

New Didactical Models in Open and Online Learning based on Social Media

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Abstract: *In this paper we present a new didactical model for open online learning using social media. Ideas underlying this model are discussed in recent literature. The innovative part of the model is that students are connected and cooperate via a social network of study friends for example via Facebook or Twitter. They inform each other about to be expected study activities, learning experiences, connect each other, cooperate in study activities and take the role of tutor or model for other students. The basic assumption is that the learning activities will be stimulated by collaboration and connection of study peers via social control, role modelling and "presence" in the study network. Special Apps have to be downloaded on phones and computer devices to connect the teaching-learning environment. In this paper we will describe the didactical model, its components and an extensive literature survey.*

Key words: *Didactical models, social media, open and online learning.*

INTRODUCTION

The European Thematic network program ETN FETCH is focussed on future education and training in computing: how to support learning anytime anywhere. Compared to the preceding thematic networks we observe a paradigm shift from a description of the content and curriculum development to a description of the teaching-learning process. The emerging technology of social media enables open and online learning on a large scale. The Massive Open Online Courses (MOOCs) attract thousands of students and social media link students and educational material together.

The project E2 "Digital education for Enhanced Editorial products" [1] developed in the framework of the Lifelong Learning Programme presents an analysis of e-Learning didactic models and methods. The teaching content development is described as the biggest problem. In contrast one of the goals of ETN FETCH is to model the teaching-learning process. First a new didactical model has to be developed around the use of social media, next the content of courses as an implementation of the didactical model.

In "classical" distant learning or e-learning students have access to learning material remote in place and time. Students are involved in individual self-study activities. The introduction of social media in the teaching/learning process, transforms the individual learning process in a group learning process. In this paper we will consider cooperative learning and its social dimensions.

From a recent survey at TUDelft it proves that students communicate via social media and older employees via e-mail or phone. Students report about their daily activities and experiences with friends in their social network. The challenging question is how to transfer this communicative behaviour of students to a network of study-friends and reports about social and private activities to study experiences. In preliminary tests it proves that gifted students are challenged by reports from other students about new ideas, smart solutions of assignments and also get involved in communication. Less gifted students find support in the communication with students about their study problems and are challenged by the positive experiences of others.

To offer a framework to students to communicate and cooperate is not sufficient. Such a network should be founded on an appropriate didactical model and embedded in the teaching-learning process and stimulated by the course material. Didactics is about theorizing learning and teaching. The challenge of a good didactical model is to develop a framework of optimal teaching and learning which is supported and used by teachers and students. Over the years many models have been developed, some of them are new, others blended versions of existing models. In this paper we present a didactical model based on social media which emerged in recent literature. The outline of the paper is as follows. In the next section we present a literature survey, then the didactical

model will be described illustrated with some experiences from the first didactical experiments. Next we present Blackboard Mobile and we end with some conclusions.

LITERATURE SURVEY

In [2] Holmes and Gardner provide an introduction to e-learning , an overview and its applications. They state that most e-learning didactical models are currently centred on the concept of communal constructivism, which include theories of behaviourism, cognitivism ad socio-constructivism together with the contributions of Bruner, Piaget and Vygotsky. In communal constructivism, each member of the community learns with and from each other as well as contributing resources to the learning community. The key-factor is the provision of enhanced communication and the creation of environments within new understandings can be fostered and developed. In recent years constructivism has extended the traditional focus on individual learning to address collaborative and social dimensions of learning.

Pedagogy 2.0 [3,4] integrates Web 2.0 tools that support knowledge sharing, peer-to-peer networking, and access to a global audience with socioconstructivist learning approaches to facilitate greater learner autonomy, agency and personalisation [5]. Friedman and Friedman [6] defined the characteristics of a wide variety of social media technology. They can be summarized by the 5 C's: communication, collaboration, community, creativity, and convergence. In [7] Weiser presents a survey paper on the use of social media in e-learning. The focus is on Web based technologies such as blogs, wikis, online social networking, and virtual worlds. She reports how critical pedagogical aspects as communication, interaction, student engagement and active learning can be realised in distant learning. Facebook is one of the most popular platforms for online social networking. Also the impact of Web 2.0 and social networking tools on education and learning has been researched. Petrovic et al. [8] researched the educational use of Facebook. They conclude that Facebook is an integral and essential part of their social and academic life. They compared Facebook and Moodle as productive online tools for teaching and learning. Selwyn [9] also researched how social networks can support the use of technology in education. But he concludes that despite huge efforts students and faculty make only limited use of computer technology, it is not an integral part of lived "student experience". In his paper he researched how educational technologists can foster a more expansive and empowered use of computer technology within university settings.

Eteokleous et al. [10] examined and evaluated the role, usefulness and value of social networking, with a focus on developing Special Interest Groups within the social networking site Facebook. The paper discusses policies for Facebook integration in higher education. Kop [11] noticed that the rapid developments of Internet and peer-to-peer communication, enables different structures and educational organizations. The use of Web 2.0 technology could facilitate the transformation from an educational model that is structured and controlled by the institution to a model that is adaptive to learners' needs. She researched if it was possible to build learning and teaching models using Web 2.0 tools where learners increasingly take control and share information. Lee et al. [12] researched the possibilities of Web 2.0 to solve the traditional problems in distance learning such as greater sense of presence, community building and participation. The research was focused on three topics: (1) the use of social networks tools to build social presence, (2) how to design and create e-learning activities in distance education, (3) the use of pedagogical strategies to support distance learners. Couros [13] describes the development of an open access, graduate level, educational technology course offered. The idea was to create an open, transparent and networked learning of participants based on recent trends in social media, open source movement and new pedagogies. It proves that the number of non-registered students outperforms the number of registered students by a factor of ten. The course provided insight in the

potential of personal learning networks in open access and distance learning of social network services in the design and implementation of e-learning systems.

According to Schuwer et al. [14] publishing and reusing Open Educational Resources (OER) poses several challenges, such as: how to find suitable OER, how to deal with different formats, how to handle different underlying didactical models, how to assess the quality of OER, availability or absence of open licenses, business models for availability of courses over the years, reward or recognition for lecturers. To describe (open) education, we use the five components open education model (5COE model) of Mulder and Janssen [15]. In this model, three components comprise education on the supply side: learning materials, learning services, and teaching efforts. Two components are on the demand side: the demand from the learner and the demand from the environment (society).

Dalsgaard et al. [16] discusses the potential of social networking within cooperative online education. He states that transparency is a unique feature of social networking. It provides students insight into each other's actions. The authors argue that cooperative learning can be supported by transparency. The authors consider transparency as means to promote affinity to learning community. They consider next to affinity, social presence as an important concept. It is important that students are visible and accessible. The learning system should suggest partners that make cooperation interesting. Dalsgaard argues that the pedagogical potential of social networking is the possibility to create awareness among students. Morten Flate Paulsen [17] researched in online education the combination of individual freedom and flexibility and meaningful cooperation and social unity. Purser et al. [18] report about peer-to-peer learning online, describing the role of cooperative student managed groupings in successful learn-by-MOOC experiences. Towndown [19] presents the concept of quad-blogging and its potential for facilitating and enhancing peer-to-peer learning in higher education, specifically in MOOCs.

The Horizontal report [20] researched social networking as an educational tool. Social interaction and social presence are essential in open and online learning. Social presence is defined as the degree of connection between people within an interaction, or the sense of being there if at a distance [21,22]. They state that the importance of the sense of presence has been established between students perceptions of negative experience such as social isolation and high drop rates in e-learning. Social presence is the critical factor to stimulate the sense of community in online courses. Ho et al. discussed in his paper [Ho] the following research questions: Does the use of a social media tool influence student-to-student collaboration on team projects in an online course? Does the student's perception of social presence change, due to the use of a social media tool as a collaborative tool?

In [7] Weiser presents a survey paper on the use of social media in e-learning. The focus is on Web based technologies such as blogs, wikis, online social networking, and virtual worlds. She reports how critical pedagogical aspects as communication, interaction, student engagement and active learning can be realised in distant learning.

According to Yilmaz [23] 3D virtual world as used in gaming offers learning opportunities. They differ from other learning environments in their similarity to real life and support effective communication and interaction. In most studies on Virtual World and Video Conference are studied based on social presence. Tapsis et al. [24] studied the differences between these two environments. He shows that virtual worlds, contrary to video conferences create a rather compact environment for its users and supports dynamic learning activities.

In [25] Dixon explains the pedagogy behind online courses. He describes the affordances of social media and networks for online Elementary German courses. He states that online courses are similar to their face-to-face counterparts, grounded on the principles of communicative language teaching and learning, but must clearly reveal the

potential of these principles to maximize participation, promote learner autonomy and influence student outcomes when applied to collaborative online learning spaces. Dixon presents examples of digital resources for interaction teacher and students. Online tools such as Wimba Viceboard and Blackboard are used to distribute learning material and for discussions about assignments to encourage "active learning". Facebook groups were used to provide opportunities for students to learn about each other, comment assignments in a casual environment in which most students already feel comfortable. Dixon states that it is possible to create an online learning atmosphere that is at least equal to the experience of language learning in face-to face classroom.

In a theoretical essay Vieira [26] discusses the possibilities of open and distance learning. This new learning platforms enables students who have different forms of cognitive understanding to take part in the learning process. In this way open and distance learning is not only a tool of spreading education but a tool to reach new levels of comprehension and consciousness, reflecting the role of education itself. Lane et al. [27] outlines and characterizes a broad range of activities using media technologies undertaken by the Open University and discusses the impact of open and online learning and open licensing of content on regular Universities. They also discuss the role of different channels and social media technology on "learner journeys". They show how open media support the mission of the Open University.

Lovegrove et al. [28] remark that despite the increase in massive open online courses (MOOCs), evidence about the pedagogy of learning in MOOCs remains limited. They discuss the pedagogy of one small MOOC introducing Higher Education teaching skills and integration of open academic practice as a vital part of professional development of Teachers. Participants were able after finishing the course to navigate the distributed platforms and environments. Experienced MOOCs user served as a role model for less experienced MOOCs learners. The research shows that small task-oriented MOOCs can effectively support professional development of open academic practice.

Heng-Li Yang [29] investigates the effect of social networks on student's performance in online education, as an enhancing mode to traditional face-to-face education or distance education. He tested the impact of social different types of social networks (friendly, advising and adversarial) on students performances. As expected advising network variables are positive related and adversarial variables negatively related with student performance. Advising and adversarial network variables are good determinants for overall academic performance. Friendship network variables are not determinants of students' performance.

Topolovcan [30] shows that teaching and learning methods (social work forms) and communication which can be used in traditional class education can be also implemented in multimedia online distance education. He shows that it shows that students' work and learning in distance online education with new media can be provided by all teaching and learning methods as they can be used in traditional in class teaching and learning.

MODEL

In Fig. 1 we display a classical model of e-learning. There is a focus on developing learning material and distribution via some e-learning environment such as Blackboard. The learning environment is installed, maintained at the University. Only regular students have access to the e-learning environment. The teacher plays a central role as developer of the learning material but also as coordinator and designer of the teaching-learning process.

In Fig. 2 we display our didactical model based on the use of social media in open and online learning. The focus is on communication and cooperation of e-learners. So we assume that the different components are connected and integrated in an e-

Learning environment via a social media framework. In Fig. 3 we display the different composing components and modules of our didactical model. Next we will describe the composing modules and components.

In designing the learning modules the teacher can chose different didactic methods as Web lectures, autonomous learning, practicals, case studies, simulations, reading scientific literature, posing scientific questions, defining problems, problem solving, cooperative learning to model the teaching learning process. All these methods are well known, used in many e-learning courses and facilitate a certain modality of learning. But as stated before, the innovative aspect of our didactical model is a social network of cooperating study-friends. They communicate with each other by sending tweets, information on Facebook or WhatsApp. As shown in Fig. 2, there is a cloud of connecting, interacting students distributed over a huge (worldwide) area. In principle every interested student can have access to the open network and no entrance exams are required. It is assumed that the network filters out students with the expected abilities, motivation and study involvement.

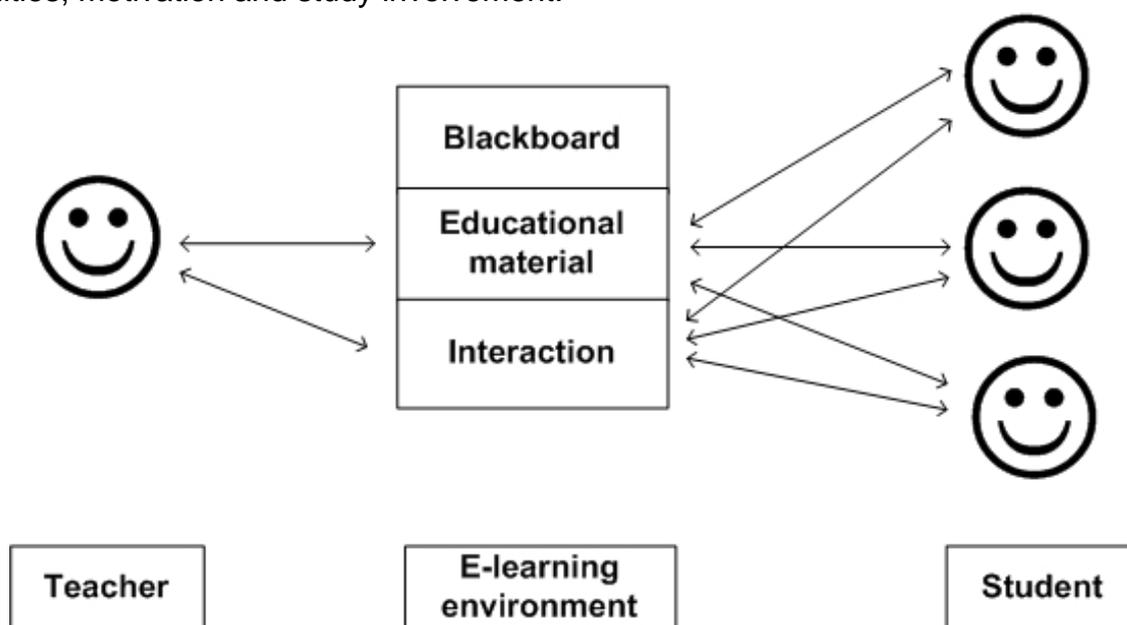


Figure 1: Display of classical didactical model e-learning

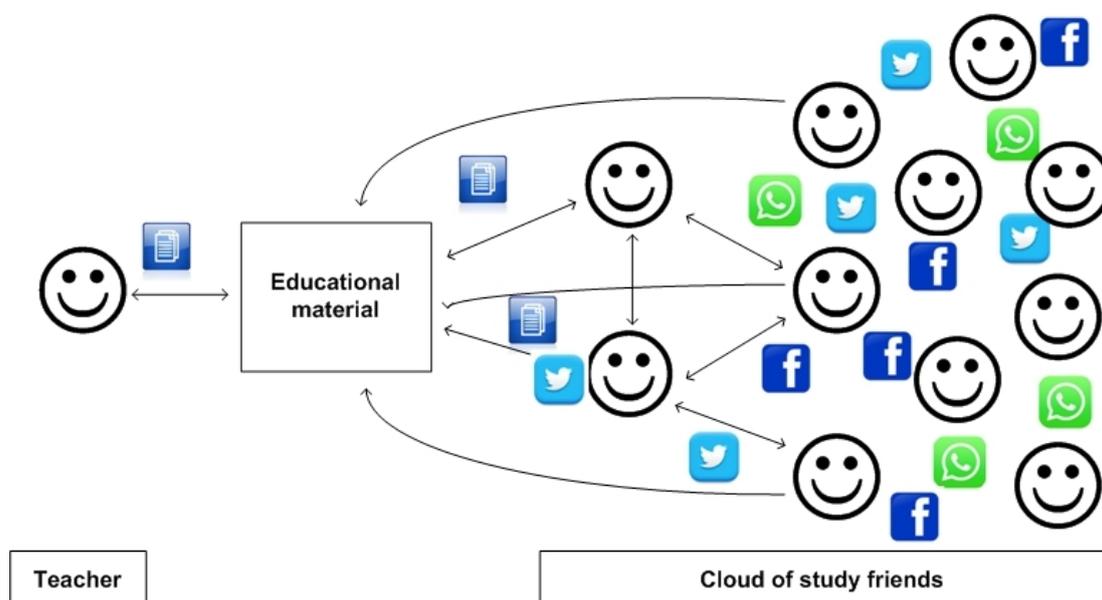


Figure 2: Display of didactical model for open and online learning using social media

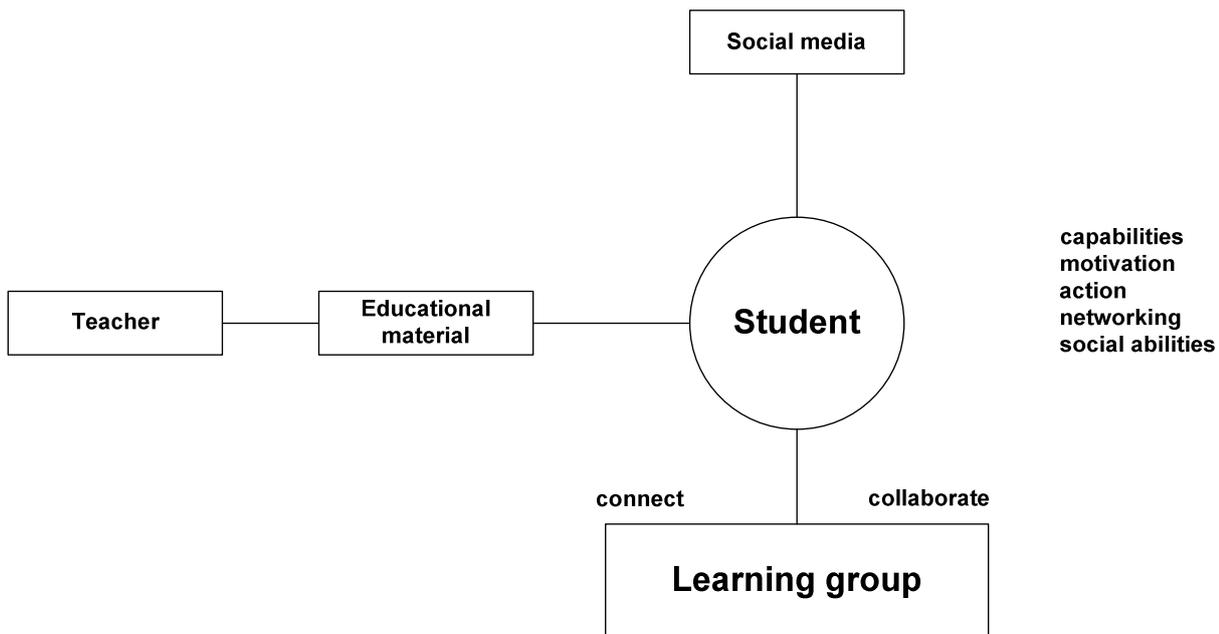


Figure 3: Display of didactical model for open and online learning using social media

We will now discuss the different components of our didactical model in more details.

Teacher. The teacher plays a limited role during the execution of the learning module. But he plays a major role of course in the design of the learning material including the implementation of the didactical model. This learning material should stimulate individual learning activities of students but also stimulate or even force students to participate in the communication in the learning community and to cooperate with other students. We list some examples:

- At regular time students have to add questions or comment to the list of open questions/comments and answering questions of others or giving comment. So it is impossible to take part in the lectures anonymously.
- Students have to solve group assignments with changing roles of participants. In one of our experiments one student was specifying the software, the next has to implement it and the last did the software test or organise a user test. In this way study progress of individuals is assessed and commented by a group of students.

Course-Learning material. There is only one way to learn programming and that is by doing it. So the learning material should include a lot of practicals. In many e-learning courses the learning material is presented via web lectures. This maybe an excellent way of presenting lectures but the default attitude of students is wait and see. We realise that most students view passively TV many hours a day and to become active is not favoured by every student. We present the following examples:

- For many years students were trained to find information in books and manuals. Nowadays if students need some information they pose a question on search engines as Google. Students realise that knowledge is everywhere, distributed and accessible by communication.
- In MOOCs many simulations are used and computer games.
- In some of the MOOCs at TUDelft, web lectures are used and students are requested to elaborate the learning material, sending around private comment or interpretations. This comment is marked in the web lecture visible for other

students. In this way the learning material of the teacher will be extended or enriched by comments of students.

- There are many tools available to add OpenCourseWare to existing courses.

Learning group. Via social media students assigning for a course are connected. Students communicate via Facebook, Twitter or other social media. The group of study-friends is supposed to provide additional information, support by role models, their study-partners. The most attractive part of MOOCs is that students feel worldwide connected. From our first experiences with MOOCs, we give the following examples:

- Students are supposed to communicate about their learning experiences. Positive and negative experiences provide role models for other students. It is important for students to read about the progress of other students but also to read that some other students have similar problems in processing some topics.
- Students are allowed to take the course anytime, anywhere. And in case of MOOCs the group of learners is very heterogeneous. It is assumed that there are many students to have a lively discussion in the learning group over time.
- A peer group matching tool has been developed taking care of needed abilities and personalities and teacher requirements to form groups to do practicals.
- The interaction in the learning groups provides students an identity in a group and a feeling of presence. Social control and interactions with peers increase motivation of students and self-awareness and stimulates study-activities.

Student. To complete any course successfully students are assumed to have the following abilities and characteristics:

- Cognitive abilities. Open online courses have no entrance exams or requirements, but there is of course no guarantee that every student is able to complete a course successfully. Computer science course require mathematical and programming abilities.
- In individual learning, students should have a strong intrinsic motivation and self discipline to complete a course. In network learning a driving learning force is coming from the community. Once students get involved in a network of cooperative leaning it is difficult to drop off or postpone activities.
- Social abilities. From students taking part in an academic study may be expected that they are able to express themselves in in oral and verbal way. But in our model it is also required that students have network abilities. They should be able to take part in social networks as active members. Nowadays it is required from (future) captains of industry or academicians that they are excellent networkers. Our didactical model offers not only training opportunities for networking but it is even required.
- There are three important factors in a students learning model. Students are supposed to have intellectual capabilities, high motivation and they have to come into action. Social control of peer students provide and excellent way to put pressures on students to start their study activities.
- An open online course should be an event in which every student wants to participate.

BLACKBOARD MOBILE

Inspired by the success and possible use of social media in education, many distant learning environments provide now a Mobile Platform. The Blackboard Mobile Learn platform for example gives students and teachers access to their courses, content and organisation on a variety of devices. The following modules are included:

Customization: this tool enables students to improve navigation by colouring favourite courses, highlight announces and blogpost.

Discussions: this is a forum for students and teachers to ask and answers questions.

Grades: via this tool students can update their academic record.

Announcements: teachers can post last minute announcements.

Content: students have access to the content of courses uploaded by their teachers.

Blogs: classmates can read blog post and interact with each other by posting comments and uploading media attachments.

A lot of facilities provided by social media are now also available via Blackboard for example. But there are important differences which have a huge impact:

- Students have no free access to Blackboard. Universities have a license and only regular students have free access. This implies that the University has the control and lead.
- In social media the network of learners is created by the students themselves.
- In case of Blackboard Mobile by the University. Students are used to report freely about their plans, ideas and activities using social media. They are less motivated to do this in networks organised by the University and if teachers play a central role. At the end of course students are graded by the teachers, students realise that it is not so wise to write about their failures, lack of understanding, abilities and time spend to the course.
- The teacher plays an important role in Blackboard Mobile, not only as provider of the teaching material but also as the conductor of the teaching learning process. At this moment Blackboard supports individual learning and Blackboard Mobile is an add-on. To our experience the main disadvantage of tools like Mobile Learning is that it has no underlying didactical model. Students are free to use it or not. And if there is no pressure or beneficial use of these additional tools only a limited part of students will use it and like it.

CONCLUSIONS AND FUTURE WORK

In this paper we presented a didactical model for open and online learning using social media. The model is based on extensive literature search. Similar ideas underlying this model have been proposed by many people. The innovative idea is that there is a paradigm shift from the content and curriculum development of e-learning courses to the process of teaching and education. The current model is inspired by the use of social media by students. Students participating in courses set up a network of study-friends and the characteristic properties of open and online learning are connecting and collaboration. Following a course should be like an event for students similar to music events.

The model has already been implemented in many courses. The application in MOOCs is successful. There are no alternatives for classical e-learning courses with such a huge amount of students. The applications in courses around Web2.0 show mixed results. In regular courses students don't feel the pressure to use social media because many alternatives to meet each other are available. But the same holds for the private use of social media. To our opinion the successful use of social media should be successfully extended to the area of distant learning. But one of the requirements is that teachers have to give up their central coordinating position in the teaching-learning process and use systems not installed and supported by the University. But most important, the used didactical model in teaching and learning should be based on connecting and collaboration. It is assumed that creating the right educational conditions, social networks will merge spontaneously. Students should feel the pressure to connect and collaborate and the network is rewarding them. From evaluation studies of MOOCs at TUDelft it proves that students are proud to be a member of worldwide network providing educational material and network partners of high quality.

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