

Let's train local practitioners better

For professionals, by professionals

- Agnes Maenhout, Managing Director Wateropleidingen / World Water Academy, Groningenhaven 7, Postbus 1410, 3430 BK Nieuwegein, +31 (0)6 5394 0795, agnes.maenhout@wateropleidingen.nl
- Johan Oost, Project Officer World Water Academy, Groningenhaven 7, Postbus 1410, 3430 BK Nieuwegein, +31 (0)6 2028 1271, johan.oost@wateropleidingen.nl

Abstract

Water has proven to be a knowledge intense sector. Water professionals, practitioners have to stay up to date with their knowledge, knowhow and skills. Life-long learning describes the learning history of a professional during his working life. The length of the life-long learning exceeds three times the duration of the initial education. This length added to the fast changing technologies and ICT underline the importance of life time development.

Worldwide a scream for well-educated and/or well-trained water practitioners can be heard, especially for technical matters. Water training centers focus on the applied knowledge in the water sector and mainly on a vocational level. World Water Academy is the leading training institute for water management in the Netherlands and abroad. Established in 1993 by the Dutch water sector to provide practical knowledge and to improve the quality of work of their operating staff. Wateropleidingen / World Water Academy has developed an innovative and sustainable method of training practitioners: The concept 'for and by professionals'.

Passionate experienced water professionals share their know how, knowledge and skills to train and to inspire their peers. Key issue is the combination of water content and didactics. A good professional is not a good trainer per se. A water professional needs didactical skills and tools to become a professional trainer, who trains and shares his knowledge and experiences to his colleagues adequately. Didactical experts design the interaction with the participants to secure the exchange of know-how and expertise.

This concept is executed in international context and proved to inspire the operators all over. The local capacity can be strengthening by the local practitioners themselves, however by well trained professionals and in an inspiring learning environment.

Key words: didactics, training of practitioners, work-based training, life-long learning, local capacity development, water training center

Introduction

Worldwide a scream for well-educated and/or well-trained water practitioners can be heard, especially for technical matters. The awareness of the problems of capacity building on executive level and middle- management in the water sector is still growing. In northern countries as the Netherlands, water professionals on a higher vocational level are educated and trained well as MSc or engineer. Especially compared with the lower vocational level and middle-management. High-skilled workers are needed to innovate and to act entrepreneurially to unlock new growth opportunities, whereas the low-skilled workers have to ensure productivity and international competitiveness. Any shortage in the quality or availability of both high- or low-skilled workers undermines productivity and competitiveness (Whitebook EU, 2012).

The Whitebook on EU Trade and Investment in South Africa (2012) states the low availability of skills as a critical concern. The quality and availability of appropriately qualified and experienced workers is more and more seen as a necessary condition to sustain economic growth. The honourable Ms Edna Molewa, the Minister of Water and Environmental Affairs in South Africa, addressed the urgency of training in the water sector on multiple occasions. Amongst a wide range of needs, she mentioned specifically that the water sector urgently needs 4000 artisans/technicians to overcome the crippling challenges of poor operation and maintenance of infrastructure, needed to achieve the MDG's in 2015 (speech 12 Oct 2012).

Asset management & Human resources

Asset management is seen as a organizational structure to ensure lifetime economical sustainability of assets. Maintenance has proven to be a very important aspect of asset management. Maintenance might be guided by the hardware, the procedures and tools, but will mainly be the work of “the software”, the operators, and based on human know how. The important role that practitioners play in maintenance leads to the expression of managers that people are the main assets of a company. The quality of the work, done by operators is determined by their competences and experience. Improving their competences will increase the quality and lifetime of the operating system immediately.

Knowledge management

Society becomes more and more knowledge driven. Thus scientists will analyse the field of knowledge into typologies. Knowledge management comprises a range of strategies and practices used in an organisation to identify, create, represent, distribute, and enable adoption of insights and experiences. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organisations as processes or practices. Many large companies and non-profit organisations have resources dedicated to internal knowledge management efforts, often as a part of their business strategy, information technology, or human resource management departments (Addicott, McGivern & Ferlie 2006). Several consulting companies also exist that provide strategy and advice regarding knowledge management to these organisations. Knowledge management efforts typically focus on organisational objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned, integration and continuous improvement of the organisation.

UNESCO (2012) distinguishes technical & vocational skills versus transferrable skills. The technical & vocational skills are specific know-how and experiences, which are demanded by the execution of the

job. The applied knowledge is the tool and working methods which are necessary for the daily tasks and operation & maintenance of working procedures. This knowledge is based on transfer of expertise and know-how: the working environment, rules & regulations, specific behavior & manners. The type of knowledge needed will differ according the job. F.i. the publications of researches are of more importance in the scientific education than in the vocational education.



Tacit knowledge

The non-written, non-explicit knowledge is called tacit knowledge. Some examples of tacit knowledge are: riding a bike, playing the piano, driving a car, how to open a tap, local knowledge of wells and water flows. Tacit knowledge has been described as “know-how” – as opposed to “know-what” (facts), “know-why” (science), or “know-who” (networking). It involves learning and skills but not in a way that can be written down. On this account knowing-how or embodied knowledge is characteristic of the expert, who acts, makes judgments, and so forth without explicitly reflecting on the principles or rules involved. The expert works without having a theory of his or her work; he or she just performs skillfully without deliberation or focused attention.

With tacit knowledge, people are not often aware of the knowledge they possess or how it can be valuable to others. Although tacit knowledge is that which is used by all people, it is not necessarily able to be easily articulated. It consists of beliefs, ideals, values, schemata and mental models which are deeply ingrained in us and which we often take for granted. Effective transfer of tacit knowledge generally requires extensive personal contact, regular interaction and trust. This kind of knowledge can only be revealed through practice in a particular context and transmitted through social networks. Without some form of shared experience, it is difficult for people to share each other's thinking processes.

Professional development

Professional development starts with the basic education, followed by the specific (vocational) education, dedicated to an occupation. This development starts at the very first working day and will continue until retirement. Examples of this development in the last decennium are: working digitally, mobile phone, skype, and in the water area: membranes, wastewater treatment, disinfection etcetera. Looking at the length, the working life as water professional is approximately three times longer than the learning life at school. At the end of the working life, the professional will retire. More and more this is not the end of the working life, but he can stay active and share expertise.

Education is aimed at the improvement of competences to do a task or manage a role adequately. A pupil at school starts to learn the basic knowledge and skills. A large part of the initial education is (especially in the beginning) based on the teaching and practicing of literacy, maths, but also the basics of history, chemistry and science. This set of basic knowledge, skills and attitudes that are necessary to take a place in the society and being able to have a paid job is called the foundation skills. UNESCO (2013)

Education and Life-long learning in the water sector

Water sector: knowledge intense

Water has proven to be a knowledge intense sector and an experience-oriented sector. The specific water knowledge is so diverse, that organizations prefer that their personnel have a good basic knowledge in a specific topic, so that they 'teach their personnel the added water component'. The other way around, the training of generalists to do more technical jobs, is considered to be harder.

Formal water education is relatively scarce. Why? Water management is relatively young and the activities need most technical (or beta-oriented) people. Furthermore water can be approached from different angles:

- Available (water as a source of life and a source of growth)
- Health (for humans and animals)
- Safety (water as flood risk)

The basics of chemistry and maths, sustainability theory, ecosystem knowledge, practical fitting skills are just a few examples of the wide landscape of topics in these clusters. The dislike of the beta-oriented studies seems to be fact of the actual era and to be spread world wide. This fact leads to a scarcity of water practitioners.

Life-long learning

Life-long learning is the process of increasing the competences of an individual person during his professional life: from pupil to retired-people. Lifelong learning is the 'ongoing, voluntary, and self-motivated' pursuit of knowledge for either personal or professional reasons. Therefore, it enhances not only social inclusion, active citizenship and personal development, but also competitiveness and employability. The term recognizes that learning is not confined to childhood or the classroom but takes place throughout life and in a range of situations. During the last fifty years, constant scientific and technological innovation and change has had a profound effect on learning needs and styles. Learning can no longer be divided into a place and time to acquire knowledge (school) and a place and time to apply the knowledge acquired (the workplace). Instead, learning can be seen as something that takes place on an on-going basis from our daily interactions with others and with the world around us (source: wikipedia).

Work-based training

Work-based training is training for profession as provided in working time or in spare time in the evening of weekend. The main focus of the professional is on the working activities, not on education. Employers demand employees to perform well, to keep updated. They often want to support the development of the employee providing money and/or time, if the training is essential

for a good output and tailored to the daily working activities. It should give information about the latest updates, improving competences for executing the job, etc.

There is a distinction between scientific and vocational training as well as between scientific and vocational education. Academic training is for scientist, engineers and higher management. Topics cover innovative solutions, integrated management, etc. Vocational training is more focused on grass root and middle management level. As most people work at that level, so there is a huge amount of potential participants. The topics are more based on the daily working: regulations & procedures, working environments, practical knowledge, etc.

World Water Academy concept

The World Water Academy offers (under the name of Wateropleidingen) training programmes for technical professionals in the Dutch water sector. The World Water Academy developed its working concept and build up a wide experience in capacity building and training. The objective is to improve the quality of the employees in the Dutch water sector with specific, practical knowledge on water issues. The main target group is the technical vocational level at the utilities and water authorities. The practical and technical trainings have a wide range of water related issues.

For and by water professionals

The concept “for and by professionals” is an innovative and sustainable method of training practitioners. Passionate experienced water professionals share their know how, knowledge and skills to inspire the peers. The innovation of the World Water Academy-concept is in the didactical methods used to achieve interaction and practical impact: “learned today, applied tomorrow”. Water professionals are consulted and involved in the design and development of the training programmes. They are didactically trained and coached to become an excellent trainer. By doing this, the courses are up to date and directly related to the daily practice, applied knowledge and know-how.

Key issue is the combination of content and didactics. Didactics (originating from the Ancient Greek word: didáskein, meaning to teach) is the theory of teaching, and in a wider sense, a theory and practical application of teaching and learning . A good professional is not a good trainer per se. With didactical skills and tools the water professional will become a professional trainer, who trains and exchanges his knowledge and experiences to his colleagues adequately. They get tools and confidence to help and train colleagues on-the-job. Thus the local capacity can be strengthened by the local practitioners themselves (Maenhout & Oost, 2011).

Why professionals?

Training on the job is closely related to day-to-day activities. The information given in the lessons has to be applicable in the daily practice. Especially the artisans and operators will learn and develop if they are directly touched by the information. Their prior knowledge is the package of the initial education in school, college and university and the working experiences. They need to know how to improve the output of their work. New experiences of colleagues and experienced professionals will feed them with very practical examples, illustrated by pictures and stories. It is about sharing and transferring practical knowledge and skills for the daily tasks.

Who can transfer these experiences better than experienced direct colleagues water professionals? They know what to do. They are used to the working environment. They know about the daily

working activities. Experienced professionals are experienced on the topic and the field and they speak the same language as the participants. They know the do's and the don'ts, they have an huge amount of practical know-how. And most important is that they speak the same language.

International experiences

Vietnam: Business management

A Business Management Training was designed, developed and delivered two times for the management of the drinking water companies in Vietnam. Capacity building of Vietnamese water sector staff is a crucial factor to maintain and sustain the investments and the large scale improvement of urban water and sanitation. The general conclusion of an assessment of ADB is that special attention is needed for business management training, including amongst others the fields of human resources management, asset management (including operation and maintenance) and quality management.

Modules about business management, financial management, HRM and Financial management were developed and delivered in Vietnam. The modules were practical and interactive, given by Dutch and Vietnamese professionals. This approach was new for the Vietnamese participants, trainers and moderators. New techniques, new insights, best practices and Dutch ways in doing things were spoken through and exchange of experience was encouraged.

Indonesia: Water treatment and distribution

The technical knowledge of the operators and the managers of the water treatment process at some Indonesian drinking water companies has to be enhanced to improve the service. The current training centers do not provide sustainable training on a practical level, in spite of the excellent facilities they once used to have. A 4-years capacity building programme is set up to strengthen the water supply companies. The programme focused on all vocational levels, from operators to engineers. The curriculum existed of nine practical courses, four MSc modules and a PhD programme. The courses and modules were adjusted to the sector's needs, as inventoried during a the Training needs analyses.

Technical Practical courses for Operators in the field of drinking water production, distribution, wastewater treatment and hygienic working were developed. With a Train the Trainer program, professionals of various water companies and water training institutes in Indonesia were trained to train their own colleagues.

South-Africa: Wastewater treatment

The design, development and delivery of practical training courses "for professionals by professionals" is an example of best practice in the Netherlands. The best practice is applied the Ethekwini region in South Africa. A course programme is designed for operators of Wastewater Treatment plants. Every module exists of basic knowledge and tacit knowledge, and is customized for the local target group. The Training of Trainers was delivered at the Wastewater Education Awareness Classroom at Northern Treatment Works in Durban. This venue reflects the practical environment. The feedback of the participants was expressed as: giving structure, enthusiasm, motivation, practical and inspiring.

The participants expressed that they have learned a lot and that they felt motivation to continue this form of learning. Besides learning from the trainer they shared a lot of their own knowledge and experiences.

Recommendations from the 3 countries:

Specific know-how

- The course/module is a job requirement and supported by the company
- The participant can apply the knowledge, new information and skills directly in his daily work
- The course materials and tools are tailored to the local situation and the course group and updated regularly

Inspiring exchange

- The course programme inspires and encourages exchange of experiences and interaction, as well between trainer and participants as between participants.
- As the form of training was new for the participants as well as the trainers, the trainers have to be well prepared by a Trainer of Trainers programme
- The programme needs a good structure in teaching methods to encourage and stimulate participants get active, giving input and questions instead of reactive listeners.
- Teach without being a preacher. The trainers enjoyed being a trainer and felt that it is quite difficult to teach the things you know. Main reward was the huge appreciation of the participants.

Quality and planning

- The course has to be planned and organized professionally by a team of a course coordinator and a secretary.
- The logistic arrangements have to be excellent (participants, trainers, venue, materials)
- The Training of Trainers combines didactical knowledge and skills with dedicated Technical knowledge. The preparation of the Technical Practical courses was part of the training were made such as a dedicated didactical skills book and the toolkit for trainers. Finally the participants of the Training of Trainers were assessed for their didactical skills.
- Each module/course has to be evaluated by the participants

Conclusions

The water sector is a relatively small sector with various fields of specialization. Dedicated water studies are scarce and, the inflow of students for specific water specializations is quite low. This, and also the many changes during the working period, demands life-long development. Work-based trainings are one of the main important sources to improve competences (meaning knowledge, skills and attitude) during the working life.

The scientific level, meaning engineers and higher management, is educated and trained quite well. They have a lot of possibilities worldwide to further develop either scientifically either on managerial skills. However, most capacity challenges are on vocational level. The artisans and operators have to operate and maintain the installations. Using local practitioners as professional trainers is a good example of coping with that challenge. Professionals know the work field, use the same language, have the best and up to date knowledge about daily practices and have skills. Didactics is the key to

develop from an enthusiastic water professional to a well-performing professional trainer. Quality assessments provides the necessary view on the progress in the trainer's performance.

Dedicated course curricula are developed in different countries, for different fields and target groups. The results were really comparable. The approach with professional trainers is evaluated very positive. Professionals that were able to interact with the group. The form of training was new for the participants as well as the trainers. The programme, being a dedicated mixture of lecture, practice and interaction was appreciated highly. The management of the course is very important and relies on a good logistic organization. Before the first delivery, the trainers attended a Training of Trainers. They started well prepared, however they were very nervous. They enjoyed being a trainer and felt that it is quite difficult to teach without being a preacher. Main reward was the huge appreciation of the participants. The training, the methods and the way how to initiate the interaction in the group was inspiring for them as well for the participants.

It is recommended that:

- A course is a job requirement and supported by the company
- The course covers the needs of the customers and the participant can apply the knowledge and skills directly in his daily work
- The course materials are tailored to the local situation and the course group and updated regularly
- The trainers are professionals, and assessed for Didactical skills
- The course programme is inspiring and encourages exchange of experiences and interaction.
- The course is planned and organized professionally by a team of a course coordinator and a secretary.

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