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Development of TVET Teachers' Career Identity through Teacher Education and Training Programs for the purposes of including ESD in Classroom Practices

Abstract

This paper has two starting points. First is the recently approved document, *Implementation plan of vocational education reform* issued by the General Office of the State Council of China (2019). One aspect of this reform is specifically related to the quality of TVET teachers. It requires the TVET sector to develop a unified approach towards selecting and educating TVET teachers at the national level. The second is China's resolve to follow a path of sustainable development (Zhang & Wen 2008). The government emphasizes the need to reduce environmental pollution and develop innovative approaches towards minimizing the use of energy and materials in all economic sectors and to establish step-by-step measures to implement these approaches (Tianbao & Fang 2018). As a result of these two developments, TVET teachers need to incorporate the knowledge and skills required for education for sustainable development (ESD) into their classroom/workshop practice that are relevant to their own specific specializations (Zhang et al. 2017). However, this creates significant challenges in terms of teacher training, as there is a lack of discussion about how to motivate teachers to address SD issues and to apply what they know about ESD into their teaching practices (Borg, Gericke, Höglund, & Bergman, 2012). This article argues that career identity theories provide principles that can be used to design teacher education and training programs to cultivate teachers' motivation and commitment to ESD. The authors put forward a model that consists of six components, which can be included in educational programs for TVET teachers with the specific aim of implementing ESD in TVET.

Keywords: *TVET teachers' career identity, teacher education, education for sustainable development*

1 Background

This paper has two starting points. First is the recently approved document, *Implementation plan of vocational education reform* issued by the General Office of the State Council of China (2019). The reform requires the TVET sector to develop a unified approach for selecting and educating TVET teachers at the national level. The second is China's resolve to follow a path of sustainable development (Zhang & Wen 2008). There is a need for all employees to recognise the importance of greening operational practices and to perform tasks related to that. In this context, there is also a requirement to develop a systematic approach

towards the inclusion of education for sustainable development (ESD) in TVET and TVET teacher education and training programs.

1.1 China endeavors to improve the quality of TVET

A recent influential event that signaled China's resolve to improve the quality of TVET was the issue of the *Implementation Plan of Vocational Education Reform* in February 2019 by the General Office of the State Council of China. According to the plan, China will endeavor to elevate TVET teachers' qualification requirements and to strengthen TVET teacher training programs. In particular, China aims to establish 100 new TVET teacher education and training institutions, to introduce the requirement for all TVET teachers to attend field practicums for at least one month per year, and to undertake compulsory training and professional development courses every five years. Excellent teachers will participate in scholarly exchange projects across countries in order to connect China's TVET with the world, as well as to facilitate innovations in TVET teaching. In October 2019, China issued an additional implementation plan targeted at recruiting and educating "double-master" TVET teachers – that is, teachers who are proficient at teaching theory and practice in a certain specialty simultaneously (Teacher No. 6 [2019]). The document clearly stated, following German's Dual System Vocational Model, that from 2020 the government demands that all TVET institutions stop recruiting teachers who have no industry experience. Thus, TVET teacher training and education institutions are required to offer compulsory practicums at enterprises related to their specializations. Following graduation, only those who are double-master TVET teachers will be permitted to work as TVET teachers.

Currently, China has more than 300 training and education institutions involved in providing TVET teacher education and training. Two thirds of these train both pre-service and in-service TVET teachers at the higher education level (Zhao & Lu 2007). Compared to college disciplines, which are organized and taught according to definitions of national classifications and a code of disciplines for training and education, TVET teachers' specializations are set up by TVET teacher training and education institutions, as there is a little guidance regarding the classification of TVET teaching specializations (Zhao & Lu 2007; Shi 2012). As a result, TVET also lacks a unified approach towards selecting and educating TVET pre-service or in-service teachers with real-life industry experience in a certain domain, as well as knowledge of teaching (Zhao & Lu 2007; Shi 2012).

Therefore, there are a number of issues that should be addressed at the system level in terms of unifying approaches related to teaching TVET teachers, and developing the curriculum for different domains that match a classification for TVET teachers' specializations (these classifications also need to be established). All these structural changes are aimed at improving the quality of TVET to meet the demands of the economy, and the important direction for economic development in China is the path towards sustainable development.

1.2 China's resolve to work towards sustainable development

China adopted sustainable development (SD) as a national development strategy in 1996 (Zhang & Wen 2008). Over the following two decades, the government of China has initiated a series of policies and actions to integrate SD into the government evaluation system and guide the development of green economic growth and industrial development. In 2016, China published its own domestic environmental governance norms for the implementation of the 2030 Sustainable Development Goals and 43 government departments have been involved in implementing the country's Sustainable Development Agenda (Tianbao & Fang 2018). According to the document, all economic sectors are required to adopt environmentally friendly technologies and processes and to apply strengthened waste disposal criteria for their operations. The emergence of the green economy agenda within the framework of SD makes additional demands on the composition of employability skills and requires TVET teachers to be knowledgeable about sustainable development education and to possess the competencies to include ESD in their classroom practice (Pavlova & Huang 2013; Majumdar 2011).

In terms of ESD education within TVET itself, teacher education and training now has multiple challenges. In relation to the above two points (TVET reform and SD strategies), TVET teacher training and education in China need to prepare TVET teachers so they have real-life SD knowledge and skills applicable to a particular specialization. Furthermore, they need to be motivated to include SD education in their classroom practices. Both of these require teachers to be prepared to engage in life-long SD learning and channel the most practical and up-to-date SD knowledge and skills to students instead of repeating text book content. What is an effective way of updating teachers' specialist knowledge and skills, particularly in rapidly changing areas, such as green innovation? As industries keep changing, TVET teachers' knowledge and skills become outdated quickly. Therefore, the best way to prepare TVET teachers for including ESD in their classroom practice is to ensure that they become self-directed learners. One of the effective ways to achieve this is through regular industry/teacher engagements so they are able to observe greening initiatives in practice or to introduce real-life scenarios into classroom settings.

Although engaging teachers in life-long learning and facilitating teacher's agency are hot topics in the domain of TVET teacher's professional development and career development (Guthrie 2010), there are not many studies that focus specifically on designing TVET teacher education and training programs for the purposes of ESD implementation. Some studies suggest that the effectiveness of ESD implementation depends largely on the motivation and experience/knowledge of teachers on SD issues (see Pavlova and Chen, this issue). Therefore, this paper focuses on the way TVET teacher training programs can achieve these objectives by developing motivation with respect to a particular career behavior related to ESD implementation. Both the Constructive Theory of Career Development (Savickas 2001) and Career Exploration Theory (Blustein & Flum 1999; Flum & Blustein 2000) frameworks emphasize the key role of career identity development for establishing life-long learning as

well as voluntary engagement in certain career behaviors. This article proposes an educational model that consists of six components to support the introduction of ESD by TVET teachers.

2 Theories of career identity development and their implications for training TVET teachers towards ESD inclusion

The development of career identity and a sense of commitment to one's job, is a process that has attracted increased attention in the field of career development (Meijers & Lengelle 2012). Technological advances are among the major contributors towards this current focus. The adoption of new technologies brings rapid changes to the work environment and job specifications, so employees have to become life-long learners and adapt to changing work requirements quickly if they would like to maintain a competitive advantage (Savickas 2001; Blustein & Flum 1999; Flum & Blustein 2000). According to Career Exploration Theory (Blustein & Flum 1999; Flum & Blustein 2000) and Constructive Theory of Career Development (Savickas 2001) the development of career identity is the key to preparing employees to become life-long learners so they are able to adapt to changes quickly.

Career Exploration Theory (Blustein & Flum 1999; Flum & Blustein 2000) considers the development of career identity to be the outcome of one's adaptation to external requirements through mutual interaction between oneself and the environment. Initially, individual behaviors are regulated by external requirements. Voluntary behaviors are established as soon as external requirements are internalized and integrated into one's own belief and value system. Therefore, to develop a particular career-related identity, there is a need to identify these initial external requirements (such as those set up by an educational reform or SD goals), and then facilitate the internalization of these by relating them to a person's own beliefs and values about their career. Finally, encouraging mutual interactions will serve to strengthen the relation.

Constructive Theory of Career Development assumes that career identity develops through one's attempts to relate one's own values with the outside world of work (Savickas 2001). As long as a person can establish a set of career-related life stories to guide, regulate, and sustain vocational behaviors, these stories will in turn help them to adapt to changes and evaluate those changes through continuous interaction with the world of work. If we are to apply this idea to designing TVET teacher education and training programs, an overall approach would be to accept people as the experts in their own lives and encourage them to seek meaning related to certain career behaviors, such as life-long learning or inclusion of SD concerns, through their personal experience. By constructing and reconstructing their own narrative stories, the wanted career behaviors are established.

Based on these theories, we are suggesting a training model that will prepare TVET teachers to include ESD education in their practice. The model is based on three steps identified following an analysis of Career Exploration Theory. Step 1, identify external requirements for the inclusion of ESD in TVET; step 2, design training modules that prepare teachers to meet

these requirements (content); step 3, include activities that enable teachers examining the meaning of ESD education by referring to their own life experience and understanding about SD to possible ESD approaches in TVET (focus on motivation). Based on key points from Constructive Theory of Career Development, we propose to adopt a teaching pedagogy that encourages TVET teachers to formulate multiple narrative stories regarding a list of SD themes in order to establish teachers' commitment to ESD teaching.

In the next section, we present a training model based on the above framework.

3 A training model for preparing TVET teachers for ESD

Teachers need to develop a capacity to provide quality SD education through TVET. Therefore, effective teacher training should include a number of features that will help to address ESD in TVET classroom practice. Goodine (2010) suggested including three elements in order to prepare TVET teachers for sustainable development education. These elements are: i) knowledge and communications regarding conflicting information about clean and green technologies, ii) technical skills in teachers' fields of specializations and an ability to identify training solutions and maintain networks and application of standards, and iii) generic skills that are required regardless of teachers' field of expertise. Majumdar (2011) and Pavlova & Chen (2019) suggested that teachers should be trained using innovative principles of ESD pedagogy, such as a real-life problem-oriented and project-based approach and the use of virtual reality to bring real-life contexts into the classroom. Pavlova (Pavlova 2016, Pavlova & Huang 2013) emphasized the importance of teachers being able to collaborate with industries to understand greening needs and practices and develop an awareness of sustainable values. We argue that to achieve the above requirements, the training model for TVET teachers should emphasize teachers' agency in SD education. Advances in modern education suggest that a teacher's role as a knowledge transferer is not so important anymore in a modern classroom, therefore a teacher's role as a learning facilitator should be strengthened (Biesta, Priestley, & Robinson, 2015; Pavlova & Chen, this issue). As facilitators, teachers need to be more creative and remain open to new knowledge and technology, varied students experiences, as well as learning practices that differ from their own previous learning experience or which simply just did not exist before. Furthermore, they need to respond more frequently to individual learning needs when the focus of the education process shifts from teaching to learning in, and outside, the classroom. All these elements require teachers to become life-long learners and agentic educators (Avalos 2011; Biesta, Priestley, & Robinson 2015).

In summary, a training model, which aims to prepare TVET teacher towards ESD education, should be designed to achieve the following goals:

- SD knowledge and practices in general;
- SD knowledge and practices in specific industries;
- generic green skills;

- ability to connect students with industry practices regarding SD;
- ability to adopt project-based pedagogies;
- develop life-long learning motivation; and
- develop agency to become an agentic educator.

To achieve these goals, the following six training focuses/components are put forward as prerequisites to support professional identity development among Chinese TVET pre-service and in-service teachers, as ESD implementators. They are: SD education in TVET, SD issues in teachers' own specializations, teachers' personal SD concerns, ESD curriculum development, ESD project development for practicum courses, and resources and self-learning plans. All six components are related to different aspects of ESD and career identity related activities. These components can, of course, be modified and extended to address the requirements of specific contexts.

3.1 SD education in TVET

This component addresses general topics, such as defining SD and ESD, why ESD education should be included in TVET, and what the roles are for TVET teachers in ESD education. In addition, teachers are expected to correlate SD topics with their personal experiences by evaluating the competencies required by external requirements with their existing competencies and experiences. For example, teachers can be asked to complete a self-reporting worksheet before and after classes, which will foster an increased awareness of the gap between external requirements (e.g. targets under SDGs in China) and their own understanding of SD teaching in TVET, as well as their roles in terms of ESD. They can also participate in discussions in class that will help teachers identify existing gaps and devise possible measures for closing those gaps.

3.2 SD issues in TVET teachers' own specializations

This component addresses SD issues related to teacher's study major in order to prepare teachers with ESD knowledge and skills in that specialist area. The component also helps teachers identify their knowledge gaps regarding advances and conflicts in people's understanding of clean and green practices and skills, as well as becoming familiar with the most up-to-date SD practices emerging in industries related to their specialization. The purpose of this component is for teachers to develop a sense of confidence and positive expectations about the outcomes of ESD. In order to achieve these goals, a checklist can be used in each class to help scrutinize their knowledge about ESD, as well as their beliefs and values related to ESD education. The classes should also have teachers propose their own solutions or teaching plan regarding existing SD problems in real-life situations. An example of a possible learning activity in a lesson can be role play. After dividing into three groups of teachers, students, and corporate owners, teacher players are asked to prepare a teaching plan regarding an SD-related practical issue. Student players are asked to write down what they would like to learn in relation to this issue and then compare the teaching plan to their own ideas. Corporate owner players are asked to write down their concerns and evaluate the

teaching plan along with the learning wish list prepared by the students. At the end of this process, all three groups should agree upon a teaching plan. By working through these process, all participants have a chance to examine teaching and learning approaches to addressing SD issues, to recognize different stakeholder perspectives, and to finalize a teaching plan.

3.3 Teachers' personal SD concerns

The purpose of this component is to provide teachers with knowledge about TVET teaching pedagogy, to encourage teachers to explore SD issues they are concerned about and to relate these issues to ESD teaching. They will be required to share their own concerns and stories about these concerns, examine what happened before and after, as well as their feelings and responses. After discussing possible ESD practices with their classmates and knowledge related to their concerns, teachers are encouraged to develop a new story. This new story includes a part about their expectations as well as teaching efforts they could use in response to their personal SD concerns. This component is designed to follow a narrative pedagogy procedure.

3.4 ESD curriculum development

After first preparing teachers with SD knowledge and practices, as well as some ESD principles, this component and the next are focused on ESD curriculum development. Teachers need to learn how to integrate generic green skills development (Pavlova 2019) throughout all the courses in their program and how they could integrate specific green skills and knowledge relevant to their specialization. A real SD issue can be used as a starting point. Teachers can analyze problems related to teaching about this issue, discuss the content and possible suitable pedagogies suitable. Teachers can take part in workshops about curriculum design and project development. Teamwork is encouraged to help teachers to establish a supportive network.

3.5 ESD project development for practicum

Like the previous component, this one focuses on the development of ESD projects for practicum courses. Teachers need to identify which projects are appropriate in a workplace context and work out how to formulate activities that can help students learn about issues such as minimization of water use, electricity, resource use, waste and water management and other issues that are closely related to technological generic green skills (Pavlova 2018).

3.6 Resources and self-learning plan

The focus of this component is to further improve teacher's commitment to ESD teaching, engage them in life-long learning of ESD knowledge and practice, and establish their provision of ESD teaching. Based on their own views, teachers are encouraged to identify the significance of ESD teaching for their careers, their own lives, the lives of students, and wider

society. In terms of teaching, they can pinpoint expected difficulties and devise corresponding strategies. In terms of future development, they are expected to identify useful resources and develop their own self-learning plans.

These six components work together to facilitate the development of TVET teachers' commitment to ESD education. At the same time, each of the components can be picked up and developed into an independent module for training teachers about ESD education.

4 Summary

The inclusion of ESD in TVET to address SD strategies in Chinese development plans, presents multiple challenges. One of them is the introduction of ESD in TVET teacher education and training. With the purpose of developing an educational model that is effective for training TVET teacher for SD education, the paper identified the need to develop the career identities of TVET teachers so they meet the external requirements related to China's SD development plans. Based on Constructive Career Theory and Career Exploration Theory, the paper proposed that teachers' commitment to SD education should be the main objective of the educational model and a narrative pedagogy should be adopted in teaching. A three-step procedure was established to develop this model. Each of the six components of the model has a specific focus, and some examples have been included to illustrate the nature of each component. The inclusion of these components in training programs will help prepare TVET teachers with real-life SD knowledge and skills applicable to their particular specializations, and will motivate them to include SD education in their classroom practices. The model also highlights the need for TVET educators to become life-long learners and agentic educators if they are to maintain effective engagement in ESD that is relevant to their SD concerns alongside the constant changes taking place in greening industry practices.

The suggested model was developed based on career identity theories and results of studies conducted in the area by other researchers. Therefore, empirical studies are required to measure the effectiveness of this approach and to formulate practice-proven recommendations for each component that will support TVET teachers' implementation of ESD. Another important point to consider is the importance of those external requirements that should be internalized in order for ESD to be implemented in TVET. The context for the implementation of the suggested educational model is China; the government is very supportive of training TVET teachers and in addressing SD issues. As the formulation of external requirements regarding ESD in TVET is very context specific, there is a need for countries with different external requirements from China to modify and adopt this model in that different context.

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