

THE RELATION BETWEEN DISTANCE STUDENTS' MOTIVATION, THEIR USE OF LEARNING STRATEGIES, AND ACADEMIC SUCCESS

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ABSTRACT

The aim of this study was to discover possible relationships between self-regulated learning dimensions and students' success in a distance-learning programme. The sample consisted of 319 students: 83 males and 236 females. They completed the 'Motivated Strategies for Learning Questionnaire' (Pintrich, Smith, Garcia & McKeachie, 1991), which was compared to their number of exams written, frequency of exam repetition and average course grade. The results show the importance of motivational factors, such as intrinsic goal orientation, task value and self-efficacy on the one hand, and effort regulation strategies on the other.

Keywords: distance learning, learning strategies, motivation, school achievement, self-regulated learning

Self-regulated Learning and Achievements in Distance Education

Theory and research on self-regulated learning (SRL) extend into the 1980s, when researchers dealt with the issue of how students can self-monitor, guide and manage their learning process. Self-regulated learning is a complex construct located at the intersection of many areas of psychological research, such as motivation, thought processes and metacognition. Over the last three decades, the study of SRL has mostly focused on the impact of learning strategies on learning achievement (Brown & Smiley, 1978; Pask, 1976). These early studies have showed that students who were trained to use learning strategies showed substantial improvement in their academic performance. They also discovered that, soon after the training finished, students stopped using learning strategies. Consequently, researchers realised the necessity to consider other reasons for the failure of pupils in the independent use of these strategies in different situations.

First, theorists began to focus on the concept of metacognition, defining it as the executive control process that includes planning, monitoring and control of cognitive strategies (Brown & Smiley, 1978). Another branch of research focused on a more affective aspect of learning—motivation. They tried to understand why, as opposed to just how, students are engaged in learning and the use of learning strategies. Based on these studies, some theorists realised that reasons for academic failure, besides not using cognitive strategies, may stem from individuals' feelings about themselves as a student or feelings about a particular learning task. In other words, motivation to learn was identified as the most important factor for the interpretation of individual achievement in the learning task. As the knowledge from different research fields and traditions in educational psychology were combined, a 'super theory' began to emerge in the form of the theory of SRL—nowadays, one of the most influential research theories in this field.

Characteristics of Self-regulative Learners

Before focusing further on the individual constituents of SRL, it is first necessary to ask what constitutes SRL and what characteristics are displayed by students who actively regulate their learning. Self-regulated learning is most commonly described as the level of metacognitive, motivational and behavioural activity in an individual's own learning process (Zimmerman, 2002, 1990). Students who actively regulate their learning often use different cognitive and metacognitive strategies that are systematically directed towards the achievement of learning goals (Corno & Mandinach, 1983; Pintrich & De Groot, 1990). They also use strategies to regulate other sources of learning such as adaptation of certain aspects of the physical environment and the organisation of time to learn so that they do become most efficient. Important components of SRL strategies are based on the regulation of learning and teaching environment. This group includes strategies such as organisation of time, effort control and regulation of physical learning environment (Pintrich & Garcia, 1991). It is also more likely that when they will find themselves in learning difficulties that they will seek help from teachers or classmates. (Pintrich & Garcia, 1991; Zimmerman & Martinez-Pons, 1988). Finally, students who self-regulate their learning have higher levels of self-efficacy, are confident in their abilities (positive attributions) and more internally motivated (Pintrich & Garcia, 1991; Zimmerman & Martinez-Pons, 1988).

Zimmerman (1990) claimed that SRL is derived from a student's own thoughts, feelings and behaviour directed towards achieving set targets. Research on SRL confirms that learning achievements are improved when students are active while learning (Ames, 1984; Dweck, 1986). Hence, it can be concluded that students who tend to regulate their learning are usually more successful than those who do not (Zimmerman & Martinez-Pons, 1988).

It was found that students not classified as 'self-regulative' used less cognitive and metacognitive strategies are less self-efficient and have external motivation for learning (Zimmerman, 2002). They are also less persistent in achieving their goals (Wolters, 1998).

Elements of Self-regulated Learning

Since SRL is characterised by its frequent link to various motivational constructs (Pintrich, 2000), the fundamental feature of self-regulation is the integration of cognitive and motivational concepts. Thus, all models of SRL are characterised by the fundamental assumptions of coherence and management of learning despite stemming from different theoretical starting points. Moreover, each model emphasises different arrangements and mechanisms. Zimmerman (1990) mentions three common characteristics of models of SRL. First, all definitions assume students are aware of the usefulness of self-regulatory processes in improving their learning and learning achievements; thus, they deliberately and consciously use the specific processes and strategies to achieve better academic success. Another characteristic common to all definitions of SRL is that the student gives himself or herself feedback during learning (Carver & Scheier, 2000; Zimmerman, 2002). Zimmerman calls this phenomenon a 'self-oriented feedback loop during learning'. This feedback loop concerns the circulation of information—a circular process in which students monitor the effectiveness of their learning methods or strategies and respond differently to these observations—from changes in self-perceptions (e.g., change in self-efficacy beliefs) or changes in behaviour (e.g., replacement of one learning strategy with another, more efficient one). A third common characteristic to all definitions of SRL is a description of how and why students choose different self-regulatory processes, strategies or responses. The opinions of the authors on the motivational dimension of SRL differ significantly from each other. For example, behavioural theorists argue that all responses are under the control of external rewards or penalties (Mace, Belfiore & Hutchinson, 2001), whereas phenomenologists take the view that individuals are motivated primarily by the positive sense of self-confidence or self-image (McCombs, 2001). Somewhere in between these extremes lie authors that highlight motives, such as achievements, in addition to goal attainment and self-efficacy (Zimmerman, 2002).

AIMS OF THIS STUDY

Research undertaken in the last two decades has shown a significant relationship between learning success and SRL in primary, middle, high school and graduate students (Corno & Mandinach, 1983; Pintrich, 1989; Pintrich & De Groot, 1990; Zimmerman & Martinez-Pons, 1990; Peklaj & Pečjak, 2009). However, no or very little research has been conducted on distance learning programmes. This study was designed to explore distance students' perception of motivation and use of SRL strategies and the ways in which SRL influences their academic success. The question guiding the collection of data was mainly focused on what SRL strategies are related to achievement in a distance-learning course.

METHOD

Sample

The sample consisted of 319 university students: 83 males and 236 females between the ages of 20 years to 49 years ($M = 29.6$ years, $SD = 6.5$).

Instruments

The Motivated Strategies for Learning Questionnaire (MSLQ), developed by Pintrich and colleagues (Pintrich, Smith, Garcia and McKeachie, 1991), is a self-report, Likert-type (1 = *strongly disagree* to 7 = *strongly agree*) instrument designed to measure students' motivational orientations and their use of different learning strategies. The questionnaire was translated into Slovenian and distributed to students. The MSLQ is based on the social-cognitive approach to motivation and learning, which is characterised by emphasis on the interpenetration of cognitive and emotional components of learning. Compared with other similar instruments in MSLQ, more attention is placed on motivational processes that affect the self-regulation of learning; the contextual nature of motivation and learning strategies are also emphasised. The questionnaire consists of two areas: motivation and learning strategies. The motivation section consists of 31 items and is determined by three sub-areas: (a) task value, (b) expectations and (c) test anxiety. Task value focus on the reasons an individual is engaged in some activity; expectations are based on individual beliefs necessary to undertake the task, and the emotional component reflects an individual's emotional response to test situations.

The area of learning strategies is also divided into three subsections: (a) the use of cognitive strategies (includes use of basic and more complex learning strategies), (b) metacognitive control strategies (that help an individual control and direct learning) and (c) management and organisation learning resources. This section includes regulatory strategy for the control of other sources in addition to cognition (e.g., good use of time, arranging space for learning, etc.) and help seeking (e.g., assistance in finding classmates or teachers when necessary).

Procedure

Surveys lasted an average of 30 minutes. Group interviewing was conducted as scheduled in participating distance education study centres. Researchers informed all subjects that their participation was completely voluntary and their responses would be held in strict confidence.

Statistical analyses

Psychometric characteristics of the instruments were determined with factor analysis (latent structure of the questionnaire) and Cronbach's α (internal reliability assessment). To evaluate our research question, several bivariate and multivariate methods were administered. To determine the relationship measures of academic achievements correlation analysis, the impact of independent variables on dependent variables was measured using multivariate regression.

RESULTS

Psychometric characteristics of the scale

The original version of the questionnaire contains a total of 15 factors (first part six, second part nine factors), although, in the present study, they were not empirically confirmed. We first analysed the main components and consequently wanted to assess the number of factors. Because of the intercorrelations between factors, we used Oblimin rotation. Bartlett's test of sphericity was highly significant ($p < .001$); the Kaiser-Meyer-Olkin rate of sampling adequacy was also suitable (KMO = .851). Factor analysis uncovered (and partly confirmed) six sub-scales in each dimension of SRL.

Motivational factors included:

1. Task value (21% variance; Cronbach's $\alpha = .81$). Evaluation of the learning subject is closely related to setting internal goals and beliefs about a student's own effectiveness in learning.
2. Extrinsic goals (11% variance; Cronbach's $\alpha = .67$). External goals indicate the degree to which the student learns for grades, awards, success or competing with others. For students with high external orientation, the aim of learning is only a means to achieve another goal.
3. Self-efficacy (6% variance; Cronbach's $\alpha = .76$). Sense of self-efficacy consists of opinions of a student's own ability to complete the task, as well as confidence in their own skills.
4. Test anxiety (5% variance; Cronbach's $\alpha = .66$). This factor indicates an individual's feelings in exam situations. Empirically, this factor is negatively associated with intrinsic goals, self-efficacy and task value.
5. Control beliefs (4% variance; Cronbach's $\alpha = .60$). Control beliefs concern the expectations of success in certain tasks. They are based on a specific task or learning.
6. Intrinsic goals (4% variance; Cronbach's $\alpha = .71$). Intrinsic goal orientation indicates the degree to which a student learns because he or she is interested in substance, mastery and challenge. Learning is an end in itself, and not a means to achieve other objectives.

Learning strategies factors included:

1. Cognitive learning strategies (18% variance; Cronbach's $\alpha = .79$). This is a strong factor covering many aspects of learning strategies, namely, cognitive learning strategies (repetition, organisation, elaboration) as well as elements of critical thinking.
2. Help seeking (6% variance; Cronbach's $\alpha = .86$). In this factor, the two sets of strategies are combined: help-seeking and peer support strategies.
3. Effort regulation (4% variance; Cronbach's $\alpha = .69$). This factor describes students' ability to control their effort and attention when they face difficulties or distractions.
4. Metacognitive strategies (4% variance; Cronbach's $\alpha = .79$). This factor consists of variables relating to the use of metacognitive strategies.
5. Elaborative strategies (2% variance; Cronbach's $\alpha = .72$). This dimension consists of four items and is correlated to elaborate learning strategies.
6. Management of learning (2% variance; Cronbach's $\alpha = .59$). This factor describes a learner's organisation of time and physical environment.

Measures of learning performance

For the criteria of learning performance, we used the following variables: number of finished exams, frequency of exam repetition and average course grade. Table 1 shows descriptive statistics and the correlations between the variables in learning performance.

Table 1: Descriptive statistics and Pearson correlations coefficients for the variables of learning performance

	1	2	M	SD	N
1. Number of finished exams	—		12.92	6.63	259
2. Frequency of repetition	-.19**	—	1.47	.67	297
3. Average course grade	.24***	-.49***	7.33	.62	315

** $p < .005$. *** $p < .001$.

The association between learning performance scores is reported in Table 1. The students completed an average of 13 exams, took the same exam an average of 1.5 times, and the average course grade was higher than 7¹. Correlation analysis revealed two statistically significant associations, one positive and low, the other negative and moderate. The strongest correlation was between the frequency of examinations and average rating. The results of our analysis show these two characteristics are negatively correlated: a greater frequency of exam retakes corresponded to lower average course grades. We found a low relationship between the number of finished exams and course grade. In principle, one could argue that students who took exams regularly and often had a slightly higher average course grade than those who passed examinations less successfully.

Factors influencing academic success

Three multiple regression analyses were conducted to identify the most important SRL characteristics that may predict ‘number of passed examinations’, ‘number of repeated examinations’ and ‘course grades’. Table 2 lists the regression coefficients that could affect the number of examinations taken during the study. Examining Beta coefficients, goals and task value yielded a significant impact on the number of passed examinations ($R = .309$, $F_{12,249} = 2.157$, $p = .014$).

Table 2: Regression analysis summary for SRL variables predicting the number of passed examinations

Variable	B	SEB	β
Intrinsic goals	1,24	,52	,19*
Extrinsic goals	,83	,39	,15*
Task value	-1,67	,71	-,21*
Control beliefs	-,32	,51	-,05
Self-efficacy	,63	,59	,08
Test anxiety	-,36	,33	-,08
Learning strategies	,81	,63	,11
Elaboration	-,71	,64	-,11
Effort regulation	,12	,39	,02
Metacognition	-,39	,49	-,07
Help seeking	,42	,31	,09
Time organisation	,18	,50	,03

* $p < .05$. ** $p < .01$. *** $p < .001$.

As indicated in Table 2, when all variables were included in the equation, only motivational variables were statistically significant in predicting the number of examinations. Both intrinsic and extrinsic goal orientations positively predicted the number of finished exams, while task value negatively predicted it. It seems that students who set strong goals (whether intrinsic or extrinsic) for themselves are more determined and successful at passing exams. Students who value their learning more finished fewer exams. Apparently, they are more focused on the quality of knowledge. Characteristics of cognitive strategies did not help much to further clarify this independent variable. None of the β coefficients were shown to be statistically significant.

Table 3 summarises the hierarchical multiple regression in which we wanted to predict factors affecting the frequency of repetition of tests. Since our evaluation of the independent variable is essentially the reverse—a higher value indicates poor performance—this should be considered in the interpretation of the results. Negative values of the coefficients of each factor thus show the positive effects of this factor on frequency of exam repetition.

¹ Grading system in Slovenian tertiary education: excellent (10), very good (9, 8), good (7), satisfactory (6), failed (5-1). To pass an exam, a student has to achieve a grade from satisfactory (6) to excellent (10).

Table 3: Regression analysis summary for SRL variables predicting the number of repeated examinations

Variable	B	SEB	β
Intrinsic goals	-,12	,05	-,18*
Extrinsic goals	,04	,04	,07
Task value	-,09	,06	-,11
Control beliefs	-,01	,05	-,01
Self-efficacy	-,08	,06	-,10
Test anxiety	,00	,03	-,01
Learning strategies	-,04	,06	-,05
Elaboration	,03	,06	,04
Effort regulation	-,08	,04	-,13*
Metacognition	,08	,05	,13
Help seeking	,01	,03	,01
Time organisation	-,05	,05	-,08

* $p < .05$. ** $p < .01$. *** $p < .001$.

This regression model is somewhat ‘stronger’ than the previous one ($R = .381$, $F_{12, 284} = 4.027$, $p = .000$). There are only two statistically significant coefficients: from the motivational side, intrinsic goal orientation ($\beta = -.13$; $p < .05$) and, from the learning strategies side, effort regulation ($\beta = -.13$; $p < .05$). Direction of both coefficients is negative, and their strength is relatively low, which means that their influence is in fact positive. These findings suggest that students who set intrinsic goals while studying and also try to regulate their effort during learning pass exams much more quickly than those who lack these qualities.

Table 4 summarises results of the last multiple regression analysis, in which we aimed to understand the factors that influence the average course grade during the study. The regression model is the strongest of the three ($R = .411$, $F_{12, 302} = 5.114$, $p = .000$).

Table 4: Regression analysis summary for SRL variables predicting the average course grade

Variable	B	SEB	β
Intrinsic goals	,08	,04	,14*
Extrinsic goals	,00	,03	,00
Task value	-,04	,06	-,05
Control beliefs	-,03	,04	-,04
Self-efficacy	,10	,05	,14*
Test anxiety	,02	,03	,03
Learning strategies	,07	,05	,09
Elaboration	-,03	,05	-,04
Effort regulation	,13	,03	,23***
Metacognition	,01	,04	,01
Help seeking	,00	,03	-,01
Time organisation	,06	,04	,10

* $p < .05$. ** $p < .01$. *** $p < .001$.

Two motivational and one learning factor positively influenced the course grade. Among the motivational predictors of course grade, the most important are self-efficacy ($\beta = .147$, $p < .05$) and intrinsic goal orientation ($\beta = .14$, $p < .05$). Students with intrinsic goal orientation and a higher level of self-efficacy scored higher than other students. Among the learning strategies, effort regulation ($\beta = .23$; $p < .001$) is particularly important. Effort regulation is also the strongest predictor in this regression model. Students who are trying to self-motivate and encourage themselves during learning are likely to have a higher average score than those not using these strategies.

DISCUSSION

The goal of this study was to provide some information regarding the influence of dimensions of SRL on academic success in tertiary distance education. We used multiple regression analysis to verify our assumptions. The findings showed that goal setting, task value, self-efficacy and effort regulation were the main strategies that led to better academic achievements in the chosen distance programme.

In general, we can conclude that, when studying in a distance-learning course, students who set themselves more intrinsic goals, value their learning, believe in their ability to successfully accomplish academic demands and can handle distractions and maintain concentration finished more exams, accomplish them faster and achieved higher test scores. Given the characteristics of extrinsic goals, their effect on the number of tests is not surprising. It is interesting that these goals ‘work’ simultaneously with intrinsic goal orientation. The importance of intrinsic goal orientation for a smaller repeat ratio of exams is easily understandable. Students who set intrinsic goals repeat the tests less often because the very method of learning study materials also changes their strategy for examinations. They come to the exams well prepared and are confident of success. On some occasions, they repeat tests simply to improve their assessment. Effects of self-efficacy can be explained by greater self-confidence in learning and minor problems with concentration or retrieving learning material. The effect of self-efficacy on learning achievement has been shown several times in the past (Peklaj & Pečjak, 2009). Greater success in academic studying also applies to students who use strategies of effort.

Some practical implications can be set out from these results. This study shows that motivational and strategic determinants have a significant impact on academic performance. Given the low use of learning strategies, possibly due to partial ignorance, it would be appropriate to develop short self-regulatory learning courses for students who believe they have this need. One possibility is establishing counselling centres that would deal with—in addition to organisational and administrative problems—the counselling of students with learning disabilities.

We must not forget that the use of study strategies and learning goals often depend on the orientation of the study (Ames & Archer, 1988). When studying is limited to the knowledge of facts, students will surely develop an external motivation and use more simple (reproductive) learning strategies. A study programme and evaluation of knowledge should therefore stimulate the greater development of critical thinking and apply problem-based learning that would deepen the understanding and relevance of learning content. Divergent questions or alternative forms of assessment would certainly contribute to a different motivation and increase students’ access to deeper learning strategies.

In the future, MSLQ should be used again to examine further the learning characteristics of students in distance education and non-traditional settings. Exploration of the SRL of students involved in distance education (e-learning) is not widespread in the literature. It would be advisable to check results confirmed in other samples of students at a distance. To determine the characteristics of learning of students in distance education programmes, it would also be worthwhile to examine their learning by using different research methods.

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