

Evaluation Summary Report

Proposal : 318767
Acronym : DEDUCATION
Program : FP7
Call : FP7-ICT-2011-8
Funding scheme : Small or medium-scale focused research project -STREP - CP-FP-INFISO
Duration : 36 months
Activity : ICT-8-8.1 - Technology-Enhanced Learning

DEDUCATION

Deductive Framework for Math-oriented Collaborative Teaching Environments

Proposal submitted by :

N°	Proposer name	Country	Total cost (€)	%	Grant requested (€)	%
1	UNIVERSITE PARIS-SUD	France	1,118,654	19.13	889,881	21.34
2	UNIVERSITE DE STRASBOURG	France	539,248	9.22	417,100	10.00
3	DEUTSCHES FORSCHUNGSZENTRUM FUER KUENSTLICHE INTELLIGENZ GMBH	Germany	864,250	14.78	655,125	15.71
4	SAP AG	Germany	1,302,200	22.27	674,100	16.16
5	UNIVERSITAET LINZ	Austria	1,038,400	17.76	785,200	18.83
6	UNIVERSIDADE DE COIMBRA	Portugal	286,966	4.91	219,234	5.26
7	ABO AKADEMI	Finland	610,720	10.45	464,080	11.13
8	Faculty of Mathematics, University of Belgrade	Serbia	86,520	1.48	66,090	1.58
	Total		5,846,958	100%	4,170,810	100%

Abstract :

While traditional mathematics education remained very conservative with respect to the systematic use of computers in education, the latter offers the potential to partially autonomous, explorative learning, where individual, interactive experiences can open new ways for pupils and students. Technologies for personal research and teaching environments (PRTes), tutoring systems and edutainment-like systems are thus of major importance for leveraging new teaching methods as well as reaching new social strata of pupils and students. On the other hand, applications in science and technology powered the development of automated and interactive theorem proving (ATP and ITP) technologies, which have become of major importance for mathematics and computer-science. Although based on expressive logical foundations and implemented in a highly trustable way, and although used in some scenarios roughly similar than mathematical tutoring systems, their potential for a wide-spread education technology is unexplored. It has been largely unnoticed in public, that theorem provers do not only prove theorems, but can manage formal content, check its logical consistency, and verify given problem solutions. This research project will extend an existing API for modern ATP and ITP systems to an implementation platform for domain-specific PRTes. On this platform, a family of PRTes will be implemented covering the area of interactive mathematical textbooks, teaching environments for algebra, logics and geometry, engineering training programs, programming teaching environments, logical games; for short, teaching activities based on problem solving strategies within a formally defined context. Chosen reference PRTes will be evaluated in a field studies in European schools and universities.

Evaluation :

1. Scientific and/or technological excellence (relevant to the topics addressed by the call) (Threshold 3.0/5 ; Weight 1.00)	Mark:
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<p>The proposal aims to extend an existing interface for modern theorem proving to a scalable cloud-based collaborative platform for domain specific personal research and teaching environments.</p> <p>The proposal is within the scope of the call and addresses multiple target outcomes.</p> <p>The underlying concept is sound, and the proposed feedback-driven framework has the potential to feed student curiosity in a personalised manner.</p> <p>However, the proposal does not make sufficiently clear how the deployment of teaching based on semantic knowledge will lead to the emergence of new learning models.</p> <p>A comprehensive description of the state of the art in theorem proving is provided. However the description does not describe the relation of the proposed work to some important relevant and well established online tutors.</p> <p>The proposed progress beyond the state of the art regarding the use of maths tools for innovative assessment is well described.</p> <p>The S/T methodology lacks dedicated research activities on pedagogical strategies that motivate and engage students.</p> <p>The evaluation of the pedagogical aspects of how the system will support students is not described in sufficient detail.</p>	3.00
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2.Quality and efficiency of the implementation and the management (Threshold 3.0/5 ; Weight 1.00)	Mark:
<p>The proposed management structure and procedures are appropriate.</p> <p>Risk analysis is described but does not include risks related to the acceptability and usefulness of the platform.</p> <p>Individually the partners have relevant expertise and experience.</p> <p>The consortium possesses relevant expertise in terms of scientific and technological research capability. Expertise in pedagogical aspects is under represented.</p> <p>Given that it is proposed to build upon existing software frameworks, the allocation of work effort for most work packages is over estimated.</p>	3.50

3.Potential impact through the development, dissemination and use of project results (Threshold 3.0/5 ; Weight 1.00)	Mark:
<p>There is potential for impact within domains where formal methods can be applied for problem solving. However, the potential impact in relation to unlocking learner potential and adaptation of educational technologies is limited.</p> <p>Dissemination plans are appropriate and the consortium has links with extensive networks that can be exploited for validation and dissemination.</p> <p>Exploitation plans for individual partners are well described.</p>	3.50

4.Remarks (Threshold 10.0/15)	TOTAL:
	10.00

Does this proposal have ethical issues that need further attention? (If yes, please complete an ethical issues report form (EIR))	N
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For each criterion under examination, score values indicate the following assessments. Half point scores may be given :

0- The proposal fails to address the criterion under examination or cannot be judged due to missing or incomplete information

1- **Poor.** The criterion is addressed in an inadequate manner, or there are serious inherent weaknesses.

2- **Fair.** While the proposal broadly addresses the criterion, there are significant weaknesses.

3- **Good.** The proposal addresses the criterion well, although improvements would be necessary.

4- **Very Good.** The proposal addresses the criterion very well, although certain improvements are still possible.

5- **Excellent.** The proposal successfully addresses all relevant aspects of the criterion in question. Any shortcomings are minor.