

Exploration of Learner Preferences and their Impact Within a Media Module

Ingo Stengel, Oliver Schneider, and Udo Bleimann

igdv – Centre for Advanced Learning, Media, and Simulation

h_da – University of Applied Sciences Darmstadt

Ingo.Stengel@h-da.de

Abstract: Learner preferences of students have been analysed within two modules that have been given in the department of media using Röll's learner preference model. A qualitative analysis of the results of an online learner preference test based on this model has been conducted. This analysis showed that for the majority of the students the revealed results were valid.

Starting from current methods used by the different learners within the learning process, an aggregation helped to identify the methods and types of content that are predominantly used by students with certain learner preferences.

1 Introduction

In the Faculty of Media students work together to generate ideas and concepts for movies, products, print, as well as digital media and interactive applications. Some of them may have problems when they are confronted with the requirements of tasks in industry. They are able to produce interesting ideas, but they are not always able to address customers' needs.

The students involved in this elective were Bachelor and Master of Arts students. During this elective we address learner preferences in the process of content production for learning material, showing how different people are. This refers to the way they perceive, interact, and use different types of learning material. Students learn to identify correlations between certain learner preferences, and the methods and types of content used during the learning process.

2 Learner preferences

Students have certain preferences when learning. While some of them are more visually oriented, others might need auditive information, or even further types of stimuli to learn best.

Learning styles have been defined by Keefe [Kee79] as the “composite of characteristic

cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment”. All these are set in context with the learning process of students.

Over 70 models [CMHE04a] of learning preferences – sometimes also referred as “learning styles” – have been developed during the years. This is the expression of the fact that researchers do not agree on the ways how to measure learning preferences. Therefore, the existing learning preference models refer to specific abilities. A classification of the existing learning style models can be found in [CMHE04b].

During his work as a mentor of students from social sciences Röll noticed how different students approach problems. Since most of the existing models are addressing only certain abilities, Franz-Josef Röll designed a new learner preference model by analysing the existing models and aggregating them into a new model [Rö05a], pointing out that there also additional factors, e.g. educational background and learning environment, that have an influence.

His learner preference model identifies six different learner preference types [Rö05b]:

- The cognitive rational preference type (analyst) is lead by logic principles. He uses causal thinking and analytic procedures. The most specific abilities are related to abstract, theoretic models and to reflective watching. He needs structure and usually enjoys traditional lectures.
- The pragmatic-experimental preference type (constructor) prefers to active experiment instead of building theoretical models. His main principle is to act. Reflections on conducted actions are of secondary importance. He needs a plan and consequently a step-by-step procedure. Usually, he prefers project-based learning. By needing visual stimuli to learn better, he has good competencies in media.
- The organisational-structural preference type (administrator) needs data and facts. He is working systematically and thus is a good organiser. Sceptical to new ideas, he is always weighing the consequences before acting. While learning he needs instructions, thus he prefers to be supervised instead of self-driven learning.
- The sensory-kinaesthetic preference type (perceiver) is influenced by the perception of his senses. This makes him detail and fact oriented. Due to his imagination, he is able to see many perspectives of a problem. Impressions (audio, visual, kinaesthetic, etc.) support his learning process. He enjoys using case studies.
- The emotional-communicative preference type (communicator) is able to act only if he can recognise the benefit of the action. His actions are influenced by the need of appreciation, emotional preferences and relations. Communication is characterised by listening and talking. The best way of learning is through communication in groups or by dialogs.
- The intuitive-creative preference type (creator) is characterised by spontaneous ideas and visions that lead to intuitive problem solving. “Trial and error” procedures and intuitive comprehensions are used more often than rational thinking. As a learner,

the creator is an individualist who enjoys self-driven learning. Further, he questions established procedures by trying to find new solutions.

For this model a learner preference test has been developed in the lerno-project [Rö05a]. It uses crosschecks to ensure correctly evaluated data. Furthermore the results are referring to learning preferences and not to personality characteristics, although some conclusions on personality characteristics could be drawn.

This test gives, as most of the existing learner preference tests, only hints (positive, neutral, negative) about the characteristic of the learner preferences. For an example of a test please see figure 1.

The learner preference test is used to identify preferences that can be used to improve learning as well as preferences that need to be developed.

3 Activities and learning resources used

For the production of eLearning content the design of the overall module and application of different types of content were addressed.

The content of learning material was designed by using various methods. These methods can be traditional methods that are bound to certain learning theories, like the instructional design method from Gagne [GBW92]. Another possibility is given by methods that allow the use of different approaches belonging to different learning theories, e.g. the method from Kerres [Ker01].

To address a problem, the current tendency goes to the use of a proper methodology independently of its categorisation to a certain learning theory. This was also one of the results of an eLearning workshop at the University of Frankfurt in January 2010.

The methods used were face-2-face learning, eLearning, problem- and project-based learning as well as combinations of these known as blended learning.

The activities that have been taken into consideration include: brain storming, applying the 6 Thinking Hats, mind mapping, step by step approaches, moderation, storytelling, discussions, role play, teaching the group, flash cards, memory cards, tests, field trips, lab style sessions, exploration and experimentation, simulation activities, video training, writing own outlines, drawing concepts, using colour codes, making summaries, using sample assignments, categorising information, applying concepts, exercise and drills, and videoconferences.

The types of content used were: text, pictures, animations, video material, podcasts, screen-cast and recorded lectures. Therefore resources like the learning management platform Moodle including Wikis, Freemind, Camtasia, different Web 2.0 applications and the Adobe Software Package including Dreamweaver, Flash etc. have been used.

4 Outline of the course module and procedure

From the perspective of a trend towards individualisation and lifelong learning, there are two potential ways to improve learning: by taking into account the abilities of the learner and using them to accelerate the learning process on one side and by improving missing abilities on the other side.

In this module the focus lies on making students aware of their learner preferences and on the effects these have on the production of eLearning content.

The methodology used is based on experimental learning and qualitative interviews and group discussions. Produced content and opinions/preferences are gathered and questioned using open questions. The procedure is highly explorative. It is characterised by a qualitative study of theoretical aspects and the process of generation of hypotheses.

The module starts with the following experiment that outlines how different people visualise information. Then they are asked to describe how they learn best and write a short essay about it. To support this, predefined categories are handed out. Then they will proceed by doing the online learner preference test. The results, a learning profile together with the essay, are submitted and anonymised. They will be used to validate the learner preference test.

During the first content production task students will select a topic and produce content taking into account their own learning preferences. The samples of content produced are analysed and discussed in a group. In this step they will be able to identify the implications of learner preferences in the production of content.

After this step they are asked to analyse a set of information consisting of learner profile, essay containing a description of the preferences and the sample. This group work delivers a mapping between learner preference types and the activities performed.

Further, they will find out if the results delivered by the learner preference test show the same tendency as the essay is outlining.

After lectures about the production of content including the possibilities how to use different types of media within the learning content production process, they will have to produce a second sample for a predefined topic and learning profile.

In a final discussion the validity of the learner preference test used and the implications of learner profile in the production of learning content are discussed.

5 Results

5.1 Example of a learning profile and samples of content produced by a student

As an example the learning profile of one of the students involved and the content he produced is presented below.

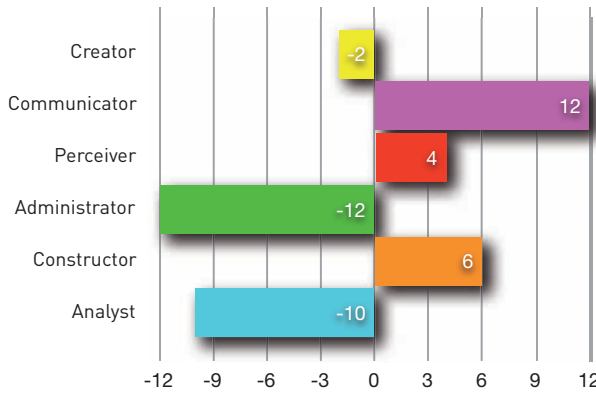


Figure 1: Learner preference profile of a student

This profile is characterised by positive tendencies in the learner preference types: communicator, perceiver and constructor and negative tendencies in the learner preference types: creator, administrator, and analyst.

From our experience:

- The learner preference creator is one of the preferences that is not “hard bound” to any other learner preference. A negative value characterises students that learn best by repeating learning material.
- The positive communicator value indicates toward a student that learns by interacting and communicating. Here a section from its essay: *“Taking a look at how I prepared myself for exams at university, the most important thing were several meetings with a learning group. We met and discussed all the topics that were relevant for the exam.”*
- The positive perceiver tendency is indicating the need of multi sensory experiences during the learning process. *“For my exams I learn with a conclusion of our professor’s slides. On these slides most is just text, but sometimes even visualised through pictures or graphics. If there are no graphics I paint little pictures by myself.”*
- The negative administrator tendency is usually giving a hint that the person is not using diagrams, tables or numbers during learning.
- The positive constructor value points at a learning process that uses exploration and experimentation in the context of a defined focus. *“Beginning a new task I always felt like this was ‘too high’ or ‘too complicated’ for me – but by just starting off [...] it was a thrilling experience.”*
- The negative analyst tendency indicates that the person is not using abstraction during the learning process.

The third element necessary for the analysis was the first content production task. This student developed a game that helps students to learn to identify the countries of Europe, see figure 2.

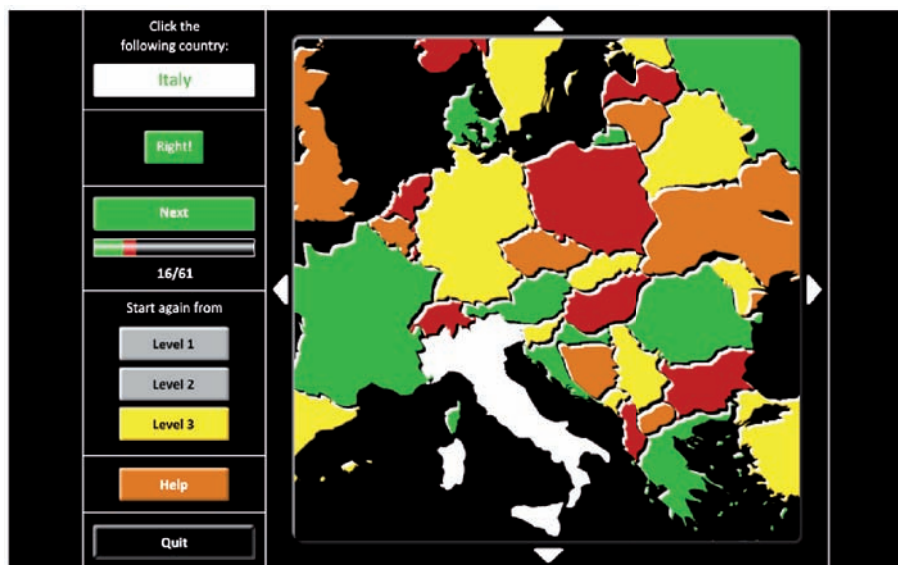


Figure 2: The Game: Countries of Europe

The game is characterised by continuous interaction through questions & answers – typical for a communicator. He needs continuous feedback, here implemented as a right or wrong statement to any action executed by the student.

The game reacts on mistakes questioning the countries that have been not recognised, addressing the need for learning through repetition (negative creator value).

The multiple details and facts as well as the multi sensory experiences (visual, colours) are typical for perceivers.

The learning by doing is characterised by practical experience, by learning through clicking on the countries. This is combined with a clear structure: starting with the basics, clear objectives, what is right or wrong, no grey areas, knowing your position through the progress bar shows the current position during the game, knowing clearly what is done. All these together with the rational, logical, practically oriented approach characterise constructors.

5.2 Findings

The total number of students involved was 30 within two modules given in the year 2008 and 2009. In each module 15 students have participated.

From the data collected using the learner preference test we can conclude:

- Some results of the same person varied since students may respond from different perspectives. One perspective was the current way they perceive learning, while alternatively they confounded it with the way how they would aim to learn.
- A couple of interesting cases have been identified, e.g. the communicator learning preference type also includes students that need to be involved passively in communication. They like to listen without being directly involved.
- The majority of students involved found the learner preference test as valid, since their profiles were fitting the way they learn. A quantitative analysis revealed the following distribution of the results, see figure 3. However, a readjustment of the learner preference analyst is recommended. In very seldom cases the value seems to be too low.

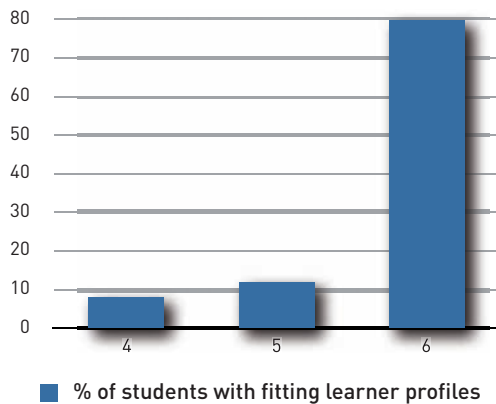


Figure 3: Percentage of students with 4–6 fitting learner preferences

- The results are statistical significant, since a Type I error characterised by the condition $P < 0.05$ was identified.
- The normal distribution of the tendencies in the learner profile contains usually two positive tendencies, two neutral values and two negative tendencies. This confirms the first observations in the lerno-project [Rö05a].
- We found that the isolation of only one learner preference type is possible] the creator. There are interdependencies between the rest of the learner preference types that lead to a restricted number of overall profile types.

- Usually, students are not aware of their learner preferences [Rö05b]. They use methods and contents sometimes instinctively and sometimes based on the results achieved.

As stated in [Pop09] “students with different learning styles have different needs and also different behaviours during the learning process”. During this module students found out that this has direct implications in the development and the production of learning contents and developed a simple mapping.

5.3 Related research

A high amount of learner style models exist. They can be very different, ranging from Neurolinguistic Programming (NLP) [DGBD80] to David Kolb’s model [Kol84] or even to personality based approaches like e.g. the Hausschild/Bambeck model [Hau02].

In [Aye96] it has been confirmed that when implementing learning environments the usage of learner styles leads to an improvement in the learning process.

Later in 2009 in [YG09] the authors affirm that “if the learning style features aren’t determined in the right way [...] the expected results cannot be reached.” In [YG09] a statistic evaluation was done using students from primary school. The learning environment was merely reduced to a class environment. This makes the implementation of learner styles compliant courses a big challenge. Some of the learner styles are hard to address in this environment.

A similar project that supports the use of own capabilities to learn more effectively is the Atlantis project [BSS09]. In this case students are encouraged to “learn their own way”.

6 Further developments

The learner-preferences can also be used to adapt the presentation of content to individual learners. The interactive digital storytelling based Coherence Service is being developed for that task. It provides the ability to merge content created by different persons during runtime. Therefore it uses content-sections that are annotated by context. This may be added explicitly, but most of the mandatory context can be set on the fly. For example, the author’s learner-preferences is a context that must be set. But as it is known to the system because of preceding learner-preferences tests, the authors don’t need to do any additional work [SBPHM09].

Regarding to Röhl’s theory students learn best, if a lecturer has created the content whose learner preferences are close to theirs [Rö05b]. Therefore the coherence service measures the distance of each of the content creator’s learner-preferences with the current content consumer’s learner-preferences. The content section providing the overall nearest learner-preferences is the best fitting content regarding the learning style.

If more than one author has created the content for one topic, this concept also enables the coherence service to explain the same topic from different point of views. Doing this will not repeat the same content-section, but presents the same topic that has been created by another lecturer. This increases the probability of the student understanding the topic, he learns about.

Of course, the learner preferences are not the only criteria for choosing the right content section. Other dependencies and context information as LBS and language are also taken into account. This enables further applications, as location dependence [SBS09] or – for experienced authors – immersive and suspenseful storytelling oriented content presentation.

7 Conclusions

Learner preferences of the students have been analysed within two modules that have been given in the department of media using the Röll model. A qualitative analysis of the results of an online learner preference test based on Röll's learner preference model has been conducted and showed that about 80 % of the students confirmed that the generated learning profiles are fitting. The rest of the students had small divergences regarding their profile (1–2 preferences not fitting). This was due to answering questions from a wrong perspective (how they would like to be) or due to a too low analyst value. This showed that for the majority of the students the revealed results were valid.

Starting from current methods used within the learning process an aggregation helped to identify the methods and types of content that are predominantly used by students with certain learner preferences. A couple of interesting cases have been identified.

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