# Output-centered Training Design: A JICA project at Ethiopian Water Technology Institute

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***Abstract:*** This presentation reports on an effort to transform training design at a national institute, so that output of trainees' learning becomes the center of design. An example is about a trainer-training project sponsored by Japan International Cooperation Agency (JICA), Project for Strengthening Capacity for Training Operation and Management for Ethiopian Water Technology Institute (EWTI). Current status of training design at EWTI was analyzed to design transformational process, so that their training will satisfy governmental requirement of occupational standards. It was taken account that the participants of EWTI training are working engineers in water technology fields, not full-time students of a vocational school. Transformational process is explained phase by phase, and recommendations for the next pilot training are also be discussed.

***Key words:*** output, training design, JICA, transformation, TTLM, EOS, TVET

## INTRODUCTION

There have been numerous efforts to call for a paradigm shift in designing education and training in all sectors, including school education, higher education, and vocational training. Such keywords have been used as competency-based, active learning, 21st century skills, learner-centered, theory-driven, outcome-based, mastery approach, performance-oriented, among others. However, in many contexts of education and training, there have been strong resistance to change the design, partially because of weak felt-needs for substantial changes, as well as shortage of resources and skills of providers of education and training to create a needed paradigm shift for better quality education and training. In fact, in many occasions including training sectors of developed and developing countries, one can still observe continuation of traditional approach to education and training; i.e., instructor-centered, lecture-based spray of information, and attendance-based qualification without assessment of learning results except for conducting reaction questionnaires.

This presentation reports on an effort to assist transformation of training design at a national institute in a developing country, so that output of trainees' learning will become the center of design. It is from a trainer-training project sponsored by Japan International Cooperation Agency (JICA), Project for Strengthening Capacity for Training Operation and Management for Ethiopian Water Technology Institute (EWTI). The project aims at introducing the latest training design to strengthen the capacity of trainers working at the Institute. The purpose of this paper is to describe how a transformation of training design has been planned and being implemented in the project.

## RESEARCH DESIGN & METHODS

First, current status of training design at EWTI was analyzed to plan transformational process, along with an analysis of the capacities of the trainers working at EWTI, as well as a need assessment to determine what areas were of high demands in the practical fields in Ethiopia. As the transformation process was anticipated to introduce some types of trainees' assessment against pre-determined set of learning objectives, related standards and ongoing practices of outcome-based training was also searched. Then, based on the analysis of current practice of training conducted at EWTI, as well as assessments and survey of the related matters, transformational process was designed, proposed to the management of EWTI, and implemented in multiple phases.

## ETHIOPIAN OCCUPATIONAL STANDARDS AND TTLM

While seeking related regulations and practices of outcome-based training, Ethiopian Occupational Standards (EOS) was located as preferable ongoing system of qualification of vocational skills. EOS, as shown in Figure 1, specifies occupational standard in each job-related area with units of competencies, assessment criteria, and evidences of skills to be sought for. EOS had already been adopted in Ethiopian Technical and Vocational Education and Training (TVET) system as the core of their curriculum design. Although it was not directly at the level and scope of EWTI's training, many resources were available for vocational high school curriculum in various other areas of competencies, as known as TTLM (Training Teaching and Learning Materials). As EWTI is expected to provide in-service training for working engineers in the field, while TVET is to train full-time students at pre-service level, it was natural to follow the same framework of EOS to place EWTI's training curriculum as an extension of TVET. Therefore, the project adopted EOS and TTLM as the framework of training design. While following the format, the contents will be added to fit the level and scope of EWTI, where EOS coverage was inadequate. Training strategies were also needed to be changed to fit EWTI's situation as an in-service institute.

So, the first phase of transformation occurred at EWTI was to put the selected training materials into TTLM format. Each team was assigned to a 10-day training, whose content was of high demands based on the need survey. It was taken account that the participants of EWTI training are working engineers in water technology fields, not full-time students of a vocational school, so a set of recommendations was given to each team, as shown in Table 1.

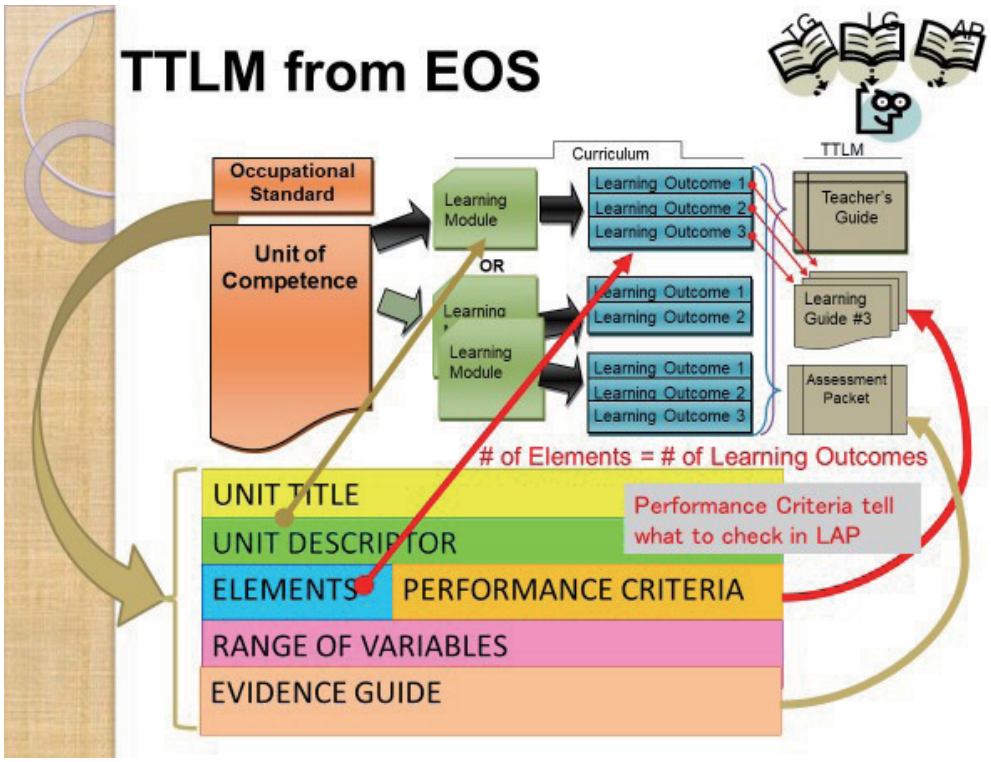


**Figure 1: TTLM from EOS**

**Table 1: Not TVET way but EWTI way (Recommendations)**

| TVET | EWTI |
|---|---|
| Students are fulltime (have more time for learning), but no/limited work experiences | Training needs to be efficient (less time for learning), but trainee may have ample/varied work experiences |
| Teaching start from the basics (assuming nobody knows the basics) | Recommended to check the basics without teaching (some may know them from their experiences)<br>1) Give a copy of entry test (Event 3) at the end of the previous day (or before coming to training)<br>2) Each trainer checks basic knowledge before the session to give him/her a chance to review<br>3) Start each morning by giving the same test, provide feedback/explanation, only if needed |
| *Learning Guides* are to be used in group training, as well as in self-study;<br>✓ *Instruction sheet* in each LO contains steps of self-study (can be used for the students who are absent)<br>✓ All the materials are to be printed and given to individual students<br>✓ Introduction of TTLM aims at making students more self-directed and independent, allowing self-paced learning without much or constant direction from the teacher | *Learning Guides* are to be used ONLY in group training with trainer's explanations (tentatively)<br>✓ *Instruction sheet* will NOT contain steps of self-study (assuming no trainer skip any session)<br>✓ *Learning Guides* (PPT) are to be displayed by trainers; only handouts and worksheets are to be printed and given to individual trainees (at least for time being to make the conversion easier; can be reconsidered after Pilot training)<br>✓ Maintain trainer-led group training; introducing self-study only for the basics, to focus to reform training and assessment more practical |

## NEW METHODLOGY IN EWTI'S TTLM-BASED TRAINING

In February 2019, EWTI and JICA created the first version of Guidelines for Training Operation and Management. Figure 2 summarizes major element in assessment scheme proposed in the Guidelines. Further suggestions have been given to EWTI management to prepare pilot training in the next phase as follows:

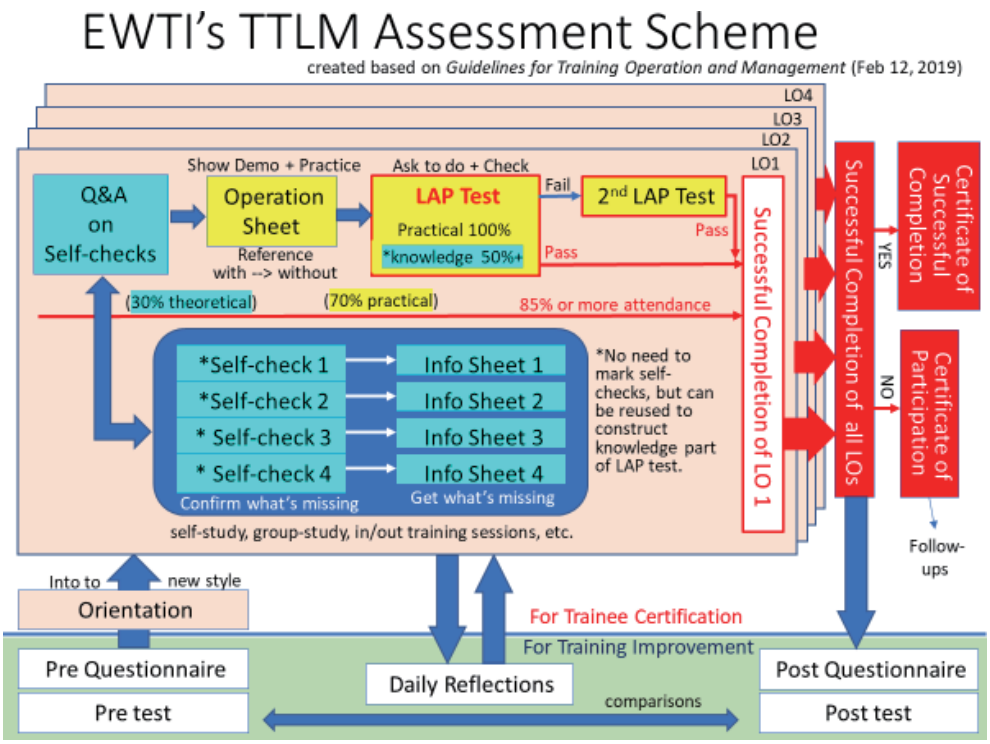


**Figure 2: EWTI's Assessment Scheme based on TTLM**

### Operation Sheet and LAP Test

Operation Sheet describes practical knowledge and skills to be acquired in the training, in descriptive format (with examples) whereas LAP (Learner Application Practice) Test describes it in inquiry format (how to test individual/small group trainees). They are to be prepared for each Learning Guide (LG), usually included at the end. So, the collection of LAP Test should cover what is specified as Evaluation Evidence in respective EOS. EWTI will determine satisfactory completion of each trainees based on LAP tests in each LG, not at the very end of training by conducting separate assessment covering all LGs (for time being, at least until assessment mechanism will be established, separate from training provision). LAP tests, in other words, functions as summative evaluation (rather than formative evaluation: no separate summative evaluation at the end), thus should maintain its quality to assess both knowledge and practical skills properly, and to be conducted rigorously to judge each trainee's passing/ not passing. Second chances will be given to those who fail to pass in the first trial, so training schedule should be planned accordingly.

### Self-check Sheet and Information Sheet

Self-check sheets describe basic knowledge and skills underpinning what is described in Operation Sheet/LAP Test, in inquiry format. Information Sheets describe them in descriptive

format. They are usually divided into 2-4 units within each LG. Participants to EWTI training are from the field, so they may possess/lack basic underpinning knowledge and skills. So EWTI should adopt "Self-check first" approach, without going through lectures on the basics (which assumes every participant know nothing like school students). Each trainee will try to answer Self-check Sheets by him/herself. If s/he finds any lack of knowledge and skills, by not being able to fill in answers, then s/he reads Information Sheet, trying to understand the contents, and fill in all answers, before the training session. During the training session, lecture to explain all items in Information Sheet will NOT be given, although explanation about Self-check items may be given upon trainees' request. Training will shift to Operation Sheet and LAP Test, as soon as possible, if no questions are asked. Items on Self-check will be covered during the Operation Sheet and LAP Test, in the form of oral questions, to confirm the trainees' understanding of basic knowledge (Self-check itself shall not be a part of trainees'assessment; they are not Tests).

**Daily Reflection Sheet**

Daily Reflection Sheet is to collect anonymous opinions from trainees at the end of training everyday. It should tentatively cover three items: (a) what is the most interesting topic of the day, (b) what is the most difficult topic of the day, and (c) any suggestions and comments. It will be collected by the trainer, reviewed by the department, and plan for reactions at the beginning of next day with possible measures taken. This serves only for improving training quality, not for assessing trainee's learning.

**Session Record**

Session Record shall be kept, showing how each session went, including time spend in each activity, learning contents and methodology, handouts and other related materials used. Pictures can be accompanied to show major activities with images. Records were taken by externally hired recorders in the first pilot in Oct 2018, and the second pilot in April 2019, but it should be managed within the department. In this way, at least one trainer will attend all the sessions, beside trainer him/herself, to maintain the quality of training by following what is planned. This serves only for improving training quality, not for assessing trainee's learning.
Pre-Post Test & Questionnaire

Omitted in the first pilot in Oct 2018, pre-post test of basic knowledge and skills was back in place in the second pilot in April 2019. Additionally, Pre-post questionnaire was administered in some courses in the second pilot in April 2019, to ask their work-related experiences and confidence of the work-related skill (target of the training). Like pre-posttest, both are to measure the gain that took place while training, by comparing pre and post, both from knowledge/skill perspective and practical applicational job skill perspective. They are to be administered at the very beginning and very end of the training. This serves only for improving training quality, not for assessing trainee's learning: Trainees' knowledge will be assessed in each LAP Test, along with performance skills, NOT by the posttest. Pre-posttest should be expanded to cover major basic knowledge in all LGs.

## CONCLUSION

This paper has described transformational process of training design, with EWTI's project as an example. It is authors' hope that the next phase of training will satisfy all the elements described

in Figure 3, as much as possible.

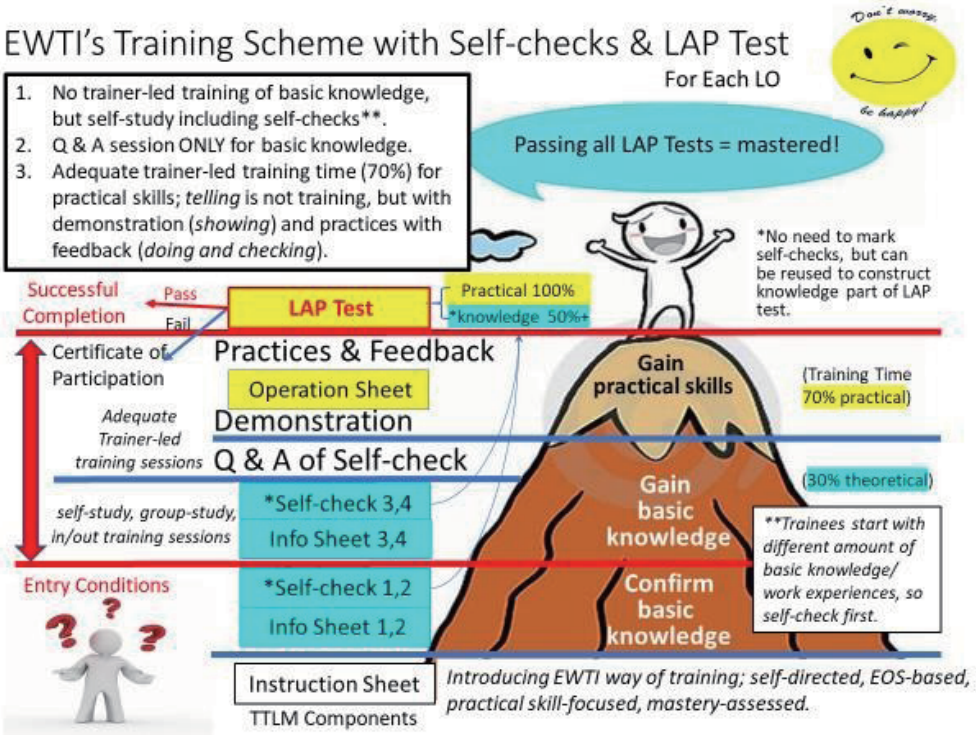


**Figure 3: EWTI's training scheme (suggested)**