

# Approaches to Net Based Learning, Experiences with Social Constructivist Pedagogy in a Global Setting

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## **Abstract**

Since the early 1990-ies net based learning has grown from rather primitive distribution of information and learning material, exercises and assignments, through stages of methods and pedagogical approaches. It is now established as serious way to offer new and distributed target groups the opportunity for higher education. This paper presents some of the theoretical background for the implementation of net based learning environments. Special emphasis is on experiences with social constructivist theories and methods, discussing obstacles, challenges and positive feed-back during the past 3-4 years of practice under the auspices of the United Nations University (UNU). Some reflections and ideas are presented for further adaptation of the learning environments, methods and strategy for assisting university staff, particularly in developing countries, to learn about and practice online learning at their home institutions. Central in the presentation are two net based courses on e-teaching, offered through the Global Virtual University, with student groups that mainly consist of university teaching staff and leaders who see the need for going online in order to fill the requirements for higher education in their respective regions. The feed-back from so highly qualified "students" is of great value for further development of net pedagogy and methods.

## **Keywords**

Net based learning, pedagogical approaches, cosntructivist, global.

## **Net based learning**

No doubt, the Information and Communication Technology (ICT) has come to stay and play a central role at all levels of education. Possible benefits from ICT in the learning outcomes, however, depend on pedagogical adaptation and transparent integration of technology and methods into the university learning environments. The use of ICT to offer flexible and net based courses and study programmes is central.

Net based learning environments still seem to be a major challenge in higher education, particularly to well established academic staff. Learning material that includes online lectures, videos, websites, texts and diagrams, exercises and assignments etc. seems scary, and at first sight, less personal. The lack of student contact and collaboration is often mentioned as the most negative side of online teaching. Not so often mentioned, but in reality a strong reason for resistance against net based teaching, is the requirement for detailed planning and advance preparation of material, material that is accessible on the net and open for detailed scrutiny and criticism. Kirkwood & Price (2006) conclude that

. . . the use of [Information and Communication Technologies] necessitates more than simply replicating or supplementing existing teaching practices: everything governing these practices must be reconsidered and reflected upon.

On the other hand, it is also a more flexible situation for tutors and professors, not being bound to a particular location at fixed hours; online tutoring and support may be performed from anywhere in the world as long as you have your pc and access to Internet. And since ICT offers flexible and easier access to higher education for students, particularly in lifelong learning settings, it is gaining in popularity. For many universities ICT support and flexible study programmes are necessary for attracting new students.

To avoid just *replicating and supplementing existing teaching practices* (above), staff and administration need to adjust their visions and methods to include the new options. This may however be like shooting at a moving target, since the technology and its applications are changing rapidly. Continuous developments and improvements of the Internet are opening for changes in net pedagogy. According to Tapscott (n.d.):

The Internet of tomorrow will be as dramatic a change from the Internet of today as today's Internet is from the unconnected, proprietary computing networks of yesterday. The Net continues to soar in reach, power and functionality.

Experiences quoted in the GVVU E-teaching flyer (2007) related to international courses on E-teaching show that pedagogical approach as well as detailed study guides and study calendars are important for the progress of the courses. Time and efforts are required by both tutors and students. When these challenges are overcome, however, it has resulted in lots of positive feedback from the actors. The involved students are mainly teachers and professors at universities, wanting to apply net based learning to groups of students. Relevant pedagogical approaches then come into focus.

### **Pedagogy and methods**

E-learning or net based learning has been developed over the past 10 – 15 years. It was initially a transfer of traditional teaching to new media, e.g. lecture texts, assignments or video on the net. PC and Internet invite for interactions between humans. Collaborative learning soon became a hot topic in R&D circles, with learning communities and peer tutoring. The professor's role should change from a *sage-on-the-stage* to a *guide-on-the-side*. Theories are interesting, but practice has not changed much.

As pointed out by George Siemens (2004),

... behaviorism, cognitivism, and constructivism are the three broad learning theories most often utilized in the creation of instructional environments.

For the past century these learning theories have driven educational pedagogy. With developments and refinements in communication tools for online learning, constructivism has emerged at the close of the 20th century as a key foundation for the creation of online learning environments. (Net Pedagogy Portal, 2006). Learning environments have continuously evolved over centuries and decades, and accelerated with the explosion of online learning in the 1990-ies. Looking at basic pedagogical principles and practicing social contact through the net, have evoked collaboration and peer tutoring. This opens up for learning communities to obtain deeper learning through the construction of new knowledge from already acquired knowledge and inputs from tutors and peers. A *social constructivist method* seems to fit the net based learning environment like hand in a glove.

#### *Constructivist and social constructivist learning*

Bruner's (1960 & 1973) constructivist theory is a general framework for instruction based upon the study of cognition and is linked to child development research (especially Piaget). A major theme in the theoretical framework of Bruner is that learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so (Kerlins). Constructivist theories and methods have been further developed and adapted to different learning environments.

Social constructivism is a variety of cognitive constructivism that emphasizes the collaborative nature of learning. According to the Berkley Graduate Student Instructors' Teaching Resource Centre (Berkley GSI), social constructivism was developed by the post-revolutionary Soviet psychologist, Lev Vygotsky. Vygotsky was a cognitivist, but rejected the assumption made by cognitivists such as Piaget and Perry that it was possible to separate learning from its social context. . . . Vygotsky's theory of social learning has been expanded by contemporary psychologists such as Miller & Dollard, Bandura to mention some.

Derek Wenmoth (2006) provides a diagram (Fig. 1) of the evolution of learning environments related to online tools and technologies, where social constructivism is a theory linked to 'emerging' methods:

**Scope of the online learning environment - OLE**


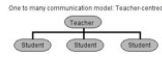
<b>Managing complexity of learning</b> <i>View of Knowledge</i>  <i>Main ideas of knowledge and learning</i> <i>Learning intentions</i> <i>Expressed as...</i>  <i>Dominant technology used</i>	<b>Emergent</b> "Knowledge as a verb" Network-centric <u>Folksonomies</u> Adaptive, dynamic, connected Contextualised, nebulous Learning 'ecologies' (Social, connected, distributed) Personal Learning Environment (PLE)	<b>Established</b> "Knowledge as a noun" Subject divisions/Hierarchical Taxonomies Structured, controlled, managed Clear objectives, outcomes Course model Learning management system (LMS)	
<b>Dominant theories of learning</b>	<u>Connectivism</u> Social constructivism	Constructivism <u>Behaviourism</u>  <u>Cognitivism</u>	
<b>Pedagogical focus</b>	Learner-centric Learner choice/management Activity-based, experiential Focus on participation/collaboration	Institutional focus Teacher managed Organization of classes, courses Focus on coverage, content delivery	
<b>Communications model</b>	Many to many 	One to many  <small>One to many communication model: Teacher-centred</small>	
<b>Technologies (for example)</b>	ELGG Flickr Del-icio-us    Peer to peer options, eg: Frappr.                      Colloquia Etc                              Groove	<u>KnowledgeNet</u> <u>Mindspring</u> <u>Moodle</u> , Interact LAMS, CECIL Etc.	<u>Blackboard</u> <u>WebCT</u>
<b>Hosting</b>	Range of hosting options – incl. server-based, hosted, (remote or local) and local PC or personal appliance based for peer to peer networks. Needs to include consideration of mobile technologies.		

Figure 1. Scope of Online Learning Environment (Derek Wenmoth, 2006)

## UNU – GUV project background

Based on outcomes and experiences from several projects and initiatives during the past decades, the UNU-GUV was established in 2002, along with the development of models in the MENU project in 2001-03. Pedagogical approaches were not particularly in focus of the MENU models, but were discussed among staff of UNU-GUV and the collaborating institutions.

Our findings presented in this paper originate from courses where this method is both the main learning approach and a central learning objective. The two courses, E-teaching 1 (E-t 1) and E-teaching 2 (E-t 2), are both offered by the United Nations University - Global Virtual University (UNU-GUV), in collaboration with two Norwegian universities, University of Agder (UiA) and Stord/Haugesund University College (HSH).

## Goals and means

Major goals for UNU-GUV activities are to reach out to developing countries, supporting sustainable development in general and in particular to promote efficient and flexible access to higher education. As part of this GUV coordinated the development of master programmes on sustainable development, and a common agreement was reached to apply a social constructivist learning approach as part of guidelines for most courses and programmes offered within the UNU-GUV partnership. In order to involve the staff at partner institutions in the authoring and tutoring processes of the courses, both the methods and the theoretical background had to be introduced and learned.

For this to take place, education on and the necessary training in the use of ICT and net based learning seem natural. The above mentioned E-teaching courses have been gradually developed over 12 years. The present structure of E-teaching 1, actually originates from the EU-funded project MENU (MENU), and has been run six times with only minor adjustments. E-teaching 2 in the present version, was planned and developed during 2006 and the first students were admitted in January 2007.

The most relevant way to reach a target group spread over 2 – 3 continents, was to offer net based courses that both taught and practiced the agreed methods, i.e. *learning by doing*. From previous projects there already existed a relevant course called PiOL, Pedagogy in Open Learning (Ask & Haugen 1999). This was first up-dated according to recent findings and theoretical views, now called POL, Pedagogy for Online Learning – the online tutor course (Ask & Haugen 2006), and later, in 2006, re-composed into two separate courses, E-teaching 1 (E-t 1) for tutors and E-teaching 2 (E-t 2) for online course developers and managers, each of them awarding 10 credits (ECTS) at master level on completion.

## Technological challenges

The lack of infrastructure and access to modern technology is often argued against this strategy for offering higher education to the huge masses in Asia, Africa and the Middle East. Different agencies, open universities and other interested parties have rather offered decentralised courses and study programmes, exchange programmes etc. instead of net based study programmes. Statistics now show, however, that the situation is changing drastically:

WORLD INTERNET USAGE AND POPULATION STATISTICS						
World Regions	Population (2007 Est.)	Population % of World	Internet Usage, Latest Data	% Population ( Penetration )	Usage % of World	Usage of Growth 2000-07
Africa	941,249,130	14.2 %	44,234,240	4.7 %	3.5 %	879.8 %
Asia	3,735,439,436	56.5 %	461,703,143	12.4 %	36.7 %	303.9 %
Europe	801,821,187	12.1 %	343,787,434	42.9 %	27.4%	227.1 %
Middle East	192,755,045	2.7 %	33,510,500	17.4 %	2.7 %	920.2 %
North America	334,659,631	5.1 %	237,168,545	70.9 %	18.9%	119.4 %
Latin Am/Carib	569,133,474	8.6 %	116,847,600	20.5 %	9.3 %	546.7 %
Oceania / Austr	33,568,225	0.5 %	19,243,921	57.3 %	1.5 %	152.6 %
WORLD TOTAL	6,608,626,128	100.0 %	1,256,495,383	19.0 %	100.0 %	248.1 %

**Figure 2 Internet statistics** ([Internet World Stats](#))

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Nowhere in the world is the *usage growth* as high as in the so-called developing countries, in Africa, Middle East, Asia and Latin America. It is thus reason to believe that within few years' time access to Internet will be rather widespread also in the developing world. Therefore, preparing the present staff at universities and schools in these regions for the new learning arenas may be of particular value to future needs and activities. It could be a way of overcoming the enormous requirements for education without spending most of available capital on campus constructions, buildings and centralised facilities. The E-teaching courses managed by UNU-GVU intend to qualify the teaching staff for entering the new learning scenarios. The required technology and infrastructure will then develop and spread in its own right, as part of business and industrial needs, more or less independent of the educational applications. Academics should be prepared to exploit the potential once it is there.

## Experiences

The E-teaching courses are announced through the UNU-GVU and the UNU homepages on the WWW, as well as by the cooperating and accrediting institutions in Norway, Stord/Haugesund University College (HSH) and University of Agder (UiA). Students are recruited from all over the world, mainly academics working at universities, teaching staff and educators who wanted to go online with their learning offers.

## Practical arrangements

The learning management system (LMS), Fronter, has been used as a platform for the course activities. This LMS gives the tutors the possibility to follow up e.g how often the students are logged on, how

many documents they have read, their contributions etc. In addition, both students and tutors use the asynchronous, threaded discussion forum as their main working area. The students are also partly working in groups on the net, a fact that implies that they have to discuss different tasks, negotiate meanings and hand in joint reports.

Data is collected from students' self evaluation, from reflection notes after each module and from summative evaluation of the courses. The analysis is based on these reports; students own comments and observed activities on the LMS.

### **Obstacles to overcome – reasons for drop-outs**

The interest and intentions of the applicants were great, but for some of the students there really have been obstacles.

#### *Pressure of time*

Since the courses are meant for part time students, they are stretched over one academic semester although the workload is estimated to only 10 credits, i.e. just one third of a semester. This was done in order to meet the fact that most of the students are working full time. But even though they plan and manage to set aside time for studying, the job or family situation may suddenly change so that they are unable to continue. Pressure of time has been one of the main reasons for dropping out. Some of the students did not realize that they had to be logged on the LMS quite often in order to contribute and cooperate with their peers. Part time online studies are often looked upon as studies where you can study at your own pace. It sometimes feels a bit odd for grownup people to be forced to work together and negotiate meanings with students they do not know.

#### *Infrastructure*

Infrastructure can sometimes be a problem, especially in developing countries where Internet access might be unstable and the bandwidth is low. Some of our students e.g. in Uganda, Tanzania, Malawi have had bad experiences in this regard. In Uganda and Tanzania the electric power could be gone for several days and the students had no possibility to log on and collaborate. One of our students, living in Malawi, did not have access to Internet either at home or at job, but had to go by bus for an hour to find an Internet café where she could get access to the net. Since the courses were stretched out in time and the fact that each student receives a CD-ROM with the learning materials that can be particularly time-consuming to download, infrastructural difficulties were solved. No students actually had to drop out because of the infrastructure. The only exception we have had is the student that suddenly because of bad climate condition had to go to his coffee-field in order to save the harvest. This took more than one month with hard work and no Internet access was available there. He did not have the guts to catch up afterwards.

#### *Economy*

The courses are priced at US\$ 1000, a fact that seemed hard to some students, especially from the developing countries. A bursary fund was established in order to help the students that were worst off. They could get from 25% till 75% of the cost covered from the bursary. This arrangement helped many to overcome an economic obstacle, but there were still students who claimed that they could not even afford to pay 25% the fee. These students never really started on the course, and they can hardly be counted as drop-outs, rather persons that were interested but could not afford to pay US\$ 250. In the most recent E-teaching 1 course 7 students out of 12 that had been offered 75% waiver, did never show up on the net.

#### *Command of English, work load and course content*

Courses using English as the working language can be a challenge for students who do not have English as their mother tongue. Being able to read, write and discuss in an academic way may be too difficult for some of them and cause much extra work. Using an asynchronous discussion forum gives students better time to formulate their meanings, compared to e.g. chat or even a physical class room situation. But even if this helps, some candidates just disappear from the courses. Last semester (autumn 2007) 2 students out of 24 applicants at one of the courses, just disappeared after a while without giving any reason, and their contributions were weak. They might have found it too difficult to contribute in a foreign language.

It is interesting to notice that 2 students in one of the courses who were teachers in primary schools, really found it hard to compose a course themselves. They argued that they were not used to develop course content from scratch; they were used to printed text books and could make their lessons based on already structured material. But they completed the course, and afterwards concluded that it had been a tough exercise, but very rewarding and a useful experience for future practice.

All in all, it is generally a challenge to go online internationally, lots of obstacles must be overcome, but if we succeed in paving a way, the results are good and comments from the students are positive

### **Positive feed-back**

For the organisers and tutors of the e-teaching courses the general impression is that the 'students', i.e. professors and teachers, in general have been very satisfied with the new skills and knowledge achieved during the course periods. Despite the hard times with lots of work, far more than the estimated 300 hrs, most of them feel that the courses have opened a new world of learning to them. They express great beliefs in the social constructivist, online learning environment and methods, and have visions of promoting their views and new knowledge to colleagues and their own students.

Some of the feedback from the students has been overwhelming, way beyond what has been experienced through years of "normal" university teaching. Some examples uttered spontaneously, may prove this point.

Sverrir Þorhallsson (Thorhallsson in Engl.) from Iceland is a Chemical Engineer by profession and sometimes lectures at the United Nations University Geothermal Training Programme UNU-GTP. He now would like to augment the lectures with on-line courseware and collaboration and in time may be produce a stand-alone course. He therefore joined the E-teaching 1 course, and reflected upon the experience this way:

I have been putting some of the pedagogical things I learned in this course to a test. . . What I especially like to tell you about is the „constructivist“ elements I added to the United Nations University Geothermal Training Programme this month. The 21 fellows have just completed one month of intensive lectures. Mine lasted for one week, and I augmented my usual „instructivist“ lectures with „constructivist“ homework for the first time. I urged the fellows to collaborate and learn from each other – to take the „constructivist challenge“. They took to this like the fish to the water! The lights were burning late in the study room during this period and I got very positive feedback from this experiment.  
(E-teaching flyer)

Sunday Philip Udeochu, is a principal programme officer, Small and Medium Enterprises Development Agency, Nigeria, and joined the e-teaching 1 course January – May 2007:

The positive social climate and attitude within the group made the whole learning episode a worthwhile one. In fact at a point the whole thing became addictive. I couldn't help logging in several times in a day. Academically, I can self-direct, plan, set personal learning goals and actively engage in group activities. (E-teaching flyer)

Sabrina Heerema-Agostino, Thunder Bay, Canada, completed the E-teaching 1 course in 2006 and then entered the E-teaching 2 course in February 2007:

I think it is a very interesting way of learning and I truly believe that becoming a competent e-tutor will benefit my career and especially the lives of those that I work with. E-education is very important! I have to say that I honestly enjoyed it, learned a lot, and had so much fun. A major part of what made it so interesting and enjoyable for me is that I had such a diverse group of classmates-each with very different personalities and learning/working styles! My classmates were from India, Peru, Kenya, Spain, Sweden, Norway, Nigeria, and Malaysia among others. (E-teaching flyer)

Comments like these are of course encouraging. We should also bear in mind that the E-teaching courses are purely online, no physical sessions, so the students have never met in real life. The high level of activity on the net and the positive comments seem to contradict several reports claiming that activity on the net is hard to maintain throughout courses. Here we have observed some students with more than 1500 visits each on the course LMS during a period of about 15 weeks, in other words more than 100 log-ons per week! Reading the contributions of others has of course been the most frequent activity, but all have contributed with own documents and discussions inputs, some with more than 100 documents. The average is of course lower, around 300-350 log-ons and 30 own documents.

What is the key to the expressed success and apparent student satisfaction in the E-teaching courses? Four central facts may explain part of this:

- 1 Detailed planning and transparent structure of the courses; Course Description and Course Calendar
- 2 A detailed outline of activities that are expected; Study Guide
- 3 Close attention and incitements by course leaders and tutors
- 4 A reasonably small, International group of students; 10 – 25, all with academic background

Closer analysis of these facts has led to some preliminary conclusions.

## Conclusions

The course planning and structure originates from the MENU model, but is further developed and elaborated in the GVU setting. The structured forms for course description, study guide and course calendar are used both in the E-teaching courses and in the master programmes through UNU-GVU. An example of the one of these forms, the course description for the E-t 1 course, can be seen at the UNU-GVU web site (UNU-GVU course). The Study Guide is an even more important document for the students. It details for each course the objectives, tasks, activities, resources and estimated working hours for every module, and normally ends up with a series of questions for reflection after completing the work. A course calendar sets the dates for the different modules, hand-ins and discussion periods.

In addition to this initial structure and documentation, the course leader and tutors have to be active with comments, incitements, follow-up when some students are not actively contributing to discussions, group work etc. This scaffolding of the learning process may be the real key to success for the student group. The tutors' ability to communicate and to be aware of pitfalls, being available and respond promptly is of outermost importance.

One reason for the positive comments and reactions from students may be due to the relatively small and, in one sense, uniform student groups who are all academics at some level and are interested in net based learning. It is uncertain whether the diversity in cultures and mother tongues is a positive or a negative factor in the development of the learning community. It is tempting to see it as an asset, a fact that creates interest and engagement among the students.

Will it be possible to expand and generalise these findings? It still needs to be investigated if the cultural differences in these highly international groups are enforcing or hampering the activity. And will it show the same effects in more complex study programmes, or is it easier to keep up in single courses like E-teaching 1 & 2? There are still questions to look closer into.

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