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Learning Styles and the Use of Lecture Videos in Adult Education

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Introduction

Technology can be of help when creating a teaching practice which takes students' different needs, for example needs related to time use and physical distance, better into account. On the other hand, the use of technology is more challenging when students' learning styles, i.e., preferences associated with different learning processes, are taken into account. There is a strong belief in different human aptitudes in the learning process. This is witnessed, for example, by the development of many learning style models and the attention they have received. Coffield [1], for example, has found at least 71 different learning style instruments and theories.

According to Felder [2], traditional lecture teaching favours certain learning styles, and there are many students who have to put up with education that is not in line with their learning style. In the worst of the cases studying can be interrupted. Losing students due to teaching that doesn't correspond with the student's learning style tends to be costly but could probably be set aright easily. On the other hand, it has not been possible to show the effect of learning styles on learning outcomes [3]. Students' motivation, their life situation and well-functioning practical education arrangements play such a big role, especially in adult education, that the effect of learning style may remain very light.

The students at the Kokkola University Consortium participating in the master's degree education in information technology are a special group due to their background. Almost all the students work and have completed a bachelor's or an equivalent degree. To be admitted to the master's education, the student's earlier studies must be convertible, in a short period of time, to correspond to the Bachelor's Degree in Information Technology. It should be pointed out also that a great many of the students live outside the town where the University Consortium is located. Thus the educational arrangements must offer enough flexibility to those who work, have families or live far from the campus. From the beginning, with the master's degree education in information technology lecture videos transmitted through a Learning Management System (LMS) have been a natural part of study together with face-to-face learning. All face-to-face education is offered to students both in the form of real-time videos and as on-demand videos.

In connection with student recruitment, students are subjected to learning style mapping so that all new students will get to know their own learning style preferences. The purpose of learning style mapping is to increase students' awareness of their own way to learn and provide course lecturers with information about the kinds of students, as far as their learning styles are concerned, attending the courses. The idea behind this is to draw the attention of both students and lecturers to their own ways of acting.

First, this article briefly presents the Felder-Silverman model chosen for our learning style mapping. After this the results of the learning style mapping to which the students of the master's degree programme in information technology were subjected are examined. The results obtained are also compared with earlier results. The survey examines whether students with a certain learning style are more likely to be selected for the education, whether there are differences between genders, and whether it is possible make predictions about study progress on the basis of learning style preferences. In addition, the survey examines whether there are differences between those who live near the campus and those who live far from it. Video lectures suit better for students living farther away than for those living near [4]. Finally, it is considered whether lecture videos ease the student's lot from the perspective of learning style.

Felder-Silverman model

The learning style model selected for this research is the one developed by Felder and Silverman [2]. The model was initially developed to be applied for students in engineering and the sciences in particular. For self-assessment of learning style preferences, Felder, together with Barbara A. Soloman, later on developed the Index of Learning Style (ILS) Questionnaire, which consists of 44 questions with a and b alternatives. The result is an assessment of learning style preferences on four

dimensions, which describe the way to receive and process knowledge. Each of the four dimensions, therefore, is measured by 11 questions. The dimensions are active-reflective, sensing-intuitive, visual-verbal and sequential-global.

Learning style preferences can be mild, moderate or strong. If the preference is mild, the person is more likely to change his/her learning style in different situations, and it can be said that the learning style is well balanced on the axis concerned. A person with a moderate preference learns best in an environment which provides support for his/her preference. A strong preference can make learning more difficult in an environment which favours a contrary learning style. Each person uses all of the styles sometimes depending on the situation, and one can improve one's least prominent learning style. Fig. 1 shows an example of a result, according to which the student is moderately active, mildly intuitive, strongly verbal and mildly sequential.
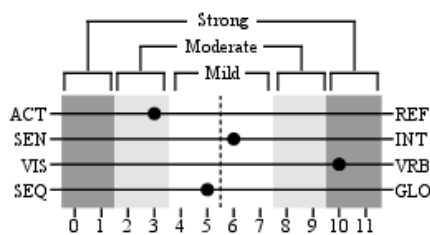

Fig. 1. An example result from the ILS questionnaire

The active-reflective dimension describes how the student would prefer to deal with information. Active students prefer to deal with information in the external world somehow. Reflective learners observe their environment and deal with information by thinking about it.

The sensing-intuitive dimension describes what type of information the student preferentially perceives. "Sensors" like empirical facts, data and practical procedures. They have patience for work tasks in which accuracy is required. "Intuitors" prefer principles and theories and are better than sensors in dealing with symbols. They don't like repeating.

The visual-verbal dimension tells about the sensory channel through which external information is most effectively perceived. Visual learners are best in remembering images, diagrams and information presented through multimedia. Verbal learners remember best something they have heard spoken or seen written.

The sequential-global dimension describes the progress of learning process. Sequential learners learn at a steady rate and like a kind of presentation where logical steps are taken to progress to a more demanding level. Global learners, on the other hand, learn in fits and starts. They might find it initially difficult to understand a new issue, but finally, once they have grasped the matter, they may, in the best of cases, be able to apply their knowledge in a way that the sequentials are unable to do.

Results

A Finnish language version of the Felder-Soloman ILS questionnaire was used in the research. Students were

asked to give their responses to it using a web form. Once the student had filled in the form, the result of his/her learning style, together with instructions for its interpretation and information about the learning style model, was immediately returned.

The survey took place during student selection among those seeking to enter the master's education programme in information technology. An introductory course, which is designed to give a truthful picture about work alongside study, is arranged for the applicants. The student selection is based on the introductory courses and background studies. In 2009, 31 students seeking for an admission responded to the learning style questionnaire and 19 of them were selected for the education. There were 12 students who either had insufficient background studies, interrupted their studies during the introductory course, or for some reason did not accept the place for study. Fig. 2 shows the averages of the ILS results for those who participated in the student application process whether they dropped out during the process or continued with their studies. The greatest difference was along the visual-verbal axis: those who continued studying were more visual. The averages for both groups, however, are moderately visual. The differences observed also in the averages of other dimensions are small, and the averages for both groups remain mild on all dimensions.
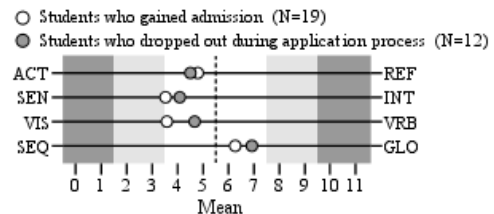

Fig. 2. Averages of the ILS results for those who participated in the student application process

There were also other things related to learning styles that were brought under examination during the survey. For this end, in addition to 19 of the students who continued studying, a request was made also to students already enrolled and students who had interrupted their study to respond to the questionnaire.

Overall, 56 results of learning styles were obtained. The learning style distribution for all the students who responded the survey is shown in Fig. 3.
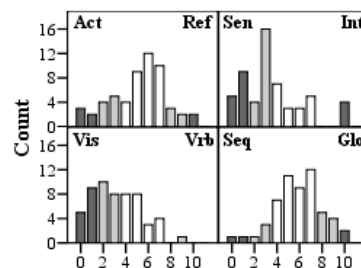

Fig. 3. Frequency bars showing the students' ILS results for each learning style dimension

In a research, mapping the results of learning style tests, it was found that the majority of engineering students are active, sensing, visual and sequential [5]. Also the

majority of the students in our master's education programme are visual and sensing. There are almost as many active and reflective individuals and a small majority of global learners. One should keep in mind, however, that even the first year students in the master's education programme in information technology have several years of both tertiary studies and work experience behind them. Rosati discovered in his research that fourth year students are more global than first year students [6]; thus even for the sequential-global axis the master's education students followed the pattern found in earlier research.
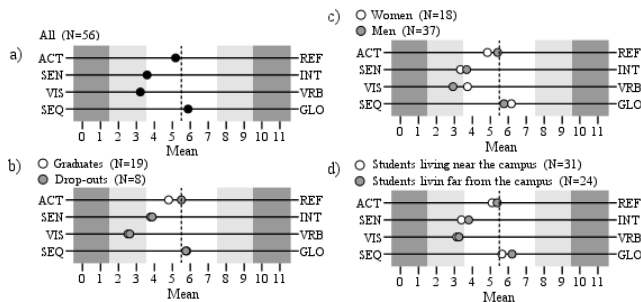

Fig. 4. Averages of the ILS results: a – all students; b – hose who completed or interrupted their studies; c – men and women; d – those living near and those living far

During the research, we also wanted to examine the possible effect of learning styles on progress/interruption of studies. Thus the questionnaire was also directed to those who had dropped out from the education programme and to those who had completed their studies. The averages of ILS results for the students who gained a degree and for those who dropped out is shown in Fig. 4b. Although the material related to drop-outs is meager, one can state that the students who interrupted their studies do not differ, as far as their learning styles are concerned, from other master's degree education students.

Fig. 4c shows the averages of the ILS results for men and women who responded to the questionnaire. No significant differences were found between the learning styles of different genres. Both men and women are active, sensing, visual and global. Rosati [6] noted that the proportion of reflectives, verbals and sequentials among women was bigger than among men. For reflectives and sequentials, the results of this article slightly differ from those of Rosati.

Especially the number of students living far from the campus increases each year. In earlier research, the use of videos and the motivations for their use have been found to differ between students living far from the campus (more than 50 km away) and students living near the campus (less than 50 km away). The opportunities of students living far to participate in face-to-face teaching are more limited, and they participate in lectures mainly through videos [7]. In addition, there were indications that video-based distance study suits better for students living farther away than for those living near [4]. Based on the results of learning style mapping, the differences between students living near and students living far are very small along all the dimensions. Fig. 4d shows the averages of the ILS results for the groups.

Discussion

Various technological solutions, such as lecture videos, enable different ways to undertake studies of the education programme in a flexible manner. For example, with the help of real-time videos it is possible to study, regardless of location, at the same pace with face-to-face teaching. With the help of on-demand videos one can participate in lectures regardless of time also. On-demand videos can be used for revision and their dynamics can be managed with the player functions. When the effects of new technologies on teaching are assessed, it is also possible to examine how the students with different learning styles benefit from those effects.

The learning environment when studying with the help of lecture videos is different from that in face-to-face teaching. Lecture videos can be viewed in peace, only a limited part of the face-to-face teaching situation can be seen and often there is a lack of interactivity. In this respect, for a reflective student who prefers to study alone lecture videos can be a more agreeable way [2] to participate in education On the other hand, for an active student who learns best through discussions [2], the use of video lectures might create challenges.

Lecture videos differ from face-to-face teaching situations also by having a lesser amount of visual information. The visual characteristics of the teaching materials themselves do not change in video lectures; the visual characteristics of the teaching situation are the ones that change. A video can be produced in such a way that only the study material to be presented is shown on video; apart from the material then, all visual information related to face-to-face teaching, including the lecturer's non-verbal communication, disappears. This may help both visual as well as verbal students to concentrate on the essential.

Typically, a tertiary level course on technology and science is organized in a sequential manner. The course advances in logical steps. The learning situation is changed by the possibility to control the rate of advance in studies with on-demand videos. On-demand videos provide an opportunity to introduce pauses between teaching in desired spots. This kind of deliberation time between presentations of new knowledge suits well for reflective students [2]. When on-demand videos are used for study, it is also possible to pass over less important portions or those parts that are already familiar to the student. Intuitive students are often perfunctory in their studies and do not like revising the subject matter [2]. Therefore, they probably will benefit from this opportunity. Also global learners find it beneficial to be able to jump within the material directly to more complex and difficult points in order to understand the bigger picture [2].

The process of mapping out learning styles will give the student a clearer idea about his/her own learning. Often, however, other things, such as time use limitations, define the manner of study that the student uses during individual lectures. Nevertheless, with the help of learning style mapping the education organizer can make students think about their own learning. At its best, this kind of awareness modifies students' behaviour and learning habits.

Mapping of learning styles can also have its effects on organizing teaching that takes different learning styles into account. Lecturers often teach their courses using familiar teaching methods. In many situations, there doesn't seem to be any apparent need for changing the teaching methods. With the help of a comprehensive learning style mapping, the education organizer can create a course-specific profile about the learning styles of students enrolled in the course. The learning style profile and information about the kind of learning methods of which the learners on the course could benefit can be given to the course lecturer. Learning style mapping provides the lecturer with a good reason to examine his/her own teaching. In the best of the cases, lecturers will pay attention to this when planning teaching methods and materials.

Conclusion

Our experience tells us that the easiest time to motivate students to respond to a questionnaire is right in the beginning of their studies, in connection with student recruitment. It was noted that the learning style preferences of the master's education students in information technology are in line with the results of earlier research which examined the learning styles of engineering students and more experienced students. Our data provides no indication that any particular learning style would influence the propensity to interrupt studies. It also seems that neither the gender nor the distances of the students from the campus area would have much influence to learning styles.

The learning environment when studying with the help videos is different from that in face-to-face teaching. Another significant difference is the possibility that the student can control the progress of the lecture when using a video. These differences may enable the representatives of different learning styles benefit, in their different ways, from the possibility to participate in teaching. To understand the real effects of these differences requires, however, more precise investigation.

Wider recognition of the importance of learning styles in our educational system depends on individual lecturers in each and every course. One future aim is to distribute information about learning styles also to lecturers. It is hoped that this would motivate lecturers to pay attention to the planning of their teaching and through it to diversification of teaching materials. For students, learning style mapping provides an opportunity to pay attention to their own learning. The hope is that consideration of one's own learning habits would encourage students to try new ways in their studies.

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S. Laine, M. Myllymäki, I. Hakala. Learning Styles and the use of Lecture Videos in Adult Education // Electronics and Electrical Engineering. – Kaunas: Technologija, 2010. – No. 6(102). – P. 35–38.

In connection with the student application process, a learning style mapping is organized for the students of the master's degree education in information technology at the Kokkola University Consortium. The purpose is to increase students' awareness of their own way to learn and to provide course lecturers with information about the learning styles of students attending the course. The idea behind this is to draw the attention of both students and lecturers to their own ways of acting. This article examines the results of the learning style mapping to which the students of the master's degree programme in information technology were subjected. The results are also compared with results published earlier. Finally, it is considered whether lecture videos used in parallel with face-to-face teaching ease the student's lot from the perspective of learning style. Ill. 4, bibl. 7 (in English; abstracts in English, Russian and Lithuanian).

С. Лайне, М. Мюллюмаки, И. Хакала. Исследование способов и видео программ при учебном процессе взрослых // Электроника и электротехника. – Каунас: Технология, 2010. – № 6(102). – С. 35–38.

Анализируется стиль учебного процесса и влияние видео материалов на процесс обучения. Дано сравнение классического стиля обучения с предлагаемым. Основное внимание уделено анализу проведения учебного процесса преподавателями и способами усвоению знаний взрослых студентов. Ил. 4, библ. 7 (на английском языке; рефераты на английском, русском и литовском яз.).

S. Laine, M. Myllymäki, I. Hakala. Suaugusiųjų mokymo būdų ir videopaskaitų naudojimas // Elektronika ir elektrotechnika. – Kaunas: Technologija, 2010. – Nr. 6(102). – P. 35–38.

Kokkola universitetų konsorciumas magistro studijose analizuoja studentų mokymosi stilius. Šio proceso tikslas yra padidinti studentų supratimą apie jų mokymosi stilių ir tuo pačiu dėstytojams suteikti žinių apie jų modulius lankančiųjų studentų mokymosi būdus. Pagrindinė idėja yra atkreipti tiek studentų, tiek dėstytojų dėmesį į jų pačių veiklos būdus. Išanalizuota mokymosi stiliai, apžvelgiama ar paskaitų video įrašų naudojimas lygiagrečiai su klasikinėmis paskaitomis pagerino studentų grupės mokymosi stilių. Il. 4, bibl. 7 (anglų kalba; santraukos anglų, rusų ir lietuvių k.).