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Abstract

The empirical study presented in this paper identifies potential strengths and weaknesses of first-year students´ learning strategies at the beginning of their studies. It concentrates on the students´ self-assessment of their self-motivation, time management, and concentration, coping with stress and fear of failure, elaboration of information, ability to focus on important information, cooperative learning, self-control of learning progress, and dealing with exams. The results reveal that during their school days, numerous students have not (or just very rarely) applied learning strategies that may be considered indispensable for successfully studying at a university, like taking notes in class or summarizing the most important information. The paper explores the results and discusses possible options to support first-year students in coping with the difficulties they might face when studying and preparing for their first exams at the university.

Introduction

It would seem reasonable to assume that students who have decided to study at a university have acquired appropriate learning skills or strategies after (at least) twelve years of schooling. Nevertheless, a considerable number of students at Austrian universities fail to finish the first year of their studies successfully. The Vienna University of Economics and Business Administration (“Wirtschaftsuniversität Wien”, short “WU”), with its more than 20,000 students is one of the largest Business Schools in Europe. Students have to take 14 courses equalling 59 European Credit Transfer System (ECTS) points on Business Administration, Law, Economics, Mathematics and Business Communication (e.g. Business English) to complete the first study year of their three-year bachelor program. At least 42 ECTS points must have been earned within the first two semesters for the students to be allowed to proceed to the second part of their bachelor

studies. Only about one third of first-year students fulfil these requirements. All others fail to earn at least 42 ECTS points -- some not having passed one single exam. Therefore, it seems desirable to gain an understanding of how first-year students at the WU studied and prepared for written exams before starting their studies, i.e. during their school days. Thorough knowledge about the pre-university learning strategies of first-year students may help understand the difficulties that many students face at the beginning of their studies and support them in overcoming these difficulties and successfully proceeding with their studies. Since the beginning of the study year 2005/06, data on the students´ pre-university learning strategies has been analysed in order to find the answers to the following questions:

1. Which learning strategies have first-year students at the WU applied during their school days?
2. Which problems did they have at school when preparing for a test?
3. Is there a discrepancy between the learning strategies students have already applied and those that are considered desirable (or even indispensable) for studying successfully at a university?

This paper focuses on empirical results that answer these questions. It describes the first part of an exploratory research project carried out by the author and supported by the vice-rector for academic programs and student affairs at the WU. It analyzes and discusses the descriptive statistics on students´ pre-university learning strategies and proposes some measures to enhance student learning at the beginning of their studies.

Theoretical framework

Referring to the work of Weinstein and Mayer (1986), Wild (2000) defines learning strategies as behaviour and cognitions that students intentionally use to influence their acquisition of knowledge. Learning strategies may intend to control the students´ motivation and emotion as well as the selection, the acquisition and the organisation of knowledge. Metzger (2004) has chosen a very similar approach. He defines learning strategies as different ways of thinking and working that students use to initiate, sustain and enhance their learning efforts. Learning strategies are chosen intentionally, used to achieve a specific goal, continuously checked as to their effectiveness and adapted if necessary. Both definitions find students to be persons, who actively perceive, elaborate, interpret, combine and apply information, and who use strategies to support and to foster these learning processes. Both approaches focus on strategies that intend to

enhance the acquisition of declarative, subject-related knowledge (Wild, 2000).

Accordingly, Wild (2000) and Metzger (2004) have developed similar concepts to empirically assess learning strategies that are considered desirable or even indispensable for studying successfully. In their questionnaires, they use similar items to measure the students´ perception of how they learn and how they prepare for tests. Metzger´s questionnaire served as a basis for the empirical instruments used for the study at the WU, because it is better suited for students who have just begun their university study, whereas Wild´s instrument seems to focus on more advanced students.

Metzger´s concept comprises eight learning strategies, four of which are intended to create favourable learning conditions. These are self-motivation, time management, concentration and coping with stress and fear. All those are needed to focus on a subject in order to dedicate enough time to studying and using this time effectively.

Discerning relevant information and elaborating given information are important learning strategies to ensure the effective (i.e. meaningful and durable) acquisition of knowledge. Lectures and textbooks usually provide an abundance of information. Therefore students need to decide what to concentrate on because it is basic information and relevant to their learning. The elaboration of information consists in repeating, applying, practising and enriching information. Students can enhance their elaboration of information by writing summaries, answering questions, solving problems and discussing what they have learned.

Self-checking the learning process and dealing with tests and exams complete Metzger´s concept of learning strategies. While writing tests (and how to do this effectively) is just one single aspect of the whole learning process, self-checking is an integrative and indispensable part of it. It mainly consists in checking and controlling one´s own understanding and knowledge. This skill requires continuous and honest monitoring of the learning process. The students reflect on their learning, which is a meta-cognitive strategy (Wild, 2000). Compared to Metzger´s concept, Wild´s model of learning strategies comprises four more factors. While most of Wild´s additional strategies seem to be appropriate for more advanced students (such as critical thinking and self-initiated search for additional literature), first-year students might already have applied cooperative

learning. In fact, learning and working in teams is a vital part of teaching and learning at many secondary schools in Austria, so first-year students at a university might be used to it and may have found it useful during their school days.

Method

Measures

The questionnaire "How do I study?" developed for university students by Metzger, Weinstein and Palmer (2004) served as a basis for the survey of pre-university learning strategies of first-year business students at the WU. The original version comprises 65 items designed to measure the eight learning strategies according to Metzger´s concept. A few modifications of the instrument were necessary to achieve the goals of the WU study: Firstly, I chose to reformulate most of the items so that they would refer to the students´ learning strategies during their school days (expressed either as a strength or as a weakness). Secondly, I added three items to measure cooperative learning, and at the same time cancelled some items that seemed redundant in order to shorten the questionnaire. Nevertheless, each learning strategy was assessed through at least three different items in the questionnaire.

The items consist of statements on how students self-assess or self-evaluate their studying and five-step Likert scales (Bortz & Döring, 1995) to indicate the extent of agreement or disagreement to the statement ("This statement is … (almost) always true (1) / frequently true (2) / occasionally true (3) / seldom true (4) / (almost) never true (5)"). A pre-test with a smaller number of students revealed that the respondents were able to understand the items and complete the questionnaire within about 20 minutes. A factor analysis confirmed that the items measured the expected (and postulated) factor structure with only one exception: In the WU study the factor "self-checking / self-control" (short "SCO") empirically split into three factors that could not be summarized by just one factor. So the study continued to work with three dimensions: "studying notes taken during a course" (factor SCO1), "self-check of understanding while studying" (SCO 2) and "visualizing information in tables and graphs" (SCO3).

Participants

The main study started in September 2005, when 623 students were asked to complete the questionnaire, and was continued one year later with another 712 first-year students. All students who had already studied at

another university were allowed to complete the questionnaire, but their data has not been included in the analyses of this research paper.

Results

Tables 2 and 3 show some basic psychometric results of the data: the mean as an indicator of central tendency, the standard deviation to reveal the homogeneity or heterogeneity of the students´ answers, and the cumulative percentage of full and almost full agreement to the statements (i.e. the first two steps of the five-step Likert scale). Results that are more detailed as well as the original (German) version of the questionnaire and/or an English version of the questionnaire are available by contacting the author by e-mail. Table 2 comprises the learning strategies that were formulated as strengths. The lower the mean, the more the students agreed to have applied this learning strategies (which can be considered favourable for their learning process and achievement). The smaller the standard deviation is, the more homogeneous the students´ answers were.

Table 2: Learning strategies (strengths), selected items

(the first rows indicate the results of the 2005/06 survey, the second rows those of the 2006/07 survey)

Learning strategies (expressed as strengths), selected items based on students´ self-assessment	Mean 2005/06 2006/07	Std. dev.	Always true/ frequently true, Cumulative percent
Self-motivation			
I work through material, even if I don't find it interesting.	2.19	0.979	64.2 %
	2.19	0.888	65.0%
I go through my notes from the previous lessons before attending classes.	3.18	0.897	18.5%
	3.17	0.840	18.0%
I am well prepared for lessons.	2.63	1.079	48.0%
	2.61	1.034	45.6%
Cooperative learning			
If I don't understand something while I'm studying I ask others for help.	2.13	1.010	69.7%
	1.91	1.010	67.9%
When we are studying for exams, my colleagues in class and I test each other.	3.33	1.209	27.9%
	3.31	1.145	25.0%
Elaborating information			
I learn new words or definitions by imagining examples or situations.	2.49	1.043	52.8%
	2.62	0.991	47.4%
I try to find connections between what I am learning and what I already know.	2.26	.913	65.4%
	2.24	0.877	66.4%
I try to see how the things I am learning could have an impact on my everyday life.	2.96	1.124	37.3%
	2.97	1.058	35.4%

When I work through a topic I rearrange the subject matter in an order which I find easier to understand.	1.98	0.944	74.5%
	1.97	0.867	76.6%
Learning form notes taken in class (SCO1)			
After each lesson I go through my notes again so that I understand the topic better.	3.83	1.065	12.8%
	3.67	1.065	15.1%
Self-check of understanding (SCO2)			
I check myself if I really understood the content I have learned.	2.15	0.924	70.4%
	2.17	0.866	69.3%
During lessons I ask myself whether I understand what the teacher says.	2.18	0.891	70.6%
	2.29	0.941	64.2%
While I am reading study material I regularly stop and think over what I have read or look through it again.	2.08	0.920	71.5%
	2.16	0.868	69.4%
Visualizing information (SCO3)			
While I am studying something, I make outlines in order to better understand the material covered.	2.94	1.213	39.5%
	3.11	1.201	32.4%
I create tables and draw diagrams in order to put the subject matter in order and to summarize it	3.35	1.254	29.5%
	3.47	1.292	24.7%

Likert scale: 1 = This statement is (almost) always true – 5 = This statement is (almost) never true

The results show that there are almost no differences between the results of the 2005/06 survey (first row of each item) and those of the 2006/07 survey (second row). Both groups of first-year students have a few main potential weaknesses when it comes to meeting the requirements of studying successfully at a university. Most students have (almost) never taken notes in class. But this seems to be useful to remember the material covered in a range of lectures on different subjects at university. The vast majority of students have not yet tried to visualize information themselves by preparing graphs or tables in order to structure given information. Maybe these skills were not necessary during their school days but they might be useful to deal with and to structure information, which is given on hundreds of pages of textbooks, and lecture notes.

A considerable number of students admit to having had problems concentrating, planning their study time and coping with stress. About one third of students lack concentration when they are in a bad mood. More than 40% put off their studying and more than 50% only study under the pressure of imminent exams. Considering the requirements of the first study-year at the WU, these results are not too encouraging.

Table 3 comprises the learning strategies that are expressed as weaknesses. Again, the lower the mean is, the more the respondents agreed

to the items. However, this time, the strong agreement does not indicate strength, but a potential problem for students who want to study effectively.

Table 3: Learning strategies (weaknesses), selected items

(the first rows indicate the results of the 2005/06 survey, the second rows those of the 2006/07 survey)

Learning strategies (expressed as **weaknesses**), selected items based on students´ self-assessment	Mean 2005/06 2006/07	Std. dev.	Always true/ frequently true, Cumulative percent
Dealing with exams			
I do badly at tests, because I don't organize the short test time well.	3.99	1.038	10.1%
	3.97	0.978	9.6%
If possible, I learn the material for a test by heart.	3.61	1.063	16.4%
	3.59	1.061	15.8%
Time management			
I only study under pressure when exams are imminent.	2.53	1.079	52.4%
	2.62	1.042	47.0%
I put off studying more than I should.	2.84	1.147	41.5%
	2.82	1.097	40.8%
I finish all the tasks I need for lessons in time.	3.04	1.139	34.2%
	3.12	1.075	28.3%
Concentration			
Private problems have the effect that I study less.	3.39	1.178	24.4%
	3.33	1.120	24.8%
I am easily distracted when I study.	2.91	1.097	36.8%
			31.7%
When I am in a bad mood I can hardly concentrate on learning.	3.06	1.092	31.0%
	3.01	1.038	31.8%
Coping with stress and fear			
Bad grades discourage me.	3.06	1.178	32.6%
	3.12	1.165	29.9%
I am very scared during important tests.	3.50	1.226	22.7%
	3.53	1.190	20.7%
I am worried that I might not be capable of finishing my studies.	3.28	1.203	26.5%
	3.46	1.214	23.1%
Discerning relevant information			
When I am studying I get lost in details and can't remember the relevant points.	3.72	0.941	11.7%
	3.79	0.897	8.4%
I find it difficult to decide what to underline or mark in a text.	3.73	1.052	14.1%
	3.79	1.029	13.6%

Likert scale: 1 = This statement is (almost) always true – 5 = This statement is (almost) never true

When it comes to discerning important information and to dealing with exams, the results seem to be more favourable. According to their self-assessment, students also have had fewer problems to motivate themselves and to check their understanding. Students are used to motivating themselves to study material they do not find interesting. They simply fail to

prepare for every lesson. This is consistent with the fact that most students only studied under the pressure of exams that are imminent and tended to put off their studying.

Most students have already tried to relate new information to something that they already know, to express it in their own words and to find relationships. On the other hand, most of them have not yet tried to relate new information to their prior knowledge and experiences. Accordingly, they do not tend to find their own examples for new concepts and terms. Yet these strategies could be very helpful for learning and understanding business matters.

These results demonstrate that first-year students did not apply (or just very rarely) some presumably very important learning strategies during their school days. In addition, if they continue studying that way at university, they might face difficulties in dealing with a range of new subjects within two semesters. Therefore, it does not seem surprising that more than one fourth of the students are concerned whether they will be capable of finishing their studies successfully. There is a considerable discrepancy between the learning strategies students have applied and those that seem desirable (or even necessary) for studying successfully. This finding implies the importance of the question whether students adapt their leaning strategies to the requirements they experience in the course of their studies, a question that will be researched in future data analyses.

Discussion

The results of the 2005 and 2006 surveys reveal that numerous students have not (or just very rarely) applied learning strategies that may be considered indispensable for successfully studying at a university. During their school days, most students did not take notes in class, they did not summarize the most important information or make outlines or drawings in order to visualize and gain a better understanding of the material covered in class. Furthermore, most students have not yet tried to apply what they had to learn to real-life problems, to relate it to their prior knowledge of the subject and their experience or to find their own illustrative examples. One out of two students only learns under the pressure of imminent exams. Hence, it seems understandable that about one fourth of the first-year students fear that they will not be able to finish their studies at the WU successfully.

Therefore, it seems necessary to discuss options to support first-year students in coping with the difficulties they might face when studying and preparing for their first exams at the university. First, they need to be provided with detailed information about the requirements of their first study year: the courses and exams they have to take, how many and which textbooks to learn and how hard it is to take so many tests for a range of subjects within such a short time period. At the beginning of their studies, they should be made aware of the fact that their learning strategies – though they may have been sufficient during their school days – might not be the best option to ensure effective learning at university. Students who are very nervous, very afraid of failing at exams or cannot structure their learning process or concentrate on studying might need some extra help, ranging from individual coaching and psychological support to establishing learning groups of students who study for the same exams.

However, students learning are not only influenced by their own learning strategies. There is an abundance of empirical evidence that instructional quality contributes significantly to the students´ learning and understanding (e.g. Entwistle, 1992, Feldman, 1997, McKeachie, 1997, and Brophy, 2001). If instructors know about the students´ weaknesses and problems they can take them into consideration when designing, planning and preparing a course. It seems to be important to make students study continuously by assigning them questions to answer and problems to solve that refer to the material covered in class or to be read in a textbook. By giving many examples and providing hands-on activities in class, the students´ understanding can be enhanced so that they do not need to learn the material by heart. A lively and activating course will stimulate students´ interest in the subject. They will be more attentive and focus. If they are not, despite an interesting and activating course, they have probably chosen studies that do not fit their interests and abilities.

Exams play a very important role for the learning process. Of course, students will try to learn in the way the knowledge is assessed in the exams. If exams only consist of questions that can be easily answered by repeating information, at least some of the students will try to learn the information by heart. This strategy will prove insufficient when knowledge has to be applied and/or reflected on to answer a question. That is how exam questions that require the application and evaluation of knowledge may influence student learning. If some questions from past exams can be provided, students can

get an impression what to expect and how to prepare for the exam. Furthermore, cooperative learning could be encouraged to make sure that less motivated students might study with more motivated ones.

Future Work

More research is needed to get a deeper insight into the way students learn and to find out which learning strategies contribute most to students´ success at university. It is planned to continue the research project by a follow-up survey of the learning strategies of students who started their studies in 2005 or 2006 and still study at the WU in order to find out if more successful students had applied different pre-university learning strategies than their (less successful) colleagues, and if learning strategies have changed since the beginning of their studies due to the requirements of the studies.

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