Prof. Gama Pinto 1649-003, Lisboa, Portugal. E-mail: amcavaco@ff.ul.pt

ISSN 1560-2214 print/ISSN ????-???? online
DOI: 10.1080/1560221031000159618

ability. Will the vigour with which they pursue their studies be affected by four years of education and how much can course content and a teacher's self-efficacy affect student achievement?

Nowadays, students' experiences and views are taken seriously. The Course Experience Questionnaire is an instrument that is used all around the world (Wilson *et al.*, 1997) to assess students' perceptions of teaching. Ashton and Webb (1986) have shown that an increased teachers' self-efficacy leads to improved student scores in the field of mathematics, so lecturers would be expected to have some effect on students in the eclectic but essentially "scientific" subject of pharmacy. Furthermore, it has been stated previously that knowledge of effective learning strategies does not ensure student success; students must develop and use these strategies properly if they want to meet their own educational objectives. Teachers and course content are an integral part of this development process.

"Achievement motivation" is an example of cognitive motivation that is concerned with the self-motivation to excel on any activity that is significant to the individual. Achievement motivation provides a link between specific goals, the planning and effort needed to attain them and feelings of self-worth. It follows that self-efficacy beliefs will allow the newly learned processes to be initiated and new skills to be used efficiently in the correct context. Obviously, this is of importance in all academic degree programmes but especially so in vocational, and moreover health professional, degrees as the ability to evoke the right or wrong knowledge could affect the well-being of another individual. Why is there a critical variation in different peoples' motivation to complete tasks? It may simply be a behavioural process and, of course, we are all unique. However, research has shown that people may fall into one of three general categories in regard to achievement motivation (Duda and Nicholls, 1992).

Evaluation of past research makes a strong relationship between self-efficacy and achievement motivation seem plausible. This relationship may be even more important in an academic (health professional) setting when the responsibility to set appropriate goals, to motivate oneself to study and to retain all the knowledge for later use is a personal decision. A lowered self-efficacy is likely to affect both the dimension of achievement motivation and the ability of the student in troublesome situations. This may be fine during the academic training stage when difficult situations can be avoided but may be of critical importance when the student is qualified and must respond objectively to such circumstances. It must be stressed that the university (academic staff) and the syllabus content have a vital role to play in inducing and maintaining the most suitable form of achievement motivation and a high degree of self-efficacy, whilst also allowing students to achieve knowledge objectives and success. The importance of the course and student attitudes toward the course they are studying must not be undervalued.

One could say that learning is centred on goals and standards that students attempt to attain and maintain. If the students reach all these goals they may consider themselves to be successful. Usually, university students cite the following goal domains as the most important:

1. Family (ability to enter and maintain an intimate relationship)
2. Educational (gain a degree) and
3. Occupational (improve occupational skills and have a job that they enjoy).

The course that students study can aid them in setting the goals whilst also helping them to plan effective learning strategies. Moreover, it can aid the development of confidence to use the skills and knowledge they have gained. It is these personal self-efficacy judgements that have been found to influence the plans and strategies developed, the goals attempted and the successes at these goal attempts (Bandura, 1986).

Goals are cognitive representations of what we would like to happen and what we would like to avoid in the future (Markus and Nurius, 1986; Ford, 1992). "Goal orientation" is a general tendency to turn or position oneself in the direction of a goal, be it physical or metaphoric (i.e. in terms of thinking and attention). Research has found that students' goals in school are closely related to how they believe one generally becomes successful in school. Factor analytic studies have uncovered at least two independent dimensions of personal academic goals and beliefs about the causes of success (Nicholls *et al.*, 1989). Further studies by Nicholls *et al.* (1990) show the appearance of a third dimension in some studies. The three dimensions are as follows (Duda and Nicholls, 1992):

1. Task Orientation: Goal of gaining knowledge

This involves the goal of improving one's skill or gaining insight or knowledge. Task-orientated individuals hold the view that in order to succeed, students must work hard, attempt to understand schoolwork and collaborate with peers. Such a person is goal-directed and less concerned with the affective or aesthetic aspects of a task than with its completion.

2. Ego Orientation: Goal of superiority

This relates to persons who set the goal of establishing their superiority over others, i.e. those

who believe that success in school requires attempts to beat others and establish superior ability.

3. Work Avoidance: Goal of not having to make an effort

This consists of the goal of not working hard and the belief that success in school is dependent on "good" behaviour in class.

One criticism of these three dimensions is that they have been found within school children and slightly different dimensions may apply to those in further or higher education. Another is that the basis of these dimensions is traced mainly through Nicholl's own work. Other orientations such as "Occupational Motivation" exists, i.e. the goal of becoming part of a profession. Research by Batcock and Smithers (1969) shows that success in professionally oriented health sciences degrees, e.g. pharmacy, was related to the strength of occupational motivation. One may speculate that occupational motivation is, in fact, a sub-set of Task Orientation but it is reasonable to state that the goal of holding the job title of "pharmacist" is what drives some pharmacy students. However, as the Portuguese versions of these constructs had been validated for use within all Portuguese student populations, these dimensions were the ones to be tested.

Further literature searches (following results analysis) uncovered work by Hastings *et al.* (2001) who showed that similar work had been carried in health professions' colleges (doctors, nurses, pharmacists) to measure student motivation in America. There were differences in the dimensions measured and no scale for the self-efficacy perception was found. The dimensions measured were developed by Archer (see Hastings *et al.*, 2001) and are very similar to those developed by Duda and Nicholls (1992). Goal orientation is used here to conceptualise university student motivation and that students exhibit:

1. Mastery Orientation: desire to develop competence and increase understanding (see task)
2. Performance Orientation: desire to demonstrate competence and ability (see ego) and
3. Academic alienation: no concern for developing competence or demonstrating achievement (similar to work avoidance).

Two surveys of 80 first year pharmacy students were conducted to determine whether a shift in pharmacy students' goal orientation occurs during one year of professional education. Although the students' goal orientation remained mastery, the results suggest that students were shifting from this goal orientation to academic alienation. Are similar changes in goal orientation evident in Portuguese pharmacy students?

The purpose of the study is to identify and further validate an instrument that would measure the goal orientation preferences of Portuguese pharmacy students in health professions programs.

METHODS

The survey questionnaire was divided in two parts: one to measure achievement motivation and the other to measure self-efficacy perception. The achievement motivation part of the survey was to be done using a Portuguese translation of a questionnaire that was developed by Duda and Nicholls (1992). The translation and validation for use within the Portuguese student population was carried out by Sá (1999) and consisted of 16 questions, which were answered on a seven-point Likert scale (1 = Not at All; 7 = Completely). The questions cover dimensions associated with Task Orientation, Ego Orientation and Work Avoidance. The Perceived Self-Efficacy part of the questionnaire was a Portuguese adaptation of an academic self-efficacy scale, originally devised by Panzuela in 1983 and then modified for use within academic situations (Cerdeira and Palenzuela, 1998). The foundation of this tool is Bandura's social-cognitive theory. Again, all eight questions were in the form of a seven-point Likert scale. The two tools used had already been adapted and validated for use within the Portuguese student population, so there was no need for a pilot study to be carried out.

The sampling procedure aimed to have a sample of students who were either at the beginning or near the end of the course. For this reason, first and fifth year students from the University of Lisbon's Faculty of Pharmacy and a private institution (ISCS) were to be asked to complete the questionnaire. An increased ability to generalise and the allowance of comparisons between the two colleges was the advantage behind having different institutions complete the questionnaire.

The study was carried out by the Department of Social Pharmacy in the Faculty of Pharmacy of the Lisbon University (FFUL). It was also coordinated with the Department of Pharmacy from the Institute of Health Sciences (ISCCS), which is also located in Greater Lisbon. At both institutions the questionnaires were given to all students at the beginning of the equivalent laboratory class. All students were informed of the study objectives and free to decline participation. Those who wanted to participate had to complete the questionnaire and hand it at the end of the class. The teacher then returned all questionnaires to the Department of Social Pharmacy. All questionnaires were anonymous.

The completed questionnaires were given a unique sequential identification number, which

TABLE I Summary of sample university status

Institute/Year	Year 1	Year 5	
FFUL University of Lisbon	200 = 41.2%	147 = 30.4%	347 = 71.6%
ICCS Private Institute	65 = 13.4%	73 = 15%	138 = 28.4%
	265 = 54.6%	220 = 45.9%	

would allow for quality assurance checks to be made on the data after it had been recorded into the database (SPSS). The number was written on the top right-hand side of the questionnaire; this was done afterwards so that the students did not believe that their confidentiality had been compromised.

Quality measures were taken to assure the data entry process. Data that had been entered from the questionnaires into the SPSS database were checked using a statistical procedure (Besterfield, 2000). For the sample size ($n = 485$) two input errors were found and thus the sample data quality was assumed.

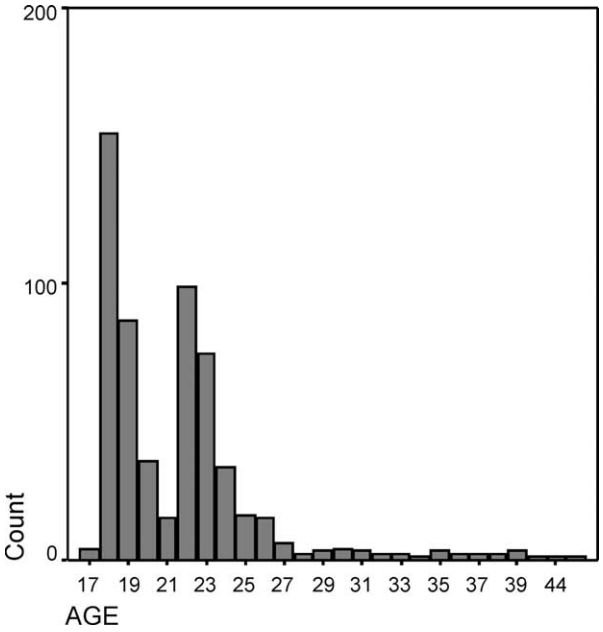

FIGURE 1 Distribution of age of students in overall 1st and 5th year population.

RESULTS

A total of 485 Pharmacy students within the two institutions completed questionnaires for the study. In total, 573 questionnaires were sent out giving a response of 84.3%, 71.6% from the University of Lisbon's Faculty of Pharmacy (FFUL) and 28.4% from the private institute (ICCS). Table I summarises the year and institute information of those who completed the questionnaire.

No demographic information was requested on the questionnaires. Rather than being sex- or age-group based, results on achievement motivation and self-efficacy perception were to be investigated using other variables such as academic years and schools of pharmacy. Besides, anonymity was extra assured. The proportions of sex and age were then obtained by checking the records for the 573 students in that discipline (who should have therefore been present in class) and calculated using sex/year cross tabulation and age/year exploration. From this sample, 24.3% were males (139) whilst 75.7% (434) were females. The range of ages of the respondents varied from 17 to 50 years and the median age was 21 years. Figure 1 shows a two peak age distribution according to the mean ages of the 1st and 5th year groups.

A Pearson's correlation matrix was generated for every questionnaire item so that the correlation between items could be judged; it was shown from this that most of the first 16 items (from the achievement motivation scale) had satisfactory bivariate correlation ($r > 0.3$) except for questions 17–24. These questions came from Cerdeira and Palenzuela's self-efficacy perception questionnaire and, although they correlated well with each other, they did not appear to correlate with the other items. This indicates a degree of independence from the two scales.

Principal Component Analysis was performed to confirm the initial factors. A value of 0.839 was generated for the Kaiser-Meyer-Olkin Measure of sampling adequacy (KMO), allowing the factor analysis to proceed. The Bartlett's test of sphericity was also used to confirm the existence of a correlation matrix between the items ($p < 0.0001$).

Four factors were extracted with an eigenvalue greater than 1.00, contributing with 20.0, 15.4, 10.6, and 7.9% of the variance, respectively, and a cumulative variance of 54.0% (see Table II). However, a scree plot (see Fig. 2) was also produced, pointing to a fifth component with an eigenvalue of 0.990. This evidence seems to point to the possibility of a fifth component being present.

Correlation matrices of the items within the four extracted factors were examined after oblique rotation to evaluate how each item loaded onto the four factors. All the values correlated well with values greater than 0.5 for factors 1 and 3, 0.7 for factor 2 and 0.6 for factor 4. This information is summarized in Table III.

The results confirm the existence of four factors or constructs (as was originally the case). Three factors were from Duda and Nichols Achievement Motivation scale and the fourth from Cerdeira and Palenzuela's Perceived Self-Efficacy Questionnaire. The scree plot and the eigenvalues seemed to

TABLE II Total variance explained

	Initial Eigenvalues			Extraction sums of squared loading		
Component	Total	% of Variance	Cumulative (%)	Total	% of Variance	Cumulative (%)
1	4809	20.038	20.038	4809	20.038	20.038
2	3705	15.437	35.475	3705	15.437	35.475
3	2553	10.638	46.113	2553	10.638	46.113
4	1895	7.896	54.009	1895	7.896	54.009
5	990	4.125	58.134			

Extraction method: Principal Component Analysis.

suggest a fifth component, supported by the strong correlation ($r = 0.42$) between items q5 and q2.

Q2: Things that I learn make real sense.
Q5: I can solve a problem by making an effort.

However, both questions were found to correlate with other items that made up the "Task Orientation" component and so, as the four factor results held greater weight, this fifth factor was not retained.

Questions 17–24 comprised of the items relating to self-efficacy. The internal consistency of all items was tested and the alpha coefficient, α, was calculated to be 0.85. The score midpoint value is 32 and the mean score for this sample is therefore quite high at 37.4. The frequency distribution curve is left-skewed and the standard deviation is 7.07, showing the data far dispersed from the mean.

Questions 2, 5, 8, 11, 14 and 16 comprised of the items relating to Task Orientation. The alpha value for internal consistency of items was 0.79, which is very close to the optimum value. For a midpoint value of 24, the mean score is therefore high at 36.8. Frequency distribution curve is also left-skewed but the standard deviation is very low at 4.92, showing that most of the data is dispersed very closely around the mean.

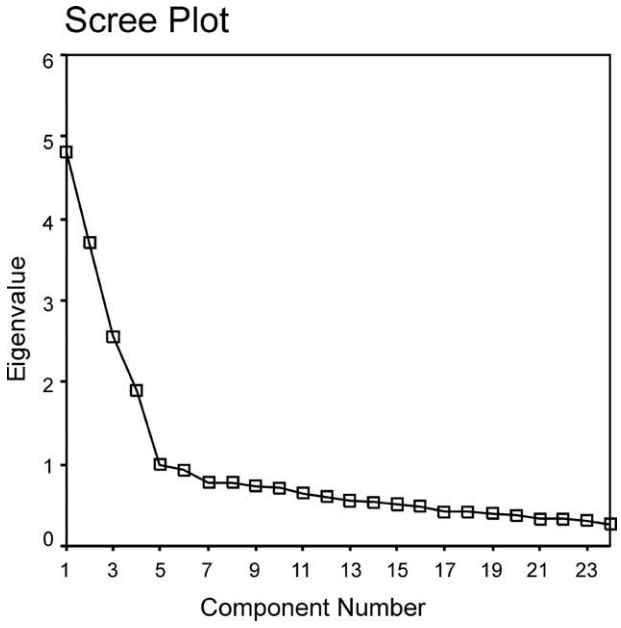

FIGURE 2 Scree plot graph.

Questions 1, 4, 6, 10 and 13 comprised of the items relating to Ego Orientation, with an alpha value of 0.85. The mean score is therefore fairly low at 14.1 (midpoint value 20), with the frequency distribution curve being right-skewed; this shows that the main spread of the data is shifted towards the lower scores for this factor.

Questions 3, 7, 9, 12 and 15 comprised of the items relating to Work Avoidance. The alpha value for internal consistency of items was 0.77, again close to the optimum value of 0.80. The mean score is about 18.6 (midpoint value of 20) and the frequency distribution reflects a normal one,

TABLE III Summary of item loading onto factors after rotation

	Pattern matrix*			
	Component			
Items	1	2	3	4
q17	.673			
q18	.635			
q19	.804			
q20	.583			
q21	.719			
q22	.618			
q23	.760			
q24	.814			
q1		.790		
q4		.842		
q6		.748		
q10		.731		
q13		.760		
q2			.621	
q5			.552	
q8			.768	
q11			.727	
q14			.714	
q16			.762	
q3				.632
q7				.690
q9				.744
q12				.816
q15				.665

Extraction method: Principal Component Analysis. Rotation method: Oblimin with Kaiser Normalization. *Rotation converged in 7 iterations.

TABLE IV Results of oneway ANOVA test to compare means of each group for each extracted factor

		Sum of squares	Degrees of freedom	F	Significance
Self efficacy	Between groups	1224.52	408.173		
	Within groups	22530.035	47.733	8.551	0.000
	Total	23754.555			
Ego orientation	Between groups	444.504	148.168		
	Within groups	19649.782	41.719	3.552	0.014
	Total	20094.286			
Task orientation	Between groups	277.546	92.515		
	Within groups	8575.179	17.902	5.168	0.002
	Total	8852.725			
Work Avoidance	Between groups	243.350	81.117		
	Within groups	14979.022	31.271	2.594	0.05
	Total	15222.373			

Critical p-value = 0.05.

showing that the data is spread fairly evenly around the mean. The standard deviation is low at 5.62.

Four different groups of students completed the questionnaire (see demographic details above). It was interesting to compare the population mean of each group using analysis of variance (ANOVA statistic). The results from the one-way ANOVA test are given in Table IV.

The calculated value of F was large, so the null hypotheses that population means were equal could be rejected, i.e. there exists a significant statistical difference between the mean of each group for each extracted factor. *Post hoc* tests, using the Bonferonni method of adjusted serial t-tests, were used to specifically locate the differences. The results are presented in the separate matrices for each dimension (Table V).

The statistical standardized value known as the "Z" score was calculated to allow comparisons to be made between the factor scores of each group (Fig. 3). On first inspection there appears to be differences in scores between all the groups. Comparisons between institutions (within the same year) show an opposite scoring for Ego and Task Orientation among first year students. Self-efficacy scores are about the same, if higher, in the private institute whilst work avoidance is definitely higher in the private institute sample. Fifth year students from the private institution (ISCS) show higher scores for all measured factors, even compared to other groups and beyond 5th year public (FFUL) pharmacy students.

If comparisons are made within institutions, achievement motivation and self-efficacy are found in opposition between 1st and 5th years in the FFUL. Within the private institute, the 1st year scores are quite negative in task orientation and self-efficacy whilst all dimensions are scored positively in the 5th year.

TABLE V *Post hoc* test for all the dimensions

	1/FFUL	5/FFUL	1/ICCS	5/ICCS
1/FFUL				
5/FFUL	a)			
1/ICCS	c)			
5/ICCS	a);b)		a);c)	

In all significant differences between groups means were found between: a) Self efficacy perception; b) Ego Orientation; c) Task Orientation. There were no significant differences with work avoidance orientation.

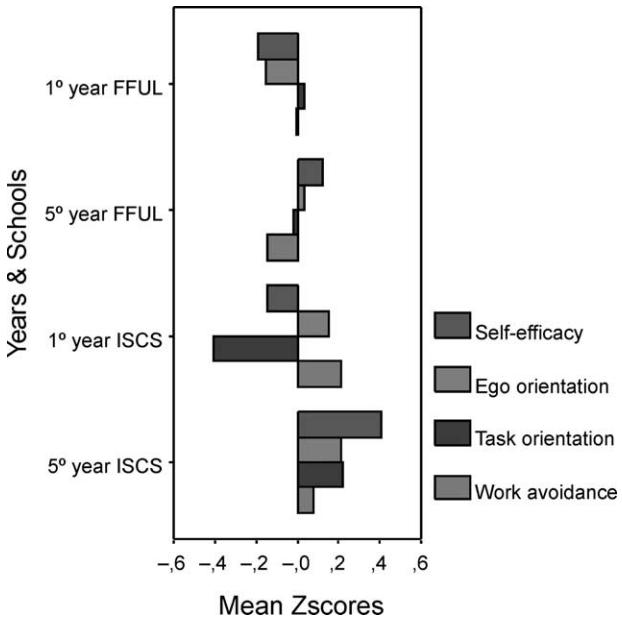

FIGURE 3 *Z* scores for each factor.

Pearson correlation (r) coefficients were carried out for the whole group and then for each group separately to measure the strength of an alleged linear association between any of the factors ($r = 0.3$ being the threshold value assumed). Positive correlations were observed between self-efficacy perception and Ego Orientation ($r = 0.19$; $p < 0.01$) and self-efficacy perception and Task Orientation ($r = 0.24$; $p < 0.01$). However, the only truly significant correlation was shown to exist between Ego Orientation and work avoidance ($r = 0.33$; $p < 0.01$). This was reflected in the individual group results; however, it was relatively stronger for the fifth years ($r = 0.35$; $p < 0.01$; $r = 0.38$; $p < 0.01$ for FFUL and ICCS, respectively) than for first years ($r = 0.31$; $p < 0.01$ and $r = 0.31$; $p < 0.05$ for FFUL and ICCS, respectively) at both institutions.

DISCUSSION

Statistical analysis of the data confirmed existence of the four different constructs, three of which related to achievement motivation with the fourth relating to the self-efficacy perception. The only significant difference found within institutions was that for the self-efficacy perception. In the private institution, there was a significant difference in task orientation (the right motivation) with there being a significant increase in 5th years. This does suggest that subject content or years of study can have a constructive effect on student goals. No such significant difference was found within FFUL students; in fact, the final years seemed to have a lower degree of task orientation than the first years. There have been suggestions from teaching staff at the FFUL that the newer curriculum at the private institute is better suited to pharmacy education and the results seem to comply with this. For all this, one must recognize the fact that first year FFUL students score higher than first year Institute students for Task Orientation whilst scoring lower for work avoidance and Ego Orientation. This may be a reflection of the fact that FFUL is the college with higher grade requirements and would thus have students who work harder.

In addition, analysis of *Z* score results showed that there were differences in scores within and between institutions. This could be due to subject content, teaching style and student attitude, which is especially important in first years.

The presence of positive correlations between self-efficacy perception and Ego Orientation and self-efficacy and Task Orientation seems to provide evidence for the link between self-efficacy and Goal Orientation if Task Orientation is equated to the educational and occupational goals and Ego Orientation is equated to power and wealth goals (Markus and Nurius, 1986; Ford, 1992). The correlations, not very strong, may be due to other factors such as planning (strategies) and ecological and biological influences also present in the system. The significance and correlation shown between Ego Orientation and work avoidance ($r = 0.35,\ 0.38$; $p < 0.01$ for FFUL and ICCS, respectively) was especially engaging considering that one involves the goal of superiority whilst the other involves the goal of not having to make an effort. Does this say that the students who want to be perceived as the best or most successful are, in fact, the laziest? Although the students' goal orientation remained mastery, the results suggest that students were shifting from this goal orientation to academic alienation. This shift can be seen within the FFUL with students shifting from task orientation to work avoidance as time goes on (see *Z* scores, 1st and 5th).

The purpose of the study was to identify and further validate an instrument that would contribute to measure the goal orientation preferences of Portuguese pharmacy students in health professions programs. The results confirmed this could be measured and the tool has been further validated. Does this imply that the tool employed in this study could be used in the future to assess curriculum reform? In addition, the value of the self-efficacy perception scale should not be underestimated as, though one may demonstrate the correct achievement motives, what really counts is the ability of the practitioner to use the skills they have acquired when in the clinical setting.

Limitations of the study include the generalness of the work. Although Lisbon is a multicultural city,

the cultural and socio-economic background of the students of the FFUL was not exceptionally varied, especially when compared to other countries such as Australia, the USA and the UK Social factors have been shown by Ferguson *et al.* (1986) to have an effect on students' motivation for pursuing careers in pharmacy, so they would be expected to have an effect on their achievement motives in college. This means that applying the finding to pharmacy students from other EU countries would be difficult. However, since Portugal is a small country, one could speculate about nation-wide generalness of these findings.

Another limitation relates to the optional specification of gender on the questionnaire. Although this was to prevent the findings from being gender-specific and relevant to all pharmacy students, it prevented direct comparisons between sexes.

The use of a Likert scales—instruments designed to determine opinion, attitude or knowledge of an individual towards a subject—can also cause certain problems to arise such as: respondents placing answers too close to the centre (contraction bias) or placing similar answers to those previously reported (sequential bias) (Oppenheim, 1992). The use of an odd numbered scale (as in this case) can enable students to avoid making a clearly positive or negative choice whilst even numbered scales or forced scales are known to have a greater risk of being left blank.

CONCLUSION

The two tools adapted have been shown to measure in pharmacy students three different dimensions relating to Achievement Motivation and a further relating to self-efficacy perception. Pharmacy students have been shown to vary in terms of achievement motives and behaviour, which seems to suggest that curriculum reform should account for such differences between different years and institutions. Furthermore, the results imply that revision of subject content and customization of teaching and learning methods should be tailored in each cohort to enable students to achieve their full academic and professional potential.

References

Ashton, P.T. and Webb, R.B. (1986) *Making a Difference: A Teacher's Sense of Efficacy and Student Achievement* (Longman, New York).

Bandura, A. (1977a) *Social Learning Theory* (Prentice-hall, Englewood Cliffs, NJ).

Bandura, A. (1977b) "Self Efficacy", *Psychological Review* **84**(2).

Bandura, A. (1986) *Social Foundations of Thought and Action: A Social Cognitive Theory* (Prentice-Hall, Englewood Cliffs, NJ).

Batcock, A. and Smithers, A.G. (1969) "Success and failure among social scientists and health scientists at a Technological University", *British Journal of Educational Psychology* **40**(2), 144–153.

Cerdeira, J.P. and Palenzuela, D.L. (1998) "Perceived self-efficacy expectancy: Portuguese version of a specific scale for academic situations", *Revista Portuguesa de Educacao* **11**(1), 103–112.

Duda, J.L. and Nicholls, J.G. (1992) "Dimensions of achievement motivation in schoolwork and sport", *Journal of Education Psychology* **84**(3), 290–299.

Duda, J.G., Patashnick and Nolen, S.B. (1985) "Adolescent's theories of education", *Journal of Educational Psychology* **77**(6), 683–692.

Ferguson, J.A., Roller, L. and Wertheimer, A.I. (1986) "Social factors motivating students toward a career in pharmacy", *Journal of Social and Administrative Pharmacy* **3**(4), 126–135.

Ford, M.E. (1992) "Motivating humans: goals, emotions and personal agency beliefs", In: Pintrich, P.R., ed, *Student motivation, Cognition and Learning* (Harcourt, Brace Johanovich Publishers, Orlando, Florida).

Hastings, J.K., West, D.S., Perrot, L.J. and Deloney, L.A. (2001) "Pharmacy student motivation: phase 1 of a longitudinal study", *American Journal of Pharmaceutical Education* **65**(3), 254–258.

Markus, H. and Nurius, P. (1986) "Possible selves", In: Pintrich, P.R., ed, *Student motivation, Cognition and Learning* (Harcourt, Brace Johanovich Publishers, Orlando, Florida) **115**, p 138.

Markus, H. and Wurf, E. (1987) "The dynamic self self-concept: a social self-concept", In: Pintrich, P.R., ed, *Student motivation, Cognition and Learning* (Harcourt, Brace Johanovich Publishers, Orlando, Florida), p 115.

McKeachie, *et al.* (1985) "Teaching learning strategies", In: Pintrich, P.R., ed, *Student motivation, Cognition and Learning* (Harcourt, Brace Johanovich Publishers, Orlando, Florida), p 114.

Nicholls, J.G. (1983) "Conceptions of ability and achievement motivation: a theory and its implications for education", *Learning and Motivation in the Classroom* (Erlbaum, Hillsdale, NJ), pp 211–237.

Nicholls, J.G., Cheung, P.C., Lauer, J. and Patashnick, M. (1989) "Individual differences in academic motivation: perceived ability, goals, beliefs, and values", *Learning and Individual Differences* **1**, 63–84.

Nicholls, J.G., Cobb, P., Wood, T. and Patashnick, M. (1990) "Assessing students' theories of success in mathematics: individual and classroom differences", *Journal for Research in Mathematics education* **21**, 109–122.

Sá, I (1999). Questionário "Percepcõess de successo." Ser Caloiro na Universidade de Lisboa. Relatório do Programa de Investigação Integrada da Universidade de Lisboa.

Wilson, K.L., Lizzio, A. and Ramsden, P. (1997) "The development, validation and application of course experience questionnaire", *Studies in Higher Education* **22**(1), 33–53.

Journal: GPHE Article no.: 31022

Author Query Form

COPY FOR AUTHOR

Dear Author,

During the preparation of your manuscript for typesetting some questions have arisen. These are listed below. Please check your typeset proof carefully and mark any corrections in the margin of the proof or compile them as a separate list. This form should then be returned with your marked proof/list of corrections to Alden Multimedia.

Disk use

In some instances we may be unable to process the electronic file of your article and/or artwork. In that case we have, for efficiency reasons, proceeded by using the hard copy of your manuscript. If this is the case the reasons are indicated below:

☐ Disk damaged ☐ Incompatible file format ☐ LaTeX file for non-LaTeX journal

☐ Virus infected ☐ Discrepancies between electronic file and (peer-reviewed, therefore definitive) hard copy.

☐ Other: .....

We have proceeded as follows:

☐ Manuscript scanned ☐ Manuscript keyed in ☐ Artwork scanned

☐ Files only partly used (parts processed differently:)

Bibliography

If discrepancies were noted between the literature list and the text references, the following may apply:

☐ The references listed below were noted in the text but appear to be missing from your literature list. Please complete the list or remove the references from the text.

☐ *Uncited references*: This section comprises references which occur in the reference list but not in the body of the text. Please position each reference in the text or, alternatively, delete it. Any reference not dealt with will be retained in this section.

Manuscript page/line	Details required	Author's Response
13	Refs. Besterfield, 2000 and Oppenheim, 1992 are cited in text, but not in list. Please check. Kindly check the expression "p<&" in the line "This was reflected in...". Refs. Duda et al. (1985), Markus and Wurf (1987) and Nicholls (1983) and are not cited in text. Please check. Kindly check the values for the columns "Total" in Table II.	