

TECHNOLOGY'S AID TO LEARNING AND LEARNERS WITH DIFFERENT

LEARNING STYLES:

Pupils' assessment

Candidate's thesis

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Tutkimuksen tarkoituksena oli lähteä selvittämään erilaisten oppijoiden käsityksiä teknisten apuvälineiden käytön hyödyllisyydestä heidän oppimiselleen. Tutkimuksessa etsitään vastauksia muun muassa seuraavanlaisiin kysymyksiin: Mitkä ovat oppilaiden omat kokemukset siitä kuinka teknisten apuvälineiden käyttö opetuksessa hyödyttää heitä parhaiten? Mitkä apuvälineet ovat toimivimpia ja millä tavalla he kokevat hyötyvänsä niiden käytöstä? Lisäksi tutkimuksessa sivutaan kysymyksiä siitä, miten erilaisten teknisten apuvälineiden käyttö ottaa erilaiset oppimistyyli huomioon sekä miten se hyödyttää erilaisia oppijoita. Tutkimus pyrkii myös selvittämään, vastaako oppilaan oppimistyyli hänen omia käsityksiään ja mieltymyksiään siitä, miten hän oppii parhaiten vai löytyykö oppilaiden oppimistyylien ja käsitysten välillä eroja tai samankaltaisuuksia.

Tutkimusaineisto koostui seitsemäs- ja yhdeksäsluokkalaisilla teetetystä kyselystä. Kysely oli kaksiosainen: ensin selvitettiin oppilaiden oppimistyyli ja toisessa osiossa oppilaan tuli vastata kysymyksiin oppitunneilla yleisimmin käytettyjen teknisten apuvälineiden käytöstä sekä niiden hyödyllisyydestä heidän oppimisensa kannalta.

Tutkimuksessa selvisi, että vaikka oppilaat tiedostavat sekä arvostavat teknisten apuvälineiden hyödyllisyyttä oppimiselle ja ymmärtämiselle, he eivät ole täysin tietoisia teknologian opetuskäytön mahdollisuuksista, oman oppimisen arviointi on haastavaa ja yhteyden näkeminen näiden välineiden ja oppimisen välillä on heille vaikeaa.

Asiasanat: Learning styles, technology in teaching, technical equipment

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1 INTRODUCTION

In the field of education, it is said to take ten years for a new idea to be accepted and another ten for it to be applied to use. The term learning styles is no longer a novelty in education but a well acknowledged fact. Modern technology could provide valuable aid for different types of learners to learn. However, this is a novelty that has not yet properly reached the school world. The slow evolution of education has unfortunately led to a situation where schools are becoming outdated and lagging behind in today's fast developing world where technological innovations are happening minute by minute. New technology is, to a certain degree, reaching schools but the old ways of thinking and teaching slow down and at worst stop the evolution at hand. New technology loses its benefits when not used to its fullest potential.

Nevertheless, without the knowledge of how teachers cannot be expected to be able to take full advantage of the newest technology. The ten-year cycles of progress affect teacher education as well. Little time is given to informing language teacher trainees of the new technology and teaching them how to use it, whereas learning styles are a part of teacher education and trainees are, to some extent, encouraged to take the different learning styles into consideration in every situation as a whole, not taking into account individual learners but the whole class. With technology, educators are leaving it up to the teacher trainees to educate themselves about technology after graduation. Technology, such as the simple, innovative and multifaceted document camera, can be reduced to the equivalent of an overhead projector or chalk and board in the hands of an oblivious teacher.

Taalas (2007:420) explains that there are several courses for teachers in the working life to improve their knowledge of technology and their multimedia skills, but the effect of these courses tends to be very short lasting. In addition, she mentions that the courses usually concentrate on particular software, Internet pages or practising individual language skills with the help of technology. Thus they provide a very narrow view to what can be done with technology in language teaching.

As well as teachers, students too are unaware of the benefits that could be achieved with the help of technology in language learning. Though today's students are

more adept at using modern technology and have the know-how, they do not seem to be able to translate it into language learning. Evaluating one's learning and analysing it seems a task too difficult at least for students in secondary schools. This could be a result of the traditional idea of what school teaching is and the traditionally passive role of a learner.

Research on technological equipment in teaching has been made in recent years, for example Taalas (2007), Salovaara (2006), Iiskala and Hurme (2006), yet research on how the use of this equipment is actually seen to work, is lacking. The present study sets out to discover pupils' views on technology, its use in teaching and how they view its benefits for their learning.

2 TECHNOLOGY AND LEARNING STYLES

Schools can benefit from the fast evolving technology. New teaching equipment, educational applications and software as well as new ways of using the existing technology are being invented as we speak. Yet, even though these developments have reached schools, they are not often used most effectively because of the lack of practical know-how in schools.

The subject of learning styles and different learners has been an ongoing topic of discussion in the world of education. There is a constant debate about how to teach different learners and how to maximize their learning. New technology could provide at least some of the tools for making learning more effective for different learners.

In the following, the possibilities of technology for aiding learning and learners with different learning styles are discussed. Also, this section introduces some of the theories underlying the four perceptual learner types (visual, auditory, kinesthetic and tactual).

2.1 Technology in language teaching

Prashnig (2000:23, 157) notes that traditional teaching is based on using analytical teaching methods and even the classrooms are made for learners who use the left hemisphere of the brain. Both mathematical and linguistic skills are highly valued in the world of academia. Traditional teaching methods therefore require learners to use the left – the analytical – hemisphere of the brain, favouring both visual and auditory skills. As an end result, students involved in the traditional way of teaching are conditioned to using a particular learning style whether it suits them or not. The problem with this in Prashnig's (2000:31,193) view is that many students cannot learn through the traditional teaching methods and for many students, listening is the worst possible and the most difficult way of learning and remembering complex information. At the present, learning environments of schools do not advance learning, Prashnig (2000:23) declares. However, Prashnig (2000:29, 31) states that people learn many things if only the teaching methods and the learning environment are suited for them. Then there are no limits to what they can achieve.

According to Iiskala and Hurme (2006:48), technology could provide help for the situation, since it can facilitate solving problems otherwise impossible for the student to tackle independently. They propose that with the help of technology (especially computers, computer programs and web-environments), learning environments can be turned into ones where learners have the possibility to influence task difficulty, acquiring and receiving additional information and the duration of tasks, thus helping the student to create their own solutions to tasks and problems. Taalas (2007:415) adds that this does not mean ridding ourselves of the traditional one-on-one lessons but using the two forms of learning side by side providing different learning paths for the needs of different learners. Having the option to influence the duration of tasks is especially substantial for the kinesthetic and the tactual learner, due to their difficulties of staying in one place for longer periods of time, therefore needing more flexible ways of studying.

Taalas (2007:413) reminds us that even though technology and the ways to use it have developed and multiplied and though technology has been an aid to language teachers for decades, it nonetheless has not become a fixed part of language teaching. On the contrary, even though it is stated in the syllabus that language teachers are expected to equip their students with information-technological skills, the use of technology

remains merely an additional spice to the lessons or an aid to practising a single area of language through mechanical repetition (Taalas 2007:413-414). Furthermore, Taalas (2007:414) adds that new electronic materials often only replace a task previously done in class. In order to implement different learning paths, teachers need to be thoroughly aware of the students' language skills and develop more diverse teaching practices. This demands a great deal of knowledge from teachers and therefore educating the teachers is critical for development. Taalas (2007:420) reports that during the years 1995-2004, there has been a multitude of technological training for teachers but unfortunately the problem with these courses has been their inefficiency to generate lasting practises.

Järvelä et al. (2006:63) speak of the advantages of using information and communications technology in education asserting that it provides opportunities for different types of learners to advance by their individual requirements. Salovaara (2006:111-112) presents for example the possibilities of hypertext as a learning aid, since its diversity allows learners to use several different ways of reading. Its non-linear structure combined with visual elements enables information to be presented in various forms, for example text can be linked to images, examples and figures. Therefore, technology in education can create possibilities for students to process information in their own way and further their learning instead of students being suppressed to using only a specific way of learning defined by the traditional school environment. However, this is only speculation of what could be. Taalas (2007:414) points out that, thus far, teaching is teacher-oriented, giving students little opportunities for individual learning or taking an active role in their learning.

2.2 Learner types: the visual, auditory, kinesthetic and tactual learner

When exploring the area of learning styles, it is easy to be confused by theories and terminology. The terms learning style and learning strategy seem to go hand in hand and sometimes even overlap as in Leino and Leino (1990). According to Prashnig (2000:303), also Gardner's (1993) multiple intelligences are often confused with learning styles. Rita and Kenneth Dunn (1993) determine learning styles as the ways in which people focus on new and difficult information and how they absorb, process and store it in their memory.

In the present study I will be using a widely known division to four types of learning styles used by scholars such as Carbo, Dunn and Dunn (1986), Prashnig (2000) as well as Kalaja and Dufva (2005). These learner types based on the perceptual strengths of a learner are the visual learner, the auditory learner, the kinesthetic learner and the tactual learner.

Carbo et al. (1986:14) describe the visual learner as someone who “learns easily by viewing, watching and observing”. Prashnig (2006:192) adds that visual learners also learn well by reading and visualization. Carbo et al. (1986:13) note that for the auditory learner, learning is easiest through hearing and listening. In addition, Prashnig (2000:192) remarks that talking, discussing and inner speech may also be beneficial to auditory learners. Carbo et al. (1986) remark that the kinesthetic learners are very different to the visual and auditory learners, since they require experiencing, going and involvement in tasks to learn the easiest. Prashnig (2000:155) states that kinesthetic learners need full body experiences and physical activities during learning. In addition, Prashnig (2000:161) notes that these types of learners are not satisfied by just sitting in one place and listening to the teacher but they excel in and are often interested in the more practical school subjects and physical education where they can use kinesthetic methods.

Prashnig (2000:157) and Carbo et al. (1986:14) describe tactual learners as those who use their hands when they need to concentrate or listen attentively. They both report that tactual learners learn the easiest when touching, manipulating and handling things. Carbo et al. (1986:14) mention that writing, doodling, drawing and moving their fingers help tactual learners remember information easier. Prashnig (2000:159) remarks that tactual learners are capable of staying in their places but it requires a considerable amount of work from them. She (2000:157) adds that when tactual learners are forbidden to use their hands, the need of touching and moving only increases, shifting the learner’s focus to what is forbidden instead of the task or situation at hand. Even though both the tactual and kinesthetic learners may seem to be using similar perceptual strengths they are indeed different. Whereas one especially uses the sense of touch to help learning, the other uses the sensory feelings of the whole body. Their ways of learning are different and, therefore, Prashnig (2000:155) stresses that it is important to distinguish the tactual learners from the kinesthetic ones.

However, Carbo et al. (1986:17-18) and Prashnig (2000:36-37, 187, 319) agree that the issue of learning styles is not as simple as that. One major factor involving these and any learning styles is the impact of the human brain. The domination of a cerebral hemisphere, whether it is the left or the right, affects a learner's way of processing information. The analytical thinker uses the left hemisphere, whereas the holistic thinker uses the right. Differences between analytical thinkers, holistic thinkers and those who use both hemispheres of the brain cause the most substantial differences between and within learner types. According to Prashnig (2000:271, 283) and Carbo et al. (1986:17-18), the fundamental difference between analytic and holistic thinkers is that analytic thinkers process information bit by bit starting from details and piecing them together to form a complete picture, whereas holistic thinkers start by forming an overall comprehension from which to proceed to examine the details. Both types learn equally well, it is just a question of what they need from the teaching to learn to their full potential.

Prashnig (2000:271, 283) describes analytical thinkers as logically and mathematically gifted. They have both cyclical and analytical deductive skills which makes them capable of working by stage to stage instructions, whereas holistic thinkers always require the overall comprehension and therefore stage to stage instructions do not suite them at all. Analytical thinkers rely on logic and consistency. They value routines and prefer to work quietly in one place. This is very different to the holistic thinkers for whom learning first and foremost needs to feel good. They need variation and occasional exercise during classes and prefer a relaxed working environment.

3 THE PRESENT STUDY

The initial inspiration for the study came during my first training cycle in the teacher education subject studies. In the course of that cycle, I was introduced to many types of technical equipment that teachers in the *Jyväskylä Normal School* use in language teaching. While I was informed by the teachers of the usefulness of that equipment for different learners, I started thinking about how the pupils might perceive the matter. I wondered whether pupils saw technology's benefits as an aid for learning.

In the following, I shall present different aspects of the course of the study. The research questions are introduced in section 3.1 and the research methods used in this study in section 3.2.

3.1 Research questions

The two main research questions in this study were:

1. How do pupils feel the use of technology and technical equipment in language teaching benefits or aids their learning?
2. Which equipment works best in aiding them and in which ways do they aid their learning?

In addition, the study touches on questions such as how the use of technology and technical equipment take into account the different learning styles and how it benefits the auditory, visual, kinesthetic and tactual learner. The study also tries to establish whether learners learn best in the ways described by their learning style, in other words, whether their learning styles correlate with their own preferences and views on how they learn best.

3.2 Research data

The data for the study was collected through questionnaires (in the appendix) that first determined a pupil's learning style and then had a set of questions related to the most commonly used technical equipment in *Jyväskylä Normal School* today. The questionnaire was then conducted in *Jyväskylä Normal School* to a group of seventh- and ninth-graders.

The subjects of the study were pupils of *Jyväskylä Normal School* secondary school in grades seven and nine. *Jyväskylä Normal School* was chosen for its vast range of technical equipment used in teaching and for its accessibility as it is the training school for the University of Jyväskylä. The questionnaire was first distributed to twenty seventh-graders, whose answers, however, were slightly lacking and surprisingly they had not had the opportunity to use all the equipment listed on the questionnaire. Therefore the questionnaire was redistributed to a group of twelve ninth-graders in order to collect

more usable data. To make comparisons easier, the questionnaire was not modified in any way before being distributed to the ninth graders.

The questionnaire comprised of two sections and contained both *yes/no*-questions as well as open-ended questions. Pupils were not required to answer any questions about their background such as gender, since it was not considered relevant for this particular study. In the first section of the questionnaire, students completed a learning style test taken from Kalaja and Dufva (2005). In the second section the pupils answered a series of questions about the use of technical equipment during lessons: Had the specific equipment been used in lessons? What had been done with it/them? Had the pupils had a possibility to use the equipment themselves? How does the equipment aid the pupils' learning in their view?

The technical equipment examined in the study was divided into four groups. (i) Audio-visual equipment and (ii) the document camera, the two that favour the auditive and visual learners, while (iii) computers and computer related technology and (iiii) the language laboratory incorporate the use of several perceptual channels. None of the equipment could be categorised truly as kinesthetic learning aids but computers and the language laboratory enable more interactive learning environments where kinesthetic learners could have the possibility to involve the use of their body more.

4 LEARNERS AND TECHNOLOGY

Today's pupils live in a highly technological world and are very adept at using technology, especially computers. They spend a lot of time playing games and chatting on the Internet for instance, thus being surrounded by new information and foreign languages on a daily basis. Yet, though having advanced technological skills, pupils find it hard to see the link between fun pastime and learning.

In this section, I shall be reporting and discussing the findings of the present study. First, chapter 4.1 examines the main research questions: the pupils' views of the usefulness of technology for learning. Second, in chapter 4.2 the pupils' learning styles and their preferred technical equipment are discussed.

4.1 Learners' assessment

In the second part of the questionnaire the pupils answered a set of questions about the most commonly used technical equipment in their school. Pupils were asked whether their teachers used the equipment in class and how. They were also asked whether the pupils themselves had had the opportunity to use the equipment themselves. Pupils were also asked to evaluate how this equipment benefited their learning. Finally the students were asked which technical equipment they preferred and thought to be most beneficial for them. What was surprising as well as confusing about the pupils' answers was the fact that pupils in the same grade and the same class were not in agreement of which technical equipment had been used in class. Perhaps this was due to absences in those classes when the particular equipment had been used.

While analysing the data from the first round of questionnaires conducted for the seventh-graders, it became evident that it is a challenge for pupils of that age to analyze and evaluate the factors involved in their learning process. In addition, the pupils had never used the language laboratory and could not provide answers for that section at all. Therefore, it was necessary to acquire another set of answers from pupils older than seventh-graders. Consequently, the questionnaire was distributed to a group of ninth-graders. The answers did not differ much from those of the seventh-graders. Fortunately some of the ninth- and seventh-graders were able to evaluate their learning in more complex ways than, for example, that it is a nice change for regular classes.

4.1.1 Computers, computer software, the Internet and applications

The first questions focused on computer related technology. It could have been expected that pupils in secondary school might give simple answers such as "computers are more fun" rather than an in depth description of how computers aid their learning by giving them more options to choose from and providing possibilities to use different perceptual skills. Yet there were a few insightful answers about how computers, different software or Internet applications for example can make learning easier.

According to the pupils, computers and related technology had been used in IT, Swedish, English and chemistry classes. When asked in which ways computers had been used in class, the pupils gave examples such as

1. collecting information
2. writing stories and compositions
3. making presentations and projects
 - using Microsoft PowerPoint (mainly teachers and teacher trainees)
4. online assignments and tasks
5. grammar exercises
6. photo editing
7. playing games, such as math games
8. analyzing web pages
9. watching videos

Motivational aspects of using computers and computer related technology proved out to be an important theme throughout the pupils' answers. For example, the Internet, online tasks and even using text processing tools were seen as nice variety for the traditional lessons, thus making learning more meaningful. A ninth-grader noted that especially computer games work well, since one has to understand the instructions, for example, in order to play the game. This is highly motivating for the pupils, since at the end they get a prize of playing the game after learning something new.

Some of the pupils had also noted the freedom that computers and computer related technology offer to choose what, how and when they learn, as Iiskala and Hurme (2006:48) have pointed out. The pupils reported that working with a computer they can have a say on what they learn and how they learn it. One of the ninth-graders and a seventh-grader reasoned that working with computers is perhaps a more practical way of learning; it is, therefore, easier to remember what was learned. It was not clear from the pupil's answer what the word practical meant but for tactual learners, for example, it could mean the possibility to really get their hands on things, literally, instead of having to rely on listening, looking and abstract thinking whilst expected to sit still in their seats. As the pupils noted, computers allow them to work more freely.

Internet pages were seen as good aids for learning to read. A seventh-grader stated that information can be found very easily from the Internet and the information found is more extensive than in books thus supporting Salovaara's (2006:111-112) proposition of hypertext as an effective learning aid. In addition, a ninth-grader declared

that it is even more helpful than learning from books. However, hypertext is not the answer for all learners. For some pupils, computers and related technology were of no importance and provided no help for their learning. One pupil even reported that the “normal” teaching methods suited him best. Therefore the use of hypertext would be a valid option in teaching, alongside traditional text forms, providing pupils the opportunity to choose which works best for them.

4.1.2 The document camera

The document camera is probably the most commonly used technical equipment and visual aid in the *Jyväskylä Normal School* today. With a document camera one can show for instance text, images and objects. Different to an overhead projector, there is no need for any transparencies and, different to a chalkboard, writing and making notes is much quicker. An effective zoom makes it easier for the pupils to see and for the teacher to exemplify.

The pupils too had noticed the popularity of the document camera among teachers. They reported that the document camera is used every day during lessons. A seventh-grader remarked that hardly anything is written on the board anymore. A ninth-grader even stated that it is used every day instead of the regular chalkboard or an overhead projector. This raises the question why this is so. As Taalas (2007:415) stated about web-based learning environments being used side by side with the more traditional learning environments, new technology such as the document camera should be used with the overhead projector and the chalkboard. After all, the idea of new technology, I believe, is to bring something new and better to teaching, not merely to replace the old without adding anything to it. As an example, a ninth-grader commented that the document camera is not all that different from the chalkboard except if you want to show pictures. This can be the case when the document camera is used only as a substitute for the overhead projector or the chalkboard. However, one ninth-grader stated that the document camera is still better than the chalkboard. Perhaps, because it is more modern. Unfortunately, the pupil did not give any reasons why they thought so.

The pupils reported that the document camera had been used for (i) checking homework, (ii) showing answers, (iii) giving instructions and (iiii) showing pictures and text in a larger scale. Some of the pupils felt that it is nice to see as well as hear the

information given. Seeing what is discussed makes it easier to follow the lesson and when the information is up on the wall, the whole class can see the same information and know exactly what is happening. In addition, some noted that they learn and understand better when they can see the information. They felt that the document camera is a very good aid in exemplifying.

4.1.3 Audio-visual equipment and materials

As could have been predicted, the pupils reported that they had listened to texts and vocabulary in textbooks, done listening exercises, listened to music as well as watched videos and edutainment (education with entertainment) programs.

Most of the pupils' answers regarding audio-visual equipment tended to be comments about how it is fun to listen to music or watch videos. They considered the audio-visual materials a nice change for the average lessons and the majority of the pupils did not see them as learning aids at all but a fun extra for the lessons. Therefore it can be inferred that pupils find audio-visual materials highly motivating. In fact, they find them so motivating that they do not consider learning through them learning at all.

Some of the seventh- and ninth-graders were able to evaluate the actual benefits of audio-visual equipment and materials for learning. They described how listening helps them to learn and understand spoken language. It also helps them with their pronunciation. A few seventh- and ninth-graders added that listening also makes remembering easier.

4.1.4 Language laboratory

The definite benefits of the language laboratory are that it uses several perceptual channels and allows the pupils to control their own work. Many of the ninth-graders appreciated the seclusion the language laboratory offers. They explained how they like the peace and quiet of the language laboratory. They can concentrate on their own work without the usual distractions of a regular lesson. Some noted that hearing one's own pronunciation helps with learning. Others liked the change that working in the language

laboratory brought to their lessons. One pupil, however, stated that the language laboratory provides absolutely no help for learning.

The ninth-graders had used the language laboratory for listening exercises and tests, speaking exercises and for practising pronunciation. The seventh-graders, on the contrary, had never used the language laboratory and therefore could not answer the questions about language laboratory work. However, two seventh graders stated that they were very enthusiastic to use the language laboratory to practise their pronunciation better.

4.2 Pupils' learning styles and preferences

In addition to attempting to discover pupils' views on the usefulness of technological equipments in teaching, the study also tried to establish whether learners' learning styles correlated with their own preferences and views on how they learn best.

There did not appear to be any substantial differences between the pupils' learning styles in terms of the points a single pupil gave for different learning styles in the learning style test. Most pupils had given quite equal points for each learning style and many had more than one primary learning styles as well as secondary learning styles. This might indicate that the pupils did not understand the options on the test or that they are unsure of the ways in which they learn the easiest. Evaluating their ways of learning could also have been difficult for pupils of this age.

An interesting discovery was that, according to this learning style test, all the pupils had visual learner as their secondary learning style, if it was not their primary learning style (see figures 2 to 4). This number is fascinating, because Prashnig (2000:195) reports that for example only 40 percent of the schoolchildren in the United States are visual learners and in New Zealand the figure is only 30 percent. As far as primary learning styles are concerned, the figure for this set of pupils (as shown in figures 1 and 3) is in the same figures as in the United States and New Zealand. The percentages of the auditive learning style are also very high. According to Prashnig (2000:193), under 30 percent of the schoolchildren in the United States and New Zealand are auditive learners, which clearly differs from the results of this study. As shown in figures 1 and 3, over 30

percent of the seventh-graders and over 40 percent of the ninth-graders have the auditory style as their primary learning style.

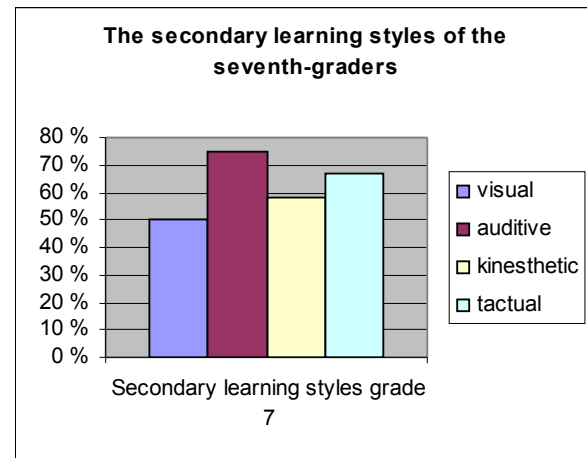
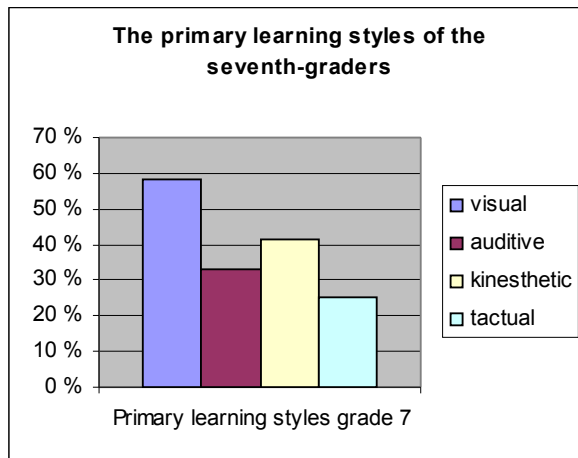


Figure 1 The seventh-graders' primary learning styles. Figure 2 The seventh-graders' secondary learning styles.

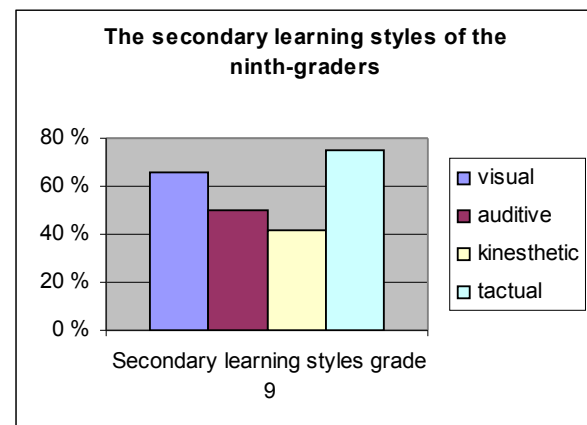
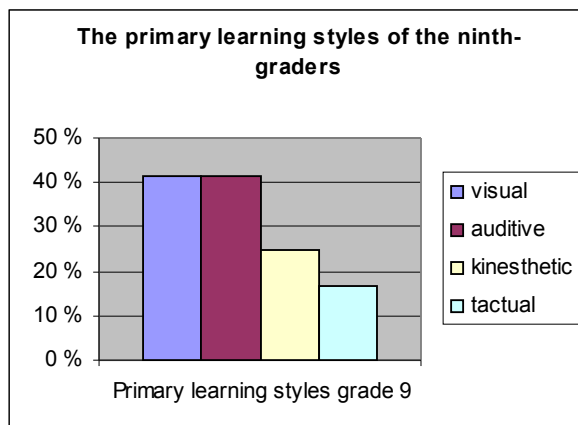


Figure 3 The ninth-graders' primary learning styles.

Figure 4 The ninth-graders' secondary learning styles.

The numbers are even greater in the case of secondary learning styles: 75 percent of the seventh graders and 50 percent of the ninth graders seem to have an auditory secondary learning style (shown in figures 2 and 4). The reason for the high number of the visual and the auditory secondary learning styles could be found in Prashnig's (2000:107) statement that schools condition pupils to using the visual and the auditory learning styles.

On the question of which technical equipment in their opinion helped them to learn the most, the pupils' reports were quite diverse. In their answers, some pupils named the only equipment that had been used, therefore not really stating their

preferences but the only option available. Some pupils did not register any equipment because they did not understand the question or could not think of an answer for it. Others mentioned equipment without knowing a reason why it helped them to learn. Most of the pupils' votes went to computers and the document camera. Both received a total of nine votes from the pupils. The pupils who managed to give reasons for choosing that particular equipment presented some good points that show some understanding of the usefulness of this technical equipment. For example, the pupils clearly had noticed the versatility of computers (examples 2, 3 and 4) and it is the kind of equipment that is easy for the pupils to use (as stated in example 1).

- (1) Tietokone. Helppo käyttää.
[The computer. It is easy to use.]
- (2) Tietokone. Kun on hauskaa oppii samaan aikaan paljon, mutta jos kaikki rupee leikkimään on eri juttu.
[The computer. When you are having fun, you learn a lot at the same time but if everyone starts playing around, it is different.]
- (3) Tietokone. Koska se on niin monipuolinen. (pelit, videot, äänitteet, kuvat, nettisivut)
[The computer. Because it is so versatile. (games, videos, recordings, pictures, websites)]
- (4) Tietokone. Sillä saa tehtyä melkein mitä vaan.
[The computer. You can do almost anything with it.]

The popularity of computers was not surprising, since it is something that the pupils are very familiar with outside school and, since it combines the use of several perceptual channels, it should be suitable for many different learner types. Sadly, computers especially are a resource that is often reduced to being used as additional spice to occasional lessons as Taalas (2007:413-414) points out. Yet, without proper training, teachers can hardly be expected to be able to use computer technology in the most efficient ways.

The document camera also received nine votes and given the high number of visual learners in the learning style test (the primary learning style of almost 60 percent of the seventh-graders and over 40 percent of ninth graders), the pupils' answers seem to follow logically from this. However, this could be the result of conditioning the pupils for using particular learning styles preferred in the school environment as Prashnig (2000:23, 157) suggests. The pupils' comments also seem to reinforce the supposition that the document camera would be a good aid for the visual learners, since it clarifies the spoken information (as explained in example 6).

- (5) Dokumenttikamera. Tehtävät selostetaan sillä.
[The document camera. The instructions of tasks are given with it.]
- (6) Dokukamera. Näkee samalla mistä ope puhuu. Helpompi seurata opetusta.
[The document camera. You can see what the teacher is talking about. Makes it easier to follow the teaching.]

Followed closely behind, was the audio-visual equipment that received a total of eight votes of which three votes were specifically for the television and one for films. The number of votes seems to go hand in hand with the high number of auditive learners in the learning style test: the primary learning style of over 30 percent of the seventh-graders and over 40 percent of the ninth-graders. The pupil's response in example 7 shows how these auditive learners rely on hearing when remembering and learning new things. Therefore, audio-visual equipment and materials should indeed receive high marks in a group such as this.

- (7) Televisiodokumentit/DVD. Koska sen muistaa helposti mistä siinä tapahtui.
[TV documentaries/DVD. Because it is easy to remember what happened.]
- (8) Telkkari. Jaksan paneutua sen katsomiseen ja sitä kautta opin.
[The TV. I can concentrate in watching it and I learn through that.]
- (9) Televisio. Kuulee kieltä ja sitä ei yleensä ole helpotettu.
[The TV. You hear the language and it has not been made easier, usually.]

The entertainment aspects of audio-visual materials, especially television and films, possibly make them highly motivating and interesting for the pupils, thus engaging them more actively in the lessons, as implied in example 8. Audio-visual materials can also be highly authentic which also adds to the motivation of pupils. Most songs, television documentaries, films, television shows etc. have not been made for teaching purposes, but for a wider audience. Therefore, when looking at language learning for example, the language of these materials is quite different to those designed for teaching purposes and they provide new challenges for the pupils, as noted in example 9. These authentic materials that have been taken to use in schools are materials that the pupils come across in their daily life as well. Therefore, the attitude towards these materials can be more positive, since they may not be seen as something related to school and learning at all but as something fun and informal.

Surprisingly, the language laboratory managed to tally two votes even though none of the seventh-graders had used it and the ninth-graders were new to using it. One

pupil (example 10) had even noticed one of the language laboratory's benefits for the teacher.

(10) Ehkä eniten hauskein ja paras tapa oppia on kielistudiossa. Siellä myös opettaja saa selville meidän kielitaidosta. Saa olla rauhassa ja harjoitella yksin.
[Perhaps the funniest and the best way to learn is in the language laboratory. There also the teacher can find out about our language skills. There are no distractions and you get to practise on your own.]

(11) Kielistudio – Hyvä kun pääsee harjoittelemaan omaa ääntään paremmin.
[The language laboratory – It is good to be able to practise your pronunciation.]

Perhaps if the pupils had been more familiar with the language laboratory, their answers would have been different, since the language laboratory also combines the use of several perceptual channels making it suitable learning aid for many different learners.

Even though some of the pupils were able to analyze the reasons behind their answers to some extent, they did not seem to be fully aware of all that could be done with the technological equipment, how it could help their learning and how it could help to make teaching and learning more individualised to suit each learner. This is likely to be due to their experiences on the use of this equipment in teaching. The model that has been given to the pupils has given them quite a narrow view of the possibilities of technology's use in teaching and learning.

On the basis of the pupils' answers for their preferred technical equipment, it was difficult to make suppositions about whether their learning styles and preferences met. From the answers given, it was, nonetheless, possible to infer that the pupils who had not merely chosen the only option available, did prefer to work with equipment that supported at least one of their primary learning styles. Yet, the problem was that the majority of the pupils had given nearly even marks for each learning style, thus having one, two or even three primary learning styles followed closely behind by their secondary learning style/styles. Therefore they could have named practically any of the technical equipment mentioned on the questionnaire getting a result that showed that their choice of equipment supported at least one of their learning styles. As a result, it would require a more detailed and precise learning style test and questionnaire for the suppositions to be more valid.

5 CONCLUSION

Because of technological developments in teaching equipment, it seemed relevant to explore how the new technology was used in schools and how the pupils felt about it. The present study set out to discover particularly pupils' views on technology as an aid for learning. The pupils from the seventh and the ninth grade of *Jyväskylä Normal School* filled out a learning style test and evaluated different technological equipment with the help of several questions in the questionnaire distributed. Since the number of test subjects in the present study was quite low and all the pupils came from the same school, no clear generalisations can be made on the basis of this study. However, it does give an indication of what pupils of this age may feel on the subject.

From the pupils' answers it was quite difficult to make definite predictions or suppositions on whether the pupils' learning styles and preferred equipment met. Yet, it became clear that many pupils feel that technical equipment does help them to learn and to understand and are very willing to work with the equipment. However, the pupils were not entirely aware of the possibilities of technical equipment. Analyzing the reasons why or how the technical equipment aided their learning proved out to be difficult for some of the pupils while others were able to provide well justified reasons for their answers.

The open-ended questions on the questionnaire produced quite diverse and at times even contradictory answers. The questions about the technological equipment might have needed to be more leading, since they proved out to be quite difficult for the pupils. However, this could have guided the pupils to answer in a specific way, instead of reporting how they really felt. Unfortunately, because the questions were perhaps too difficult for the pupils, the data collection should have been conducted on a higher grade. Also the learning style test would have needed to be more precise and detailed to produce more valid results, since the pupils tended to give quite equal marks for each learning style. Therefore it gave them a total of four very evenly marked learning styles, thus making it difficult to identify them as certain learner types.

One of the reasons why the pupils found it hard to give reasons for their answers might be that they have been taught to evaluate their own learning in a specific way and through specific evaluating tasks. Therefore, the types of questions that were in the questionnaire were unfamiliar to them. Another reason could be that the pupils do not

see the connection between learning and the technological equipment. The games played for fun and surfing the Internet in their spare time are not learning but fun. Learning is strictly something done in school. If the pupils understood that learning is something that happens all the time, it could help them to see how they can take advantage of the technology they use on a daily basis.

Yet, to take the fullest advantage of technology as an aid for learning, most importantly, teachers need to be informed of the usage of technology as well as their pupils' learning styles. In return, they can inform their pupils, who then have the tools to apply this knowledge to use in ways that suite them best. If teachers are not aware of their pupils' learning styles, all actions to take different learning styles into account are only a general precaution that attempts to take all learning styles into consideration. Knowing the pupils' learning styles and how to use technology to aid their learning makes it possible to create individual learning paths for each pupil. Educating the pupils about these matters gives them later on the know-how to create these paths themselves.

In the future, it would be fascinating to find out more about the pupils' views on technological equipment in teaching and also the teachers' views and knowledge on the subject. Also, further research on the actual uses of different new technology as an asset for teaching different learners, such as the innovative and interactive *SMART Board*, would be beneficial for teachers all around.

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Appendix

Hei,

Olen Jyväskylän yliopiston opiskelija ja teen opinnäytetyötäni kielten laitoksella englannin kielen oppiaineessa. Opinnäytetyöni koskee tekniikan käyttöä opetuksessa ja oppilaiden käsityksiä siitä kuinka se hyödyttää heidän oppimistaan. Oheisella kyselylomakkeella kerään tarvitsemaani aineistoa, jonka pohjalta rakennan oppinäytetyöni.

Kyselylomake koostuu kahdesta osiosta. (1) Ensiksi selvitämme oppimistyyliäsi muutamien väittämien avulla. Oppimistyylyttesi on otettu teoksesta *Kielten matkassa. Opi oppimaan vieraita kieliä* (Kalaja 2005).

(2) Seuraavaksi sinua pyydetään vastaamaan muutama kysymykseen, jotka koskevat teknisten apuvälineiden käyttöä oppitunneilla. Pohdi kysymyksiä omakohtaisesti, ei yleisellä tasolla, sillä tarkoitukseni on selvittää juuri Sinun mielipiteesi ja kokemuksesi.

Kyselylomakkeessa ei tule ilmi vastaajan henkilöllisyys ja vastaukset tullaan käsittelemään nimettöminä. Kyselylomakkeiden tiedot käsitellään luottamuksellisesti eikä niitä käytetä muihin tarkoituksiin kuin opinnäytetyöhöni.

Kiitos osallistumisestasi!

Jyväskylässä 27.1.2009

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Oppimistyylit

Vastaa kyselyyn, joka koskee oppimistyylejasi.

- ① Ehdottomasti eri mieltä
- ② Jokseenkin eri mieltä
- ③ En osaa sanoa
- ④ Jokseenkin samaa mieltä.
- ⑤ Ehdottomasti samaa mieltä

Valitse kokemuksiasi vastaava vaihtoehto kunkin väittämän osalta.

1. Ymmärrän tehtävän paremmin, jos opettaja kertoo minulle ohjeet ① ② ③ ④ ⑤
2. Minulle sopii parhaiten sellainen oppiminen, johon liittyy tekemistä ja liikkumista luokassa. ① ② ③ ④ ⑤
3. Opin paremmin, jos opettaja kirjoittaa asiat taululle. ① ② ③ ④ ⑤
4. Opin paremmin, jos saan tunnilla ohjeet suullisesti. ① ② ③ ④ ⑤
5. Opin paremmin, jos saan tunnilla tehdä asioita kuuntelun tai oppikirjan lukemisen sijaan. ① ② ③ ④ ⑤
6. Muistan tunnilla kuulemani asiat lukemiani asioita paremmin. ① ② ③ ④ ⑤
7. Muistan ohjeet paremmin, jos saan lukea ne. ① ② ③ ④ ⑤
8. Opin enemmän, jos saan mallintaa opittavan asian esimerkiksi käsitekartaksi (mind-map). ① ② ③ ④ ⑤
9. Ymmärrän tehtävän paremmin, jos saan lukea ohjeet. ① ② ③ ④ ⑤
10. Opin enemmän, jos saan tunnilla olla mukana tekemässä projekteja. ① ② ③ ④ ⑤
11. Minusta on mukavaa tehdä tunnilla muutakin kuin istua paikoillaan. ① ② ③ ④ ⑤
12. Opin paremmin, jos saan selvittää opittavia asioita piirtämällä. ① ② ③ ④ ⑤
13. Opin paremmin luentomaisessa opetuksessa: opettaja puhuu, oppilaat kuuntelevat. ① ② ③ ④ ⑤
14. Ymmärrän tunnilla käsiteltävät asiat paremmin, jos niitä harjoitellaan roolileikeillä. ① ② ③ ④ ⑤
15. Opin luokassa paremmin kuuntelemalla. ① ② ③ ④ ⑤
16. Muistan oppimani asiat paremmin, jos saan työstää jotain käsillä. ① ② ③ ④ ⑤
17. Opin lukemalla paremmin kuin kuuntelemalla. ① ② ③ ④ ⑤
18. Minusta on mukavaa osallistua projekteihin luokassa. ① ② ③ ④ ⑤
19. Opin luokassa parhaiten, jos aihetta käsitellään myös toimintaa vaativien tehtävien avulla. ① ② ③ ④ ⑤
20. Opin enemmän oppikirjaa lukemalla kuin opetusta kuuntelemalla. ① ② ③ ④ ⑤

Lähde: Kalaja, P. ja H. Dufva 2005. *Kielten matkassa. Opi oppimaan vieraita kieliä*. Helsinki: Finn Lectura.

Mieti ensin hetki mielessäsi: onko tekniikan käytöstä opetuksessa mielestäsi apua asioiden ymmärtämiselle? Millaista hyötyä tekniikasta voisi sinulle olla?

Vastaa seuraaviin kysymyksiin:

Mitä teknisiä apuvälineitä käytätte tai olette käyttäneet oppitunneilla?

1. Tietokone (myös mm.tietokoneohjelmat ja internet) kyllä / ei

Miten on käytetty/mitä on tehty?

Onko sinulla itselläsi ollut mahdollisuus käyttää tietokonetta oppitunnilla?

Millaisissa asioissa olet käyttänyt tietokonetta oppitunneilla?

Millä tavoin tietokoneen käyttö (myös mm.tietokoneohjelmat ja internet) auttaa sinua oppimaan ja ymmärtämään asioita helpommin?

2. Dokumenttikamera

kyllä / ei

Miten on käytetty/mitä on tehty?

Millä tavoin auttaa sinua oppimaan ja ymmärtämään asioita helpommin?

3. AV-välineet

kyllä / ei

(televisio,videonauhuri/dvd-soitin,cd-soitin/kasettinauhuri)

Miten on käytetty/mitä on tehty?

Millä tavoin auttaa sinua oppimaan ja ymmärtämään asioita helpommin?

4. Kielistudio

kyllä / ei

Miten on käytetty/mitä on tehty?

Onko sinulla itselläsi ollut mahdollisuus käyttää laitteita oppitunnilla? Millaisissa asioissa/tehtävissä olet käyttänyt kielistudiolaitteita?

Millä tavoin auttaa sinua oppimaan ja ymmärtämään asioita helpommin?

Mikä tai mitkä edellä mainituista teknisistä apuvälineistä (tietokone ja tietokoneohjelmat, dokumenttikamera, av-välineet, kielistudio etc.) auttavat sinua **parhaiten** oppimaan ja ymmärtämään asioita? Miksi juuri kyseinen väline?

Kiitos vastauksistasi!