STATE OF THE ART OF „VISUALEARNING" IN THE NETHERLANDS

National Report

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1.   Preliminary Remark

According to the project application of the EU-project " visuaLearning' there will be pre-
pared an expertise of the state of art concerning visual learning in The Netherlands.
The project is supported by the European Community within the action GRUNDTVIG of
the SOCRATES programme. The inquiry for this expertise has been done almost ex-
clusively online. The sole responsibility of the content lies with the authoress. The opin-
ion of the European Commission is in no way portrayed.

2.   Introduction: Objectives of the project "visuaLearning"

Knowledge based societies today are highly focused on transfer of information based
on text. During school time and later on during vocational training, university studies or
further education learning proceeds through reading and writing. At the same time
communication by means of pictograms increased a lot in everyday life as well as in
business life. Many work processes in connection with PC work with icons. All software
programmes e.g. of Microsoft or Apple guide the user through their programmes by the
support of icons. Vending machines are equipped with touch screens and the same
goes for computer information sources in museums. They all include pictograms, pic-
tures and icons in order to make information more accessible to the user. In all these
examples the understanding of pictures and signs is required. Common learning theo-
ries do not give an appropriate answer to the question how learning happens through
visual processes. The question about the influence of pictures in learning process as
well as the reception is left to disciplines related to arts, e.g. design, advertising, etc.
and has not yet been posed by adult educators in particular. From our experiences in
basic skills we know that especially people with low literacy skills depend on process-
ing information by means of pictures. This is regarded as a compensation strategy for
managing daily life. In the same time it is a special strength or competence that has not
been acknowledged or recognised enough yet for reasons that this is an informally
acquired competence. With this project we want to build upon current findings from
both basic skills and acquisition of informal competences in order to find out how the so
called "visual learning" makes the process of learning easier.

2.1   The Dutch partner: The Reflexion Foundation

Reflexion is a "Stichting" (small size foundation) that offers technical and educational support to people who want to become familiar with modern information and communication technologies. The reason for their demand may be of professional or private origin. Supporting people with physical disabilities had the highest priority in the past, but nowadays long term unemployed, immigrants and other groups threatened with exclusion from social and economic life are equally welcome to our training and support programmes.

The overall aim of the organisation is to promote employment by training for people who do not easily find suitable jobs because of physical, mental and/or social obstacles. These terms cover a wide diversity of impairments, ranging from wheelchair dependency to deafness and/or blindness to claustrophobia. Apart from these, also non disabled unemployed people have completed the training programmes with good success rates. To enhance employment for these groups the creation of specific and suitable jobs is necessary. Reflexion takes an active part in designing and shaping work environments that meet the requirements of people with special needs. The application of modern office technologies is one of the core elements in the innovative approach to professional and vocational training.

3.   Description of the Procedure

According to data given by the project coordinator (The German Institute for Adult Education - DIE) the analysis of the current state of the art of "visual learning" in the Netherlands was carried out on two levels: 1) Study by means of the Internet 2) Analysis of the literature.
The search area was extended by related terms that are directly connected with the subject and were suggested by the project coordinator, e.g. 'Visual Learning', 'Visual Literacy', Visual Competence', etc. Through Internet research we were able to select several current topics within the field of visual learning. This report focuses on the area of education and aims to provide up to date aspects of visual learning within this area in the Netherlands.

4.   The Term "Visual Learning"

When starting my basic search (Google search: 'visual learning') on the Internet, Google comes up with several theories on learning styles and on multiple intelligences, but nothing directly on visual learning itself or on visualization. Neither during my search in Internet abstract databases. Only Wikipedia dares to give an exact (but not very scientifically) definition of visual learning:

Visual learning is a proven teaching method in which ideas, concepts, data and other information are associated with images and represented graphically. Graphic organizers, such as webs, concept maps and idea maps, and plots, such as stack plots and Venn plots, are some of the techniques used in visual learning to enhance thinking and learning skills. By representing information spatially and with images, students are able to focus on meaning, reorganize and group similar ideas easily, and make better use of their visual memory.[1]

In Wikipedia also scientific research is mentioned, which concludes that visual learning improves student performance in several areas (such as organization and comprehension). By representing information spatially and with images, students are able to focus on meaning, reorganize and group similar ideas easily, and make better use of their visual memory.

Research makes clear that visual learning and other visual aspects play an important role in several scientific theories. For this project (focusing on adult education) the theories on different learning styles and multiple intelligences seem to be the most relevant and important.

4.1   Learning Styles

The ways in which an individual characteristically acquires, retains, and retrieves information are collectively termed the individual's learning style.[2]

Some students are comfortable with theories and abstractions; others feel much more at home with facts and observable phenomena; some prefer active learning and others

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[1] http://en.wikipedia.org/wiki/Visual_learning
[2] R.M. Felder. Learning and Teaching Styles in Foreign and Second Language Education. *Foreign Language Annals, 28*(1), 21-31 (1995).

lean toward introspection; some prefer visual presentation of information and others prefer verbal explanations.

One learning style is neither preferable nor inferior to another, but is simply different, with different characteristic strengths and weaknesses. In most classes still very little visual information is presented: students mainly listen to lectures and read material written on chalkboards and in textbooks and handouts. A goal of instruction should be to equip students with the skills associated with every learning style category, regardless of the students' personal preferences, since they will need all of those skills to function effectively as professionals.

Several dozen learning style models have been developed. The best known of these models is Jung's Theory of Psychological Type as operationalised by the Myers-Briggs Type Indicator (MBTI).

People are classified on the Myers-Briggs Type Indicator (MBTI) according to their preferences on four scales derived from Jung's Theory of Psychological Types:

1) extraverts or introverts
2) sensors
3) thinkers
4) judgers or perceivers.

Another one is (for example) Kolb's Experiential Learning Model.

In Kolb's model, students are classified as having a preference for

(a) concrete experience or abstract conceptualisation (how they take in information) and

(b) active experimentation or reflective observation (how they process information).
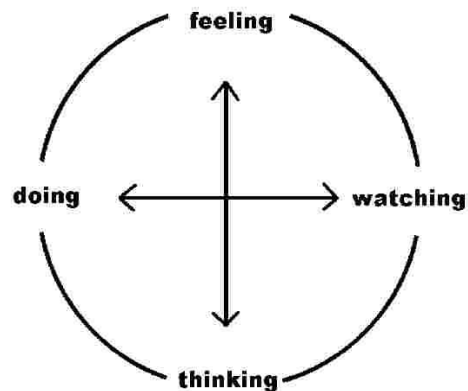
The four types of learners in this classification scheme are:

1. the diverger (concrete, reflective)
2. the assimilator (abstract, reflective)
3. the converger (abstract, active)
4. the accommodator (concrete, active).

4.2   Multiple Intelligences

Howard Garden argues the traditional definition of intelligence. It does not adequately contain the variety of abilities humans have. Gardner defines 7 types of intelligence: (1)Bodily-Kinesthetic, (2)Interpersonal, (3)Linguistic, (4)Logical, (5)Musical, (6)Naturist and (7)Spatial. There have also been lots of critics on Gardner's theory, saying the intelligences are just other names for talents or personal identities. The spatial intelligence can be described as the intelligence related to pictures and images. It allows people to perceive visual or spatial information and to recreate visual images from memory. These multiple intelligences have a certain impact on education. Traditional schooling heavily favors the linguistic and logical intelligences. Gardner suggests a more balanced curriculum that incorporates the arts, self-awareness, communication, and physical education. Gardner favors of course instructional methods that appeal to all the intelligences, including role playing, musical performance, visualization, story telling, and so on. When teachers are planning their lessons, they should try to involve as much intelligences as possible of course.

5.   Development of Visual Learning in Dutch Education

In this section we will describe some main developments of visual learning in the Dutch educational system. Special attention is paid towards the E-generation, Mind Mapping, Second Life, E-Portfolio and Digital White Boards.

5.1   The E-generation

'*Our students have changed radically. Today's students are no longer the people our educational system was designed to teach.*'[3]

As mentioned before, class teaching nowadays is still standard, although most students grow up doing homework while watching TV and doing almost everything while listening to an Ipod. Many of them feel much more comfortable doing more than one thing at a time than their fellow students in the past. They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and so on.

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[3] Marc Prensky. On the Horizon. NCB University Press, Vol. 9 No. 5, October 2001

They have little patience for lectures, step-by-step logic, and "tell-test" instruction. Students are used to scanning a text (in books but also on a monitor) instead of reading. It is clear that today's students think and process information fundamentally differently from their predecessors.

Marc Prensky refers to these students as *Digital Natives*. Our students today are all "native speakers" of the digital language of computers, video games and the Internet. Others call it the E-generation. We need to invent new methodologies for this new generation, at all levels. This process has already begun. During my research I came across several new educational methods. Most of them are not yet widely known or used but seem extremely interesting for the E-generation. Examples can be found in the following paragraphs.

5.2   Mind Mapping

Mind maps are tools that help us think and remember better and creatively solve problems. A mind map can encourage creativity and flexibility. They support the generation of ideas via associations.

A Mind Map starts in the middle of the page with some key word or core idea. Then additional ideas are written down or even drawn as images (you can also use images from magazines or newspapers, you can use as much fantasy as you want), related to the key word. They are arranged intuitively according to the importance of the concepts and they are organised into groupings, branches, or areas.
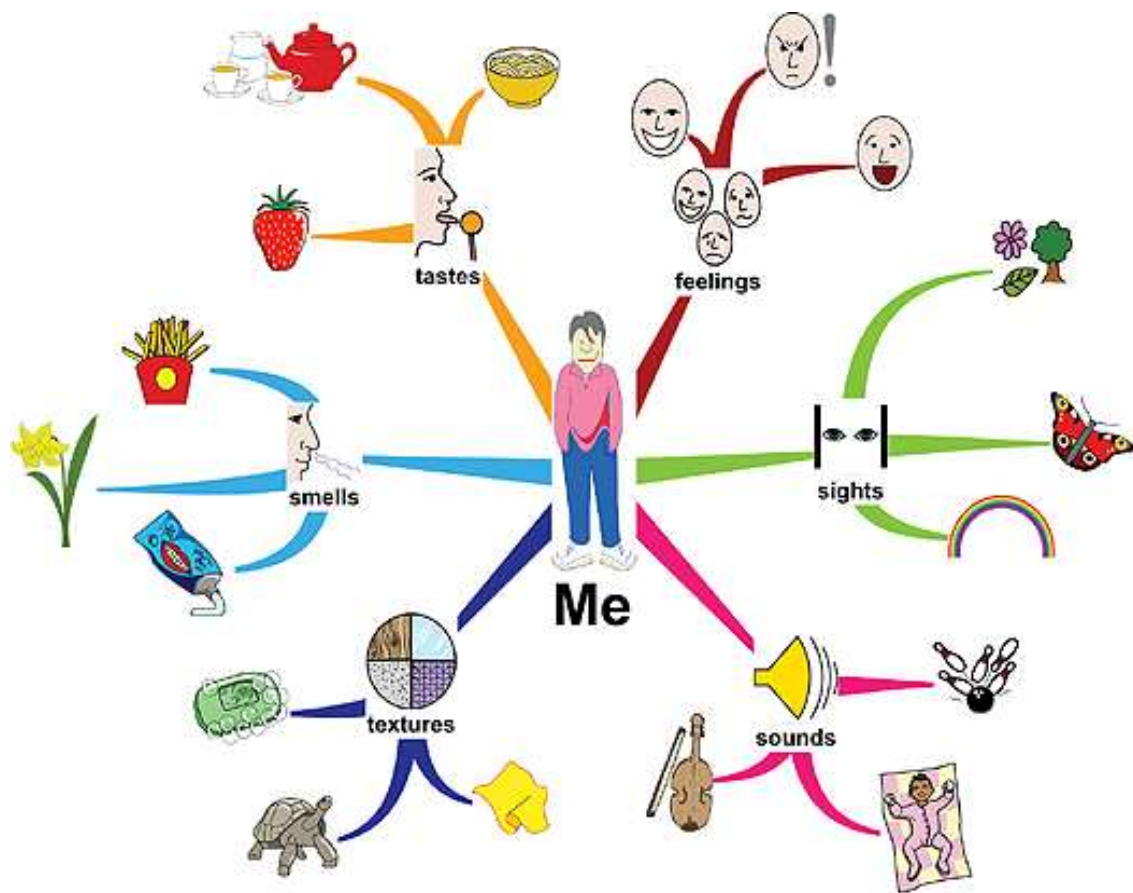
Mind maps have many applications in personal, family, educational, and business situations, including note taking, brainstorming, summarising, revising and general clarifying of thoughts.[4] Mind mapping can also involve images, colours, associations and symbolism. Mind mapping therefore uses both hemispheres (whole brain involvement).

Mind Maps seem to have become popular or more widely known recently (end of 1999), but have been around since the beginning of the '90s. The term "Mind Map" is a registered trademark of the Buzan Organisation, a company owned by the Mind Map inventor Tony Buzan[5].

How to create a Mind Map:
- Take a sheet of paper
- Write the theme/topic of the mind map in the middle of the paper
- Create branches to relations of the topic and try to define structures

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[4] http://en.wikipedia.org/wiki/Mindmapping
[5] http://c2.com/cgi/wiki?MindMap

- Use colours, symbols, pictures and images
- Use key words and as little text as possible

Mind mapping is a very easy technique which helps students to remember more easily. The visual aspect gives the students more insight into a topic and makes correlations clearer. As mentioned before, mind mapping involves the whole brain. It stimulates cooperation between the left and the right hemisphere. Our left hemisphere is mostly used for mathematics, language and analysing. The right hemisphere is used for creative processes. It works with images, colours and shapes.

Education traditionally makes an appeal to the left hemisphere, so a huge part of the brain capacity is not used. Mind mapping is therefore a perfect solution for students having problems in that particularly part of the brain. For example; for some students with dyslexia, mind maps can help to structure information more easily and in this way help them to remember the information.

The Digital University[6] is a cooperation between several universities and colleges in the Netherlands. It focuses on the innovative use of IT within education. There are several methods for the use of concept mapping mentioned on their website. Such as the use of concept maps in history classes.
Students had difficulties with one of the handbooks used in class. The teacher thought it might help to schematise the chapters in a concept map. Students had to make a concept map of every chapter (after a short introduction course on the software). The concept maps were presented and discussed in class. The teacher published the concept maps on the digital learning environment.

The Digital University also describes the use of concept maps for Academic Writing, Business Analyses and other courses. More information can be found on their website. Digital University: www.du.nl

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[6] www.du.nl/conceptmaps

5.3   Second Life

General

Second Life (SL) is an Internet-based virtual world launched in 2003, developed by Linden Research, Inc. It's not seen as a computer game. There are no goals to pursue, nor assignments to be done, there's no visible beginning or ending. It's in fact a simulation of the real world with residents building this world, making it bigger and bigger. The residents can interact with each other, go shopping, go out on a date, study, socialize, participate in individual and group activities, create and trade items (virtual property) and services from one another. If you enter the world for the first time, you first have to choose an *avatar*. This is a 3D character which you're using to exist in the virtual world. You can adjust your character to your wishes, using as much fantasy as you like. Second Life has already more than 7 million inhabitants (users). There are around 320.000 Dutch users on the English version of Second Life and about 44.000 users on the Dutch version (secondlife.nl).

Use in education

A big advantage of Second Life is that it's open 24/7 and accessible from every internet linked computer in the whole world.

Second Life provides a unique and flexible environment for educators interested in distance learning, computer supported cooperative work, simulation, new media studies, and corporate training. Second Life provides an opportunity to use simulation in a safe environment to enhance experiential learning, allowing individuals to practice skills, try new ideas, and learn from their mistakes. Students and Educators can work together in Second Life from anywhere in the world as part of a globally networked virtual classroom environment. Using Second Life as a supplement to traditional classroom environments also provides new opportunities for enriching an existing curriculum.[7]

Looking at visualization, Second Life has almost unlimited possibilities. It's a great place for projects. For instance: students can create their own sculptures and together they can organize an exhibition in a sculpture park or in an art gallery.

Teachers can create anatomical and cellular models. But it can also be used for other situations. If the students are not really used to work with computers, you can also let them watch.

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[7] http://secondlife.com/education

For citizenship courses (social integration courses for immigrants) the teacher can visualize situations from daily life (for example buying a ticket for the train, going shopping or visiting the doctor). He can use video streaming or create the situations in Second Life himself.
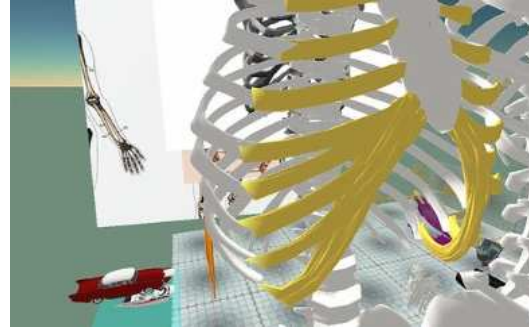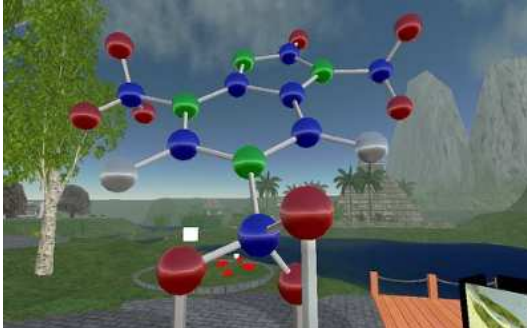
I was not able to find exact examples from Dutch school and universities using Second Life within education. There are several universities (Universiteit van Amsterdam, Universiteit Utrecht) which started a campus on Second Life. Some of them are already using video streaming, but most of them are still doing research on how and in which way Second Life can contribute to the student's learning process. Creating your own space in Second Life is not enough. You have to invest time and energy in it to make it appealing to students, otherwise it will never work. And next to that, you also need special hardware and software at school with which you will be able to run the program.

5.4 E-Portfolio

A dictionary definition for a portfolio is: '*a set of pictures (as drawings or photographs) usually bound in book form or loose in a folder* or *a selection of a student's work (as papers and tests) compiled over a period of time and used for assessing performance or progress.*' An e-portfolio is an electronic format for learners to record their work, their achievements and their goals, to reflect on their learning, and to share and be supported in this. It enables learners to represent the information in different formats and to take the information with them as they move between institutions and/or jobs. Portfolios have been used for recording evidence and work for many years.
However, the "e" in e-portfolios does add significantly to their utility, adding flexibility, ease of sharing, reuse of entries in different presentations for different contexts, portability and different views for different contexts.

An e-portfolio is most often a collection of things produced to share with others: papers, videos, images, presentations, statements, audio records, poems, music and so forth.

The Survey Report produced for the Pellea-project (Socrates Grundtvig 1) provides ample information and references related to the digital portfolio. It can be downloaded from www.pellea.org.

5.5 Digital Whiteboards

A digital blackboard is an interactive whiteboard; a touch screen connected to a beamer and a computer. There are three different kinds of digital blackboards: (1) hard boards; they feel like a normal whiteboard, you can write on the surface with a special pen. (2) soft boards; these boards are pressure sensitive. You can use any object to work on these. (3) boards which make use of ultrasonic infrared technology.

Digital whiteboards are mostly used by primary schools (especially for the first years) but also in lower secondary education. The visual aspect makes it easier for students to cope with a certain problem/issue. Through animation you can visualize subjects like geography (animation on earthquakes, topographical maps of the Netherlands), languages (images of words) or biology (images and animation of the human body). Useful examples can be found on http://www.digitaalschoolbordonderwijs.nl/

6.   Conclusions and Recommendations

Over the last last decennia, communication by means of pictograms, pictures, videos and games has increased substantially in everyday life. In order to get a better insight into visual learning and education, this desk research report has focused on the aspects of visual learning in the area of education in The Netherlands.

With this research we wanted to build upon current findings from both basic skills and acquisition of informal competences in order to find out how the so called "visual learning" makes the process of learning easier. The analysis of the state of art of 'visual learning' in The Netherlands was carried out by means of an internet study and a literature study.

From this desk research we can conclude that visual learning and other visual aspects play an important role in several scientific theories on learning. For this project (focusing on adult education) the theories on different learning styles and multiple intelligences seemed to be the most relevant and important. With respect to research on different learning styles we found that it is recommendable to equip students with the skills associated with every learning style category, regardless of the students' personal preferences, since they will need all of those skills to function effectively as professionals.

The term *learning style* is defined as: *the ways in which an individual characteristically acquires, retains, and retrieves information are collectively termed the individual's learning style.*[8]

So, we may conclude that besides text based information, students should also be thought in other ways, for instance with the help of visual methods in adult education. This is also in line with the multiple intelligence theory of Gardner. According to Gardner it is recommendable for teachers to course instructional methods that appeal to all the intelligences. The spatial intelligence can be described as the intelligence related to pictures and images. It allows people to perceive visual or spatial information and to recreate visual images from memory.

Despite these theories, it should be admitted that in the Dutch educational system little visual information is presented during lessons and most information given is still text based. However, some changes in the direction of a more visual approach can be de-

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[8] R.M. Felder. Learning and Teaching Styles in Foreign and Second Language Education. *Foreign Language Annals, 28*(1), 21-31 (1995).

tected in the Dutch educational system. For instance students' use of digital portfolio's, digital whiteboards in class, the use of second life for educational purposes and also mind mapping are some visual methods we have discussed in this report and that are quite often used on Dutch schools. All in all, we can conclude that a beginning is made, but there is still a lot that can be done to make the Dutch educational system more visually oriented.

7.   Bibliography

 Books

- Buzan, T, *The Mind Map Book*, New York: Penguin, 1991.

- Buzan, T, *Mind Mapping,* Harlow : BBC Active, 2006.

- Hendriksen, J, *Cirkelen rond Kolb*, Soest: H. Nelissen, 2005.

- Kommer, P.A.M, ed., *Cognitive tools for Learning*, Berlin: Springer-Verlag, 1992.

- Svantesson, I, *Mind mapping in de praktijk*, Deventer: Van Loghum Slaterus, 1989.

Electronic references

- M. Alvarez, 2007. *Second Life and School: The Use of Virtual Worlds in High School Education* [online] Available at:
  http://www.trinity.edu/adelwich/worlds/articles/trinity.manny.alvarez.pdf
  [Accessed August, 5th, 2007]

- R.M. Felder. Learning and Teaching Styles In Foreign and Second Language Education. *Foreign Language Annals, 28*(1), 21-31 (1995) [Accessed March 27th, 2007]. Available at:
  http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/FLAnnals.pdf
  [Accessed March 27th, 2007]

- M. Prensky. On the Horizon*.* NCB University Press, Vol. 9 No. 5, October 2001. Available at:
  http://pre2005.flexiblelearning.net.au/projects/resources/Digital_Natives_Digital_Immigrants.pdf
  [Accessed February, 26th , 2007]

Relevant websites

- Digital University: www.du.nl [Accessed February, 26th , 2007]

- Second Life: http://secondlife.com/ [Accessed August, 5th , 2007]

- Second Life and education: http://secondlife.com/education
  [Accessed August, 5th2007]

- E-Portfolio: www.pellea.org [Accessed, February, 26th , 2007]

- Digital Whiteboards (in Dutch only): http://www.digitaalschoolbordonderwijs.nl/
  [Accessed April, 3rd 2007]