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Hydrology and Earth System Sciences Discussions

Interactive comment on "T-shaped competency profile for water professionals of the future" *by* S. Uhlenbrook and E. de Jong

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We thank the reviewer for all critical but overall quite positive and encouraging comments. In the following, we would like to respond to his/her main points; all specific comments and language corrections will be done during the revisions of the manuscript.

Comments in the introduction paragraph:The reviewer states that *'there is no doubt to expect that water professionals need a strong background in one discipline'.* Furthermore, it is stated that *'leader of an interdisciplinary team has to be a generalist'.*

Response: We agree and are happy to see that the reviewer shares the same views

on the importance of a strong background in one discipline (vertical leg of the T). However, we do see not a community wide agreement regarding this point. Many IWRM programme are rather focused on educating generalists (expertise in many fields but never very deep) instead of a T-shape competency profile. This will be discussed in somewhat more detail in the revised paper.

However, we do not agree that the team leader has to be a generalist. As long as the competencies of the team leader that are summarised in our paper with horizontal bar are well developed, and the team leader has the necessary integrative competencies, he/she can also have a T-shape competency. We argue that it is even better, if the 'vertical leg competency' of the team leader is well developed, as he/she would understand the disciplinary challenges and limitations better.

Finally, we agree with the reviewer that mix of competencies also depends on the socio-cultural background, and we will emphasize this more in the revised paper.

Comment 1: Flexible learning paths and group works often are not a realistic option to develop personal competencies. There is too little time (in European universities) to do the intensive mentoring. It is better achieved by 'learning by doing'. Staff members are often experts in one discipline (I-shape competency profile) and have little time in the tight time tables of the curricula.

Response:

From our experience in our programme at UNESCO-IHE, we can report that flexible learning paths and group works are effective but need considerable efforts regarding time of the academic staff that is invested in student interactions. There is likely little difference in Europe vs. North America vs. developing countries - agendas of academic staff members who have to score in research and usually have many other obligations are always full. However, the time does not always need to be invested in direct contact hours, though we consider this an essential component of the education. Modern IT/Web 2.0 technologies can facilitate the supervision/mentoring and make it more

efficient. Therefore, e-learning tools including self-study material (recorded lecturers, web-based exercises etc.), discussion groups, WIKIs, etc are essential components. We will discuss this challenge in further detail in the revised paper.

Additionally, we feel that commitment at university/institute level (i.e. Rectorate, deans) to these innovations in education is needed. Creating flexible learning paths and common groupworks need the co-operation of a complete school or faculty and cannot be achieved by, for instance, the hydrology teaching staff only. A common view at higher level is needed and has to be embedded in the general education policy. We expand on this point in the revised paper.

Comment 2: The reviewer addresses the 'open attribute for learning'. He/she thinks that only if students are confronted in their daily work with topics not related to their own discipline, they are more interested in these.

Response: We agree to a large extent with the point, but therefore it is even more important to cover important topics in such a way that the student are confronted with a wider perspective, that should include for instance the fields mentioned by the reviewer (e.g. flood hydrology has to include vulnerabilities, social issues, engineering ethics etc.).

At UNESCO-IHE the population of students consists of mainly mid-career professionals and not of young graduates. These students see the importance of other related topics often very well and they are willing to spend time on it during their education.

Comment 3: The reviewer address the point that 'a stimulating environment' is needed but difficult to implement by the academic staff as they are evaluated based on other criteria (publication output etc.). Furthermore, he/she is of the opinion that lecturers have little influence on this.

Response: We agree with the point re the assessment of academic staff. However, we argue that also this needs a vision and leadership from higher level (cf. out response

to comment 1). A common view on education and related innovations needs a university/faculty wide approach. If there is no support and shared vision from higher level (Rectorate, dean), the development and implementation of a T-shaped competency profile is very difficult. We will discuss this in further detail in the revised paper.

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