

# Designing a Competence Structure to Generate Learning Paths and Assessment Questions for Self-Study

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## Abstract

*Nowadays there are several sources of online materials, e-assessments and feedbacks available on the Web. Some of these systems were designed based upon the idea of an intelligent tutoring system. However they could suffer from the problems of: high development costs, updated knowledge information will be required for their future use, risk of inconsistently modeling the user when estimating a learner's knowledge level and do not support the learner's intended learning outcome. The aim of this research is to propose a self-study system which is capable of providing study material links from the Web to learners. It can generate a possible learning path guiding the learners based on their chosen competence. However, in this abstract we also would like to propose another idea of designing assessment questions for a self-assessment and a learner will consider whether they can be able to give the answer to the generated question or not. These*

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*suggestions which are offered to a learner depend upon their chosen competences. For our research, a competence indicates the learner's intended learning outcome based upon the different contexts of learner performance. There is a competence structure which is considered for identifying the parent-child relationship among the learner's competences. As a result, our system only requires the appropriate competence structure to be embedded within it, and this is a major advantage of our approach. The reason is the design of a competence structure can be conducted by one person. The structure can be embedded within a system and used by many learners for learning within particular knowledge domains. Hence this helps reducing the cost of updating knowledge within the system. In addition, our considered competency model supports the pedagogical approach of the learning transaction, gives consistency in recording the learner's level of performance. There is the methodology of constructing a competence structure from a published course syllabus. Currently, we choose a knowledge domain of photosynthesis for a key stage 4 learner. We also design an XML schema for a competence structure. This schema allows for reusability and modification within a competence structure.*