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INSTANT ONLINE COMMUNITIES FOR IMPROVING PERCEIVED LEARNING
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TIIVISTELMÄ

Internetiä käytetään kasvavassa määrin kommunikointiin. Internetissä yhteisöjä muodostuu jaettujen kiinnostusten ja näkemysten ympärille, toisin kuin perinteiset, sijaintiin perustuvat yhteisöt. Tämä siirtymä kohti verkkoyhteisöjä on vaikuttanut myös oppimisyhteisöihin, jotka ovat oppijoiden muodostamia yhteisöjä.

Yliopistoissa oppimisverkkoyhteisöjä käytetään sekä tukemaan perinteisiä opintojaksoja että tarjoamaan kokonaan verkossa toimivia opintojaksoja, joita opiskelijat voivat suorittaa ilman tarvetta olla fyysisesti kampuksella. Nykyiset verkko-oppimisessa käytetyt ratkaisut eivät kuitenkaan hyödynnä kaikkia verkkoyhteisöiden mahdollisuuksia. Useilla opintojaksoilla on käytössä vain verkkosivu, joka tarjoaa opiskelijoille kurssin keskeiset tiedot. Verkkosivua käyttää suuri osa kurssin opiskelijoista, mutta se ei tarjoa mahdollisuuksia opiskelijoiden vuorovaikutukselle.

Pikaverkkoyhteisöt tarjoavat kevyen ratkaisun luoda verkkosivulla vierailevien käyttäjien välille mahdollisuus vuorovaikutukseen. Tätä ajatusta voidaan käyttää myös opintojaksojen verkkosivuilla luomaan oppimisverkkoyhteisölle mahdollisuus vuorovaikutukseen. Kun opiskelijat saapuvat verkkosivulle, he tulevat siten tietoisiksi verkkoyhteisön olemassaolosta ja itsestään sen jäsenenä, ja voivat kommunikoida muiden yhteisön jäsenten kanssa. Näin voidaan tukea sosiaalista läsnäoloa ja siten parantaa opiskelijoiden kurssilla kokemaa oppimista.

Tässä tutkimuksessa käytiin aluksi läpi kirjallisuutta ja tutkimuksia liittyen verkkoyhteisöihin ja verkko-oppimiseen, sisältäen pikaverkkoyhteisön käsitteeseen tutustumisen, oppimisyhteisöiden teorian ja periaatteet joihin oppimisen tukeminen oppimisverkkoyhteisöiden avulla yliopiston opintojaksoilla perustuu. Tämän jälkeen tutustuttiin tarkemmin pikaverkkoyhteisöiden ominaisuuksiin. Teoriaan ja ominaisuuksiin pohjautuen esiteltiin ajatus helposta oppimisverkkoyhteisöstä ja sen keskeisimmistä ominaisuuksista. Opiskelijoiden keskuudessa tehtiin selvitys heidän asenteista ja odotuksista siitä, miten tällainen idea voisi parantaa heidän oppimista. Selvityksen tulokset yhdistettiin aiemmin esiteltyihin ominaisuuksiin ja muodostettiin ehdotus helpon oppimisverkkoyhteisön tärkeimmistä ominaisuuksista ja sellaisen käyttöönotosta. Lisäksi nostettiin esille tärkeimpiä avoimia kysymyksiä ja aiheita tulevalle tutkimukselle.

Helpon oppimisverkkoyhteisön keskeisimmiksi käsitteiksi todettiin tietoisuus verkkoyhteisöstä, toisista opiskelijoista ja opintojakson ohjaajista sekä vuorovaikutus keskustelulla. Opintojakson ohjaajan läsnäolo havaittiin erityisen tärkeäksi. Myös tarve sekä synkroniselle että asynkroniselle keskustelumahdollisuudelle nousi esiin.

ABSTRACT

The Internet is increasingly used as a medium for communication. On the Internet, communities are forming around shared ideas, in contrast to former, location-based communities. Transition towards these online communities has also affected learning communities that are formed around learners such as university students.

In universities, online learning communities are used both for supporting traditional courses and to offer courses that students can complete online, without the need to physically go to the university campus. However, current solutions for online learning do not fully utilize the potential of online communities. In many courses, there is only a website that offers essential information. It is accessed by a large percent of the students, but the website has minimal or no support for interaction.

Instant online communities offer a lightweight solution for establishing interaction support for a group of visitors of a website. This idea can be used to enable interaction support for online learning communities in a course website. The students become aware of the online learning community they belong to when they access the course website, and they can communicate with other members of the community. This fosters social presence among the students, and thus improves their perceived learning in the course.

In this study, first the literature and research behind online communities and online learning was briefly reviewed. This included studying the concept of instant online communities, learning communities, and how online learning communities can support learning in university courses. Secondly, features of instant online communities were more thoughtfully examined. Based on these, an idea of instant online learning communities was described with the features it should support. Thirdly, a group of students was inquired in order to find out their attitudes and expectations on how the idea could support them in learning. Finally, a proposal for features and establishment of an instant online learning community was constructed.

Central aspects of an instant online learning community were found to be awareness of other students and the instructor, and discussion as a form of interaction. Presence of the instructor was found to have an important role. Also a need for both synchronous and asynchronous discussion was clear. With several issues still left open, a need for further study is acknowledged.

CONTENTS

1.   INTRODUCTION

Online communities are a form of social interaction that is becoming more and more important in numerous fields of science, business, educations and lifestyle. Unlike traditional location-based communities, they form around common interests or shared ideas of people around the globe, who interact using a service that supports the community. This is possible because of the Internet providing us with means to break the limits of physical proximity. With various pros and cons, online communities habiting the Internet have certainly become one of the natural ways people communicate today. This can be seen from the immensely growing popularity of social network sites such as Facebook. These sites offer online visibility to the underlying social network and ways to communicate and share information among communities.

Instant online communities are a new way to enhance a traditional web page with a functionality of an online community. The idea behind them is to transform an already existing group of visitors into an online community by establishing awareness of the community membership and by enabling communication and visibility of the community.

On the Internet, people are often given an opportunity to share the content they create in an online community or traditional website to another online community. Instant online communities take this idea even further and make it possible to bring content into the community from outside the service automatically, employing technique called content syndication. As the content of the online community is no more limited to what is created by the members using a specific service, this technique is causing the boundaries of online communities to become fuzzy.

Besides social network sites that usually focus on friend connections and socialization, there is a wide range of other online communities for various purposes. One of these purposes is learning. For over two decades, there has been growing amount of research on online learning communities that would make distant learning possible and support traditional education. Online learning communities support learning through collaboration, social activities and peer support. Successful use of online learning communities calls for transition in technology, teaching methods and policies of educational institutes. Although the technology is improved fairly well, it is still rarely used to its fullest.

Many different collaboration tools are used for online learning, and nowadays most of these use world-wide web as their platform. Integrating instant online community into these websites used by learners, an online learning community with support for

social activity could be created. Online presence of both other students and instructors could improve students' perceived learning and satisfaction.

There is a large body of research on online learning and establishment of online learning environments. This study does not attempt to bring all this research together, but rather focus on the issues that are essential to instant online communities and their usage in online learning. In particular, this study concentrates on the role of social presence.

Aim of the literature review in chapter 2 is to form a very basic concept of instant online learning communities (IOLC) and to define its key factors in improving perceived learning. Common features of instant online communities are examined in chapter 3, after which the central features to support the key factors of IOLCs are determined. In chapter 4, user data is gathered using role-playing method with students of Tampere University of Technology. This inquiry is used for acquiring data on how the students would use the features of instant online learning community if given the possibility, and how the theory-based conclusions match with the ideas of the students

The thesis concludes with presenting the central features of IOLC, defined in the third chapter and improved by the results of the student inquiry in the fourth chapter. This preliminary description of IOLC can be used as a starting point for establishing online learning communities. In particular, it can be used in university courses that do not yet have support for such communities but do use internet to deliver information in, for example, a website. IOLC can also be used to enhance learning environments that have inadequate support for community interaction. The conclusion includes assesses the study and suggest future research objectives to extend and improve the idea of instant online learning communities.

2. THEORETICAL BACKGROUND

Community has earlier been a term defining a group of individuals primarily based on physical features such as location and size. Along the development of transportation and telecommunication, this kind of definitions of community has become less useful, and emphasis in defining modern communities has moved on to relationships between individuals (Preece 2001). The Internet as a medium for telecommunication provides various ways to create and support these relationships. Therefore it is an ideal base for communities not restricted to physical location. Perhaps more importantly, it can be used to support formerly location-based communities by enabling individuals to keep in touch with the community when physically disconnected from it (Ellison et al. 2007).

This chapter provides research background and theoretical justification for this study. The reader is given necessary insight for understanding following chapters and grounds for the conclusions and proposals presented.

Section 2.1 of this chapter explains the concept *online community*. It includes defining, developing and evaluating online communities and their success factors. Instant online communities as a way to support online communities and the concepts of awareness and social presence are also introduced. In section 2.2, *online learning communities* are investigated. Aspects that are discussed include communal aspect of learning, combining definition of online learning and online communities, online learning software, factors that affect learning online and online community establishment in educational environment. The section also explains the relation between social presence and perceived learning. The chapter is summarized in section 2.3, which also clarifies the objectives of this study.

2.1. Internet as a Platform for Communities

In the early stages of online communities, it was feared that using computers to communicate would cause seclusion and alienation from the "real" world (Rheingold 1993, p. 14; Wellman 1997, p. 8). Rheingold notices that virtual communities need more than "words on a screen" to avoing being just an ersatz, an inferior substitute for communities communicating face-to-face, and attention must also be paid to pitfalls such as obsessive use of computer mediated communication. However, he points out that people use the Net as a medium for genuine human interaction too. Wellman empasizes that communities are already sparsely-knit regardless the way they communicate, and also virtual communities sustain in-person encounters. The existense of emotional support and the sense of belonging was also noted by Hilz and Wellman (1997) in the context of online learning.

In 1985, a system called WELL (Whole Earth 'Lectronic Link) was established to form a network of users using dial-in connections. WELL is a still active online conferencing system and discussion forum (The WELL 2010). At the early years of WELL, the term online community was not yet established, but WELL can nevertheless be considered to be the pioneering online community according to current definitions. Along with his experiences of WELL, Rheingold (1993) describes the Net at the time as *"loosely interconnected computer networks that use [computer-mediated communication] technology to link people around the world into public discussion"*, and *virtual communities* as *"social aggregations that emerge from the Net when enough people carry on those public discussions long enough [...] to form webs of personal relationships in cyberspace."* Whereas WELL had its influence on the development of online communities, Rheingold's definition acted as a base for definitions that are widely used today by for example Preece (2001) and Lee et.al. (2003, according to Iriberri & Leroy 2009).

In the first wave of online communities research, which was initiated by advances in the availability and ease of use in communication technology, the impacts of the Internet use on individuals and society was studied. The research started from the Rheingold's introduction of the term 'virtual community' in 1993. Focus of this first wave of research was on social aggregations, identity, social networks and social and collective actions. (Iriberri & Leroy 2009, pp. 4-8.)

Since the Internet has become a part of everyday life of billions of people, online communities have drawn more attention among both users and researchers. In the following waves of online community research, focus shifted to analyzing value of community-created content to business organizations, to members' relationships and attachments, and most recently to members needs, development and implementation of supporting tools, online communities' new purposes and outcome assessment. Disciplines liable for each shift were management researchers, psychology researchers and information systems researchers, respectively. The last wave also integrated previous perspectives, developed working definitions and initiated more controlled empirical study of online communities. (Ibid, pp. 5-7.)

The number of online communities is growing gradually, but only a part of them grows in number of members, while others have only little participation or eventually die out completely (Boyd & Ellison 2007; Iriberri & Leroy 2009). It is therefore important to have tools to analyze and evaluate communities, including definitions of the factors of online community success, which can be used to build and maintain lively communities promote their purpose. This was also the focus in the latter years of the fourth and last wave of online community research (Iriberri & Leroy 2009, p. 7).

2.1.1. Definition of Online Communities

As seen from the previous paragraphs, scholarship behind online communities is relatively young and involves many diverging perspectives. Focus can be for example in social relations, roles and activities of individuals or software that supports the

community. This has led to various definitions for the term online community, with some differences according to the perspective.

One widely used definition of online communities is the one from Lee et al. (2003, according to Iriberri & Leroy 2009, p. 3). After comparing nine previous definitions, they have produced their working definition that reflects the online communities' complex nature and underline cyberspace, information and communication technology, member-driven content, members' interaction, and relationship formation as components of online communities that should be subject for further study. From each of these components can be derived the disciplines that concern online communities, which are computer science, information systems, management, sociology and psychology, respectively. (Iriberri & Leroy 2009.) Although this definition is versatile and takes into account the different perspectives, it is found to be too restrictive for this study, as the aim is a more general view of online communities.

De Souza and Preece (2004) define online community broadly as *"a group of people, who come together for a purpose online, and who are governed by norms and polices."* This definition encourages considering both social and technological issues, and applies to communities regardless of the existence of physical presence of the community. Focus of this definition is on the three components, namely

- people
- purpose
- policies.

People are the users of the software, who form the online community. In other words, they are the members of the community. *Purpose* is an interest, need, information, service or support that is shared among the community members. It is the reason for the members to belong to the community. *Policies* consist of the language and protocols that guide people's interaction inside the community. Policies also affect the development of social norms and "folklore and rituals" of the community. (de Souza & Preece 2004, pp. 1-2; Preece 2001, pp. 4-5.) In this study, this definition of online communities is applied since it suits well online communities used in learning, as these communities can be either based on physical approximity or online-originated. It also allows to examine both technological and social issues, and provides guidelines for establishing successful online community.

In addition to the definition above, de Souza and Preece (2004) and Preece (2001) define two factors that affect the quality and success of online communities. People, purpose and policies, and how they are supported by the online community, contribute to the *sociability* factor. The other factor is *usability* that is dependent on the software that the online community is supported by. While usability is concerned with the interface between single user and the computer, sociability has focus on user-to-user social interaction. (De Souza & Preece 2004, pp. 2; Preece 2001, p. 4.)

2.1.2. Online Community Software

Online communities build on software supporting the purpose and policies of the community. Software is not necessarily a single program or website, but a collection of programs and systems that members of the online community can use. Software defines the human-computer interface for a single user, and therefore defines the *usability* of the online community, which is the one of the two main factors in online community quality. Software also shapes all human activity involving people, purpose and policies. This means that the activities are carried out using the software. It must therefore match the sociability requirements of the whole community. The policies devised inside the community itself must also be represented by the software, and therefore must be taken into account when designing the software. Policies also change as the community evolves, which must also be considered in the design of the software. (de Souza and Preece 2004, pp. 2-3.)

Although the policies of online communities are supported by the software, it does not define the policies. Software only enables the community to define its own policies in a best possible way. The decisions concerning policies must be made prior to the software design, so that the design is flexible enough to support intended sociability. (De Souza & Preece 2004.)

Social network sites (SNSs) are one type of software build to support online social activity. According to definition by Boyd and Ellison (2007), social network site is a web-based service that allows users to construct a public or semi-public *profile* of oneself, articulate social *connections* to other users of the site and provides users means to traverse through these connections. While the definition for online communities by de Souza and Preece (2004) is about the people and their relationships, Boyd's and Ellison's definition of social network sites concentrate more on the software and how it supports the community and actions of individuals. Social network site is in a way a representation of the online community or communities it supports. While the word 'networking' is sometimes used instead of 'network' as in social networking sites, it is in most cases somewhat misleading. 'Networking' emphasizes creating new relationships, while the primary practice on many, though not all, of the sites is more or less maintaining relationships initiated elsewhere. (Boyd & Ellison 2007.)

There are some massively popular SNSs in the World Wide Web today. Facebook reports to have more than 400 million active users with over 50 percent of the number logging in each day (Facebook statistics 2010). MySpace has approximately 200 million users (Ribeiro et al. 2010). While these sites definitely have an impact on the social activities in the Internet, there are some important differences between them and traditional online communities. Firstly, SNSs are primarily organized around the user, and the user is positioned in the center of the community. More precisely, the emphasis is on social connections of the individual, not the community, and there may or may not be an actual community behind the site. Secondly, public profiles and publicly articulated social connections, necessary to a SNS by definition, are not in any way a

requirement for an online community according to the definition by de Souza and Preece (2004). (cf. Boyd & Ellison 2007.)

Iriberri and Leroy (2009, p. 12), who describe social networking sites as online communities with a single purpose of social relationship creation and maintenance, point out that SNSs with their growing popularity seemed at one point to supersede traditional online communities of interest. However, recently developers of SNSs are also promoting *vertical social networks*, which are social networks concentrated around similar personal interests of members within the social networking service. Resemblance to traditional online communities with shared interest is clear, with the distinction of taking advantage of the improved technology for interaction and information exchange developed for the SNSs. (Iriberri & Leroy 2009.)

The significance of Social network sites for this study is therefore more technological than theoretical. Multimedia, Web 2.0 technologies such as social bookmarking and photo and video sharing, and detailed profiles are some of the features of SNSs (Iriberri & Leroy 2009) that users would probably be expecting from any modern online community software. This issue is examined more closely in chapter 3, where the features and technologies of online communities and SNSs are explained.

Another aspect of the online community software is the limitations it sets for the community it functions online. No matter how sophisticated the software is, it causes subtle but crucial changes in the regulations of the community. The software must be able to, for example, identify who is a member of the community, whereas in face-to-face communication this data might only exist in the memories of the community members. While these technological issues might not always be directly visible to the members, they could be sensed by them as lack of flexibility or loss of spontaneity when using the software. (Silva et al. 2003.)

2.1.3. Instant Online Communities

Instant online communities can be seen as a type of online community software, but in a more abstract level, they are an idea to support online communities independent of a single website, with considerable ease. In their introducing article, Kindsmüller et al. (2009) describe instant online communities (IOC) as a service that *"instantly enables social interaction for online communities."* This means that the community that already exists as a group of visitors of a website is provided with visibility, awareness and means of interaction. In other words, it enables and supports the community composed of the page's visitors as an online community. (Kindsmüller et al. 2009.)

Kindsmüller et al. define two classes of goals in producer recipient interaction that instant online communities tries to address. Producer is the one providing the content the website offers, while recipient is the visitor of the site. Goals of content providers are communicating with visitors, gathering feedback from them, provide support for them, and increase loyalty and stickiness. Visior goals include knowing who others are online, interacting and communicating with others with the site content as a shared interest, giving feedback to the producer, and expressing loyalty. (Kindsmüller et al.

2009.) Although these goals show some basic needs of the community members, it is obvious that more specific goals their emphasis differ considerably depending on the type, domain and the purpose of the community (Preece 2001, p. 11). In the section 2.2 of this chapter, the specific goals and needs of online learning communities are examined, with the speculations of how instant online communities could be used to address them.

Defining feature of an instant online community is that it establishes the awareness of being a member of a community. A precondition for this and therefore for using instant online communities is that there already exists a community. The community is in a form of shared 'virtual place', a website, with a number of visitors compromising the community's members. In fact, not just a whole website but any content on the web that is consumed by a group of visitors can be seen as a community (Marathe 1999). However, visitors of a website may not know anything about the other visitors or about being involved in a community. Kindsmüller et al. (2009) denote that such communities exist only virtually and not in fact. Providing visitors with awareness information enables the community to become factual online community. The awareness information allows members to see other users' online activity and content they have contributed to the community. (Kindsmüller et al. 2009.)

One technique associated with instant online communities is *content syndication*. Hammersley (2003) describes content syndication by saying that it makes *"site's content available for use by other services."* The content is contained in a *feed* that can consist of both content itsef and metadata about the content. Services can offer feed of desired part of the service's content using common technologies and allowing users to experienece the site on devices of their choise and to be notified of updates in multiple services at once. (Hammersley 2003.)

Many online communities use content syndication and feeds, and some social network sites use them as a central concept of the design of the software. This is an issue of interface and functionality design rather than technological solution. Users are provided with a feed-like view to the actions that takes place in the social network, most recent actions on the top. According to Kirkpatrick (2007), this trend was initiated by Facebook and it's News Feed in 2007, which also popularized the concept of syndication and feeds in general.

Content syndication in a form of a feed is available in instant online communities. But more interestingly, content can also be aggregated from different sources. Media resources from remote content providers such as Flickr, YouTube and Twitter can be made accessible through the instant online community. Using matching tags, desired content can be automatically fetched and displayed as a part of the content of the instant online community. This kind of *content aggregation* can be used to generate awareness of the general web activity about any subjects that interest the community. (Cf. Kindsmüller et al. 2009.)

Instant online communities use content syndication and aggregation for sending and receiving content in feeds, but they also provide also a *backchannel* for responses

members create to the syndicated content. Through the backchannel a response that is made to a syndicated content in the instant online community is also shown to users in the original context. This way the response can be recognized by the user that originally created the content inspite of that the user may not be aware of the fact that the response is created using a different service. (Ibid.)

A fundamental aspect of IOC and content syndication is that they make community boundaries fuzzy. Currently online communities usually concentrate on one service, be it a multi interest platform like Facebook or Twitter, or a special interest website that supports the community in some way. Community membership is therefore defined by identifying a specific group of people using the same technical carrier system. This is no longer case if instant online communities and content aggragation is used to gather the content created by the members of the community. (Ibid.)

Online communities spreading beyond one specific system cause a paradigm shift in online community services. As the system is no longer limiting the reach of the community, it can spread thorough the Internet using multiple services to support the same community. This is even more encouraged by the backchannel feature of instant online communities. The community is then truly concentrated on the shared common subject, the purpose of the community. There can be any number of websites supporting the community, in addition to multi interest platforms that can be used to provide more functionality and connections. Shared common subject in relation to services supporting it is described in **Figure 2.1**. (Ibid.)
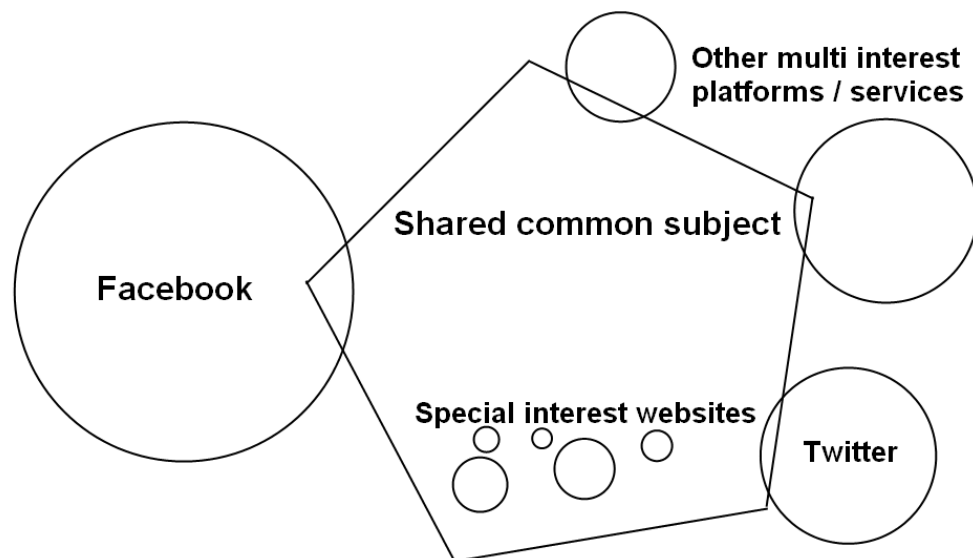

Figure 2.1. Shared common subject and system boundaries, adapted from Kindsmüller et al. 2009, p. 70.

One significant benefit of instant online communities is the ease of with what an online community can be enabled, in other words, deployed into the website. This is due the separation of IOC service and the hosting website it is used in. The service provides

all the functionality for the community and all that is needed to enable the community is to integrate the service into the website (Kindsmüller et al. 2009).

How the integration is done depends on the IOC service. There are various ways for providing integration, which are more closely discussed in the next chapter. However, independent of the implementation, there is a tradeoff to be made between ease and depth of the integration. If the integration of the instant online community into the hosting website is very basic, it may lack visibility and diminish the benefits of the online community (Kindsmüller et al. 2009, p. 68). Deeper integration can be done if it is supported by the service, but even in that case it requires at least a little more effort.

Although the term instant online community is introduced for the first time by Kindsmüller, Milz and Schmidt in 2009, the idea of providing similar service does have some other implementations too. Similar ideas can also be found from the most popular content management systems WordPress, Joomla! and Drupal (Shreves 2008). The implementations and their differences, including the ones offered with the content management systems, are more closely examined with instant online community features in chapter 3.

2.1.4. Sociability and Usability in Online Communities

Sociability of the online community is determined by how well the three key components, people, purpose and policies, are supported. This considers development of the software, but also the decisions that are made prior and during the establishment of the online community. Decisions that are made by community developers set the initial sociability. Later the community itself gradually establishes the social norms and policies during its evolution. (Preece 2001, pp. 4-5.)

Key issues of sociability that designers must address include keeping discussion on-topic, encouraging reciprocity, enabling development of peoples own identities, supporting shared understanding, and protecting privacy. Reciprocity means that participants give back to the community in addition to advantaging from it in order to avoid social dilemmas. These issues are relevant to both individuals and the community. Their importance varies between communities according to the community profile, stage of the community's development, the size of the community and the culture that has developed in the community. (de Souza and Preece 2004.)

Research on usability is more established and well utilized in system design compared to sociability. Usability issues for online communities are similar to any web-based software (for usability in web, see e.g. Nielsen 1999). There are however some particularly important usability components that concern how the software works as a medium between users and as a place for social interaction. Also the development of new technologies such as different kinds of online community software has challenged traditional usability paradigms. (Ibid.)

Usability design can affect the community impacting conviviality, efficiency, effectiveness and the satisfaction that the members feel about belonging to the community. Conviviality includes how the members of the community communicate,

how they react to each other and what kind of behavior occurs. This can be affected by usability for example in cases where bad design leads to unintended or unwanted behavior. Efficiency is the easiness and quickness of achieving operational tasks including communicating. It is essential to take efficiency into account as users will do the task off-line if it is more efficient way to do it. Effectiveness is how well the activities of the community members are performed and does the software support working effectively. Satisfaction consists of many factors and is related to how well the purpose of the community is fulfilled. (de Souza & Preece 2004.)

De Souza and Preece (2004) propose *sociability first* as a design principle to encourage designers to focus on the social needs before deciding on the software design. The decisions that define sociability must be made first, and then decide on how to communicate the developed policy to community members. Software and usability is designed according to and after these decisions. The way the sociability principles are communicated to members brings usability and sociability of the online community together. (de Souza & Preece 2004.)

As there are numerous different types of online communities, also the importance of different sociability and usability aspects differs according to the type and domain of the community. Educational communities tend to be goal-directed and more controlled, putting more emphasis on collaborative working than social chitchat. There is also higher tolerance for argumentation and debates in academic communities compared to communities offering social support. These differences have direct impact on sociability and usability requirements, and therefore measures to provide information about domain-specific needs are needed. While the existence of different communities for different purpose is somewhat obvious, there are differences between communities with same purpose too. Also these differences must be recognized to successfully determine the community needs. (Preece 2001.)

2.1.5. Awareness and Social Presence

As the word *awareness* is highly elastic and ambiguous, also the concept of awareness in computer-supported cooperative work is being used in contradicting ways among researchers, to the extent that it is hardly a concept anymore. The term becomes meaningful only when referring to a person's awareness of something. It is not a category of mental state, independent of action, but an integrated aspect of practice. It is therefore necessary to express the intended object of awareness when discussing about the concept. (Schmidt 2002.)

In computer-supported collaboration, awareness is considered to comprise various issues on the subject that the collaborators need to be assured that their counterparts are 'there'. They need to know what tools and resources other collaborators can access; what relevant information they know; what do they expect; what are their attitudes and goals; how they evaluate joint outcomes; what is their focus of attention and action during collaborative work; how their views evolve over time. Considering these issues,

awareness has been divided into *social awareness*, *action awareness*, *workspace awareness* and *situation awareness*. (Carroll et al. 2006.)

Social presence, initially defined by Short, Williams and Christie as the *"degree of salience of the other person in the (mediated) interaction and the consequent salience of the interpersonal relationships"* (1976, according to Richardson & Swan 2003), can be interpreted more simply as *"the degree to which a person is perceived as 'real' in mediated communication"* (Richardson & Swan 2003, p. 70). It is found to be not just an attribute of the communication medium, but also a factor of the communicators and their presence in a sequence of interactions (Gunawardena & Zittle 1997, according to Richardson & Swan, 2003). Social presence can be seen as a subconcept of awareness of another person (Rettie 2003), which can in turn be seen as a part of social awareness.

In examination of interaction, social presence can also be defined with more simplicity. Especially in online learning, it can refer simply to sense of being and belonging and the ability to interact. Although this definition has more emphasis on the individual, it also takes into the account the factor of the medium, as the medium clearly affects the ability to interact. It should also be noted that because social presence is a perception, it varies between individuals and across time, and can also be situational. (Picciano 2002.) In other words, social presence is affected by factors such as the individuals attributes and situation at given moment, including used hardware, the surrounding people and the place, time of the day and year.

The definitions in this section are not a comprehensive review of research on awareness and social presence. There is a lack of consensus in literature considering usage of the terms, with a bunch of related concepts such as *connectedness* (Rettie 2003), *immediacy* (e.g. Roivai 2002) and *sense of community* (ibid). It is therefore not a simple task to combine results of various different studies on these concepts. For this reason and for the sake of simplicity, social presence is used in this study as a general concept to refer immediacy, sense of belonging and sense of community, and ability to interact considering the medium and the communicators.

One form of social presence is self-presentations of community members. In social network sites, individuals in the social network are presented by profiles. These profiles are a public presentation of the member. Typical information in a profile of a SNS member contains personal data such as age, location, interest, and in most sites also a profile photo. Some sites also allow modifying the profile's look and feel by colors and media elements. (cf. Boyd & Ellison 2007.) Profiles are a fundamental way to promote social presence in almost any type of online community, often enhanced with various status indicators that in a very basic form show if the member is online or not.

As mentioned earlier, a key component of instant online communities is to establish awareness of being a member of a community (Kindsmüller et al. 2009). This can be seen as a part of social awareness. Assuming that the other members of the community are in any degree perceived as real through the IOC, it can be derived that the use of IOC adds to social presence on the part of communication medium. It improves ability to interact and fosters immediacy behavior. Based on this, it is postulated in this study

that <u>instant online communities foster social presence</u>, when compared to the website with no support for social presence.

2.2. Online Learning Communities

2.2.1. Online Learning

The Internet has been increasingly used to support education and learning. It is used to support alternative teaching methods alongside traditional classroom teaching, but it also makes possible to create distinct learning systems that do not have certain physical place or time for the class to assemble. Therefore the Internet has an important role especially in distant education, providing medium for communication when face-to-face meetings are not an option. Nowadays online learning is becoming integrated part of both distance and on-campus learning, with many advantages over traditional learning. (cf. Quan-Haase 2005; Kazmer & Haythornthwaite 2005.)

Learning can be divided into three different types. *Formal learning* is education in an institution, leading to a diploma or other qualification. *Non-formal* learning takes place alongside main education system and does not aim for a formalized certificate, but it is however an activity which has a purpose of learning. *Informal learning*, on the other hand, is not necessarily intentional. It is learning as a natural part of everyday life, which contributing to the increasing knowledge and skills of individuals. (European Comission 2000.) This study focuses on online learning communities in educational institutes, and therefore clearly emphasizes formal learning. Also the potential of informal learning taking place in chat rooms and other less formal communication channels is worth noting.

It is important to see the difference between distant learning and hybrid, supplemental online learning. Latter is also referred as mixed-mode or web-enhanced (Picciano 2002). While much research that exists on primarily distant learning gives a good idea of what is needed in both of the cases, there are some major differences that should be taken into account. The first and the most obvious one is the distance. As online learning is used to enable learning even if there is no possibility for the learners to meet face-to-face, the online learning environment is supposedly the only place where the members interact with each other. This is of course not the case in all solely online courses, as there may be an opportunity for meeting as a group, previous relationships between members, or simply not that much distance. But in hybrid courses, on the other hand, there are face-to-face meetings on more or less regular basis. Therefore they have the existing classroom community regardless of the existence of online learning environment, although going online certainly affects the community. Most distant learning has to cope with the difficulty of forming new relationships using computer-mediated communication, while the research indicates that online environments are more suitable for maintaining than initiating relationships in both latter (Ellison et al. 2007) and former (Koku et al. 2001) half of the past decade.

Online learning raises new questions and challenges for both technology and methods of education. The teaching methods used in offline classes cannot and should not be directly applied to online teaching. When using online learning and offline, on-campus classes together, it affects the offline teaching methods too. Distinguishing learning and teaching is becoming less evident in online learning, as the students become active learners that are less dependent on teacher or instructor. (cf. Quan-Haase 2005; Kazmer & Haythornthwaite 2005.)

Freedom of learning in any place any time brings different situations and surroundings into the picture. There are much more chances for disturbance when the location of learning can be about anything from home to work, kitchens to coffee shops, and buses in between (cf. Kazmer & Haythornthwaite 2005). These issues are most relevant when designing usability, but they may also have some effects on sociability. As a simle example, users could be more reluctant to send messages to the community when accessing it in a public, crowded places such as buses.

2.2.2. Learning Communities

Learning community is a concept based on the idea that all human learning has a social nature. This idea is commonly attributed to Dewey (1938, according to Kilpatrick et al. 2003), although there are studies that discover similar philosophies from the first century A.D. or as far as ancient Athens and Plato (Longworth 2002). Being one of the most discussed concepts in higher education at the end of twentieth century, the definition of learning communities has continued to evolve along with the changing needs of learners and new dilemmas in education. (Kilpatrick et al. 2003, pp. 3-4.)

There are two main uses for the concept of learning communities in literature. The first focuses on the development of the community through synergy of individuals, where the community is based on geographical location or shared interests. The second has focus on learning of a pre-determined curricular content, and it is more used in educational settings (e.g. Hiltz & Wellman 1997; Sheard 2004; Quan-Haase 2005). The second use also emphasizes individual learning over collective benefits and knowledge sharing. It could be described as 'learning in a community', in contrast to 'learning as a community'. Common themes in both of the uses include: common or shared purpose, interests or location; collaboration and learning; respect for diversity; and enhanced potential and outcomes. (Ibid, pp. 3-5.)

According to the definition of learning communities proposed by Kilpatrick et al. (2003), *"[l]earning communities are made up of people who share a common purpose."* Furthermore, these communities *"collaborate to draw on individual strengths, respect a variety of perspectives, and actively promote learning opportunities."* As an outcome of collaboration, a vibrant, synergistic environment is created, members' potentials are enhanced and a possibility to create new knowledge is formed. This definition is adopted in this study for its suitability with the definition for online communities, making it straightforward to define online learning communities.

Moreover, it is well suited for but not restricted to the educational context used in this study.

Collaborating, working together (co-labor) is the basis of learning communities. Whipple (1987, according to Hiltz 1988), for example, emphasizes that education is not just "pouring" information from teachers to students. Knowledge is built through interaction between the contributors when they exchange information and understand each other, he specifies. Many different names has been used for collaborative learning, including the terms 'team learning', 'peer-group learning' and 'syndicates'. They all have the same pedagocical approach that learning involves presenting ideas to others and receiving feedback. (Hiltz 1988.)

It should be noted that the definition for learning communities is independent of the instance or instances of the community. In particular, it can be applied to traditional or online communities, to different levels of education, and to formal and non-formal learning. As it is stated in the definition that it actively promotes learning, a community with informal learning as the only form of learning does not fit the definition. This does not, however, cancel out the possibility of informal learning taking place in a learning community. In fact, it is most likely that informal learning occurs in learning communities as it rather inseparable part of life (European Comission 2000).

2.2.3. Defining Online Learning Communities

Having defined online communities, online learning and learning communities, a definition for *online learning communities* can be derived from them in a very straightforward way. Thus, in this study the term online learning community stands for an online community that is also a learning community utilizing online learning, according to the definitions presented. Although there are existing definitions for online learning communities, they are relatively new and not yet widely established. Therefore, using one would diminish the value of defining online communities and learning communities separately. The benefit of these two definitions is the ability to address issues from both of these aspects. Online communities bring forth, as previously examined, the basic needs of any community that is supported by software utilizing telecommunication; namely sociability and usability. Learning communities, on the other hand, focus on the educational and social issues in learning as a community. These issues are more closely discussed in this latter section of the theoretical background.

Another perspective in online learning communities is computer supported learning in general. It brings a third aspect to the concept, emphasizing the usage of computers and computer networks to assist learners in the learning process. While the previous two aspects focus on the community, the third one concentrates on how the Internet and going online affects learning. Although this aspect is with no doubt a major factor in the quality of online learning communities, it is outside the main focus of this study that has emphasis on the effects of community awareness on learning.

Cuthell (2002, according to Sheard 2004) states, that online learning communities are both dependent on the online technology and a result of it. He defines an online

learning community as s social structure providing students with opportunities to meet and interact with others that share the same interests. Supporting interaction between students is based on the concept of learning community, and to the assumption that it will ultimately lead to better learning results. Studies show that social presence has a positive impact on perceived learning in online learning communities (e.g. Richardson & Swan 2003; Picciano 2002).

Online learning takes place in an online learning environment, a collection of software that is built for or adopted to the function of learning. Although these environments usually include some cooperative functionality, in which case they are often called CSCL (computer supported collaborative or cooperative learning) environments, they also include individual side of learning in a form of learning materials, exercises, links to external materials and such. In this study, online learning environments offer a basis for comparison and clarification of the main issues that exists in current environments. One of the goals of this study is to offer such environments a lightweight but decent support for learning community, not just cooperation.

2.2.4. Online Learning Community Software

The function of online learning community software is to provide interface for online learning individually and as a community, and to support sociability of the underlying community. It has to consider usability issues of both the community and learning tools it offers. These issues are partly distinct, and can therefore be developed separately. However, the cooperative functionality of the software does concern both community issues and learning issues, as cooperation means that a number of learners, that is members of the community, do some task working together. The software must then support both the task functionality and the interaction that can be anything between task-relevant and formal to social chitchat.

One of the first online systems for communal education purpose was Virtual Classroom, a piece of software for *"asynchronous group-oriented learning process for distance education"* used in New Jersey Institute of Technology from the year 1986 (Hiltz & Turoff 1990). It enabled students of the university to participate in several courses fully or partially online, using dial-in connections. Computer-mediated communication systems had been used for learning purposes previously, but Virtual Classroom differed from these by specifically designing the software to support group-oriented educational process and by evaluating the learning outcomes. (Hiltz 1988; Hiltz & Turoff 1990.)

The key aspect of Virtual Classroom was asynchronous communication. Unlike traditional classes, participants could use the system at any time and at the pace that was the most convenient for them. This different kind of interaction took some time to get used to by students, but was recognized as the single most important factor in the environment. In addition to enabling students to participate regardless of their schedule, it gave students possibility to take just the time they needed to read the material without having to adapt to pace of others. (Hiltz & Turoff 1990.)

Interaction support can be seen as the most relevant aspect of online learning community software in the context of awareness and social presence. The software provides community members the medium to interact, which directly affects social presence.

2.2.5. Interaction and Social Presence in Online Learning Communities

Interaction is evidently an important component of building a learning community (e.g. Picciano 2002; Roivai 2002; Richardson & Swan 2003; Suh et al. 2005). This leads to the fact that support for interaction is a key feature in online learning community software. But interaction is a very broad concept, and it must be further examined to identify the most relevant types of interaction in these communities and how they can be supported.

The terms interaction and communication are very often used interchangeably in literature. The difference, if any, is that communication refers to a tangible instance of interaction, which is more abstract concept. This study refers to communication as some action of verbal or non-verbal discussion between two or more members of the community, and interaction as all the intended and unintended meanings passed on to other members through the interface of the software.

Interaction can be divided into task-driven interaction and socio-emotional-driven interaction. The former has a functional role and its objective is completing assigned tasks, while the latter, also referred as socializing, is directed towards building and maintaining social relationships among the community. Both types of interaction rely on instructors, as facilitating productive interaction can be seen as the most important responsibility of the instructor in online learning communities. Task-driven interaction is often initiated by the instructor by creating discussion topics for students to respond. Socializing, on the other hand, also depends on the instructor to create an environment for discussion, but the interaction itself is more student-originated. Environment that promotes socio-emotional-driven interaction and thus helps in forming of a feeling of mutual interdependency among learners nurtures sense of community. (Roivai 2002.)

Asynchronous communication is one of the main differences between forms of interaction in traditional face-to-face in-class learning and online learning communities. In a classroom, discussion takes place in turns at the same time and place, synchronously. Discussions in online learning communities are often asynchronous, as the instructor and students need not to be online at the same time. This is called asynchronous learning network (ALN) model of online learning communities. There is, however, also a synchronous model of communication in online learning, which uses technologies such as video and audio teleconferencing. (Ibid.)

As the time people spend online is still growing with a decent pace, precisely by 24 percent between september 2008 and september 2009 (comScore, Inc. 2009b), and people are using online services more and more with their mobile devices (comScore, Inc. 2009a), there is a better chance of members of a learning community to be online at the same time. This makes it more beneficial to have a synchronous mode of online

interaction. Traditional chatting technologies such as *IRC* and private communication applications such as *Skype* and *Windows Live Messenger* use more synchronous discussion mode. These applications have features such as showing participants when someone is writing a message before it is sent, and showing who is online, offline, away from computer or not wanting any disturbance. These very basic features promote social presence in a simple but effective way. Synchronous discussion could have positive effects on interaction in online learning communities too, as people are nowadays more used to such discussion.

When using CMC to channel the discussion, communication is limited by the software and medium it uses. Although learning effectiveness is primarily a result of course design and pedagogy, the medium that is used poses limitations that must be compensated. Compared to traditional face-to-face learning, more attention and effort on the part of both learners and instructors is required for equal amount of interaction to take place. (Roivai 2002.)

Social presence in online learning communities is affected by the quality and quantity of interaction, which can both strengthen and weaken the sense of community (Roivai 2002). Communicators' perceptions of the communication medium can also be seen as a factor of social presence, in addition to the actual limitations of the medium. According to Short, Williams, & Christie, who initially investigated social presence, communicators tend to avoid interactions that require higher sense of social presence than the medium offers (1976, according to Richardson & Swan 2003). But this view has been critisized by more recent studies, which imply that communicators in fact compensate for the lack of non-verbal cues by adapting their textual language to convey expressions of emotions, feelings and such (Swan 2003). It is nevertheless important to consider not just impoving the means of interaction, but to present the possibilities clearly so that members of the community can feel comfortable to interact in a manner that requires and utilizes higher social presence, reducing the needed effort.

Studies on online learning communities also support the notion that social presence is not just a factor of the medium, but is in some way cultured by the communicators. Since there are differences in social presence among the users of the same communication media, there is something more than the media that affects it. (Richardson & Swan 2003.)

Social presence has a vital role in perceived learning of students in online learning communities. It has been found to affect students' satisfaction with the course and their perception of the quality of instruction and value of the course. Richardson and Swan also found that social presence fosters not only social activities but also individual activities. This supports the literature that identifies interaction among students to be critical in learning and cognitive development. (Ibid.)

The level and type of interaction varies from student to student. In her study on the use of asynchronous discussion forum in university environment, Sheard (2004) identified differences in types of forum posting in respect to the student's year level of studies. 1st year undergraduate students used the forum mostly to ask questions directed

at the instructor. Similar type of posting was found among 2nd year undergraduate students, but some questions were also answered by other students instead of the instructor. At the level of 3rd year undergraduate students a change in the behavior was observed, as there were many student responses and comments to other students' questions. Discussion in this level resembled more a learning community and was claimed better manageable by the teaching staff, relieving the pressure from instructors. But again in 1st year postgraduate level, behavior similar to 1st year undergraduates was observed, with less interaction among students and more instructor directed questions. (Sheard 2004.)

The findings of Sheard (2004) are consistent with the literature that indicates that online communities are more suitable for maintaining existing connections than establishing new ones (Ellison et al. 2007). As the 1st year students of both undergraduate and postgraduate level are more or less new to each other, there is no significant signs of sense of community in the discussion. On the other hand, 3rd year students who have already established relationships when studying in the same university for two years have more community-like discussion.

2.2.6. Perceived Learning

Student performance can be measured by various meters such as successful completion of a course, grades, added knowledge, and skill building. It is understood to be a multivariable phenomenon affected by the student, the instructor, course design, prior knowledge and various other factors. As such, it is a very difficult to evaluate objectively. Student perception of their learning may therefore be ultimately as good as any other measure, because it acts as a catalyst for continuing to pursue learning opportunities. (Picciano 2002.)

Perceived learning is a term used to describe how well and how much students consider to have learned (ibid). This is a very subjective measure, but as shown above, relatively valid as such. Perceived learning can be measured by asking the students questions about their learning. They can be asked to rate the quality and quantity of their learning experience (Picciano 2002), or the quality of their learning in a course and how well it met their expectations (Richardson & Swan 2003).

Various studies have found that there is a significant direct relation between how the students perceive social presence and their perceived learning. Using correlation analysis of a student questionnaire, Richardson and Swan (2003) found that students who reported higher social presence also perceived to have learned more from the course than students who reported lower social presence. Picciano (2002) examined a student satisfaction survey and found that student perception of social presence and their perception of their learning had a highly positive correlation. In addition, he summarized that "*there is a definite, consistent and strong relationship among student perception of interaction, social presence and learning*" (Picciano 2002, p. 30). This is consistent with the statement that all learning has a social nature, which is the basis of the idea of learning communities.

To improve perceived learning of the students, it is therefore important that mechanisms and behavior that support social presence is taken into account by instructors and designers in order to have good results in perceived learning. This is both a matter of course design and pedagogy, and the software that is used for supporting the online learning community.

2.2.7. Role of the Students and the Instructor

Pedagogic science has an important role in learning communities. It is crucial to take into account the pedagogic aspect so that effective use of new technology is possible. Teaching in online learning communities has different requirements for teaching methods when compared to traditional on-class teaching. It causes <u>changes in the roles of teachers or instructors and students</u>. Students become active learners, meaning that some amount of teaching takes place among the students as they interact. In a sense, the students become teachers. In order to this teaching to be accurate and effective, instructors should support the interaction by providing appropriate amount of guidance and restrictions. (Sheard 2004.)

The presence of an instructor in an online community is also important factor in how the students experience the benefits of the community (Shih & Swan 2005). In fact, studies have showed that instructor immediacy and overall instructor satisfaction affects perceived learning even more than social presence perceived by the students (Richardson & Swan 2003). This indicates that although presence of other learners does improve perceived learning, presence of the instructor is even more important.

Students' presentation of themselves is also important in supporting social presence. One way to support student presentations is the use of profiles that can be modified by the students. In additions, students should be trained in the importance of social presence and how to present themselves and discuss online. This way students can better adapt to the medium and make use of its full potential. (cf. Shih & Swan 2005.)

2.2.8. Establishing OLC in Educational Settings

In her article on establishing electronic learning communities in university environment using asynchronous discussion forums, Sheard (2004) presents a set of strategies how to establish and maintain such discussion to best promote the online learning community. Adapted from these strategies and literature review above, a set of guidelines for course planning and instructor behavior for establishing an online learning environment is identified:

- Explain the purpose and basic rules of the online learning community.
- Promote instructor presence in the community and explain how it is used by the teaching staff. Participate in communication at a level appropriate for the current level of students and provide role model for them.
- Promote the importance of students identifying and presenting themselves.
- Monitor discussion and promptly deal with inappropriate messages.

- Discuss popular topics of online learning community in face-to-face classes too.
- Involve tutorial staff in the community. (cf. Sheard 2004.)

These guidelines provide instructors with some help in establishing and maintaining the online community. This is important, as instructor and faculty support has an essential part in building such a community even with state-of-the-art software (e.g. Roivai 2002). It is, however, important for the software not to get in the way and cause extra distance among community members.

In educational institutions that inhabit students for several years, there is also a long-term aspect for online learning communities. Form a student's point of view more or less same community accompanies him or her from year to year, usually for a four or six year period in a university. From the institute's point of view, the community is ongoing and develops when students join to and depart from it.

Firpo and others discuss establishing of a community that supports conversation, knowledge sharing, student and practitioner networking, and social learning in a graduate university (2009). They use a concept of *online intellectual community* to describe what they are striving for. On their experiment, the establishment is implemented in three phases, accordingly from starting an online community, to encouraging early online interaction, and further to moving to a self-sustaining environment. They discover in the study that the online community requires administrator presence to get and maintain the desired level of interaction. Using four different interventions, active and passive participation was significantly boosted along with strengthening a sense of community. (Firpo et al. 2009.)

Kazmer (2005) examines what kind of effects the extensive reliance on technology has when students have to departure from the online learning community upon graduation. The study reveals that students develop attachment to technologies that are used by the community, and this can be a cause of stress if students do not know which technological resources they have access after graduation. As an implication, she proposes that administrators clarify the departure procedures and support students in making technology transitions that are necessary. Although Kazmer's study centers on a distant education program where students meet only in initial two-week on-campus session, these findings are presumably applicable for education where online communities support traditional on-campus learning. This is especially true as the use of online communities in such environments is expected to increase, causing reliance on technology to increase. (Kazmer 2005.)

The importance of these long term aspects of online learning communities is acknowledged. It is seen as a desirable future goal to establish an online intellectual community, where instant online communities certainly have potential as a tool to help to achieve this goal. However, the focus of this study is on supporting learning in independent courses. For this purpose, the studies above are used as general examples of how online learning communities form and develop in universities.

In addition to the actual members of the learning community, the facilities of the surrounding institution also have a major role in online learning communities (Kazmer & Haythornthwaite 2005). This also affects how the online learning community is established and maintained. To be successful in supporting students, the online learning community requires faculty support. Instructors must be given proper resources and time to cherish the community by following the guidelines above. Technical issues such as implementing, customizing, deploying and maintaining the online learning community software is a matter requiring faculty support. Effective use of online learning communities may also require changes in faculty processes. Together these issues can be summarized as acceptability of the solution. Acceptability is as much an issue of opinions and politics as it is of resources. This study does not go into details of acceptability, but aims to take it into account when discussing solutions and proposals for future.

2.2.9. Online Learning Environments In TUT

Many universities use the Internet to support teaching methods and to provide students with additional sources for information and tools for learning. Tampere University of Technology (TUT) is used as an example, but the situation is assumed to be very similar in many post-secondary educational institutes.

There are several environments used in various courses in TUT. These include general environment such as **Moodle**, **A&O** and **Idle**, and subject-specialized environments such as **Javala**. In addition, almost every course has its own web page. In many cases this is just a channel for delivering course information from instructors to students, but some courses use also blogs and wikis. Some of the courses organized by the hypermedia laboratory use a specialized environment containing blog-like information delivery, course material in HTML form and user profiles of students and instructors.

Two main issues are recognized in using of online learning environments for individual courses. Firstly, not nearly all the courses have any support for student interaction. A fairly static web page is still all that is offered online in many courses. Secondly, the variety of different environments used causes students a need to familiarize themselves in all of them and to become aware of their differences. It could be assumed that this extra work impairs the benefits and prevents forming of a vibrant online learning community.

2.2.10. Instant Online Learning Community

The goal of this study is to provide a basis for using the idea of instant online communities to establish an online learning community. This concept is referred as *instant online learning community* (IOLC). In principle, it is a learning community solution that can be instantly enabled for a website. The website can be a static website of a single course, teacher's blog, online learning environment or any other website that

is used for learning purpose. Enabling learning community means that the website is enhanced with support for interaction that is beneficial for learning purpose. This interaction, in turn, promotes social presence and sense of community, improving perceived learning of the students.

Users of these online communities are the members of the corresponding learning communities. Under the focus of this study, the learning community is a group of people that participates in a university course. Worth nothing is the fact that this is not restricted to only students, but also instructors are an important part of the community. Although their role is less a role of a teacher and more of a facilitator of discussion, the presence of the instructor is one of the most important factors in perceived learning. The course can, and in many cases should, also involve tutorial staff (Sheard 2004). Tutors can help to manage large volumes of questions, but they should also be a part of the community (ibid).

Currently, there are no well-known implementations of instant online learning communities. For this study, no learning-purpose instant online community software or studies on usage of such technology could be discovered. There can be several reasons for this. Firstly, the concept of instant online community is relatively new, and although there are services that provide the technology, it is not yet common or widespread in specific domains such as education. As the technology becomes more mature, it is expected to become more common and applied to learning communities too.

Secondly, online learning communities that are used in universities are not usually open for public. As a rule, universities have their own information systems and their usage is restricted to the students and staff of that university. This includes online learning communities that are used in individual courses. One of the implications of universities' internal information systems is that they use integrated authentication system. Using an open service that requires authentication through registration to that service is therefore not an option in many cases. This issue is discussed in more detail in chapter 3. Also, observing is limited to what is available in public, leaving out any possible implementations that might exist in closed systems used in universities.

Finally, there are the reasons that this study attempts to address. First and foremost, there is little or no knowledge of the benefits this solution has to offer. Therefore this study seeks to answer the following questions: what are the benefits that instant online learning communities offer over existing solutions for online learning? How can they improve learning? What kind of technological and other issues are related to them? The answers to these questions are sought in the following chapters.

2.3.   Summary and Study Objectives

Proliferation of the Internet has initiated a transition from location-based communities into communities that form and evolve around shared interests. People from any place that has access to the Internet can become members of the community. The members

obey common policies and use software to support interaction that is shaped by these policies.

These online communities can be supported by various types of software. While it is common that the software concentrates on a single website that is offered by a service provider, this restricts the interaction of the community to that specific website. Kindsmüller et al. (2009) introduce an idea of instant online communities that easily enables online community in any desired website. It establishes awareness of an online community that concentrates around common subject, spreading to multiple websites, services and platforms.

Online learning communities support learners through social interaction, which is found to be an important factor in learning. In particular, social presence of other students and instructors is found to support perceived learning of the students. Instant online communities could be used to establish awareness and support interaction in online learning communities, and that way improve social presence. This would in turn improve perceived learning.

The purpose of this study is to examine how the idea of instant online communities can be used to improve perceived learning. As explained previously in this chapter, awareness and social presence are the key concepts supporting perceived learning. Another important point is discussion, as it is a central feature in supporting interaction. Concentrating on these aspects, this study aims to define an idea of instant online learning communities.

Instant online learning communities (IOLC) are an adaptation of instant online communities in the context of learning communities. This study concentrates on learning communities that exists in a university course, but further studies could extend this idea to more persistent learning communities in universities and distant learning. The goal of this study is to define IOLC to the extent that the reader could understand the reason why they would be useful, and what are the central features that make them useful. Furthermore, the reader is given knowledge of what are the common features in instant online communities today and how well they support the central features of IOLC. The reader is able to use the results of this study as a basis for establishing an IOLC in a university course.

The study is conducted in three phases, described here in chapters 2, 3 and 4. As the first phase, this chapter examined the literature to determine the key factors of instant online communities that would improve perceived learning. This is based on previous research on instant online communities and online learning communities. Both theoretical articles and results of empirical studies are utilized to form a reliable base for the later phases.

In the second phase, these key factors are translated into central features of an IOLC. This is based on both the theoretical background from the first phase and the features that are offered by current instant online communities. Two different services for creating an instant online community are examined by actually using the service and

analyzing the features they have. As a result of the second phase, the central features are listed with the theoretical ground for why they are included.

The third phase includes a student inquiry that aims to determine how the students perceive the benefits of these central features. Using role-playing method, attitudes and opinions of the students towards such features are investigated. The goal of this inquiry is to determine how students would utilize these features, and whether their opinions are in line with the theory.

After these three phases, the study is concluded by presenting the idea of instant online learning communities, constructed and improved through the three phases. This gives the reader a basis for starting to utilize the idea in university courses. The conclusion also includes assessments of the study. Finally, some open issues and subjects for further study are proposed as a means to improve this basic idea and its usage.

3. FEATURES OF INSTANT ONLINE LEARNING COMMUNITIES

Instant online communities have a potential to offer benefits of online learning communities with a very affordable deployment. This chapter first examines the features of instant online communities, what kind of technologies they use, and how are they implemented in existing IOC services. Secondly, it explains which of these features are the most relevant in learning, that is, what are the central features of instant online learning communities. Before the features, however, a quick look is taken to some alternatives to instant online communities.

Using an IOC service is not the only way to easily enable awareness of an online community in a website. If the site is using a content management system (CMS) that offers functionality for communities, these can be used in a similar way. If the website is using Drupal, it can enable social network features using a number of community building and social networking modules that are freely available (for a list of modules see Community building and social networking modules 2009; for building a social network site using Drupal see e.g. Peacock 2009). There are also similar functionalities for Joomla! offered as extensions. Although in a single website this type of "instant" online community can be very similar to the solution that uses IOC, it does not offer the benefits that IOC services offer when integrating an online community into a number of different websites. These solutions also force the website to use the specific CMS to create the whole website. When using a separate IOC service to provide support for online community, there are virtually no restrictions for technologies that can be used to create the website. This also makes possible to change the implementation of the website with minimal effort and no loss of data in the online community, as only the integration of the service might have to be done again.

3.1. Features of Instant Online Communities

This section explains the features that are essential to instant online communities. The description of Livecommunity as an instant online community service in the article by Kindsmüller et al. (2009) is used as a basis to decide which features are the most essential. Also the features that are offered by both Livecommunity and Friend Connect but that are not common in traditional online community software are included. It should be noted that the Licecommunity service has been under constantly development also after the release of the article. For this reason, the article is not used as a source of

information about the service itself, but merely as a definition for essential IOC features.

The features are divided into six subsections, which each explain a separate aspect of instant online communities and common features that are provided by IOC services. These aspects are: creating and managing a community inside the IOC service; integration of the community into a website; features that enable awareness; features that enable communication; content aggregation features; and authentication solutions. The sections below explain what the function of these features is and what are the technical solutions and limitations with them.

3.1.1. Creating and Managing a Community

First phase in establishing an instant online community is to create the community inside the IOC service. From technical point of view, this must in some form include the procedure to create the community identifier, which is used to link the community with its data. As the website does not host any of the data of the community, the IOC service must provide a storage space and procedures for accessing the data. As this is highly technical issue with a host of different possibilities for implementation, it is not examined further in this study.

A community creation procedure is usually very simple. Advanced settings are accessible through community management. Available features and settings depend on the IOC service, and there are very few that are available in both of the services examined here. Setting the name of the community is only feature that is expected to be found from any service. Another common feature is sending a newsletter to all the members of the community.

3.1.2. Integration

Integration is the procedure that the website administrator is required to do in order to get the online community visible in the site. Although there are several techniques, this is in almost all the cases done with *widgets*. W3C provides a following definition for widgets: *"A widget is an interactive single purpose application for displaying and/or updating local data or data on the Web, packaged in a way to allow a single download and installation on a user's machine or mobile device."* (Caceres & Priestley 2009).

A common way to implement a widget in a website is a short piece of code, a *code snippet*, containing HTML and JavaScript. Administrator adds the code snippet to the HTML code of the website, which causes the widget to be shown to a visitor of the page. This is also the case with IOC services. A code snippet provided by the IOC service is copied to the hosting website.

There is usually a set of different widgets that can be used in online community integration. Judged by the few services that were examined for this study, the most commonly provided widgets are a widget to display a list of members, a widget to read and write messages and other content, and a widget that combines all the essential

features of the instant online community in a single, composite widget hereafter referred as community-widget. The different widgets are explained in more detail in the following sections according to the features they provide.

The actual integration of the interface of the website and the online community is carried out by a JavaScript code provided by the IOC service, separate from the widget code. This code, usually referred as API (application programming interface) by service providers, must also be integrated to the hosting website. Similarly to the integration of widgets, the API is also integrated by linking a JavaScript code into the HTML of the website. Unlike the widget, however, the code is usually linked as an external code file using `script`-tag and its `src`-attribute. Examples of integration code used in Livecommunity and Friend Connect are shown in the sections 3.2.1 and 3.2.2, respectively.

Kindsmüller et al. mention a lack of visibility as one of the issues of the Livecommunity service (Kindsmüller et al. 2009, p. 68). At the time, the only available widget was a widget with all the functionality in one page that covered the hosting website when used. When covered, the hosting page could not be accessed, and thus there was no joint interaction. Users either used the community features of features of the website. Improving integration and interconnection of the contents was mentioned as one of the core objectives in further development of Livecommunity (ibid).

Deeper level of integration is now achieved by using widgets that offer just a small part of the online community functionality. These widgets can be integrated to the website into desired place, better serving the purpose of the functionality and simultaneous use of the widget and the hosting website. Users can now use the hosting website as they would without the community enabled, and they can simultaneously interact with the community without interrupting the interaction with the website.

3.1.3. Awareness

Awareness is the most essential feature of instant online communities, in particular the awareness of being a member of a community (Kindsmüller et al. 2009, p. 64). The most straightforward way to promote awareness is to display a list of members in the hosting website. This provides the visitor with basic awareness of the fact that there exists a community that is somehow related to the website he or she is watching. It is also common to display a number of members in a community.

A little more sophisticated way for awareness information includes also a status of each member, usually simply a piece of information whether the member is currently watching the website (online) or not (offline). Using this information, a number of members that are online can also be displayed. This can be seen as a way to improve social presence of the members of the community. When users are aware of other users that are currently somehow interacting with the community, a discussion could be emerged more easily as there would more likely be a response within a short period of time.

Promoting social presence could be taken even further by providing information such as the last time each member was online. Also techniques like radar view could be used to promote social presence and awareness in tasks that require collaboration inside the community. Radar view is used to provide information about where the other collaborators are currently working, for example a cursor position. (Carroll et al. 2006, p. 36.) Awareness information of this much detail is not always necessary, and is significantly more difficult to implement. In instant online communities, detailed awareness information could be for example a simple link to the page that the user is currently viewing on the website.

A list of members is not a requirement for awareness, although it emphasizes it. Awareness can be achieved by just providing ways of interaction. Stating the actor alongside the message, comment, photo or any form of interaction can be used to form community awareness. But with only interaction tools, it depends on the user whether awareness of being a member emerges. A simple discussion or chat is much more common feature in web pages than a full scale online community. The issue of community awareness in discussion was studied using stories gathered from students. This method and the results are explained in detail in chapters 4 and 5.

Social presence can also be fostered by providing access to member profiles. This is a common feature in IOC services. A link to user profile is usually attached to user name in the member list, and to any content such as messages or comments that might be created by that user. Profile pages include basic member information such as name and profile picture, recent actions of the member, tools to interact with the member, and list of the members connections. The last feature, a list of connections, does actually broaden the view outside current community. These connections also make the profile page not a member profile but a user profile, where user is an actual user who have joined this and maybe some other communities. By listing also other communities that the user is member of, the view of the profile page is broaden outside the current community. This is also the case in *friend*-connections that are in some cases a part of profile pages in IOC services. Friends can be users that are members of the current community, but they can also be members of other communities.

Another feature that promotes awareness is a display of recent action in the community. It is a list of events such as user joining the community and messages sent by community members. These events are displayed with links to related pieces of information. Related information can be for example the profile of the subject of the action or the original source of the action in case of aggregated content.

3.1.4. Communication

The most common form of communication provided by the IOC services was synchronized chat. In both of the services that were examined, some form of synchronized chat was provided both as a separate widget and as a part of the community-widget. However, the type of communication and how the service supports

it was significantly different between the two services. For this reason, communication features are examined in more detail for the two services separately.

3.1.5. Content Aggregation

One of the significant new features of instant online communities is content aggregation. It can be used to make the online community a combined source of information about the subjects that interest the members of the community. Using content aggregation, any content from designated sources can be automatically fetched and displayed in the instant online community. Content can be fetched according to tags. In a content provider such as **Flickr** or **Twitter**, users can attach tags to their content to describe it. In the instant online community, tags that interest the community can be defined and content that has matching tags is then automatically fetched by scanning these services.

Content aggregation can be used to fetch interesting content from the web, but it can also be used as a technique to enable different services as a part of the online community. If the members are aware that by using specific tags their content is displayed in the instant online community, they can deliberately attach these tags to their content. This means, that community members can use the service that they are accustomed to use, and the content they create can be seen by the members of the community even when they do not use the same service. This is especially beneficial when using large, multi-interest services such as Twitter, **YouTube** and Flickr that concentrate on one type of content. In other word, users can create content using the service that is made to create that specific type of content, but also gain the benefits of integrating many different types of content into one place, the instant online community.

There may be a problem with the use of matching tags in content aggregation. If the system is using popular services such as Flickr to fetch content according to the tags associated with it, there is a possibility of the tags overlapping. If there are a great number of instant online communities that use tags to achieve content aggregation, there is a possibility that two completely different communities have decided to use the same tag. This leads to undesirable consequences, when both of the instant online communities display all the content that uses the tag, regardless of which it was intended to be displayed on.

Another issue of fetching content simply using tags is the significant ease of spamming. If all the content from Flickr, for example, is fetched to a specific instant online community that is integrated into a website, a malicious user can add undesirable content to Flickr and use the tag of the community. As the procedure of fetching content is completely automatic, this leads to the undesirable content to be displayed in the website. This is more serious problem than usual spamming because the user that wants to send spam does not have to do anything in the website that the spam is displayed in. The malicious user does not have to have any kind of membership of the community or access to it.

3.1.6. Authentication

One of the major hindrances for any new service is that users are required to undergo registration procedure in order to gain full benefit from the service. A new user can easily turn the service down simply because he or she does not want another username and password to remember. There are some solutions for this under development. This study does not go into details of various issues related, but simply presents the current state of the solutions and how they are used in instant online communities.

One of the solutions is an open authentication protocol called OpenID. OpenID 2.0 is a platform that provides a way for service providers to receive proof that user controls an identifier (OpenID Foundation 2007). This identifier can be used to uniquely identify the user, and thus used to create a unique user profile and to link the user with this profile when receiving the proof. As a result, OpenID can be used to log in the user and to identify the user profile, communities, friends and all the content related to the user.

OpenID has become a popular way to make the registration process if not unnecessary then remarkably easier. Upon the first use of the service, user is required to fill in the data that is used by the service, while logging in can be done using the OpenID service. It is also common that user can log in using one of the popular services such as Google, Twitter or Facebook. These services provide an authentication method similar to OpenID. User can then use his or her username and password for those services and log in to the IOC service.

Due to OpenID and other services providing similar functionality, the user is no more to undergo whole registration procedure when joining to a community in IOC service. But this solution does not always solve the problem. As the community is integrated into a website, there is a possibility that the website already has some kind of user database. In such case, it is not desirable that users are forced to register again, even if the registration and logging in could use some popular authentication service that user most probably already has registered into. The issue there is that the user of the IOC service cannot be linked to the user of the hosting website. This forces the user to log in to both of them when using the website and the community integrated into it. It also prevents linking the content that is created by the user in the community to the content that is created in the hosting website.

To solve the problem of duplicate user identities, changes must be made to the user authentication procedure in the hosting website. For example, it could accept registration and logging in using OpenID, so that users could log in to the hosting website and to the community using the same OpenID, and the data could be linked to the identifier received through the OpenID protocol.

3.2. IOC Services

In this section, two systems implementing the idea of instant online communities are examined. First one is the reference implementation of the IOC service called

Sixgroups.com **Livecommunity** (http://sixgroups.com/) described in the article by Kindsmüller et al. (2009). Second one is Google **Friend Connect** (http://www.google.fi/friendconnect/), a similar widget-based IOC service from the web giant Google. The service by Google is included for comparing the reference implementation to a similar service that has a different background. Livecommunity was included in the study as it is a service that is intentionally following the principles of the idea if IOC. On the other hand, Friend Connect supposedly does not intentionally aim to provide an IOC service, but clearly has many features in common. It was chosen for this study because of its availability, and because of the fact that a service that is provided by Google clearly has a large group of potential users. If such service could provide equally good support for the community, it would be a very attractive option. The main purpose of including Friend Connect, however, is the comparison between "intentional" and "unintentional" IOC service.

Because of the lack of any information about connections between Friend Connect and Livecommunity, it is assumed that they have been developed separately. Some basic differences between the two also supports this view, but due to lack of a source of information, this is nevertheless just a assumption.

There are actually a number of other similar services, with lot of them based in Germany, as is the Livecommunity. Some of the other services that were noticed but not examined for this study include MyBlogLog by Yahoo! (www.mybloglog.com), Groops (www.groops.net) and mixxt (www.mixxt.de). As the concept of instant online communities is very new, the high number of implementations existing already today was surprising. This might implicate that there is at least some markets for the idea. The services based on Germany could be assumed to have some kind of connection to the Livecommunity. This study does not attempt to provide any precise or large-scale comparison results, but a more complete review of available implementations could prove useful as a future research subject.

Both of the services examined here were launched in May 2008 (sixgroups.com, 2008; Shore 2008). They are both free to use without any fee. In Livecommunity, there are some advertisements that are shown to the user under the messages sent by users, whereas Google's Friend Connect does not have any integrated advertisements. As an interesting detail, these advertisements are offered through Google's AdWords advertising platform.

The features were examined by reading the instructions offered with the service and testing the integration by actually integrating a community that was created for the testing purpose in both services. The testing was done in order to get a feeling of how the services actually work, instead of relying on the documentation alone. Also the documentation provided for Livecommunity was very limited.

For both of these services, a community called 'miinosekai' was created. A title 'Mii no Sekai' was also given if giving a title was required. The hosting website, a simple blog, was located in the address http://miinosekai.blogspot.com. For the purpose of this simple testing of features, the website that the communities were integrated into

made no difference, as there was no direct interaction between the hosting website and the widgets. The code examples that are examined below are available for any community administrator. After registration and creating a community in an IOC service, the creator becomes the administrator of the created community.

3.2.1. Livecommunity

Sixgroups.com Livecommunity is the instant online community service that is introduced and studied by Kindsmüller et al. in their introducing article on instant online communities (2009). In the article, the basic concept of IOC is actually very briefly described, while more emphasis is on the features of the Livecommunity service located in Sixgroups.com. The service is also studied using a use case *Support for Conferences*, which is used to take a deeper look into the service and its usefulness in fostering conferences.

In Livecommunity, the instant online community that is created gets also its own community website hosted in Sixgroups.com. For our community, a website was given the address http://miinosekai.sixgroups.com. If there is no website that the community could be integrated into, this address can be used by community members to interact with the online community. Functionality provided by this website is identical to the Livecommunity-widget described later in this section. The website is also the only place where the discussion forum and administrative tools are accessible.

Livecommunity offers a basic set of widgets for integrating the community into the website. The number of different widgets does not compare to Friend Connect, and there is not a possibility to create a new kind of widget. All the widgets of the community use the same JavaScript Widget API. Integrating the Widget API is done by inserting the following code snippet to the host website.

```
<script type="text/javascript"
  src="http://miinosekai.sixgroups.com/widgets/api/json/v/3/">
</script>
```

This integrates the Widget API that is available in the URI location defined by the src-tag. It can then be used by the different widget code snippets. By examining the URI, it can be noted that the API is fetched from an address defined by the name that is given to the community. This means that the API can be customized for each community.

By examining the code in the address above, a closer look can be taken into the Widget API. By the time of writing, it is a little less than 1000 lines of JavaScript code. As the service develops, the Widget API most probably undergoes some changes, and therefore the code itself is not examined in this study. However, the fact that it is customizable for each community has some interesting implications.

In all IOC services, the API needs to somehow know in which community on which website the user of a widget is. This can be simply implemented by sending pre-decided

parameters with the API function calls. Details of this technique are omitted for the reason that they are very basic procedures in any programming environment and not of a special interest considering this study. However, the fact that Livecommunity does not just use parameters but customizes the API code itself is an interesting choice. It makes possible to customize the functionality of the widget depending on which community it is used for. For example, color themes can be changed simultaneously for all the widgets in all websites that have integrated the community. This way the community is uniform in every website and easy for the users to recognize as the same community. On the other hand, this makes it more difficult to integrate the widget consistently into each website, because they might use different colors and layout. Sometimes it is more desirable to be able to integrate the widget into the website than to provide widget with same kind of layout in different websites. In fact, also Kindsmüller et al. (200968) set one of the objectives for further development of the Livecommunity to be a deeper integration of the community into the hosting website. Accordingly, this would increase the visibility of the community and the interconnection of the community and the contents of the website. Visibility in this case probably refers to the fact that the community would be recognized by more users if it would be naturally integrated into the website's content that the user is interested into. It is therefore a rather odd decision to make it possible to choose color themes for all the widgets of the community together, but not for a single widget or widgets of a single website.

Currently, the Livecommunity service has four different widgets that the administrators can use to integrate the online community into the hosting website. These are:

- *Livecommunity*, a full featured widget that contains all the functionality of the IOC in one page that can be displayed over the hosting website, in other words, it contains all the other widgets. By default, the Livecommunity-widget is a small bar at the top of the website, and it can be opened by the user.

- *Livecontent*, a widget that shows the content that is added to the community. Content can be for example a message, a picture or a video. A closer look into different types of content in Licecommunity is later in this section.

- *Members*, a list of members of the community and status indicators showing which of them is online. This is a very central widget considering awareness in online communities. Also hyperlinks to the profiles of the members are provided in this widget.

- *Dynamic badge*, a small widget showing community statistics such as number of members, number of websites it is integrated into, and number of different content that has been added into the community.

These widgets can all be integrated by simply selecting the desired widget and copying the code snippet that is displayed in a text box. As an example, a code snippet that is used for the Members-widget is shown below. Spaces and indentation is added for clarity.

```
<div id="sgMembers" class="sgContainer">
 <span style="font: 9px Arial, sans-serif; color: #ccc;">
  <a style="font: 9px Arial, sans-serif; color: #ccc;"
    href="http://miinosekai.sixgroups.com"
   title="Mii no Sekai">Mii no Sekai</a>
  powered by
  <a href="http://instantcommunities.com/"
    title="Social Software by Instant Communities">Instant
Communities</a>
 </span>
</div>

<script type="text/javascript">
  if(sg){sg.addWidget({type: "sgMembers", count: 6,
partnercodeId: 11741});}
</script>
```

Program 3.1. *Code snippet for Members-widget in Livecommunity.*

The most of the code lines in the Members-widget code snippet in Program 3.1 are used to display a static link to the community website in Sixgroups.com and to the website of the company that provides the IOC service. If for some reason the user of the website does not allow execution of JavaScript in the website, the static content is all that is displayed. The JavaScript code inside the `script`-tag makes a function call to the widget API with some parameters. The code or these parameters are not examined here in any more detail, as the code is included only to provide some insight on how the integration is done in Livecommunity.

There are various forms of awareness information that are offered by the widgets for the users of Livecommunity. First of all, the Members-widget that is used as an example above shows the list of members of the community, and whether each user is online or offline. A profile page, accessible through the widget, contains information about a specific user. The most recent time the user was online is also available, which can also be considered to be information that promotes social presence.

Communication in Livecommunity concentrates around the Livestream, which is available as a separate widget and as a part of the Livecommunity-widget. The Livestream includes all the messages and other activity that takes place inside the community. The Livestream is in a way one form of synchronous chat, but the fact that it is not real-time but seems to update with a significant delay makes it less synchronous. A separate discussion forum is also offered in the website that is created for the community under the sixgroups.com domain. This offers a more traditional form of communication for the community. In addition to public Livestream and discussion forum, Livecommunity also enables private messaging between members.

Livecommunity offers content aggregation from well known services including Twitter, YouTube and Flickr, and few less popular ones too. Content can be fetched from these services by defining a set of tags. Additionally, any feed can be aggregated

into the Livestream by giving the address of the stream, but this there are no techniques for filtering the content of a generic stream and therefore all the content of the stream is included in the Livestream.

Authentication methods supported by the Livestream include Facebook, Twitter, Google, Yahoo, OpenID and yiid. Registering a new account for the Livecommunity service is also possible on the sixgroups.com website. The support for OpenID makes it possible, in theory, to integrate the service into an existing service such as online learning environment, but as discussed earlier, there are several issues with this.

As a whole, the Livecommunity offers an impressive set of features, some of which are arguably pioneering in the development of instant online communities. That said, the service seems still to be somewhat incomplete, with some issues in the user interface, translations and functions. When considering using this service in a university environment, this might be a considerably major issue.

3.2.2. Friend Connect

Google's Friend Connect service offers many features that are very similar to the Livecommunity IOC service. Although it seems to aim to the same goal of making visitors aware of each other and able to communicate, it lacks some of the features that Livecommunity has. In this study, Friend Connect is also referred as an IOC service as the definition for an instant online community is rather vague, but the lack of some of the central features indicates that it is a plain simplification of the idea.

In Friend Connect, components that are used for integrating the service into a website are called *gadgets* instead of widgets. In the scope of this study, these two terms are interchangeable, but the word gadget is used for Friend Connect widgets as it is the term that the service itself uses. Friend Connect offers a comparatively large collection of different gadgets. Google also offers developers a chance to build their own gadgets and make them available for other users of the service. This is done by providing developers with a comprehensive documentation of the widget API that Friend Connect uses (Google 2010). All the gadgets use the same API, independent of the community they present or the website they are integrated into. There are several ways for developers to access the API. Although further examination of them is out of the scope of this study, they offer an interesting option for developing an IOLC service with a different approach.

A basic set of the most common gadgets offered by Google is displayed as featured gadgets for website administrators. In the time of writing, featured gadgets include:

- *Social bar*, a composite gadget with multiple functionalities, similar to the Livecommunity-widget. It contains a list of members, members' comments and recent activities in the community. As the Livecommunity widget, social bar is by default a small bar at the top or bottom of the page. Unlike Livecommuinty, however, it does not open to cover the whole page, but

individual functionalities can be opened and closed separately to cover just a small part of the hosting website.

- *Members*, a simple list of small profile pictures of the members and their names as a tooltip text that pops up while the mouse is over the picture. A significant difference to the Livecommunity's members-widget is that Friend Connect has no online status of the members displayed in this or any other gadget.

- *Comments*, enables members to comment on the website, a page on it, or a piece of content identified by a unique id. Commenting can be used as synchronous chat, but without the online status information of other members.

- *Ratings and reviews*, a very similar to the comments-gadget, but with a five star rating attached to the comment.

- *Interests poll*, a gadget to ask members questions about their interest. Each member's answers are displayed as additional information in the members profile page. Interests are also used to personalize gadgets such as *featured content*, and to filter newsletter receivers.

- *Recommendation*, which is actually a set of two gadgets. First one displays a button that allows members to recommend a specific content inside the website. Second one is a list of those pieces of content that have most recommendations.

- *Featured content*, which shows the member a list of links to specific pages in the website that match the interest of the member.

- *Newsletter subscription*, a simple button that members can use to subscribe to receive a newsletter. Newsletters can be composed by the administrator, and they can also be directed to only specific members according to their interests.

These gadgets are integrated to the hosting website using similar HTML and JavaScript code snippets than in Livecommunity. As an example, a code snippet for integrating a members-gadget is presented below in Program 3.2. Lines similar to the `skin['BORDER_COLOR']` are omitted for brevity.

```html
<!-- Include the Google Friend Connect javascript library. -->
<script type="text/javascript"
src="http://www.google.com/friendconnect/script/friendconnect.
js"></script>

<!-- Define the div tag where the gadget will be inserted. -->
<div id="div-4353562725162881036"
style="width:276px;border:1px solid #cccccc;"></div>

<!-- Render the gadget into a div. -->
<script type="text/javascript">
```

```
var skin = {};
skin['BORDER_COLOR'] = '#cccccc';
// Eleven lines similar to above are omitted
google.friendconnect.container.setParentUrl('/');
google.friendconnect.container.renderMembersGadget(
  { id: 'div-4353562725162881036',
    site: '03931344432651320865' },
  skin);
</script>
```

Program 3.2. *Code snippet for Members-gadget in Friend Connect.*

The code in Program 3.2 reveals that Friend Connect has more conventional approach for connecting the gadget to the correct community. As the API code for all the communities is the same, the code that calls the API must include parameters to identify the community. Additionally, parameters for customizing the interface of the gadget are included in the integration code. This makes it possible to customize each widget separately, allowing also integration of the gadgets outlook to the hosting website.

Compared to Livecommunity, Friend Connect has some drawbacks concerning awareness, but it also offers some features that are missing from Livecommunity. The most significant is the lack of online status of the members. This might have drastic effects on the social presence, as the members are not able to choose to communicate with the members that are currently online and thus are more probably going to answer with less delay. On the other hand, Frien Connect offers a feature to gather the interest of the members and display them to other members, thus potentially improving awareness.

The most basic form of communication among the community members in Friend Connect is using the comments-gadget. The administrator can integrate a comments-gadget with comments on the whole website, so that all the comments are part of the same conversation. This is similar to a synchronous chat, although the delay between sending a message and others receiving it is significantly longer than in usual chat rooms. The newsletter is also a form of communication, but it can only be sent by the administrator, and does not offer anything for the communication between the community members. For private messaging between members, Friend Connect offers a possibility to send an e-mail using a form accessible from a members profile page, but no private conversation using only the website is possible.

Friend Connect does not have the content aggregation features that Livecommunity has. The social bar –gadget, which shows recent activity in the community, only displays events that take place inside the hosting website and its gadgets.

Another drawback is that the community cannot be integrated into multiple websites. When creating the community using the administrative tools, administrator must insert the address of the website that the community uses. When integrating

gadgets into the hosting website, they only work if the address of the website is the same or a subpage of the address that administrator has inserted.

Authentication is supported using several services in addition to the Google's own sign-on system. The supported services are Twitter, Yahoo, OpenID, AIM and Netlog. There is no significant difference between Livecommunity and Friend Connect considering authentication. Both have the support for OpenID, which makes it possible to integrate authentication to the one that the hosting website might use.

Instead of providing a fixed service for website administrators to use, Friend Connect offers a social platform. The featured gadgets offer a basic set of features that can be used to integrate a community into a single website. However, the fact that API is documented and open for developers makes very deep integration to the hosting website possible, although it requires expertise on some of the supported web development techniques. As a IOC service ready for use, it does lack some of the essential features. However, as gadgets can be made available for other community administrators to use, there are a number of gadgets created by others that can be used. Some of these gadgets might offer, for example, better support for awareness and synchronous communication. For this study, only the featured gadgets were examined.

3.3.   Building an Instant Online Learning Community

This section brings forth the most important features that instant online learning communities offer in comparison to traditional solutions for online learning. These features are not features of any existing service, but an ideal set of desirable but feasible features that could be offered by such service. That said, much of this section is still based on the features that the Livecommunity offers as a reference implementation of the IOC idea. Combined with the theoretical background of online learning communities and compared with other existing IOC services, an IOLC service is described. Each subsection contains a list of features that are related to the aspect in that subsection. Thus some of the features are included in more than one place, as they are related to more than one of the aspects.

Features in this section describe the service, but an important aspect is also how the community is established and how the service is utilized. The features in this section are built to support establishment of an online learning community in university settings. These guidelines are described in section 2.2.8.

3.3.1.   Awareness and Social Presence

Features concerning awareness and social presence in particular are the most important features in IOLC service. This argument is based on two main findings. Firstly, as a defining feature of IOC, awareness information is what enables the community and the interaction. In many courses in universities, students have no awareness of the community they are part of when they are online. In IOC and thus in IOLC too,

awareness information is clearly displayed to the student so that he or she can interact as a member of the online community.

Secondly, the awareness information, and social presence it promotes, is an important factor in how the students experience their learning. The literature review showed that improving social presence improves perceived learning in an online learning community. Therefore it is justified to state that awareness information is essential when improving perceived learnin.

Features promoting awareness and social presence in IOLC service include:

- *Members list*, displaying a list of community members and their total number. The listing can use the names of the members, their profile picture, or any composition of information available, chosen for each instance of the list separately.
- *Online status*, an indicator of whether a specific member is currently online or not. This indicator is attached to all the places where any information about the member is displayed. The member is considered to be online if he or she is viewing the hosting website. If there are multiple websites hosting the same community, the indicator also shows which website the member is viewing. If the member is not online, the last time he or she was online is displayed.
- *Member profile*, a collection of information about a member that other members can see. Information can include anything that the member would like to show to others. Instructors can encourage students to include more relevant information to further promote social presence.

Using these features, the members are aware of each other and the existence of the community. They also know the members that are currently online, which also acts as a support to initiate discussion that is the next aspect of IOLC explained.

3.3.2. Discussion

The support for discussion is also an important factor in IOLC as a primary form of interaction. Both synchronous and asynchronous modes of discussion can be used to promote interaction among the community members. Asynchronous discussion features are more traditional in online learning, but especially with the online status feature that gives the members information on who is online, also synchronous discussion can promote interaction and also social presence very effectively.

Features to support discussion are chosen based on what is available in current IOC services and how they could be improved according to the literature review in this study. The discussion features include:

- *Synchronous chat*, offering members that are currently online ways to communicate with minimal delay.

- *Discussion forum*, a form of asynchronous discussion that enables interaction between members that are not simultaneously online, and offers a more permanent storage of conversations.
- *Private messaging*, which offers a discussion channel where users can feel more comfortable to discuss privately or ask questions from a specific member.

Only the basic requirements for the discussion features are set here, and the actual implementation can vary according to what is most appropriate and feasible.

3.3.3. Supporting Features

In addition to the central features that form awareness and enable discussion, there are some features that are necessary to the online community to function. The most central ones are the integration features and authentication features. They are necessary for any IOLC service to exist in some form.

Additionally, some supporting features can efficiently improve the functionality of the service with little effort needed from the administrator. Content aggregation as one is included in the set of IOLC features. When content aggregation is used, members are not restricted to the websites that the online community is integrated into, but they can interact by using other services too.

Supporting features does not define a specific function, but rather describe how the service operates as a whole. The features include:

- *Simple integration*, offering a simple way for the administrator to integrate the community into the hosting website without a need for expertise on web development.
- *Deep integration*, which offers a possibility for integrating the interface and the functionality of the hosting website into the functionality offered by the IOLC service, if a decent level of expertise is available. An open and documented API to access the service is a decent implementation of this feature.
- *Versatile authentication*, so that members may sign on to the IOLC service without a need to undergo a registration procedure.
- *Authentication integration*, which makes it possible to integrate the identity of a member in an existing authentication service into the IOLC service and to enable the member to sign on using that service. One promising technique for this is the OpenID.
- *Content aggregation*, enabling the use of services such as Flickr, Twitter and YouTube to create content into the community.

With these features, the IOLC service can be integrated into a website with good usability and visibility of the online community.

3.3.4. Summary of the Features

As a conclusion of the IOLC service described and the two IOC services examined, the features Livecommunity and Friend Connect are summarized in relation to the features that an ideal IOLC service should have. Table 3.1 shows which features are supported by each service.

	Livecommunity	Friend Connect
Members list	yes [1]	yes [1]
Online status	yes [2]	-
Member profile	yes	yes
Synchronous chat	yes	yes
Discussion forum	yes	-
Private messaging	yes	using e-mail
Simple integration	yes	yes
Deep integration	-	yes
Versatile authentication	Facebook, Twitter, Google, Yahoo, OpenID, yiid, sixgroups.com	Twitter, Google, Yahoo, OpenID, AIM, Netlog
Authentication integration	-	using OpenID
content aggregation	yes	-

Table 3.1. Features of the Livecommunity and Friend Connect services in relation to IOLC features.

Notions about how a feature is implemented in the service are attached to some of the features:

1) The member list feature is available in both of the services, but they do not support selecting which information is displayed in the list.
2) Online status only has the indicator whether the member is online or not. It does not show which website the user is watching.

This chapter described the features that define an instant online community and examined two services that can be used to create such community. Using the information gathered, it then described an instant online learning community service by defining some of the most central features. In the following chapters, this set of features and the service that has been defined is evaluated and improved to better match with the students opinions on using such service.

4.   STUDEN INQUIRY

After reviewing the literature on online communities and exploring the features of instant online community services, an inquiry among students was conducted to get an idea of how students would respond to possibilities of IOLC. This chapter first describes the goals of the inquiry and then explains in detail the research methods that were used and how they were applied in this study. Finally there are the results, observations from them and the inquiry, and some assessments of relevance and reliability of the student inquiry. The results presented in this chapter are used to improve the IOLC service defined in chapter 4. This discussion is included in the conclusion in chapter 5.

4.1.   Goal

In the second chapter, a concept of instant online learning communities was constructed based on literature on instant online communities and online learning communities. In the third chapter, the features that are offered by current IOC services were examined in the light of how they would work as instant online learning communities. This gives a good understanding of what an IOLC could be and how it could support perceived learning, in theory.

The purpose of this study is to provide information that is needed to build a starting point in using IOLC in university settings. It is therefore essential to investigate also users' opinions on how they see IOLC could provide improvements for their activities, and what kind of attitude they have towards such technology. The primary users of a learning community are the students and the teaching staff, including instructors and tutors. The information on their opinions could help to determine, what the most important features and propertied of an instant online learning community are in supporting perceived learning in a university course. This inquiry includes only the students. Including the instructors in the inquiry would require a different approach to some of the issues. As the study concentrates on perceived learning of the students, this inquiry concentrates on the opinions of the students.

To narrow down the scope of the inquiry, some of the most essential issues considering perceived learning were identified. Based on the literature review in chapter 2, social presence and awareness in general was brought up as the most central concept. Additionally, based on the literature and the features that IOC services offer, discussion as a fundamental part of interaction was emphasized.

The goal of the student inquiry was finally summarized in few questions, which were settled in the context of a university course; how do students utilize presence of

other students, or do they utilize it at all? What kind of expectations they have considering social presence information? How do they perceive other students' presence in discussion?

A secondary goal of the inquiry was to determine, whether students' opinions were consistent with the conclusions that were made based on literature. Particular issues that were investigated were the importance of social presence and the roles of students and instructors. Answers to the following questions were sought: do students emphasize social presence of others as a factor of learning? Do students emphasize social presence of the instructor? Do they rely on support of others and do they support others in questions about the object of learning? The analysis of the results considering these questions is done in this chapter, and comparing the literature and this study is done in the conclusion of the study in chapter 5.

The inquiry is also used to gather ideas that students might have on creating, establishing or using instant online learning communities. These ideas are not gathered by any formal method, but they are picked up from individual answers and discussed separately.

4.2. Method

As the goal of the inquiry was to get information on students' opinions and attitudes, *role-playing method* was selected for gathering qualitative data on the subject. This method was selected for its suitability for studying thinking and attitudes towards a solution that does not exist yet. The method was also lightweight and simple enough to be completed with the resources available.

The inquiry aims to gather data from individual students. The size of the sample was kept small in order to be able to concentrate on each individual answer. The inquiry does not and is not meant to provide statistically significant data on student opinions in general, but to find out the ways that the students would utilize the given features. For this reason, the results should not be used as a measure of student opinions. Furthermore, they should not be interpreted as the only opinions that exist in student body. The inquiry reveals some of the opinions of the students in the sample, and it is likely that also different opinions exist. Through the analysis, the results express examples of the opinions and ideas that the students have.

4.2.1. Role-Playing Method

Role-playing method is a method for gathering data on the research subject. In the method, the respondent is asked to write based on a story frame given by the researchers. The form in which the response is written can be freely decided by the respondent, although a narrative story is a common way to react on the story frame. (Saaranen-Kauppinen & Puusniekka 2006, 6.5.)

The story frame is a central component in role-playing method. The respondents does not all respond to same story frame. Using the method includes creating several

variations of the story frame, usually from two to four. These variations are similar on the most parts, but they have one thing that is different in each variation. Each respondent is given a single story frame. Separate groups of respondents are selected to respond to each variation. (Ibid.)

Central in using the method is to observe the differences in the responses when different respondents are given slightly different variations of the story frame. The purpose is to analyze the changes that occur between the answers when one thing is changed, and also the similarities that each version has. (Ibid.)

The fact that the respondents are not familiar with the exact research problem of the study is a source of some risks that using the role-playing method has. The respondents do not answer to any specific question, but write their own story based on the story frame. Other risks involved in using this method include: a failure in constructing the story frame or the different variations; answers may be very shallow or stereotyped; as with all qualitative research, a caution must be paid to avoid over-analyzing or leaving the analysis too light. (Ibid.)

Compared to other methods, role-playing and empathizing to a situation were seen as a possibility to gather genuine opinions of the students. The system does not exist yet, as the goal of this study is to determine how such system should be created. For this reason, a questionnaire with assumptions on the system and its usage could easily lead to biased information. It would have been very difficult to create a questionnaire with explicit questions, but without any assumptions. Giving the students only the situation where the system is supposed to be used, they could freely express their opinions and thoughts. In particular, they could bring out issues that were not detected by the researcher. Furthermore, the role-playing method allows the inquiry to concentrate on a specific issue, in this study it being the role of social presence and discussion in perceived learning. This is because of the different variations of the story frames, which are described in the next section.

4.2.2. Story Frames

The story frames of the inquiry were constructed based on the goals described in section 4.1. A course website in Tampere University of Technology (TUT) was used as a basic background, as the inquiry was conducted among the students of TUT. All story frames also mentioned course material as a concrete example to help respondents empathize to the situation. The two central concepts, social presence and discussion, were chosen to be the variables in the stories. Below are the two variations in whole, translated into English, as the inquiry was conducted in Finnish.

Variation A:

"Student of TUT enters the website of a course he is attending to read course material. In the site he sees others reading the same material. Empathize with the situation and tell what he does."

Variation B:

> *"Student of TUT enters the website of a course he is attending to read course material. In the site he sees a discussion about the material. Empathize with the situation and tell what he does."*

The variation A mentions others who read the same material, so that the respondent is led to think about presence of others in the situation. However, it does not mention any form of interaction. The purpose is to get the respondent to write about the ways he or she actually sees the others, and what kind of interaction would occur.

In the variation B, the word 'discussion' is used as a central term in the story that is otherwise identical. The respondent is led to think about precise form of interaction, but the presence of others is not mentioned at all. The purpose of this version was to find out whether the respondent would expect some kind of social presence information of others that participate in the discussion. Another question was about the content of the discussion; would it concentrate only on the content, or would the respondent mention some form of informal socializing also.

The difference between the two story frames was constructed to help determine what the respondents think about social presence in the given situation. Changes in the responses when varying from mentioning others to mentioning discussion was expected to let light on questions that were set in the primary goals of the inquiry; how does the perception of social presence change when the story frame changes from mentioning other students explicitly to mentioning only discussion. Also the contents of the responses themselves were used to answer questions in primary and secondary goals, as well as to gather ideas from the students.

4.2.3. Execution

The candidate respondents for the study were initially gathered using e-mail inside TUT. The selection of the students was based on the requirement of being a currently present student in TUT. This requirement was set so that the respondents could, as current students, empathize with the given story frame as well as possible. Because of using solely e-mail, the candidates were also restricted to students who had previously shared their student e-mail address with the researcher. An e-mail to enquire willingness to voluntarily participate in an inquiry about student opinions was sent to all of these students. The e-mails were sent during April 2010. A total of eight students accepted to participate in the inquiry.

At the end of April, an e-mail containing the enquiry was send to the eight students that had responded to be willing to participate. The message that was sent contained a very short and general explanation of the purpose of the study, without mentioning any precise goals of it. To four students, a message that contained story frame A was used. To the other four, a message containing story frame B was used. Before the story frame, there were three simple questions to gather some background information from the

respondents; student's year level, degree programme and major was asked. These questions were primarily included for analyzing the study, and they were not designed to be used as results. Students were advised to spend from 15 to 20 minutes to write the answer. Also a simple instruction on how to answer to the story frame was included, as recommended by Saaranen-Kauppinen and Puusniekka (2006, 6.5). The precise content of the message including story frame variation B is contained in appendix 1 (in Finnish). The message for story frame variation A differs only by the story frame.

In early May, a remainder e-mail was sent to the students that had not yet sent their response, mentioning a time limit in four days. Until the time limit, six responses out of the eight were received. Among the received responses, three were for variation A and three were for variation B. Thus the number of received responses maintained the balance between the two variations. The six responses were copied from the e-mails to a single text document, with one response in each page. On the top of the page, the degree program, major and year level was included, along with the information that which story frame variation the respondent used. All the information that could identify the student was removed from the responses. As no such information was in the responses themselves, this concerned only the e-mail address of the student and possible signature at the end of the e-mail. The text document was used as the data for the analysis. This document is included in appendix 2 (in Finnish).

As all the respondents were native Finnish speakers, the story frames and questions were sent in Finnish to avoid misinterpretations caused by foreign language. Thus the responses were also originally in Finnish. The quotations from the responses below are all translated into English by the author.

4.2.4. Analysis

The responses were analyzed using a qualitative, theory-originated content analysis (Saaranen-Kauppinen & Puusniekka 2006, 7.2.3). This offered a reasonably simple and reliable analysis for the very limited amount of data, which was originally ready in transcribed form due to using e-mail. Theory-originated analysis was a natural choice as the goals of the inquiry was to compare the responses with the theory. Thus the theory from chapter 2 was used as a basis for dividing the concepts identified from the responses into three categories: social presence of other students, social presence of the instructor, and discussion.

The division was conducted by highlighting the relevant words and sentences related to each of the category. Analyst interpretation was used to determine the relevance of a word or sentence for in category. This was done for each of the responses separately, as they were received individually as responses to the e-mail that contained the questions. Using the highlighted responses, each category was analyzed by going through the highlights relevant to that category.

In addition to the theory-originated analysis, the responses were used to gather ideas from the students. These were extracted from the responses as they are, and presented without revising them. As they are received directly from the students, they have a

potential to improve students' perceived learning. However, to be included as features of IOLC, their actual benefits and other influences must be examined further.

4.3. Results

4.3.1. Social Presence of Other Students

None of the respondents brought up the presence of other students when given the story frame variation B, which mentioned only the discussion and not the presence of others. Emphasis was on content-centered discussion and in some cases student opinions or comments on the content. Discussion as a way to socialize was not mentioned in any of those responses. This partly answers the question on perceiving other students' presence in discussion; most important was the content created by other students, not their presence. Respondent 4 stated that *"He checks out what the conversation is about and continues reading if it is interesting"*, and *"[the student] could participate to the conversation if he had something to ask or something to say about the course material."*

On the other hand, when the presence of others is given as a presumption using the variation A story frame, the respondents explain and utilize the presence information in various ways. The responses also reveal what kind of expectations respondents have considering social presence, and in what kind of situations and how they would use it.

The three respondents of variation A expect presence information such as online status, attendance to events, name of the student, and detailed profiles. Two out of the three mention that the student would look for familiar students who are online or attending the course, and also two of them mention names of the students being visible. Again two of them mention the word profile, and all three responses include a set of student information that could be described as a profile. Altogether, presence information that the respondents brought up included:

- attendance to the course or to a specific upcoming class
- attendance to the current lecture
- online status.

Several usages of social presence information were identified from the responses, most of which was initiating some form of discussion with students who were online. These include starting a chat about sports with a friend who is online, forming a group of students to do an exercise, asking questions about the course material, and chatting among the students who are attending to the same virtual lecture.

4.3.2. Social Presence of the Instructor

Instructors' presence in discussion was given emphasis in the variation B of the story frame, unlike social presence of other students. This is very consistent with the literature, where presence (Shih and Swan 2005) and immediacy (Richardson ja Swan 2003) of the instructor have been proved to have a key role in perceived learning. Respondent 5 states that *"if the instructor of the course would participate in the*

discussion, even educational conversation could arise." This indicates that the respondents sees instructor presence as an important factor in learning.

From the responses to variation A story frame, there could not be found any references to instructors. However, this is most probably because of the choice of the words in the story frame. Even though it did not directly mention presence of other student but 'others' in general, it very strongly indicated that the others were students, as they were reading the course material. The lack of mentions of instructor presence in variation A cannot therefore be used as a basis of conclusions.

4.3.3. Discussion

Firstly, topic of the discussion was seen by most of the respondents as strictly concentrated on the course subject. Most commonly mentioned use of the discussion was asking questions about the material. Possibility of writing and reading opinions about the material was also mentioned by some. But respondent 3, on the contrary, mentioned that it would not be that interesting to *"read random comments of other students"*, stressing the importance of being connected to the course instructors and staff instead.

The respondents of both story frame variations brought up some aspects of how the other students could provide support for learning. In the variation A, one respondent mentioned the possibility to ask questions when something was unclear in the material. In the variation B, one respondent mentioned that the student could ask for information about a lesson he did not attend. This indicates the possibility of students searching for and providing support for each other, in other words, becoming active learners. However, the instructor's role in teaching was seen as more than just a facilitator. Respondent 6 for variation B stated that *"if the course staff would clearly participate in the discussion, some unclear points in the material can be asked."*

Only one of the six respondents brought up social chitchat. This could in some level indicate that socializing does not play an important role in online learning environments, but more likely explanation is that the method and the story frames led respondents to concentrate solely on studying. It is possible that students do not wish to socialize in a learning environment, but rather use other channels to it. However, the fact that one respondent out of six did deliberately mention social chitchat also indicates that some users might use a system such as IOLC for socializing too.

Various forms of conversation were mentioned in the responses, mainly in the story frame variation B. The responses assumed availability of both asynchronous discussion forum and synchronous chat. They utilized both private chats between two or more students, and open chats visible to all students currently online. In addition, a forum-like threaded discussion was brought up in the synchronous chat too, when respondent 1 described that *"[they] decided to look for the third person for the group by starting an open conversation that can be seen by other students currently reading the website."* The same respondent later mentioned discussion forum as a separate function, clearly

implying that both asynchronous and synchronous modes of discussion would be available.

4.3.4. Ideas for IOLC Implementation

In addition to opinions and attitudes towards a system such as IOLC, the responses offered a wide range of ideas for implementing a successful system. These ideas, extracted directly from individual responses, mainly consider the functionality and usage of the system.

In two out of the three responses for the variation B story frame, respondents brought up that the system should enable forming a group for an assignment, if one was included in the course. Depending on availability of a group work environment, this could be either a functionality of the IOLC or a functionality of the group work environment integrated into the IOLC. In either case, the implementation should support forming of a group based on interaction inside the IOLC.

Giving feedback and comments and critique about the course and the course material was also brought up by some respondents. The IOLC could then be used as a channel for feedback during and after the course. Respondent 5 stated that discussion where the instructor is present *"could help to understand possible abstruse parts in the course material"*, and the discussion could then be used for improving the material.

4.3.5. Other Relevant Notions

Anonymity is usually an issue with both advantages and disadvantages in an online community. None of the respondents mentioned anonymity, and in fact two out of three respondents for the variation B suggest that the names of the other students should be displayed.

4.4. Assessments and Reliability of the Results

Using the role-playing method to achieve goals set for the inquiry was considered successful. The method offered a possibility to study student opinions and attitudes within strict schedule and limited resources, still providing useful results. No major problems were encountered during the inquiry, and the results can be considered reliable and valid in the given context. Some minor issues in story frames and selection of the respondents are discussed below.

Some difficulties were encountered while gathering respondents for the study. In addition to using e-mail to enquire about willingness to participate in the study, some public chat rooms inside TUT were used, but no voluntary respondents could be found from them. In addition, responses were received from only 6 out f 8 students that had accepted to participate. This was not predicted, and so further reduced the number of responses for the analysis. Regardless of these difficulties, however, a decent amount of responses was received.

4.4.1. Story Frames

The role-playing method and the success of using it depend heavily on the story frames. In this study, the story frames can be considered successful in most parts. Some issues, however, were identified when analyzing the responses.

Most of the respondents of the variation A understood the discussion as an asynchronous discussion forum, although it was intended to refer to any type of discussion, including both asynchronous and synchronous forms such as chat and instant messaging.

Some respondents also understood the reference to course material differently from what it was intended to refer. As the purpose was to describe a website that was the course material itself, some of the respondents imagined the website as a page that included information about the actual course material such as books. But this is not a major issue, as it could be assumed not to affect the analysis considering the goals of the inquiry.

4.4.2. Respondents Background

Few questions on the background of the student were included in the inquiry. Answers to these questions were used for a simply analysis of the study and respondent selections.

Among the received responses, 100 percent of the students were year level 5 or more. Also 5 out of 6 students were studying under *degree programme of information technology*. Majors of the students were also rather homogenous; 4 of the respondents were majoring *software systems*, two others being *software science* and *usability*. Although this sample belongs to target user group, it is not comprehensive as the lower year level students and students from other degree programmes were not equally represented. This is not a serious problem considering reliability of this type of method, but it must be taken into account when drawing conclusions about the results. More comprehensive sample could also provide richer ideas from the students.

Another shortcoming of this inquiry was the lack of instructors as respondents. As the instructor presence was confirmed to have a major role in how the students perceive the online community, it would be even more important to include opinions of the instructors in this study. Along students, instructors are also members of the learning community and users of the online community software. In addition, the instructor might in many cases be the administrator of the online community and the one that creates and integrates the community into the website of the course that he or she might be responsible for. Further study is required to include these new aspects into the concept of IOLC.

4.5. Summary of the Student Inquiry

This chapter explained the inquiry that was conducted among students using role-playing method. This allowed an affordable examination of student opinions and attitudes towards the features in an IOLC. The inquiry was conducted using six students of Tampere University of Technology, who responded to the inquiry by writing a short story based on the given story frame. Two variations of the story frame were used, and three students responded to each.

The responses were analyzed using three concepts based on the theory: social presence of other students, social presence of the instructor, and discussion. Students utilized the information about social presence of others, but only if the story frame directly implied that such information existed. On the other hand, social presence of the instructor was more strongly present in the responses, and it was seen as a key factor in their learning. Discussion was assumed to be available both as a synchronous chat and as an asynchronous discussion forum. Asking questions from other students and from the instructor was common use for the discussion. Also forming a group was brought up by many students, implying that such function would be useful in an IOLC. Socializing was mentioned by only one of the students.

The findings of this chapter can be utilized to improve and prioritize the features that are included in the IOLC. The results were mostly in line with what was concluded by the literature review, but other students role in improving their learning was not equally emphasized by the students.

5.   CONCLUSION

This study has examined the idea of instant online communities, and how it could be used in university courses to improve perceived learning. This chapter first summarizes the findings in previous chapters to answer the questions of improving perceived learning. Next it presents the idea of instant online learning communities and the changes that are made based on the student inquiry. It then briefly assesses the study and relevance and significance of its results. The chapter concludes with some issues left unsolved and other needs for further study.

5.1.   Improving Perceived Learning

According to the literature, there is a significant positive relation between students' perceived social presence and their perceived learning (Picciano 2002; Richardson & Swan 2003). By providing visibility and awareness of the community, instant online communities can improve social presence of the other students in a university course website. Therefore, it is presumed that the idea of instant online communities can be used to improve learning by fostering social presence.

Based on this, the concept of instant online communites was adopted to online learning communities with a goal of fostering social presence and thus improving students' perceived learning. The features that foster social presence were further specified to include various social presence information presented to the students and discussion features to support interaction. Including discussion to features supporting social presence was based on the presumption that interaction is a key factor in social presence. This is because discussion clearly affects the ability to interact, which further affects social presence (Picciano 2002). Consequently, with these features the perceived learning could be improved using instant online communities.

The student inquiry showed that when the students are given the social presence information, they find various ways to utilize it in their learning. On the other hand, when students were asked about discussion, they did not bring up anything about other students besides the content of the discussion. This could be interpreted as an indication of the need to bring up the social presence so that the students can utilize it. These results are very similar with the results of the study by Richardson and Swan, which indicates that the social presence perceived by students is directly related to their perceived learning (2003, p. 79). Thus, using instant online communities that provide awareness of other students could significantly improve perceived learning. This is, however, based on the assumption that the answers of the students would be consistent with their perception of learning and social presence if measured after actually using the

system. This assumption is supported by previous studies on online learning and social presence by for example Shih and Swan (2005).

Besides the social presence of other students, also presence of the instructor is an aspect that can be improved using instant online communities. This is achieved by features similar to when supporting the students' social presence, although the precise functions these features provide is not covered by this study. The presence of an instructor, especially in discussion, was given much more emphasis by the students compared to presence of other students in the student inquiry of this study. The importance of instructor presence is similarly highlighted by previous studies (e.g. Richardson & Swan 2003).

On the other hand, previous studies imply that online learning communities would cause changes in the roles of instructors and students (Sheard 2004). In the inquiry in this study, the students still valued the direct feedback from the instructor, in some cases clearly over the feedback from other students. Even though students did in some situations suggest supporting each other and seeking support from each other in learning, the role of the instructor is still perceived crucial. No clear implications of students' transition into active learners, such as suggested by the theoretical background (e.g. Richardson & Swan 2003), was found by this study. Considering the research method and the limited sample, this cannot be interpreted as there would be no need for peer support or peer feedback, but rather an implication of the importance of instructor presence. By promoting social presence of the instructor in an online learning community, instant online communities could definitely improve perceived learning, but this is as much an issue of instructional design and pedagogy as it is a technological issue. Furthermore, how the instructor presence should be supported is an important subject of further study.

5.2. Instant Online Learning Community

A concrete explanation of how instant online communities can be used to improve perceived learning was constructed in this study. This explanation was made in a form of a service that would best support learning communities. This service was referred as an instant online community service.

An instant online learning community (IOLC) service is a service that enables a learning community in a website that is used by students of a specific university course. It is used by integrating the service into one or several websites using simple code snippets that are available from the IOLC service provider. After the integration, students can access the community and its features when using one of those websites. Two central aspects of IOLC are awareness and discussion.

Awareness is supported by features including a *members list*, *online status* and *member profile*. When a user signs on to the website, the list of members shows the names of the students and instructors in the course, indicating who is currently online, viewing the same page or attending the same lecture. The names of the students are

displayed because, according to the student inquiry, it is common for the students to look for familiar names among the members and start a chat or form a group based on a the name. Also added to the online status, attendance to a lecture is displayed so that the student could initiate discussion with other students in the same lecture. A member profile is a page with information about a specific student. The profile includes information about the interests of the student and the courses he or she has completed, if the student has chosen to allow other students to view the information. This information is used for finding a compatible member to for example form a group for an assignment.

Discussion is supported by offering both *synchronous chat* and asynchronous *discussion forum*. A chat can be initiated with the members that are online, with the members on the same lecture, or with the selected members. It can then be used to ask questions or to just socialize, and it can be used to form a group of members. The student inquiry showed that forming a group is a very common way to use the presence information on other students. Similarly, a discussion forum is used for asking questions, but it can also be used to store the answers so that they are more easily accessible later. It also enables interaction better when the participants of the discussion are not simultaneously online.

The student inquiry confirmed the fact that the presence of the instructor is very important in online learning communities. The IOLC can promote this by displaying online status of the instructor, so that the students can see if an instructor is online and participating to the discussion. Messages sent by the instructor are also clearly marked as instructors messages, separating them from the ones from students. This helps the instructors to facilitate discussion, potentially making it more educational. On the other hand, social chitchat in the community is also encouraged, although the student inquiry indicated that it might not have that significant role.

C*ontent aggregation* can be used to enable usage of external services to create content into the community. This works by attaching specific tags to the content that is created in services such as Twitter or YouTube. The IOLC services uses the tags to fetch the content and shows it in the website where the IOLC is integrated into. Although this is an interesting feature, no learning-related use to it was found in this study. This feature and its uses in learning communities is one of the areas that need further studying.

The software that supports the learning community is only a part of the solution for supporting learners online. Although the focus of this study is more on the capabilities and restrictions of the software and how they can be improved, the importance of proper establishment of the community cannot be disregarded. This includes explaining the purpose of the community to the students; promoting presence of the instructors and participating in the discussion; encouraging students to present themselves online; dealing with inappropriate messages; discussing topic of online discussions in face-to-face lectures; and involving tutorial staff in the community. Using these guidelines to establish the community and proper software to support it, a viral learning community that benefits its members can be created.

5.3.   Assessment of the Study

The study offered a many-sided view to instant online communities and online learning communities. It spans from very theoretical view of online communities to a very technical and practical view of instant online community services. This approach made it possible to make a rather practical proposal with also strong theoretical grounding, although it forced to take a rather exploratory approach when examining currently available services.

Research on online communities and especially online learning communities is still very sparse. There are many competing definitions of even the most central concepts such as *online communities* and *online learning*. In fact, the term *online* is far from universal consistency, with also several adjacent terms such as *virtual* or *electronic*. This poses a challenge when employing a wide range of research in order to provide strong theoretical basis for studies in this field.

In the more technical view to the features of the two sample services in the third chapter, a very experimental approach was taken. This was forced by the fact that there was no documentation of the features, and only way to access them was to create a community that uses the service. Nevertheless, it offered a good look to what is offered by such services today.

Surprisingly lot of information could be gathered with the student inquiry compared to its size. It offered a good insight to the thoughts of the students, and many new ideas for the service. The sample of students that was used was rather homogenous. Although the results can still be considered reliable, a more comprehensive sample could certainly give more information.

5.4.   Unsolved Issues and Proposals for Future Study

A preliminary proposal of an IOLC service is presented above, but a few issues still remain, including some theoretical and technical issues. One aspect of online learning communities that was left out from this study was the temporal aspect of long-lasting communities. This study concentrated on support for a single course. But the students usually take many courses, and the same course is held each year. This could affect how the IOLC service should work. Students also have to disengage from the online community, and the student should be properly supported in this transition.

How social presence supports perceived learning may be also affected by the learning styles of an individual student. Pohjolainen et al. (2006) suggests that not all the learning styles benefit from the presence of others. This should also be taken into account in the service, but further study is required to examine the issue. Another aspect concerning different target users is the instructors that have a major role in online learning communities. Further study is also required to determine their opinions and needs in an IOLC. This is especially important, as instructor presence was noticeed to

be one of the major factors in supporting perceived learning in online learning communities.

From the technical issues identified along the study, maybe the most significant is the authentication issue. Using all the features of the service described above requires the service to be able to have access to the students' data, his or her name at the very least. It is very complicated to achieve this when using an external service for sign on. One technique that could offer some answers is OpenID. In any case, the issue of authentication requires further study.

A need to form groups among the students was brought up by many students in the inquiry. Support for groups is usually far from satisfactory in current online community software, including IOC services examined in this study. Although some support for forming groups could be provided by enabling students to form private chats among desired students, the students' answers to the inquiry suggest that the feature could be taken much further. This is, however, a difficult technical issue, especially with the difficulties in authentication, and requires more study on possible solutions.

Finally, the idea of instant online learning communities examined in this study concentrates on universities as an environment for learning communities. Further study is required for extending this idea to online learning in general.

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APPENDIX 1: STUDENT INQUIRY EXAMPLE

Hei,

teen DI-työtä varten tutkimusta, jossa toivon saavani myös opiskelijoiden äänen kuuluviin. Ensin pari alustavaa kysymystä tulosten analyysin helpottamiseksi. Nimeäsi ei käytetä tuloksissa missään vaiheessa.

1. Koulutusohjelma

2. Pääaine

3. Vuosikurssi

Seuraavassa on lyhyt alustus, jonka pohjalta voit vapaasti kirjoittaa mitä se tuo mieleesi. Käytä vastaamiseen 15 - 20 minuuttia.

"TTY:n opiskelija menee käymänsä kurssin kotisivulle lukemaan kurssimateriaalia. Hän näkee materiaalisivulla materiaaliin liittyvän keskustelun. Eläydy tilanteeseen ja kerro mitä hän tekee."

Kiitos vastauksistasi!

Ystävällisin terveisin,
    -Mikko Vuorinen-

APPENDIX 2: STUDEN INQUIRY RESPONSES

Student 1

Degree programme of information technology / majoring software systems / year level 5
Story frame variation A

Opiskelija näkee tutun henkilön ja aloittaa chätin tämän kanssa. Aluksi he keskustelevat päivän jääkiekkotuloksista ja tämän jälkeen huomaavat että kurssilla on 3 hengen harjoitustyö. He sopivat olevansa samassa ryhmässä ja päättävät hankkia kolmannen henkilön pistämällä avoimen keskustelunavauksen joka näkyy muille sillä hetkellä sivuja lukeville opiskelijoille. 3 Opiskelijaa vastaa 5 melkein heti ilmoitukseen ja he päättävät valita heistä yhden joka on tuttu nimensä perusteella. He myös katsovat että kyseinen henkilö on sallinut näyttää profiilinsa tiedoissa käymänsä kurssit, ja näyttää siltä että opiskelija on käynyt paljon aiheeseen liittyviä kursseja. Tämän jälkeen he ilmoittavat ryhmän kurssinhallintajärjestelmään siten että yksi opiskelija ilmoittaa ryhmään kuuluvat henkilöt ja muut hyväksyvät toimenpiteen heille saapuvan pikaviestin välityksellä.

Opiskelija päättää myös käydä vilkaisemassa sivuilla olevaa keskustelupalstaa jonne onkin jo tullut hyödyllisiä kysymyksiä. Yhteen mieltä askarruttavaan kysymykseen siellä ei kuitenkaan vielä ole vastausta joten hän päättää kirjoittaa pikaviestin ja lähettää sen kurssin sähköpostiosoitteeseen sekä keskustelupalstalle.

Tämän jälkeen opiskelija muistaa ettei käynyt tällä viikolla viikkoharjoituksissa. Hän menee katsomaan olisiko muita kiinnostuneita opiskelijoita osallistumaan tänä iltana virtuaalisiin viikkoharjoituksiin. Illan harjoituksiin on tullutkin jo paljon ilmoittautumisia ja hän päättää myös mennä mukaan. Harjoitusten aluksi tehdään lyhyt henkilökohtainen teoria osuus jonka jälkeen siirrytään ryhmätehtäviin, joita tehdään käyttämällä yhteistä piirtopyötää, chättiä ja halutessa myös puheyhteyttä.
Opiskelija päättää myös osallistua virtuaaliselle luennolle ja samalla chättäilee muiden läsnäolijoiden kannssa luennolla esitettävistä kysymyksistä.

Muita hulluja ideoita:
-sivuille myös kurssia sponsoroivan yrityksen foorumi, jossa esim kesätöitä, kilpailuja, tehtäviä joista voi voittaa palkintoja
-linkkejä vastaavien kurssien sivuille, esim muissa kouluissa
-arvostelu ominaisuus jossa voia arvoida kurssia ja lukea arvioita
-vapaa-ajan chät/yhteisö kurssin opiskelijoille, voi ostaa/myydä tavaraa, hakea opiskelu seuraa yms...

Student 2

Degree programme of information technology / majoring software systems / year level 7
Story frame variation A

TTY:n opiskelija näkee sivuilla muita materiaalia lukevia opiskelijoita, joista näytetään nimi (etunimi + sukunimi) ja kuva, mikäli opiskelija on lisännyt kuvansa palveluun. Opiskelijat luetellaan sivun vasemmassa laidassa olevassa palkissa listana ja sukunimen mukaan aakkostettuna.

Opiskelija tuli sivuille lukemaan kurssimateriaalia, koska hän ei ehtinyt käydä kyseisen viikon luennoilla. Nähdessään sivuilla muita samaa materiaalia lukevia opiskelijoita, hän päättää kysyä löytyisikö joltain luentomuistiinpanoja, jotka hän voisi kopioida. Opiskelija lähettää kaikille samaa materiaalia lukeville viestin, jossa hän kysyy luentomuistiinpanoja. Vastausta ei kuuluu, joten opiskelija päättää kysyä luentomuistiinpanoja myös kurssin yleisellä keskustelupalstalla. Kaikki kurssille osallistuvat näkevät yleiselle keskustelualueelle jätetyt viestit. Mahdolliset vastausviestit tulevat sitten aikanaan lähetetyn viestin alle ja ne lähetetään myös opiskelijan sähköpostiin.

Viestien lähettämisen jälkeen opiskelija avaa .pdf muodossa olevat luentokalvot ja lataa ja tallentaa ne myös omalle tietokoneelleen. Mikäli johonkin opiskelijan lähettämään viestiin tulee vastausviesti silloin, kun opiskelija on kirjautuneena kurssin sivuille, näytetään opiskelijalle pop-up ikkuna ""Vastausviesti saapunut"", jota klikkaamalla opiskelija pääsee lukemaan viestiä. Kalvot luettuaan opiskelija sulkee selainikkunan (ja samalla hänet kirjataan ulos sivuilta).

Student 3

Degree programme of information technology / majoring software systems / year level 6
Story frame variation A

Opiskelija tarkastaa, onko samalla kurssilla hänelle tuttuja ihmisiä. Jos kurssilla on ryhmässä tehtävä harjoitustyö, hän ottaa yhteyttä tuttuihin henkilöihin ryhmän perustamiseksi. Jos tuttuja ihmisiä ei löydy, opiskelija alkaa tutkia muiden opiskelijoiden profiileja löytääkseen harjoitustyöryhmään mielenkiintoisia tai motivoituneita ihmisiä.

Student 4

Degree programme of information technology / majoring software science / year level 5
Story frame variation B

Hän vilkaisee mitä keskustelu koskee ja jatkaa lukemista jos se on häntä kiinnostava. Sen jälkeen hän rupeaa lukemaan sivuilta löytyvää kurssimateriaalia. Hän saattaa palata lukemaan keskustelua myöhemmin uudelleen jos näkee sen tarpeelliseksi, tai hän voi jopa itse osallistua keskusteluun jos hänellä on jotain kysyttävää tai sanottavaa kurssimateriaaliin liittyen.

Student 5

Degree programme of automation science / majoring software systems / year level 5
Story frame variation B

Yksi vaihtoehto on tietenkin että laiskana opiskelijana hän ei tee mitään. :) Jos kuitenkin oletetaan että kyseessä on asiasta jonkin verran kiinnostunut opiskelija, hän mahdollisesti ensin tutustuu siihen mitä muut ovat sanoneet materiaalista. Jos materiaalisivulla on lueteltu esim. useita kurssin aihepiiriin liittyviä kirjoja, opiskelija voi lukea keskustelun viestejä löytääkseen vinkkejä siitä mikä kirja olisi lukemisen arvoinen. Lisäksi hän voi etsiä viesteistä vinkkejä siihen löytyykö materiaalista tietoa johonkin tiettyyn kurssin aihealueeseen.

Jos opiskelija on itse tutustunut materiaaliin, hän voi esittää siitä mielipiteitä. Oliko se hyödyllistä jne. Parhaimmillaan keskustelua voisi syntyä myös itse aiheista. Mikäli keskusteluun osallistuisi myös esim. kurssin vetäjä, voisi syntyä opettavaistakin keskustelua. Tällainen keskustelu voisi auttaa ymmärtämään materiaalissa mahdollisesti esiintyviä vaikeaselkoisia kohtia. Myös kaikenlainen asiaa taustoittava, laajemmin valaiseva tai käytäntöön soveltava keskustelu voisi olla parhaimmillaan mahdollista.
Yhtenä vaihtoehtona voisi olla myös että opiskelija esittää vaihtoehtoista materiaalia, mikäli hän on itse tutustunut tällaiseen. Keskustelukanava voisi mahdollistaa myös kritiikin esittämisen materiaalia kohtaan. Jos materiaalin joukossa on esim. kurssin vetäjän itse tuottamaa materiaalia, keskustelukanava voisi olla parhaimmillaan myös mahdollisuus tämän materiaalin kehittämiseen.

Student 6

Degree programme of information technology / majoring usability / year level 5
Story frame variation B

Ensinnäkin keskustelusta voisi tarkistaa onko materiaalissa virheitä, kirjoitusvirheitä tai muuten, ja miten niihin on reagoitu. Onko esimerkiksi korjattu jo jakeluss olevaan versioon.

Toisaalta jos kurssin hekilöstö selvästi on mukana keskustelussa voi kysyä jos jonkin kohta materiaalissa jää epäselväksi.

Ellei keskustelun kautta pidetä jonkinlaisia virtuaalisia harjoitusryhmiä pitäisin tärkeimpänä ominaisuutena juuri yhteyttä kurssiin ja siten todennäköisimmin materiaalin tekijöihin. En pitäisi kovinkaan mielenkiintoisena lukea satunnaisia toisten opiskelijoiden kommentteja materiaalista.

Toisaalta riippuu hyvin pitkälle aiheesta voiko siitä syntyä muuten mielekästä keskustelua. Joistakin vaikkapa fysiikan kaavoista tuskin riittää kovinkaan paljon pohdittavaa. Mutta jos materiaalissa esitetään vain tekijöiden näkemyksiä käsiteltävästä aiheesta saattaisi siihen saada mielekkäitäkin kommentteja ja keskustelua aikaan.
Mutta takaisin kysymykseen mitä hän tekee. Materiaali on kuitenkin tenttimateriaali sellaisenaan, joten ensimmäinen kohta lienee tärkein ja keskustelusta tarkastaisin lähinnä sisällön mahdollisiin virheisiin tai puutteisiin liittyvät kommentit, en niinkään etsisi toisten opiskelijoiden kommentteja.