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Teacher Action Competence in Education for Sustainable Development

Abstract: When considering teachers' competencies in education for sustainable development (ESD), both theory and practice emphasise the importance of teachers' willingness to act on the implementation of the ESD. Therefore, it is necessary to consider the construct of teacher action competence that describes teachers' action potential in ESD. This paper proposes a Model of Teacher Action Competence in ESD that consists of three interrelated multidimensional aspects: (I) knowledge and abilities (ESD content and pedagogical content knowledge), (II) motivational beliefs (teacher ESD self-efficacy, ESD value assessment, and ascription of personal responsibility), and (III) willingness to act (intention to implement ESD). The proposed model has the potential to be empirically researched, and the relationships among the competence elements can have significant implications for planning educational interventions aimed at training ESD teachers.

Keywords: sustainable development, education for sustainable development, teacher competence, action competence, teacher action competence in education for sustainable development

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Introduction

To contribute to sustainable development (SD), individuals must learn to understand the complex world in which they live and how to respond to insecurities, trade-offs, risks, and the rapid pace of social change as well as how to cooperate, advocate, and act towards positive change (UNESCO 2017, 2020). Thus, education is recognised as a key to accomplishing desired changes, i.e., a framework that enables individual empowerment and training to face today's challenges efficiently, collaboratively, and systematically. Education for sustainable development (ESD) refers to educational programmes and experiences designed to provide an opportunity to develop key competencies for promoting SD, the so-called sustainability competencies (Frisk and Larson 2011; UNESCO 2017). Sustainability competencies are mostly seen as the interrelationship of knowledge, abilities and skills, motives, and affective dispositions that people should adopt to deal with today's complex challenges constructively and successfully. Within ESD, great emphasis is placed on the possible methods of implementing education for SD that should develop sustainability competencies (UNESCO 2017, 2020). In consideration of the role of the teacher in SD, the question is what competencies teachers need to have to successfully implement ESD in their practice (UNESCO 2017). To answer this question, various authors have offered conceptual models of teachers' sustainability competencies (e.g., Sleurs 2008; UNECE 2012; Rauch and Steiner 2013). These models describe »desirable« teachers for ESD—their attitudes, values, knowledge and behaviour, and how they reflect on sustainable development and education in general. Although these models share some commonalities, such as emphasising the need to empower teachers to act towards sustainable development, the scientific community still requires consensus on the most relevant elements of teacher competencies in ESD. Existing models place a particular emphasis on teachers' willingness to act and implement ESD and on the need for innovations in teacher education that would empower teachers to act effectively towards SD in the education system (Rieckmann 2018). Thus, in the last few years, the scientific discourse on teacher competencies in ESD has introduced a construct of teacher action competence (e.g., Bertschy et al. 2013; Brandt

et al. 2019, 2021) that describes the teachers' action potential in the ESD context.

This paper conceptually explores the existing literature on action competence and teacher action competence in ESD and, as a result, offers an upgrade to previous knowledge through the proposal of an integrative Model of Teacher Action Competence in ESD.

Teacher action competence for sustainable development

As a construct, action competence first appeared in the 1990s in publications by the Royal Danish School of Educational Studies, written by Jensen and Schnack (1997) and Breiting and Mogensen (1999). Jensen and Schnack (1997) defined action competence as the ability to act with respect to environmental issues. Later, this construct was expanded to the area of sustainable development and, at the individual level, was defined as the latent capacity of individuals to act towards SD (Olsson et al. 2020).

In the action competence construct, the notion of action differs from »ordinary« behaviour and refers to voluntary behaviour aimed at changing or resolving a controversial issue or problem (Jensen 2000; Breiting et al. 2009). Action competence can be seen as the process by which individuals identify SD issues, find solutions, and take actions in such a manner that develops their ability to address such issues (Jensen 2002). The types of competencies needed to empower individuals to develop action competencies consist of three main components: (I) knowledge of the action possibilities, (II) belief in one's own influence, and (III) willingness to act (Breiting and Mogensen 1999; Sass et al. 2020).

Bertschy et al. (2013) have been the only ones to offer a coherent idea of teacher action competence in ESD so far: the so-called model of »ESD-Specific Professional Action Competence of Teachers in Kindergarten and Primary School«. They defined professional action competence in ESD as a combination of two multidimensional aspects: (I) motivation and volition, and (II) knowledge and ability. In their model, Bertschy et al. (2013) placed the most significant emphasis on the components of knowledge and ability. They emphasised that teachers must possess meaningful knowledge of SD topics as well as pedagogical knowledge that includes teaching methods and approaches needed to achieve specific ESD goals (Bürgener and Barth 2018). The motivational aspect refers to the need for teachers to accept the importance of the idea of SD as well as to understand the role of education as a social resource in achieving SD goals.

Bertschy et al.'s (2013) model was a coherent starting point for defining teacher action competence in ESD. One of the model's key contributions was opening a discussion on teacher action competence in ESD and contributing to current knowledge about the necessary competencies of teachers for ESD implementation (Bürgener and Barth 2018). However, this is the only attempt to define teacher action competence in ESD thus far. Further elaboration of teacher action competence in the ESD construct and clearer specifications of its elements are needed, which the authors recognised as well (Bertschy et al. 2013, p. 5076).

To contribute to the dialogue on key teacher competencies in ESD, this paper proposes a new, more integrated Model of Teacher Action Competence in ESD. The focus is directed at three points that offer an upgrade to existing knowledge about teacher action competence in ESD. First, starting from Bertschy et al.'s (2013) model, it can be argued that teacher action competence is a combination of (I) motivation and (II) knowledge and ability to implement ESD. However, when one considers that the generally accepted definition of action competence is stipulated as a combination of ability and willingness to take action (Mogensen and Schnack 2010), it is clear that in their model, Bertschy et al. (2013) placed great emphasis on the »ability« aspect while omitting the »willingness to take action.« The theoretical framework of action competence (e.g., Jensen and Schnack 1997; Mogensen and Schnack 2010) emphasises that the action component refers to intentional goal-oriented behaviour. Clearly, willingness to take action is a crucial aspect of action competence. Accordingly, a vital indicator of the representation of action competence in ESD should be the teacher's intention to implement ESD. After all, the idea of training teachers for such work is not only the acquisition of ESD knowledge and the development of positive attitudes towards it, but also facilitating the intention of teachers to truly implement ESD in their professional work as teachers (Leicht et al. 2018). Only the presence of intent proves the existence of action potential for implementing ESD at the individual level. Thus, willingness (intent) to implement ESD is identified as a key element of teacher action competence.

Second, the motivation component of the teacher action competence in ESD has been defined so far solely as teachers' perception of ESD as a framework within which the achievement of SD goals and progress towards a more sustainable future can be accomplished (Bertschy et al. 2013). While it is an undeniably essential aspect of teacher action competence necessary for ESD promotion, there is more room to define the motivational and self-regulation factors that guide implementation. These factors could include various *motivational beliefs* teachers possess regarding their abilities and roles in implementing a particular aspect of education (Baumert and Kunter 2013). Thus, relevant motivational and self-regulation factors of teacher action competence in ESD will be singled out and discussed below.

Third, there is an absolute lack of theoretical models in terms of teacher competence in ESD that define the interrelationships between different competence elements. So far, all the proposed models (e.g., Bertschy et al. 2013; Sleurs 2008; Rauch and Steiner 2013) describe how teachers should behave and think and what values and attitudes they should possess, but they do not specify the interrelationships of the model elements. However, based on empirical research, it is known that different elements of competence models are interrelated, and there are many open questions in this regard. For instance, research has shown that the mere acquisition of knowledge or a deeper understanding of SD will not necessarily lead to sustainable behaviour (e.g., Heimlich and Ardoin 2008; Kollmuss and Agyeman 2002; Jensen 2002; Wolf and Moser 2011) or to a greater level of intent to implement ESD or to a more successful ESD implementation in the context

of teachers (e.g., Cutter-Mackenzie and Smith 2003; Kennelly et al. 2008; Liddy 2012; Stevenson 2007; Thomas et al. 2017). It is evident that some third variable (or set of variables) mediates the relationship between knowledge acquisition and subsequent action. To better understand how teacher action competence in ESD implementation is developed and shaped, it is essential to study the interrelationships—that is, the effects of action competence elements on each other.

Building on previous knowledge and models, this paper will propose a relational Model of Teacher Action Competence that will define the elements of action competence as well as assume the interrelationships of the constructs of model elements.

Based on Bertschy et al.'s (2013) conceptualisation of teacher action competence and on the idea that willingness to take action is a crucial aspect of action competence (e.g., Jensen and Schnack 1997; Mogensen and Schnack 2010), three interrelated multidimensional aspects of teacher action competence in ESD can be identified: (I) knowledge and abilities, (II) motivational beliefs, and (III) willingness to act. All three aspects will be presented and the relationships among them discussed.

Aspects of teacher action competence in education for SD

Authors of various teacher competencies in ESD models have recognised the importance of knowledge related to SD content and the pedagogical approaches needed to achieve ESD goals (e.g., Bertschy et al. 2013; Sleurs 2008; Rauch and Steiner 2013). In other words, teachers should have two main types of knowledge necessary for teaching: ESD subject matter or *ESD content knowledge* (CK), which refers to teachers' understanding of what they teach about SD, and *ESD pedagogical content knowledge* (PCK), which refers to teachers' understanding of how to apply diverse teaching strategies to help students understand a particular SD topic in different contexts defined by cultural and social constraints (Bertschy et al. 2013; Shulman 1986; Park and Oliver 2008).

For knowledge to be translated into action, motivational and self-regulation factors that facilitate teacher behaviour are necessary. In Bertschy et al.'s (2013) model, motivational factors of teacher action competence in ESD refer to competencies such as accepting the importance of the idea of SD and both understanding and accepting the role of education as a social resource in achieving the SD goals. In other words, the emphasis is on evaluating ESD and perceiving the importance of achieving SD goals through education. An extended definition of this aspect was offered by Brandt et al. (2019, 2021). They operationalised "motivation for ESD implementation" as a combination of assessments of ESD values and attitudes towards SD (which is in line with the original understanding of Bertschy et al. 2013) and teachers' self-efficacy. The construct of teachers' self-efficacy refers to teachers' personal beliefs about their ability to plan, organise, and perform activities necessary to achieve desired educational goals (Skaalvik and Skaalvik 2007; Tschannen-Moran and Woolfolk Hoy 2001). However, it must be emphasised that

Brandt et al. (2019, 2021) did not offer a conceptual upgrade of Bertschy et al.'s (2013) model—only an operationalisation of some of its components.

Motivational and self-regulation factors are among the key elements of teacher professional competencies (Baumert and Kunter 2013). These factors include a teacher's assessment of the importance of a particular action type, as emphasised in Bertschy et al.'s (2013) model, and motivational beliefs that teachers have about their abilities and roles in implementing a particular aspect of education (Baumert and Kunter 2013). Accordingly, motivational beliefs as an aspect of teacher action competence in ESD should, in addition to (I) *assessing the ESD value*, include two other key assessments: (II) *assessing teacher's self-efficacy* (previously identified by Brandt et al. 2019, 2021) and (III) *assessing their own role as teachers in ESD, i.e., attributing responsibility for achieving the goals of SD through the ESD implementation*.

Rationales for including the aforementioned motivational beliefs in the teacher action competence model can be found in theories of social psychology and motivation psychology, such as the Norm Activation Model (NAM; Schwartz 1977) and the Expectancy-Value Theory (Eccles 2005; Wigfield and Eccles 2000). These theories can also serve as a basis for building an understanding of the intercorrelation of teacher action competence's elements.

The NAM (Schwartz 1977) focused on the norms that drive human behaviour. One of the model's main assumptions was that people are ready for a particular behaviour if their personal norm is activated. For the norm to be activated, people must accept responsibility for their actions and perceive themselves as capable of implementing a particular behaviour. In the educational research context, the latter is a construct called teacher self-efficacy. The former is a construct ascription of responsibility that is mostly defined as a feeling of internal obligation to create or prevent specific outcomes (Lauermann and Karabenick 2011). In educational research, the ascription of teacher responsibility most often refers to measuring the attribution of teachers' personal responsibility for individual educational outcomes. Thus, empirical research results often indicate that teachers' sense of responsibility is positively associated with their beliefs about the teaching profession, their job engagement (Eren 2014; Halvorsen et al. 2009), and their teacher self-efficacy (Lauermann and Karabenick 2011). In line with NAM assumptions, educational research has shown that higher levels of teacher self-efficacy are seen in those who take responsibility for a particular educational outcome and value the teaching profession more highly. Lauermann and Karabenick (2011) conceptualise the ascription of responsibility as a motivating factor behind teachers' decisions to express particular behaviours that they feel are effective.

Furthermore, the personal norm in the NAM (Schwartz 1977) refers to the assessment of the value and propriety of a specific behaviour as well as to the general values that stand behind a certain behaviour spectrum. In the context of teacher action competence, ESD value refers to an assessment of the importance of ESD in the education system, its adequacy, implementation importance, and its value in terms of ways to achieve SD goals and encourage progress towards a sustainable future (Vukelić 2021).

To explain the relationship mechanism between the evaluation of an action (e.g., implementation of a specific type of education) and consequent action, we can examine one of the fundamental motivation theories: Expectancy-Value Theory (Eccles 2005; Eccles and Wigfield 2002). This theory's underlying assumption is that behaviour is most influenced by motivational beliefs—that is, one's expectation of success and the value placed on the task. The expectation of success is defined as an individual's belief in how successful they will be in future activities, whether immediate or distant (Eccles and Wigfield 2002). At the same time, beliefs about abilities are also defined as an assessment of one's own competence in a specific area. There is a remarkable similarity between the concept of expectation of success and the concept of self-efficacy from Bandura's social-cognitive theory (Bandura 1997), or in the context of teachers, teacher's self-efficacy (Tschanen-Moran and Woolfolk Hoy 2001). All these concepts aim towards assessing one's own abilities to perform a behaviour and achieve a goal. Another key construct in the Expectancy-Value Theory is the subjective task value. It refers to a person's beliefs about why they should get involved in an activity (Wigfield and Eccles 2002). In the context of building a Model of Teacher Action Competence in ESD, that would be an assessment of the ESD value, which was previously identified by Bertschy et al. (2013) as a key indicator of teacher action competence. Therefore, according to the Expectancy-Value Theory, the key determinants of teachers' activities in ESD are their assessments of self-efficacy and ESD value.

Willingness to act is the third and key aspect of teachers' action competence in ESD, which directly implies action potential for ESD implementation. Willingness to act refers to the *teachers' intention to implement ESD*. The intention to implement ESD implies the teachers' aspiration to implement ESD aspects in their current or future professional teaching (Vukelić 2021). In educational research, the level of intent for a particular type of teacher activity stands out as a valid predictor of consequential choice and action (e.g., Billingsley et al. 2004; Rots et al. 2010, 2014). In other words, if teachers intend to behave or act in a certain way, they will most likely put it into action. Building on this research, we recognised the importance of studying teachers' intention to implement ESD as a possible predictor of real behaviour in their current or future professional lives and a key indicator of the development of action competence in ESD.

The interrelationship between elements of teacher action competence in education for SD

To clarify the relationship between the elements of teacher action competence in ESD, the NAM (Schwartz 1977), the Expectancy-Value Theory (Eccles 2005; Eccles and Wigfield 2002), and one of the fundamental theories of social psychology—the Theory of Planned Behaviour (Ajzen 1991)—were used.

The Theory of Planned Behaviour (Ajzen 1991) assumes that an individual's behaviour is determined by the intention to perform that behaviour, and the intention itself is conditioned by the attitude towards that behaviour and the in-

dividual's subjective norms, which refer to the evaluation of specific behaviour. If people perceive that a particular behaviour or action is worthwhile, they are likelier to conduct it. One of the principal constructs of the Theory of Planned Behaviour is the so-called perceived behavioural control, which Ajzen (1991) defined as the expected ease of performing the intended behaviour. Therefore, people who estimate that they can perform a particular activity or action will be the ones to do it. In educational research, perceived behavioural control is most often defined as a previously clarified assessment of teacher self-efficacy (Tschannen-Moran and Woolfolk Hoy 2001). In line with this theory, Zint (2002) discovered that the science teachers' intention to include topics about environmental risks in their professional activities could be explained by their attitudes towards this behaviour (more positive attitudes towards the implementation of these topics led to greater willingness to implement them) and perceived behavioural control, i.e., teacher self-efficacy (higher assessments of their abilities were followed by a greater intention to include these topics).

Having examined the predictors of student teachers' self-efficacy in ESD, the assessment of ESD value and the ascription of responsibility for addressing sustainability challenges proved to be essential (Vukelić et al. 2018; Vukelić and Rončević 2019). Higher levels of teacher self-efficacy for ESD are shown by student teachers who think they (and not someone else) are responsible for solving sustainability challenges and attribute a high value to ESD. It is possible that student teachers who think it is their responsibility to at least try to deal with today's sustainability challenges also recognise ESD as a framework that enables taking action and addressing such challenges. Thus, they focus more on potential ways of implementing ESD in their future professional lives and consequently feel more equipped to take steps to do so. Regarding the explanation of different teacher behaviours, these assumptions are consistent with the aforementioned theories (Ajzen 1991; Eccles 2005; Eccles and Wigfield 2002; Schwartz 1997). According to the aforementioned theories, evaluation and attitude towards a particular behaviour or action (e.g., a specific form of education, teaching methods or professional work strategy) and a sense of personal responsibility predict the self-efficacy of teachers regarding that behaviour and action and, consequently, behavioural intent (e.g., Columna et al. 2016; Fahlman et al. 2011).

It is interesting to note that previous research has found that acquiring knowledge or deepening understanding of SD does not necessarily lead to a higher level of intention to implement ESD or to a more successful ESD implementation (e.g., Cutter-Mackenzie and Smith 2003; Cutter-Mackenzie and Tidbury 2002; Kennelly et al. 2008; Liddy 2012; Stevenson 2007). Apparently, some third variable (or variables) mediates the relationship between knowledge acquisition and consequent action, but there are no empirical answers to this question yet. Also, empirical research (e.g., Effeney and Davis 2013; Malandrakis 2018; Vukelić et al. 2018) has detected a connection between the perception of SD knowledge and teacher self-efficacy for the ESD of future teachers. Future teachers who rate their sustainability knowledge higher also show higher levels of teacher self-efficacy (i.e., they feel more apt to implement ESD in their professional work).

Hence, we can assume that teacher self-efficacy is what mediates the relationship between the acquisition of ESD knowledge and the consequent action—that is, intentions for ESD implementation. This assumption is in line with scientific findings indicating that a lack of teacher confidence is the main barrier to successful ESD implementation (Evans et al. 2013; Kennelly et al. 2012; Nolet 2009).

In the context of building this model, it is particularly interesting to see that teacher self-efficacy stands out as a central construct in educational research, i.e., as a principal predictor of future teachers' intentions to take specific actions (e.g., Rots et al. 2014; Watt et al. 2014). Teacher self-efficacy is most often found to be a mediator of the relationship between intentions and other tested variables, such as assessments of the importance of particular actions or attitudes. Thus, it can be assumed that teachers' self-efficacy in ESD is a positive predictor of their willingness and intention to implement ESD. Also, it can be assumed that teacher self-efficacy mediates the relationship between teachers' willingness (intention) to implement ESD and other elements of teacher action competence in ESD.

Model of teacher action competence in education for SD

Based on theoretical and empirical considerations of action competence (e.g., Jensen and Schnack 1997; Mogensen and Schnack 2010), teacher action competence in ESD (Bertschy et al. 2013; Brandt et al. 2019, 2021), as well as insights into the Theory of Planned Behaviour (Ajzen 1991), the NAM (Schwartz 1977), and the Expectancy-Value Theory (Eccles 2005; Eccles and Wigfield 2002), the Model of Teacher Action Competence in ESD is proposed in Figure 1.

The model portrays that teacher action competence in ESD consists of three interrelated multidimensional aspects: (I) knowledge and abilities (ESD content knowledge and pedagogical content knowledge), (II) motivational beliefs (teacher ESD self-efficacy, ESD value assessment, and ascription of personal responsibility), and (III) willingness to act (intention to implement ESD). When examining the teacher action competence in ESD, all three construct sets stood out as essential indicators of the competence's representation. We propose the following conceptualisation of teachers who have action potential or, in other words, have already developed action competence in ESD: *A teacher with an ESD action competence is characterised by knowledge of the key SD content, recognition of the importance of ESD implementation, and a sense of personal responsibility to address the SD challenges through ESD implementation. Such a teacher possesses the pedagogical knowledge necessary for effective ESD implementation, assesses oneself as capable, and plans to respond to the challenges of ESD implementation.*

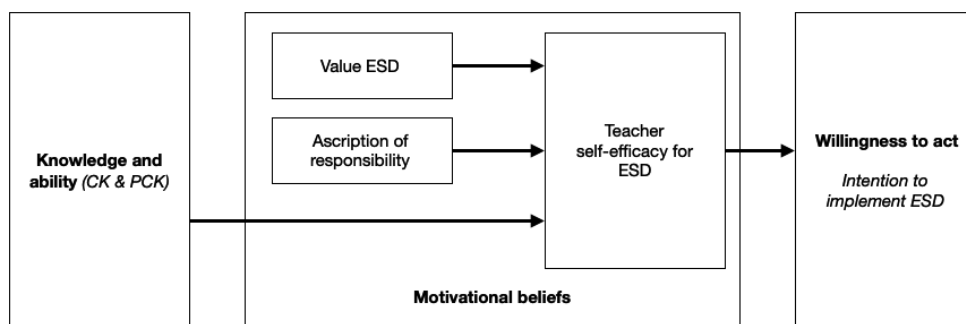


Figure 1: Model of Teacher Action Competence in Education for SD

The model portrays the indirect effects of the knowledge and ability, as well as the assessment of ESD value and ascription of responsibility on teachers' willingness (intention) to implement ESD, mediated by the teachers' self-efficacy.

Assessments of the ESD value, ascription of responsibility, and knowledge and abilities are not expected to directly impact teachers' willingness to implement ESD but to do so indirectly through teacher self-efficacy. With a higher level of content and pedagogical content knowledge and abilities, a higher assessment of ESD value, and greater responsibility for addressing sustainability challenges and issues, teacher self-efficacy is also higher, just as, consequently, is the willingness (intention) to implement ESD.

Implications of the model of teacher action competence in education for SD

Theoretical models and empirical data on future teachers' willingness to implement ESD and what influences the development of their action potential are rare and do not capture the phenomenon's complexity. Therefore, in this paper, a Model of Teacher Action Competence in ESD is proposed. It integrates previous knowledge of this construct (e.g., Bertschy et al. 2013; Brandt et al. 2019, 2021) and broader theoretical considerations (e.g., Ajzen 1991; Jensen and Schnack 1997). The model includes descriptions of action competence elements but, above all, proposes an action mechanism of complex interrelationships between different potential indicators of teacher action competence in ESD. As such, it can serve as a basis for further quantitative and qualitative research. Testing the model could allow further upgrade—that is, identifying other potential indicators of teacher action competence in ESD and/or different interrelationships of the model's constructs.

Apart from the potential for generating research ideas and empirical studies, this model has significant implications for the development of educational offers aimed at training ESD teachers. It places the construct of teacher self-efficacy at

the centre of defining teacher action competence in ESD. In the proposed model, teacher self-efficacy is perceived to be a key predictor of teachers' behaviour and their success in implementing ESD. The model assumes that other teacher action competence elements (knowledge, ESD value, and ascription of responsibility), although not leading to action directly, are associated with higher levels of teacher self-efficacy, which leads to greater intention to act or to implement ESD. It is essential to consider the implications of this assumption for ESD teacher training programmes, or in other words, it is crucial to study how teachers' self-efficacy is shaped to ensure the transfer of knowledge into action. Previous studies have found that teacher self-efficacy is shaped based on information from four sources: personal experience, vicarious learning, social persuasion, and interpretation of physiological conditions (Tschannen-Moran and Hoy 2007). Teachers can benefit the most from vicarious learning, i.e., from observing competent and convincing learning models (Rots et al. 2010; Tschannen-Moran and Hoy 2007). Focusing on factors that shape teacher self-efficacy in ESD teacher training programmes could potentially lead to higher assessments of (student) teachers' self-efficacy for ESD and, consequently, facilitation of ESD implementation, leading to more prosperous and valuable benefits for students.

The proposed Model of Teacher Action Competence in ESD has the potential to be operationalised and empirically verified, while the relationships between the competence elements identified by future empirical research could have significant implications for planning educational interventions aimed at ESD teacher training.

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References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, pp. 179–211.
- Baumert, J. and Kunter, M. (2013). The COACTIV model of teachers' professional competence. In: M. Kunter, J. Baumert, W. Blum, U. Klusmann, S. Krauss and M. Neubrand (Eds.). *Cognitive activation in the mathematics classroom and professional competence of teachers*. Boston, MA: Springer, pp. 25–48.
- Bertschy, F., Künzli, C. and Lehmann, M. (2013). Teachers' competencies for the implementation of educational offers in the field of education for sustainable development. *Sustainability*, 5, issue 12, pp. 5067–5080.
- Billingsley, B. S., Carlson, E. and Klein, S. (2004). The working conditions and induction support of early career special educators. *Exceptional Children*, 70, pp. 333–347.
- Brandt, J. O., Bürgener, L., Barth, M. and Redman, A. (2019). Becoming a competent teacher in education for sustainable development: Learning outcomes and processes in teacher education. *International Journal of Sustainability in Higher Education*, 20, issue 4, pp. 630–653.

- Brandt, J. O., Barth, M., Merritt, E. and Hale, A. (2021). A matter of connection: The 4 Cs of learning in pre-service teacher education for sustainability. *Journal of Cleaner Production*, 279, pp. 123749.
- Breiting, S., Hedegaard, K., Mogensen, F., Nielsen, K. and Schnack, K. (2009). *Action competence, conflicting interests and environmental education: The MUVIN Programme*. Danmarks Pædagogiske Universitetsskole, Aarhus Universitet.
- Breiting, S. and Mogensen, F. (1999). Action competence and environmental education. *Cambridge Journal of education*, 29, issue 3, pp. 349–353.
- Bürgener, L. and Barth, M. (2018). Sustainability competencies in teacher education: Making teacher education count in everyday school practice. *Journal of Cleaner Production*, 174, pp. 821–826.
- Columna, L., Hoyos-Cuartas, L. A., Foley, J. T., Prado-Perez, J. R., Chavarro-Bermeo, D. M., Mora, A. L., ... and Rivero, I. (2016). Latin American physical educators' intention to teach individuals with disabilities. *Adapted Physical Activity Quarterly*, 33, issue 3, pp. 213–232.
- Cutter-Mackenzie, A. and Smith, R. (2003). Ecological literacy: the »missing paradigm« in environmental education (part one). *Environmental Education Research*, 9, issue 4, pp. 497–524.
- Cutter-Mackenzie, A. N. and Tilbury, D. (2002). Meeting commitments for a sustainable future: Environmental education in pre-service teacher education. In: B. A. Knight (Ed.). *Reconceptualising Learning in the Knowledge Society*. Post Pressed, pp. 17–34.
- Eccles, J. S. (2005). Subjective task value and the Eccles et al. model of achievement related choices. In: A. J. Elliot and C. S. Dweck (Eds.). *Handbook of competence and motivation*. New York: Guilford Publications, pp. 105–121.
- Eccles, J. S. and Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual review of psychology*, 53, issue 1, pp. 109–132.
- Effeney, G. and Davis, J. (2013). Education for sustainability: A case study of pre-service primary teachers's knowledge and efficacy. *Australian Journal of Teacher Education*, 38, issue 5, pp. 32–46.
- Eren, A. (2014). Uncovering the links between prospective teachers' personal responsibility, academic optimism, hope, and emotions about teaching: A mediation analysis. *Social Psychology of Education*, 17, issue 1, pp. 73–104.
- Evans, N., Whitehouse, H. and Gooch, M. (2013). Barriers, successes and enabling practices of education for sustainability in far North Queensland schools: A case study. *The Journal of Environmental Education*, 43, issue 2, pp. 121–138.
- Fahlman, M., McCaughy, N., Martin, J. and Shen, B. (2011). Efficacy, intent to teach, and implementation of nutrition education increases after training for health educators. *American Journal of Health Education*, 42, issue 3, pp. 181–190.
- Frisk, E. and Larson, K. L. (2011). Educating for sustainability: Competencies & practices for transformative action. *Journal of Sustainability Education*, 2, issue 1, pp. 1–20.
- Halvorsen, A. L., Lee, V. E. and Andrade, F. H. (2009). A mixed-method study of teachers' attitudes about teaching in urban and low-income schools. *Urban Education*, 44, issue 2, pp. 181–224.
- Heimlich, J. E. and Ardoin, N. M. (2008). Understanding behavior to understand behavior change: A literature review. *Environmental education research*, 14, issue 3, pp. 215–237.
- Jensen, B. B. (2000). Health knowledge and health education in the democratic health-promoting school. *Health Education*, 100, issue 4, pp. 146–154.
- Jensen, B. B. (2002). Knowledge, action and pro-environmental behaviour. *Environmental education research*, 8, issue 3, pp. 325–334.

- Jensen, B. B. and Schnack, K. (1997). The action competence approach in environmental education. *Environmental education research*, 3, issue 2, pp. 163–178.
- Kennelly, J., Taylor, N. and Maxwell, T. (2008). A student teacher's personal pathway to education for sustainability. *Australian Journal of Environmental Education*, 24, pp. 23–33.
- Kennelly, J., Taylor, N., Maxwell, T. and Serow, P. (2012). Education for Sustainability and Pre-Service Teacher Education. *Australian Journal of Environmental Education*, 28, issue 1, pp. 57–58.
- Kollmuss, A. and Agyeman, J. (2002). Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental education research*, 8, issue 3, pp. 239–260.
- Lauermann, F. and Karabenick, S. A. (2011). Taking teacher responsibility into account (ability): Explicating its multiple components and theoretical status. *Educational Psychologist*, 46, issue 2, pp. 122–140.
- Leicht, A., Heiss, J. and Byun, W. J. (Eds.) (2018). *Issues and trends in education for sustainable development*. UNESCO Publishing.
- Liddy, M. (2012). From marginality to the mainstream: learning from action research for sustainable development. *Irish Educational Studies*, 31, issue 2, pp. 139–155.
- Malandrakis, G. (2018). Influencing Greek pre-service teachers' efficacy beliefs and self-confidence to implement the new Studies for the Environment' curricula. *Environmental Education Research*, 24, issue 4, pp. 537–563.
- Mogensen, F. and Schnack, K. (2010). The action competence approach and the 'new' discourses of education for sustainable development, competence and quality criteria. *Environmental education research*, 16, issue 1, pp. 59–74.
- Nolet, V. (2009). Preparing sustainability-literate teachers. *Teachers College Record*, 111, issue 2, pp. 409–442.
- Olsson, D., Gericke, N., Sass, W. and Boeve-de Pauw, J. (2020). Self-perceived action competence for sustainability: the theoretical grounding and empirical validation of a novel research instrument. *Environmental Education Research*, 26, issue 5, pp. 742–760.
- Park, S. and Oliver, J. S. (2008). Revisiting the conceptualisation of pedagogical content knowledge (PCK): PCK as a conceptual tool to understand teachers as professionals. *Research in science Education*, 38, issue 3, pp. 261–284.
- Rauch, F. and Steiner, R. (2013). Competences for education for sustainable development in teacher education. *CEPS Journal*, 3, issue 1, pp. 9–24.
- Rieckmann, M. (2018). Learning to transform the world: Key competencies in Education for Sustainable Development. In: A. Leicht, J. Heiss and W.J. Byun (Eds.). *Issues and trends in education for sustainable development*. UNESCO Publishing, pp. 39–59.
- Rots, I., Aelterman, A., Devos, G. and Vlerick, P. (2010). Teacher education and the choice to enter the teaching profession: A prospective study. *Teaching and Teacher Education*, 26, issue 8, pp. 1619–1629.
- Rots, I., Aelterman, A. and Devos, G. (2014). Teacher education graduates' choice (not) to enter the teaching profession: does teacher education matter? *European journal of teacher education*, 37, issue 3, pp. 279–294.
- Sass, W., Boeve-de Pauw, J., Olsson, D., Gericke, N., De Maeyer, S. and Van Petegem, P. (2020). Redefining action competence: the case of sustainable development. *The Journal of Environmental Education*, 51, issue 4, pp. 292–305.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational researcher*, 15, issue 2, pp. 4–14.
- Schwartz, S. H. (1977). Normative influences on altruism. In: L. Berkowitz (Ed.). *Advances in experimental social psychology*. New York: Academic Press, pp. 221–279.

- Sharma, U. and Jacobs, D. K. (2016). Predicting in-service educators' intentions to teach in inclusive classrooms in India and Australia. *Teaching and Teacher Education*, 55, pp. 13–23.
- Skaalvik, E. M. and Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of educational psychology*, 99, issue 3, pp. 611–625.
- Sleurs, W. (2008). *Competencies for ESD (Education for Sustainable Development) teachers. A framework to integrate ESD in the curriculum of teacher training institutes*. Retrieved from http://www.unece.org/fileadmin/DAM/env/esd/inf.meeting.docs/EGon-Ind/8mtg/CSCT%20Handbook_Extract.pdf (Accessed on 10. 5. 2017).
- Stevenson, R. B. (2007). Schooling and environmental/sustainability education: From discourses of policy and practice to discourses of professional learning. *Environmental education research*, 13, issue 2, pp. 265–285.
- Tomas, L., Girgenti, S. and Jackson, C. (2017). Pre-service teachers' attitudes toward education for sustainability and its relevance to their learning: implications for pedagogical practice. *Environmental Education Research*, 23, issue 3, pp. 324–347.
- Tschannen-Moran, M. and Woolfolk Hoy, A. (2001). Teacher Efficacy: Capturing an Elusive Construct. *Teaching and Teacher Education*, 17, pp. 783–805.
- Tschannen-Moran, M. and Woolfolk Hoy, A. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and teacher Education*, 23, issue 6, pp. 944–956.
- UNECE. (2012). *Learning for the Future: Competences in Education for Sustainable Development*. Geneva: UNECE. Retrieved from https://www.unece.org/fileadmin/DAM/env/esd/ESD_Publications/Competences_Publication.pdf (Accessed on 10. 5. 2017).
- UNESCO. (2017). *Education for Sustainable Development: Learning Objectives*. Paris: UNESCO. Retrieved from <http://unesdoc.unesco.org/images/0024/002474/247444e.pdf> (Accessed on 21. 6. 2018).
- UNESCO. (2020). *Education for Sustainable Development: A Roadmap*. Paris: UNESCO. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000374802> (Accessed on 11. 1. 2021).
- Vukelić, N. (2021). *Predictors of student teachers' intentions to implement education for sustainable development*. (Doctoral dissertation). Rijeka, Croatia: University of Rijeka, Faculty of Humanities and Social Sciences.
- Vukelić, N. and Rončević, N. (2019). *Can (future) teachers initiate social change? Educational Systems and Societal Changes: Challenges and Opportunities ESSCCO*, Rijeka: 6.–7. lipnja.
- Vukelić, N., Rončević, N. and Vinković, A. (2018). Are future teachers ready for education for sustainable development? In: E. Dedić Bukvić and S. Bjelan-Guska (Eds.). *Proceedings of the 2nd International Scientific and Professional Conference »Stepping Towards Challenges in Education«*. Sarajevo: Faculty of Philosophy of the University of Sarajevo, pp. 326–338.
- Watt, H. M., Richardson, P. W. and Wilkins, K. (2014). Profiles of professional engagement and career development aspirations among USA preservice teachers. *International Journal of Educational Research*, 65, pp. 23–40.
- Wolf, J. and Moser, S. C. (2011). Individual understandings, perceptions, and engagement with climate change: insights from in-depth studies across the world. *Wiley Interdisciplinary Reviews: Climate Change*, 2, issue 4, pp. 547–569.
- Zint, M. (2002). Comparing three attitude-behavior theories for predicting science teachers' intentions. *Journal of research in science teaching*, 39, issue 9, pp. 819–844.

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AKCIJSKA KOMPETENCA UČITELJEV V VZGOJI IN IZOBRAŽEVANJU ZA TRAJNOSTNI RAZVOJ

Povzetek: Pri obravnavi kompetenc učiteljev na področju vzgoje in izobraževanja za trajnostni razvoj (VITR) teorija in praksa poudarjata pomen pripravljenosti učiteljev za izvajanje VITR. Zato je treba upoštevati konstrukt akcijske kompetence učiteljev, ki opisuje sposobnost učiteljev za delovanje na področju VITR. Avtorica v prispevku predlaga model akcijske kompetence učiteljev za delovanje na področju VITR, ki je sestavljen iz treh medsebojno povezanih večdimenzionalnih vidikov: (1) znanje in sposobnosti (VITR in znanje o pedagoških vsebinah), (2) motivacijska prepričanja (samoučinkovitost učiteljev za VITR, ocena vrednosti VITR in prevzemanje osebne odgovornosti) in (3) pripravljenost na delovanje (namen izvajati VITR). Predlagani model je mogoče empirično raziskati, odnosi med elementi kompetence pa lahko pomembno vplivajo na načrtovanje vzgojno-izobraževalnih intervencij, namenjenih usposabljanju učiteljev za VITR.

Ključne besede: trajnostni razvoj, vzgoja in izobraževanje za trajnostni razvoj, kompetence učiteljev, akcijska kompetenca, akcijska kompetenca učiteljev za delovanje v vzgoji in izobraževanju za trajnostni razvoj

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