Motivation in Web Based Learning – Lessons Learned from Volunteer Web Communities

MATTI KOIVISTO
Information and Media Technology
Mikkeli University of Applied Sciences
P.O. Box 181, 50101 Mikkeli
FINLAND

Abstract: - Millions of people devote substantial amounts of their time and energy to collaborative user-generated content projects. In these open web communities the task itself and how a person feels about it are important motivation factors. In student motivation studies the main interest has been in other motivation dimensions like importance and effort. In this paper we suggest an extended method to measure student motivation which covers also the affect dimension. The results of our experiment indicate that methods used in volunteer motivation studies can also be applied in student motivation context. We also identify the differences and similarities between feelings related motivation determinants in the web based studying context and in the web based volunteer work.

Key-Words: - Student motivation, web communities, eLearning

1 Introduction

Student motivation has a strong impact on the quality and the level of learning, no matter how it is provided. Problems related to student motivation are well documented in the literature both in the classroom (e.g. [1], [19], and in the eLearning contexts (e.g. [14] [21]). However, less attention is paid to the blended learning situations where eLearning is used together with the face-to-face teaching.

Although student motivation is an abstract concept that is difficult to measure in any meaningful way [12] scholars have developed different frameworks and metrics to measure it. One good example of them is a Student Opinion Survey (SOS) [20], which analyzes motivation from two different dimensions: importance and effort. However, the SOS does not include the affect component of motivation i.e. how a person feels about the task.

In volunteer web communities a large number of people devote their valuable time and effort to collaborative user-generated content projects. Well-know examples of these include Linux and Wikipedia. Earlier studies have indicated that the participants' opinions and feelings are important motivation factors in these environments. Thus, the motivation in volunteer and mandatory or semi-mandatory settings have differences but the key question is could the educational organizations and educators learn something from the motivation determinants of volunteer web communities?

In this study student motivation is analyzed in the blended learning environment which combines both classroom work and studying in the web based environment (Cisco Network Academy). The study has two main aims. First, we aim to extend the SOS motivation metrics to cover also the affect dimension. Our aim is to apply the methods and metrics used in volunteer motivation studies here.

Second, we want to identify the differences and similarities between feelings related motivation determinants in the web based studying context and in the web based volunteer work. Thus, we benchmark our results against the findings of an earlier study on motivation of Wikipedians [17].

The structure of the study is as follows: Chapter 2 includes a short literature review on student motivation and motivation in volunteer projects. In Chapter 3 the research design of the study is explained followed by results of the experiment. In Chapter 4 the motivation factors in mandatory and volunteer web communities are compared. Finally the conclusions and some suggestion for further studies are made in Chapter 5.

2 Motivation in Mandatory and Voluntary Settings

2.1 Student Motivation

Motivation is an abstract concept that has many definitions and descriptions. Entwisle [9] describes three generic types of motivation:

- *Extrinsi*c: the desire to complete the course in order to attain some expected reward.
- *Intrinsic*: deriving from an interest in the subject.
- *Achievement*: based on doing well and (sometimes) better than peers.

Based on the general concepts of motivation scholars have developed different kinds of frameworks to analyze motivation in eLearning. Cocea and Weibelzahl [5] distinguished three main eLearning research directions: motivational planner [6], ARCS model [13] and Social Cognitive Learning Theory (SCT) [2].

Although student motivation is an abstract and complex concept that is difficult to measure scholars have developed different frameworks and metrics to measure it. Some well-know examples arethe Student Motivation and Engagement Scale (SMES) [15], the Motivation and Engagement Scale-High School (MES-HS) [16] and Student Opinion Scale (SOS) [29]. In this paper we will concentrate only on the SOS because we will use a modified version of it in the empirical part of the study.

The Student Opinion Scale (SOS) is a short, easily administered self-report measure of motivation. It is based on the expectancy-value model of achievement motivation theory [7], [18]. According to the theory, motivation to perform well can be defined by three factors: expectancy for success, value of the task, and affect. The expectancy for success is integrated in person's abilities and competence. The value is related to a person's perception that this task is important, interesting or useful. The third component, affect, captures how a person feels about the task.

Although the theory behind the SOS includes three dimensions it measures only two of them: importance and effort. So, no affective measures were included in scale development. [20]

2.2 Volunteer Motivation

Every year, millions of people devote substantial amounts of their time and energy to helping others. One important example of human helpfulness is volunteerism, whereby people provide e.g. companionship to the lonely or counseling to the troubled. During the recent decades new virtual forms of volunteerism has emerged in the form of open source software and collaborative user-generated content projects.

What actually motivates a person to do some volunteer work is a complex question. It is also true that the determinants of the motivation in volunteer and mandatory or semi-mandatory situations differ. However, understanding the volunteers' motivations can be of great assistance to educational organizations although.

The motivation of people to volunteer has received a lot of interest among the scientists. One of the key areas of interest has been to identify the sub-constructs of the motivation. Many classifications exist but one of the most widely accepted study is made by Clary et al. [4]. They identified the following six motivational categories in their Voluntary Functions Inventory (VFI):

- *Values:* volunteering gives volunteers an opportunity to express values related to altruistic and humanitarian concerns for others.
- *Understanding:* through volunteering, individuals may have an opportunity to learn new things and exercise their knowledge, skills and abilities.
- *Social:* Volunteering may offer opportunities to be with one's friends or to engage in an activity viewed favorably by important others.
- *Career:* Volunteering may provide an opportunity to achieve career-related benefits such as preparing for a new career or maintaining career-relevant skills.
- *Protective:* involves protecting the ego from negative features of the self, reduce guilt over being more fortunate than others, or address one's own personal problems.
- *Esteem or Enhancement*: this is category somewhat related to the Protective category, however in contrast to the latter's concern with eliminating negative aspects related the ego, Enhancement involves positive strivings of the ego.

VFI has been used in many studies in its original form (e.g. [11], [8]) and some scholars have extended it with new concepts like reciprocity, recognition and self-esteem [10] or fun and ideology [17]. In this study the affect dimension of motivation is measured with a modified VFI suggested by Nov [17].

3 Test Design

3.1 Test Environment – Cisco Network Academy

Cisco Network Academy is a comprehensive eLearning program that enables students to develop their information and communication technology skills for increased access to opportunities in the global economy. Since 1997, Network Academy has grown to reach a diverse population of approximately 600,000 students each year in more than 160 countries. All students receive the same education, supported by online content and assessments, performance tracking, hands-on labs, and interactive learning tools [3].

Network Academy provides many different courses. In this study the students are participating CCNA Exploration courses. This curriculum teaches networking based on technology, covering protocols and theory at deeper levels reflective of university practices. Students learn the basics of routing, switching, and advanced technologies

3.2 Data Collection

Data collection was carried out with a paper questionnaire among the students in a Finnish university. All participants had studied the first three modules of the CCNA and were studying the last one when they took part of the experiment. The questionnaire contained three parts: the first part

included some demographic variables like age, gender and nationality. The second part included the modified SOS questions and the third part modified VFI questions similar to [17]. (See Appendix A for more details).

The total number of participants was 44 but the answers of two participants were rejected because they had not answered to all questions. The average age of the subjects was 23.9 years (stdev 2.8). Most of the students were male (90 per cent) and they all had information technology as their major.

3.3 Results

From the collected data we were able to get three different motivation components. The first two, importance and effort, came from the SOS questions and the third one – affect – from the modified VFI questionnaire. The results of all three components are reported in Table 1. The results of the modified VFI are converted to the same scale with the SOS metrics (from 5 to 25).

Table 1 Means of the motivational components

Component	Mean (Stdev)	95 % CI range
Importance	15.4 (2.5)	Min 14.6 Max 16.1
Effort	17.5 (2.1)	Min 16.8 Max 18.1
Affect	15.7. (3.1)	Min 14.8 Max 16.7

The results indicate that the effort component got a little bit higher ratings than importance and affect, but the differences were quite small. The more important aspect, however, is to find out if the modified VFI can be used together with the SOS to measure the affect component. To find that out we calculated the correlations between the components as reported in Table 2. We also calculated the correlations between the single questions of the modified VFI and the SOS components and found no correlations there either. Because our results suggest that there is no correlation between the components modified VFI measures a different dimension of motivation that the components of the SOS.

Table 2 Correlation matrix

	Importance	Effort	Affect
Importance	1		
Effort	0.34	1	
Affect	0.36	0.12	1

4 Motivation in Mandatory and Volunteer Settings

The results reported above are suggesting that modified VFI is a good candidate to measure affect side of the motivation. But how does people's feeling differ in mandatory and voluntary settings. To find this out we compared our results against the results of [17]. Table 3 shows the results.

Table 3 Our results and earlier results

Motivation	Our Study Mean (Stdev)	Nov´s Study Mean (Stdev)
Ideology	5.40 (1.81)	**5.59** (1.71)
Values	5.19 (1.33)	**3.96** (1.55)
Understanding	4.98 (1.52)	**3.92** (1.48)
Career	4.90 (1.34)	**1.67** (0.94)
Fun	3,93 (1.72)	**6.10** (1.15)
Enhancement	3.86 (1.32)	**2.97** (1.39)
Social	3.52 (1.49)	**1.51** (0.92)
Protective	3.43 (1.74)	**1.97** (1.05)

In mandatory settings the fun seems to be less important than in volunteer environments. Ideology, values and understanding instead are getting high ratings in both contexts. Enhancement, social and protective dimensions seem to be the least important factors in both cases.

5 Conclusion

Motivation studies among volunteers have revealed that the volunteers feeling about the task are important sources of motivation. We believe that affect is an important motivation determinant also in mandatory or semi-mandatory contexts. Therefore we suggest that it should be also measured in student motivation studies.

The results of the study suggest that VFI is a good candidate as an affect metric in student motivation studies. However we want to emphasis that further studies are still required in this field.

When our results were compared against earlier results among volunteers [17] we found out that fun is not the key to success in web based learning systems. Students value

highly concepts related to their professions like understanding and career. Ideology and values were on the top of both lists. We cannot fully explain why also students gave so high ratings to these issues, which are more often connected to the voluntary work. However, we think that it is worth mentioning that university studies are free in Finland and this could have an effect about students' views.. However, deeper analyzes are still required before any final conclusions can be made.

Appendix A. Questionnaire

Modified SOS Questions:

1. *Doing well on the Cisco Network Academy is important to me*
2. *I engaged in good effort throughout the Cisco Network Academy*
3. *I am not curious about how I did at the Cisco Network Academy relative to others*
4. *I am not concerned about the scores I receive at the Cisco Network Academy*
5. *The Cisco Network Academy is important to me*
6. *I gave my best effort at the Cisco Network Academy*
7. *While studying at the Cisco Network Academy I could have worked harder*
8. *I would like to know how well I did at the Cisco Network Academy*
9. *I did not give my full attention to the Cisco Network Academy during my studies*
10. *While studying at the Cisco Network Academy I was able to persist to completion of the tasks*

Modified VFI Questions:

1. *By studying at the Cisco Network Academy I feel less lonely.*
2. *I feel it is important to be free to study whenever I want.*
3. *Studying at the Cisco Network Academy might help me in my career*
4. *My classmates encourage ana want me to study at the Cisco Network Academy*
5. *Studying at the Cisco Network Academy allows me to gain a new perspective on things*
6. *My classmates respect my practical skills learnt at the Cisco Network Academy*
7. *Studying at the Cisco Network Academy is fun.*
8. *I think studying at the Cisco Network Academy should be free and open to all*

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