

## Challenges in Education in Global Software Engineering: What Are the Problems in Communication Mismatches, and How to Ensure Information Consistency?

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### Abstract

This talk presents needs, challenges and experience of education of Global Software engineering. In Global Software Development the developers and other stakeholders are acting in a distributed environment, with different contexts and with different assumptions. This usually causes different understanding of the same information and different reactions of the stakeholders which may lead to different problems during the development process. What can be done to avoid these problems? This talk addresses these questions through an analysis of education for distributed development, performed in a distributed environment. In particular, experiences from a course "Distributed Software Development" (DSD) will be discussed. DSD course was organized and performed between the School for Innovation, Design and Engineering at Mälardalen University (MDH), Sweden, the University of Zagreb, Faculty of Electrical Engineering and Computing (FER), Croatia, and partially joined by the Politecnico di Milano, Italy. The talk will discuss the challenges in creating and performing a joint DSD course due to misunderstanding of information and the solutions implemented at DSD, lessons learned, and success stories.

**Keywords:** Education in Global Software Engineering, Distributed Environment.

### Extended Abstract

A strong trend of globalization is in particular visible in ICT. ICT is the main enabler of all activities that spread all over the world. This also has consequences on education – young people should not only be prepared for technical & professional tasks but also to perform them in a distributed, geographically dispersed, and culturally diverse environment. Training students to act in a distributed multicultural environment is a new very important initiative, and a form of such education is becoming an obligatory part in ICT curricula. Education in distributed environment suffers however from low experience how to manage interactions between the actors (the students, the teaching staff, administration), laws, legacy issues, and cultural differences.

One of emerging education initiative is Education in Global Software Engineering (GSE). GSE is also emerging trend in software development: Development of software systems and software-intensive systems in a global environment, distributed through all continents. Education in GSE is even more challenging than education in Software Engineering. In addition to "real industrial problems" simulation, where sufficiently complex problems (still solvable with a reasonable amount of efforts) should be given, GSE education also requires appropriate simulation of a distributed environment. Experience in GSE shows that the successful performance in GSE context requires specific skills beyond the technical expertise. In GSE the developers and other stakeholders are acting in a distributed environment, with different contexts and with different assumptions. This usually causes different understanding of the same information and different reactions of the stakeholders which may lead to different problems during the development process. What can be done to avoid these problems? These challenges than should be addressed in education. The best way is to perform the training in a real distributed environment, having geographically separated students, as well as teaching

staff, performing a development project that student experience directly the challenges , they are supposed to trained to.

This talk presents needs, challenges and experience of Education of Global Software engineering. This talk addresses these questions through an analysis of education for distributed development, performed in a distributed environment. In particular, experiences from a course "Distributed Software Development" (DSD) will be discussed. DSD course was organized and performed during more than 10 years between the School for Innovation, Design and Engineering at Mälardalen University (MDH), Sweden, the University of Zagreb, Faculty of Electrical Engineering and Computing (FER), Croatia, and partially joined by the Politecnico di Milano, Italy. The talk will discuss the challenges in creating and performing a joint DSD course due to misunderstanding of information and the solutions implemented at DSD, lessons learned, and success stories. The talk will cover the following topics: a) providing and understanding information in a distributed environment: the challenges are two folded – first the information is limited both contents-wise and amount-wise, second the semantics of the information can be quite different; b) managing communication: both technical and cultural aspects are of crucial importance, and c) organizational aspects: the project organization and development models used in a distributed environment play a crucial role for a successful implementation.