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## ENHANCING STUDENT-CENTRIC LEARNING BY BUILDING ON VISUALIZATION

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### Abstract:

The observation that the roles and dynamics are changing within education is central to this paper. It means that students play a more central role in the learning process. In literature several people have already served this. The central observation is that they see a change in the way the so-called net-generation learns and plays. Amongst others it is very notable that visuals play a very important role in communication these days, much more than in the past.

Based on this we set out on a project to investigate these changes, and in what way this can adapt university education and education in general. In a newly initialized project we are looking at the various options available, and test them through real-life educational situations. It is our objective to consider the worth of these different approaches. The result of the research project will be a 'toolbox' of procedures and tools, which can then be used and utilized.

**Keywords:** Visualization, Learning,

### I. INTRODUCTION - "WHAT IS LEARNING"?

Within academia learning is mostly seen as a systematic and sequential process, a process in which developing a logical train of thought is central. Reasoning must be clear, reproducible and traceable; to make sure it can be tested and proven. This is also reflected in the way scientific knowledge is usually shaped. Clearly structured, according to a clear set of rules: (1) why is the subject matter relevant, (2) what is the central question, (3) what is the used flow of reasoning, and (4) which conclusions are reached.

Similarly, traditional teaching is often structured along similar lines (Robinson, 2009). This roughly translates into: Choosing a subject, formulating a learning-goal, studying literature used to define the learning-path. Objective is to help shape the learning process for students. In short, learning is seen as a 'trade' between students and teachers. Which - when done and repeated - will result in increased knowledge - the so called cognitivist approach - or extending our repertoire of possible actions - the behaviorism approach (Abcouwer & Smit 2008). In current times students quite often disagree with this approach. In literature this is quite well documented: for example, students are frequently bored in class (Pryor et al., 2009). Also, in a survey of 211 British university students it was indicated that 59% of the students found lectures boring in at least half of their classes and 30% find most or all of their lectures boring (Mann & Robinson, 2009). The least boring methods were found in seminars, practical sessions, and group discussions, where students could interact and actively participate.

### RECENT CHANGES

In recent years it is becoming increasingly clear that students all have different learning styles. This is clearly observed by several authors (Christensen, 2008, Robinson, 2009). These learning

styles are closely related to the 8 types of intelligence as defined by Gardner (Gardner 1993; Gardner 1999). These different types of intelligences are greatly influencing the learning process.

To better deal with these changes, methods are sought which are based on a student-centric approach, leaving space for and embracing the individual differences, within the context of learning as a group process. One of the solutions is presumed to be project oriented education. However, even in a project orientation the learning goals generally are defined as fixed, yet the road travelled by students will vary.

Recently different authors are investigating these approaches. The learning differences are not solely dependent on different intelligences, but also on student's passion. Robinson (Robinson, 2009) states that drawing upon the individual's student's passion should be the base for successful learning. According to him current learning environments pay to little or no attention to this. Also Christensen observes that in order to connect to learning needs of students schools "need to move away from the monolithic instruction of batches of students", as well as moving away from the mainstream approach of teaching and testing (Christensen, 2008).

## CHANGED LEARNING APPROACHES

Modern technological means give rise to a new approach to learning. As mentioned earlier, learning becomes more and more a group-process – in literature this is called the constructivist approach. Student's input is being actively sought out and used. Another approach goes even further, and assumes that students are part of a network of people with different knowledge, intelligences and passion. Using the input and skills of these participants should be reconsidered – the connectivist approach (Siemens, 2004). In both these approaches improving the quality and richness of communication is of crucial importance for the success of the learning process.

To improve the quality of the communication, these individual differences should be explicitly taken into account, as well as the influence these differences will have on the value of the input of each of the different participants. Within the current educational system these differences hardly play a part. We strongly believe that the method in which students (and teachers) visualize their knowledge is of high importance in settings where groups are sharing their combined knowledge and learning-experiences. This applies so even more in IS-education, where ICT is part of the subject matter. In our daily practice we experience classes where geeks meet with students with a strong business-orientation. Bringing these students together this creates a unique learning opportunity for both.

Our research project will aim to investigate the ways in which the differences in visualizations can be utilized in education, supporting the learning process. It is based on the research of Ivanova who found that by: "Digital Tools: today's students have mastered a large variety of digital tools that are like extensions of their brains" (Ivanova, 2009)

Within these settings it is important that students can find and use any method they feel comfortable with, in order to be able to take advantage of each others knowledge. Combined with the current attitude of "what you can find on the net, you don't need to learn", this gets only reinforced. What you can learn as a group, you don't need to figure out by yourself.

## RESEARCH APPROACH

As these various methods of visualization are so important we started a project "crowd-visualization" to investigate these various methods. In this project we will - in direct interaction with students during several different courses in our IS curriculum - investigate the different possibilities of knowledge visualization. In a second phase we will evaluate the outcomes and usefulness of the different methods of visualization. These findings will be documented and shared, making them available to teachers and students, as well as published.

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