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New investment in international vocational education research by the German federal government

In previous issues of the JAEE, I have often reported on conferences which I thought were interesting for the readership of the journal. This Editorial will be about a recent event I attended, at which I had the privilege to give a keynote speech, together with Professor Hubert Ertl, who is the successor of Professor Reinhold Weiss, as director of research of the Federal Institute for Vocational Education (Bibb) in Bonn, Germany. The purpose of the event was to introduce, explain and discuss a new measure of the International Vocational Education branch of the Federal Ministry of Education and Research (BMBF) in Germany. The measure, for which only German universities and research institutes can get funding, is to initiate research on international vocational education cooperation. There are five core elements of the research: (1) Cooperation between employers and trade unions, industry organizations and governments; (2) Learning within the work process; (3) Acceptance of national standards; (4) Qualified vocational education and training staff; and (5) Institutionalized vocational training research and vocational training advice. Next to that, the measure will fund research on the following three priorities: (1) current issues in VET research in the context of VET cooperation; (2) Research on the prerequisites for successful VET cooperation in countries with existing BMBF cooperation in VET and in other countries and regions; (3) Development of joint pilot measures for capacity building in VET research in the BMBF's partner countries. These priorities are not meant as being exclusive. Interested parties have the opportunity to submit proposals on the themes they find important and interesting. Obviously, there are evaluation criteria to bear in mind when submitting proposals. Given the nature of the event, it was no surprise that the room was fully packed with professors and senior staff of German universities and research institutes.

The meeting was organized by Hannes Barske and Antje Wessels and colleagues of a branch of the German Aerospace Center (DLR), which may seem odd, but the DLR also acts as project bureau for ministries such as the one at stake. Dr. Henk van Liempt, head of the Division at the BMBF and responsible for international cooperation in education opened the meeting, stressing the importance of strengthening the research on international cooperation in vocational education. Next, there were the two keynotes. Professor Ertl spoke about internationalization of VET from the German perspective, and I was invited to speak about VET research from an international perspective. Next, Kristina Hensen-Reifgens with colleagues informed the audience about the details of the funding measure and answered many questions. Finally, there was an open panel discussion with panellists Dr. Henk van Liempt (BMBF), Isabelle Le Mouillour (BIBB), and Antje Wessels (DLR-PT), which was facilitated by Hannes Barske (DLR-PT).

I am reporting on this event especially as it is quite unique that a national government is investing seriously in vocational education *research*. You may have encountered German development workers in education and extension, but most of them are working on practical projects, such as capacity development, community development, and educational development. The proposed measure will however, be research-driven. In times that many governments have decreased the investment in vocational education research, the strategy of the

German federal government may seem counter-intuitive. However, it is part of the trade development policy of the government, which means that the research should at the end of the day contribute to trade relationships. Germany, one of the top manufacturing countries, which works hard on the implementation of Industry 4.0, which is the full integration of production and information technology, has companies which have branches in many other countries. The companies need personnel which is well-trained according to German standards and the requirements of the jobs in the companies concerned. An important question is how to train students at school and job entrants in the competencies needed in the high-tech workplaces which exist. The immediate reaction of the German partners is then to locally develop vocational education which reflects the Dual system (for an introduction, see the videos about the Dual system on <https://www.bibb.de/govet/en/54891.php>). The Dual system of vocational education however, requires a well-established labor market, with social partners who are maintaining sectoral social dialogues about vocational education. However, in many countries in the global South, these conditions do not exist. The economy is informal, an organized structure of companies is absent, employee organizations are not well-established, and there is no common interest in the development of vocational education. This may be too much black-and-white reasoning, as there are many differences by countries and professional fields, but in general at least based on what I have seen internationally), vocational education is in a poor state because of these circumstances. Nevertheless, German employers are attractive, and create employment, based on which job entrants and employees are interested in training and development for getting and maintaining a job. I experienced the same in East-Africa when I was there with colleagues to work on curriculum development for various programs in the field of floriculture and horticulture. Dutch farmers employed many workers and were very interested in strengthening local vocational and higher education so that the general level of skills of the graduates would be increased and of more value added. So, it seems that international trade cooperation is an interesting line along which vocational education can be developed and strengthened in such a way that it will unite the different stakeholders at sectoral, regional and national levels.

The ambition of the Federal government in Germany is to create better systems of vocational education in those countries in which Germany has a strong economic interest, but also in other countries which express interest in the German VET system. In my keynote, I have stated that Germany is probably in the best position to do this, as the volume and substance of German vocational education theory and research are probably the biggest and most profound in the world. The state definitely has the highest number of VET professors per square kilometer. I have never counted them, but estimate there are hundreds. This is partly caused by the fact that vocational education teacher training is embedded in the university, and that all VET teacher training leaders are thus professors, but also by the given that craftsmanship in Germany is highly esteemed. There are many legally regulated occupations. A unique feature is also that Chambers of Commerce have an essential role in the apprenticeship system. Apprentices have to do their exams in the chambers, signifying the responsibility of the organized industry for the content and quality of the practical training of the apprentices (See: <https://www.dihk.de/en/segments/training/education-training>).

Regarding the research lines that are suggested by the text of the international vocational education research measure, it can be expected that there will be many proposals on the three funding priorities, but the first funding priority is quite open. It is – as mentioned – about current issues in VET research.

There are at least three types of VET research which can be distinguished, which follow the strands of the measure: (1) Research on the development of local vocational education and training; (2) Research on the national development of regulatory frameworks for vocational

education and training; and (3) Research for scientific purposes. The objectives, contexts and activities of these projects, differ significantly. In the first kind of projects researchers will be found a lot at specific locations for vocational education or vocational education management and development units of universities. In the second kind of projects, they will be more active with ministries and other national stakeholders such as employer and employee associations, production and export associations, innovation bodies and non-governmental organizations. In the third kind of projects, researchers will be more intensively active with colleague-researchers in universities and research institutes of partners countries. They will be working with joint PhD projects or other research cooperation projects.

Regarding the first research priority, research on current themes, practically all is possible. There seems to be no limit regarding the specific themes for which proposals can be submitted. Although three subthemes are being mentioned, empirical VET research, business education, and subject didactics, many other themes are possible. I have shared a full list of possible research themes, by which the three themes are significantly expanded. The themes emerged from earlier VER research reviews I did with a co-worker, and are amended based on research which was conducted in the last couple of years. See the full list below.

VET and society

- Cooperative and competitive models of governance of VET
- Cultural aspects and national esteem of VET
- Regulation and deregulation of VET practice and the balance between autonomy and control
- Career perspectives of VET graduates in countries with high unemployment rates
- Personal identity development of VET students
- Public-private partnership and cooperation in VET
- Intensifying and shortening of, and reducing dropouts from the VET programs
- High-level multi-stakeholder national initiatives to support STEM education
- Stimulating entrepreneurship in VET
- Managing learning of migrants for social inclusion
- International comparisons of quality of VET

VET system, policy, organization and management

- Upstreaming from VET to HE
- Making VET first choice
- International comparisons: from benchmarking to bench-learning
- Developing learning VET organizations
- Appreciative human resource management in VET
- The role of private training institutions in VET provision to overcome skills shortages

VET teacher education and teacher behavior

- Competence profiles for and capabilities of VET teacher and trainers
- Continuing professions development in VET teacher development teams
- Roles of experienced professionals in the field of teaching in VET
- Training of in-company VET trainers
- Analysing professional working theories of teachers
- Development of authentic assessment competence

- Stimulating interdisciplinary teacher cooperation
- Developing an inquiry-oriented attitude amongst teachers

VET curriculum

- Alignment with relevant and current competence frameworks
- Attention to future-oriented competence (robotics; drones; augmented reality)
- Industry 4.0 competence and consequences for VET
- Global competence (intercultural awareness, understanding and diversity)
- Hybridization of and boundary crossing in VET programs
- Stimulating opportunity recognition and realization in VET programs to promote entrepreneurship

Learning and instruction in VET

- Evaluating the effectiveness of education and learning theories in VET
 - The role of informal learning in competence development
- Working with computer-supported collaborative learning platforms in VET
- The potential of practical and computer simulations; competitive and social games
- Overcoming challenges in transfer of learning in VET programs
- Boundary crossing: assess to internships/apprenticeships
- Effectiveness and conditions of workplace learning
- ICTs and multimedia (virtual and augmented reality) in VET

Assessment and testing of educational achievement in VET

- Assessment of, for and as learning in VET
- Summative and formative testing in VET
- Authentic assessment and the role of the practical trainer in assessment
- Continuous assessment in VET teaching and learning
- Designing high-quality assessment programs in VET
- Using rubrics for assessment in face-to-face and online VET programs

What is the relevance of this report and overview for the field of agricultural education and extension? To me it is obvious. If all vocational education and training (VET, or often referred to as Technical-Vocational Education and Training, or TVET, or Career-Technical Education, CTE, or workforce education, or WFE) is replaced by AVET (or ATVET, ACTE or AWFE), whereby A stands for Agricultural, the whole content of the program suddenly brightens, and would be a worldwide example of investment in agricultural vocational education and training. Imagine the scope and effect of that, especially in countries which have for long neglected agricultural education whilst they were dependent on agricultural production to a large extent. May many national governments appreciate the German VET research initiative, see it as a source of inspiration, be willing to work with the researchers who will be successful in getting grants, but also be interested in building their research infrastructures within universities and research institutes by setting up or re-installing VET management and teacher education departments, including the appointment of professors and staff.

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