

A Teaching Maturity Model for Informatics Teachers in Primary and Secondary Education

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Abstract. In order to improve the teaching quality in primary and secondary schools, we suggest the introduction of a Teaching Maturity (TeaM) model. Comparable to the Capability Maturity Model Integration (CMMI) model, we propose to use Process Area (PA) and to address their implementation via Capability and Maturity Levels.

Keywords: CMMI, Teaching Maturity Model, Primary and Secondary Education

1 Introduction

Feedbacks and inspectors are the usual forms to assess the improvement of the teaching quality. Sometimes, those results are biased and not objective, depending on personal feelings. The same problems were to be found in the field of SW development and it turned out that the introduction of a maturity models helped on improving the process. We thus suggest our TeaM Model, borrowed from Capability Maturity Model Integration (CMMI). CMMI developed by SEI, evaluates and monitors the software development process with the aim on improving it [1].

2 Research

The TeaM model determines the relevant factors of the teaching quality and refers to them with the term Process Area (PA). The implementation of a PA is assessed by two representation paths: the continuous representation (Capability Level - CL, it improves the process by implementing one individual PA) and the stage representation (Maturity Level - ML, it improves the process by implementing a set of related PA). Each PA consists of Specific Goals (SG) which include Specific Practices (SP) and Generic Goals (GG) which include Generic Practices (GP). Specific Goals are specific to a PA, while Generic Goals are common for all PAs. The latter have to do with the institutionalization of the Process

Area (Capability Level). A set of Specific Goals/Practices should be fulfilled in order to reach a specific level of Maturity. A Maturity level is achieved when all the Process Areas assigned to that level reach the maximum Capability level (3:max, 0:min). For example, when a secondary teacher at ML 2 (Initial) wants to improve the process by one stage she has to implement the respective PAs: Teaching Unit Delivery, Environment/Infrastructure Management and Course Design. So when the three PAs achieve CL 3, than the teacher has mature the process with one level and moved at ML 3 (Repeatable). Each ML has its corresponding PAs defined with different colors (see fig.1). If the secondary teacher at ML 3 wants to improve one more stage she has to implement the relevant PAs of this ML (Incident Resolution and Prevention, Teaching System Development, Teaching System Transition and Teaching Continuity) and also the corresponding PAs of ML 2. The same procedure is followed until the Optimizing level is reached.

Process Areas	Chaotic	Initial	Repeatable	Stable	Optimizing
Teaching Unit Delivery		2	3		
Incident Resolution and Prevention			3		
Teaching System Development			3		
Teaching System Transition			3		
Teaching Continuity			3		
Work Monitoring and Controlling					
Environment / Infrastructure Management		1	3		
Course Design		2	3		
Teaching Process Control					
Teaching Process Reflection					

Fig. 1: The Maturity of Levels

3 Conclusion and further research

Currently, we have two case studies that demonstrate the feasibility of the model, and the next step is a holistic study of the TeaM model for informatics teachers in primary and secondary education.

References

1. Forrester, E.C., Buteau, B.L, Shrum, S.: CMMI for Services. Guidelines for Process Integration and Product Improvement. Second Edition. Pearson Education, Inc. USA.(2011).