Chapter X
The UML 2 Academic Teaching Challenge:
An Integrated Approach

Stanisław Wrycza
University of Gdańsk, Poland

ABSTRACT

UML 2.x version has become even more complicated and diverse set of graphical techniques than its predecessors. Therefore, system developers propose preparation of its reduced, limited or minimal version called Light UML. This problem has become also the serious challenge for the UML academic teachers. The goal of this chapter is the study of specifying the UML 2.x Light version content on the basis of the questionnaire survey registering opinions of 180 university students of the University of Gdansk, Poland. After the introduction, the methodological prerequisites of the survey are clarified. Then, the research results are presented and discussed according to seven essential UML diagrams assessment criteria, included in a questionnaire. The final UML 2.x version, resulting from the accomplished survey is exposed in the last section of the chapter.

1 INTRODUCTION

Unified Modeling Language (UML), proposed by G. Booch, I. Jacobson and J. Rumbaugh (2004), has attracted the attention of both academics and practitioners of information systems analysis and design. In the last few years, increasing interest in UML stimulated spreading it across computing curricula at universities. This tendency evoked the exchange of ideas regarding the effective teaching of UML among the language trainers. Version 2.0 (OMG 2005) and the working drafts of future UML versions (OMG 2006) are in fact a diverse and in some parts excessive toolbox, which combined with system development process create a methodological platform for developing a working system.

Most of the UML teachers stress the question of the language complexity and variety of its modeling constructs. They consider this issue as a fundamental problem from a teaching point of view. On the basis of practical projects and teaching experiences it may be stated that only purposefully selected part of the complete UML potential is used. Moreover, a few diagrams and sets of UML notions are known to form the core of a typical system model. There are versatile opinions what specific modeling notions are the most required for teaching and practical aims. Such set of UML diagram types and notions might create its minimal set or – as it is commonly called – UML Light version.

The question of the effective implementation of UML in education, in respect of a UML Light version concept, has already been raised in different papers. Flint, Gardner and Boughton (2004) indicate a number of problems associated with UML teaching. They stress that the use of strict subsets of UML is easier to understand than the full language notation. Burton and Bruhn (2004) generalize their experiences related to use of the UML and underline the role of CASE tools application in UML teaching. In their opinion such tools are important factors, stimulating support of the active students' involvement in teaching process as well as allowing enrichment of system specifications by using stereotypes. The concept of minimal set of UML diagrams was also proposed by DeLooze (2005). Another survey, carried out among 171 practitioners, was directed at the UML version that would have a limited scope as well (Dobing and Parsons, 2006). It seems that the quickness of UML upgrading and implementing modifications as well as potential difficulties in getting familiar with the language by novices are underestimated. The goal of this chapter is the study of specifying the UML 2.x Light version content on the basis of the questionnaire survey of the university students' opinions.

The courses of UML (2.0 and earlier versions) have been given at the University of Gdansk since 2001. The complete UML teaching approach was implemented soon after and then continuously modified and improved with each released UML version. The UML teaching process is discussed in detail in (Wrycza and Marcinkowski, 2005b). The authors identified and analyzed several problems described in (Wrycza and Marcinkowski, 2006). One of the essential conclusions, being in accordance with the opinions expressed by authors cited to follow, is that the students are overwhelmed by the number of different UML diagrams (13 in UML 2.0), complicated interrelationships among them and the extensive number of modeling notions. The following constraints should concern such Light version:

- Light version would only consist of diagrams that are most often used in practice and would include only part of the current, detailed syntax;
- The minimal UML version should support the RUP basic disciplines, i.e. requirements specification as well as analysis and design;
- Light version should be entirely compatible with the "full" version of UML 2.x.

This concept does not limit the UML potential as the system specifications elaborated in the Light version could be subsequently extended towards the full version by the application of complete scope of UML modeling diagrams and constructs.

2 METHODOLOGICAL BACKGROUND

To solve the problem of UML Light version concept, the authors decided to carry out the