Technical and Vocational Education and Training (TVET) has been expanding for the last decades in Bangladesh. The Diploma-in-Engineering programme of TVET in Bangladesh is offered through polytechnics and leads to a mid-level technical/vocational qualification for technicians (Diploma engineers). The duration of this programme has been increased, from three years to four years in 1999 in order to improve the quality of Diploma engineers with regard to international level standards. The curriculum has been reviewed. A student competency assessment in the TVET sub-sector and a comparison at intercontinental or regional level has not been made yet.

This empirical study investigates the Diploma-in-Engineering (Electronics Technology) curriculum including student assessment approach and learning/teaching outcomes, and compares them with Germany's initial vocational training in the Dual System.

The required data was collected through a self-designed test and a questionnaire. Consultation with experts, senior teachers, key persons and some students was made too. The survey (data collection) was conducted with vocational schools (Berufsschulen) in Baden-Württemberg, Germany (N = 160) and with polytechnic institutes in Bangladesh (N = 160) within the period from July 2009 to February 2010. The competence test measured mainly students' technical competencies, particularly in the case of practical relevant tasks. Both quantitative and qualitative methodologies were used to analyze the data.
The results of the test show that Bangladeshi polytechnic students lag clearly behind the German apprentice trainees. The polytechnic students in Bangladesh obtained only a fourth of the points that the German vocational school trainees obtained in the competence test. These findings support experts' and teachers' opinions (who work in the TVET sector in Bangladesh), who are in doubt about the practical competences of the polytechnic graduates. They blame the lack of prior-knowledge and basic competences of students at the entry-stage of the course. They also complain that there is a lack of teachers who regard their profession as a vocation. However, the learning environment that includes, among other determinants, the curriculum and its complexity level, plays a significant role in developing students' competencies. An inadequate curriculum (too complex or too simple or not yet properly tuned) may hinder the development of students' competencies [6, p. 10; cf. 7, p. 123].

Students' competencies at different categories of the cognitive process were examined in this study too. The findings showed that the tasks, which require only knowledge reproduction (level 1: the cognitive process category of Remember), are solved correctly with a higher probability than the tasks which require knowledge transfer and/or knowledge production (level 3: the cognitive process category of Apply). Students' performances in solving the tasks in the cognitive process category of Remember (reproduction) and the category of Understand (re-organisation) were found to be almost the same.

A comparison between the two countries at different cognitive levels was made. The findings show that the polytechnic students in Bangladesh perform poorly, whereas the trainees in Germany perform relatively well in answering the tasks at all three levels of the cognitive process. It was found that the differences in the categories of Apply and Understand were bigger than the difference in the category of Remember. The analysis of the curricula of both countries shows: The content of the Four-Year Diploma-in-Engineering curriculum/syllabus in Bangladesh is inflexible and organized according to subjects. It is delivered through polytechnics (full-time schooling); with only 12 weeks of in-company training. The content of the syllabus can be categorise as the domain specific/technical subjects (56.0% of the total lesson hours, 55.4% of the total credit points), the mathematics and natural science (16.3% of the total lesson hours, 18.7% of the total credit points), other related subjects (14.3% of the total lesson hours and 22.2% of the total credit points) and the industrial training (13.3% of the total lesson hours and 3.6% of the total credit points) [1, 3]. The three and a-half years long initial vocational training in the Dual System in Germany is provided at two learning places: vocational schools (part-time schooling) and companies. The curriculum for vocational schools is flexible and Learning Field (Lernfeld) based [8; 9]. About three-fourth (74.3%) of the total lesson hours are allocated for in-company training, the rest (25.7%) of the time is spent at vocational schools [2, 3].

Furthermore, we investigated and found that the student assessment approaches in Bangladesh and Germany differ greatly regarding their theoretical requirements and practical relevance. In Bangladesh the question items assess mainly students’ theoretical knowledge (knowledge reproduction). That means, the question items are constructed in such a way that they rarely demand ‘transfer’ level skills. The question items of the last three years have been categorized according to the Bloom’s Taxonomy of Educational Objectives [5]. The percentage of the test-items in the category Remember, Understand and Apply were found 51, 43.9 and 5.1, respectively [3, p. 82 - 83]. In Germany the tasks in the examination question papers are practical situation oriented. Mostly, at the beginning of a question paper, a project from a learning situation is described. Then it is followed by a set of questions, mainly regarding this project. The questions/ items in the final examination
for the last three years have been analyzed and found that 65.8% of the question items are of category Apply, 26.3% are of category Understand, and only 7.9% are of category Remember, according to Bloom’s [5] taxonomy. The findings of the examination questions analysis clearly indicate that little emphasis is placed on transfer-based tasks in Bangladesh compared to Germany.

The curriculum content analysis, the analysis of student assessment approach and the competence test results showed that the Diploma-in-Engineering curriculum in Bangladesh mainly focuses on theoretical matters. The learning field based curriculum of vocational schools in Germany focuses on practice-oriented learning and teaching, and fosters the trainees' knowledge transfer capability.

Finally, we identified the strengths and weaknesses of the current Diploma-in-Engineering (Electronics Technology) curriculum in Bangladesh, and made some suggestions to modernise it accordingly.

However, if the quality of a curriculum is good, then the outcomes depend on the quality of its delivery processes, as well as institutional and individual context factors. We suggest future studies pay more attention to these named areas.

REFERENCES


