Leveraging Engagement and Participation in e-Learning with Trust
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Abstract: This article describes a project that builds on authors previously body of knowledge on Trust and uses it to leverage higher levels of engagement in eLearning contexts. The presented research aims to investigate on unobtrusively strategies to evaluate a toolset of Trust indicators that monitor trust levels thus facilitating the deployment of trust level regulation interventions. So far results include project concepts, the design, develop and implementation of tools and indicators to measure trust in eLearning formal contexts. The Project underlying hypotheses aims in real time offering possible future directions to the study of the roles of learning engagement, participation and overall sustainability to support self-directed and sustainable learners activities that imply a strong need for cooperation between learners and learning systems and technologies, and between learners through systems and technologies in the context of open learning scenarios.

Keywords: Trust, Social learning, learning engagement, electronic participation

1. Introduction
The increasing pervasiveness of computing systems again raises the challenge of focus on humans, beyond the pragmatic usefulness and usability dimensions, when developing interactive systems and technologies. As mentioned by Jaimes (2007), computing is at one of its most exciting moments, playing an essential role in supporting human activities, facilitated by the growing availability of services, devices and interaction modalities. Moreover, users were brought from the periphery to the center of the emerging global ubiquitous computer with the evolution from the large-scale computing to the contemporary pervasive and ubiquitous computing interaction paradigms through the successive waves of the personal, networked, collaborative, mobile, augmented and virtual reality interaction paradigms. Notwithstanding, the computing community still designs and develops systems and technologies without fully taking into account our cognitive abilities, the ways we perceive and handle information, go about our work and life, create and maintain social relations, use our cultural context and relate to our environment (Jaimes, 2007). Examples abound in the literature on Human-Computer Interaction (HCI) (Norman, 2004), Computer-Supported Cooperative Work (CSCW) (Preece and Shneiderman, 2009), User-Centered Design (UCD) (Keates, 2011; Kuniavsky, 2003) and eLearning (Sousa and Lamas, 2012, Sousa and Lamas, 2011)

As an approach to address the highlighted shortcomings, Human-Centered Computing (HCC) is an emerging field that aims at bridging the gap between various disciplines involved in the design and development of systems and technologies that support human's activities, which focus on all aspects of humans with systems, humans with technologies, humans with their environment, humans with humans integration. Within this landscape, we focus on leveraging HCC with Trust. This rationale is built on the belief that a thorough leveraging Human-Centered Computing Trust we are able to intervene as interaction facilitator construct aiming that way to foster higher degrees of human integration with and through technological artifacts, systems and their shared environment thus leading to higher levels of engagement, participation and overall sustainability.

Following section establishes the relevant background on Trust and its interrelation with Human-Centered Computing.

2. Fundamental notions on trust
Trust is a complex concept with multiple dimensions and there is much work and progress made to understand it concepts and implications on human relations on areas like sociology, psychology, economics, management science and technology. From a sociological perspective Trust is seen as a reflection of behaviors, choices and decisions (e.g. Gambetta, 1998); for psychologists, trust is seen as an attitude or intention (e.g. Erikson, 1968); on the other hand social psychologists interpret trust as a interpersonal phenomenon (e.g.
Meyerson, 1996), and economists see it as a commitment in a form of a rational decision (as a game) (Bachrach et. al., 2007). For scholars in management science, trust has been recently connected with the notion of docility introduced to describe the tendency of people to trust social channels as a major basis for making decisions (Weber, 2003). Trust has also been approached in HCI, in CSCW and other computing systems and technologies contexts (Constantine, 2006). In the field of Technology Enhanced Learning (TEL), a significant relation between Trust and academic performance was identified building on three trust factors: trust towards teacher and facilitators and learner’s interactions, trust towards the online learning environment and Trust towards the technological infrastructure.

Further, a socio-technical model of trust was developed which depict trust as a construct informed by attributes such as trust predisposition, reciprocity, predictability, honesty, benevolence, and competence, determining the extent to which one relates with one’s social and technical environment. This model builds on what one perceives to be trustworthy and is influenced by a number of factors such as the history of participation and perceptions of the communication medium and of other users. Using this model as a research lens, relations were found linking trust to openness and sharing (Sousa et.al, 2011; Sousa and Lamas, 2011), to privacy (Lorenz, et. al., 2012) and to collaboration (Sousa and Lamas, 2012) in online learning environments. On the literature we further read that Trust influences the degree of engagement and commitment towards specific activities; and the degree of peer engagement and willingness to establish communication. The herein proposed research project builds on this body of knowledge to leverage Human-Centered Computing, perceiving Trust as an interaction facilitator construct.

2.1. Research focus and scope

One contribution towards perceiving Trust as an interaction facilitator construct is to design, develop and evaluate a toolset to monitor trust levels thus facilitating the deployment of trust level regulation interventions. The underlying hypotheses is that real time monitoring of self and third party trust levels can in fact be used to trigger interventions designed to regulate (moderate, improve, recover) trust levels to adequate standings. Thus, as on the design, development and evaluation of tools to monitor trust levels based on the current understanding of the construct, the research questions are: RQ 2.1 What data can be used to monitor trust? RQ 2.2 How often should data be sampled to generate robust trust indicators? RQ 2.3 How should data samples be collected taking into account that the impact of the sampling process in the generation of confidence indicators should be minimized? RQ 2.4 What metrics should be used to express trust levels? RQ 2.5 How should trust indicators be interpreted?

To construct the measurement instruments, we detained first our efforts on addressing above research questions, aiming in the end to be able to answer the following question, how to moderate Trust in a specific context, i.e how to moderate learners predisposition to trust fostering them towards enaging in successful interactions. We focus our framework of reference on the previous described proposed socio-technical model of Trust in online learning context(see figure 1), which represent the interceptions of Human-Computer Trust Components and the dynamic nature of Trust in relationships (Sousa and Lamas, 2012). As a results we design a multi-dimensional trust scale to quantify and evaluate learners commitments and willingness to learn, their rational and irrational trust perception towards the mediators, the technology and the learning environment.
The observed case study: two distinctive courses were observed, one that is completely delivered online named “Foundations of Human-Computer Interaction” and another partially delivered online (with 3 face-to-face meetings) named “Evaluating the User Experience. Both courses have similar pedagogical and technical scripts, same learning timeframe, similar type of assignments and are content related.

The full online course includes a sample of sixteen (16) students and the other includes a sample of ten (10) students, they are all students at Institut of Informatics at Tallinn University, in Estonia.

The implementation: study implementation include two major procedures, a survey instrument and an additional collecting data sample gather from interviews to teachers, transcription of online synchronous and asynchronous communications and interactions.

Data is collected biweekly started in the end of January and ends in the beginning of May. The survey is conducted online by using an open source web application called LimeSurvey and used Likert scale as well as open-ended answers. Survey aim to explore students' changes on emotions, commitments and intentions when learning. Additional collected data aim to explore students' behaviours and patterns.

Refining the scales: factors collected in the survey included question that addressed students predispositions, rational feelings and emotional perceptions in two main dimensions: (1) information about students' level of commitments and willingness towards the learn activities; (2) second indicators measure students trust predisposition towards three main factors, the course mediators, course artifacts and course learning environment; (3) third indicators measure students’ ration perception towards competence, predictability and reliability (4) fourth and last indicators measure students irrational perceptions on reciprocity and benevolence and and honesty. Additional data collected aims to be correlate with above information so we can obtain a better understanding of the results.

2.2. Validating the instrument

When submitting the final version of this paper, the following steps will be already accomplished, we hope them to present answers to all our research questions special in what regards understanding what is the needed collection sample interaction, what metric express better students trust predisposition variations throughout time and how should this indicators be interpreted. We also will have in mind that there is three main moments as crucial for analysis this learning interactions and commitments: a initial moment (the articulation), that help to create learners' initial trust predisposition towards the course. A second moment in time (the connecting), ensure the success of the interaction and the success of working commitments. This moment provide necessary group support and continuity for the interaction process and the motivation to be positively engaged in the working task. The end
moment (the reflection) happens after the course fulfilment, when students re-evaluate their experience and decide how this will effect future relations (Sousa and Lamas, 2012).

2.3. Closing remarks

This work's major contributions are towards facilitating the understanding of the role of Trust in moderating the interactions between the learner and the learning technologies, and the human mediation between students, teacher and institution through systems and their learning technologies. Thus intercept areas of knowledge such Human-Centered Computing (HCC) and Technology enhanced learning and is expected to point possible future directions of study on the potential role of trust to leverage relations and rethinking the different points of views on the design of adaptive complex and dynamic learning process and artifacts presented in today digital knowledge environments which support self-directed and sustainable learners activities.

References


