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Research paper

Measuring preservice teacher self-efficacy in music and visual arts: Validation of an amended science teacher efficacy belief instrument

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HIGHLIGHTS

- Validation of the Arts Teaching Efficacy Belief Instrument (ATEBI).
- ATEBI had good internal consistency and re-test reliability on the personal teaching efficacy scale.
- ATEBI had good validity statistics using ANOVAs on all scales.
- ATEBI offers an alternative measurement instrument for preservice teacher efficacy in the Arts research.

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ABSTRACT

The Science Teacher Efficacy Belief Instrument has been a widely reported measure of teachers' personal efficacy and outcome efficacy beliefs. This pilot study examined if the instrument could be amended for use in The Arts learning area. A small cohort of 110 Graduate Diploma of Education preservice teachers participated in the pilot. Factor structures were examined through confirmatory factor analyses. The model displaying best fit consisted of six items measuring outcome expectancy and 10 items related to teaching efficacy. Measuring self-efficacy is important as many teachers who teach the Arts in Australia and internationally are not subject specialist teachers.

1. Introduction

Self-efficacy is both a complex and dynamic concept linked to human psychology. Bandura (2015) asserts that "In social cognitive theory, self-efficacy is assessed by domain-linked measures scaled in terms of different levels of performance demands that individuals believe they can realize" (p. 1028). In the teaching profession, Bandura's definition supports the construct of personal teaching efficacy; explained by Pendergast, Garvis, and Keogh (2011) as the "beliefs teachers hold about their own perceived capability in undertaking certain teaching tasks" (p. 47). However, Bandura and Locke (2003) also explained a connection between self-efficacy and goal setting practices. In a recent commentary Bandura also explained the covariance between efficacy and goal theory; "The higher their self-efficacy, the higher the goals people set for themselves" (Bandura, 2015, p. 1026). In the classroom context a teacher's goals can be linked to his/her students' educational outcomes. Hoy, Tarter, and Woolfolk Hoy (2006) found that higher collective efficacy in a school's staff improved their optimism for students' achievement, and subsequently improved students' academic outcomes.

As self-efficacy has implications for both teachers and students, it is reasonable that teacher educators would want to develop positive teacher self-efficacy during preservice teacher education courses. Although, in the past, there has been limited research into preservice teachers' efficacy in the Australian context (Pendergast et al., 2011), the recent years show increasing research in this domain both locally and internationally (Gao, Xiang, Chen, & McBride, 2013; Palmer, Dixon, & Archer, 2015; Scheer, Scholz, Rank, & Donie, 2015; van Dinther, Dochy, & Segers, 2015). While many teacher educators are interested in researching preservice teachers' self-efficacy in their content domain, their research is dependent on finding a valid and reliable measurement tool that fits within their research design.

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This challenge is increased when the aim of research is to measure preservice teachers' efficacy beliefs related to a specific task or subject area, because quantitative efficacy belief instruments will sometimes generalise definitions of efficacy or assess efficacy as a global and static construct (Wyatt, 2014).

In the Arts learning area, quantitative instruments are challenging to find and often need to be created (Morris, 2015). The purpose of this research was to adapt the well-established *Science Teaching Efficacy Belief Instrument – B* (STEBI-B) (Enochs & Riggs, 1990) for preservice teachers and to pilot the new instrument to determine its validity and reliability in The Arts. The STEBI-B was chosen as it has already been successfully adapted for other learning areas (Enochs, Smith, & Huinker, 2000) and has been widely investigated with findings reported in the science education literature since its creation (Smolleck, Zembal-Saul, & Yoder, 2006). Although developed for science, the STEBI-B items are not written with specific science terminology (e.g., *I know the steps necessary to teach primary school science skills effectively*), and this was one aspect that encouraged the adaptation of the STEBI-B instrument into the Arts learning area for this research. For this pilot project, the researchers amended the STEBI-B instrument to create the Arts Teaching Efficacy Belief Instrument (ATEBI). Creating the ATEBI was important as many general education teachers teach The Arts in Australia, as opposed to having subject-specialist teachers with high levels of experience and mastery in the Arts subjects. The ATEBI aims to provide a valid measure of self-efficacy for any teacher teaching within The Arts.

1.1. The construct of self-efficacy

Bandura (2012) asserts that "Self-efficacy is concerned with people's beliefs in their capability to produce given attainments" (p. 15). The construction of self-efficacy is shaped by many factors, including self-reflection on past experiences and the achievement of goals, as well as the integration of values and attitudes in one's self (Bandura & Locke, 2003; Bandura, 2012; Hoy et al., 2006; Scheer et al., 2015). Sitzmann and Yeo's (2013) meta-analysis found that past performance has significant influence on an individual's self-efficacy. The connection between performance and self-efficacy supports the role of metacognitive reflection in shaping efficacy, as metacognition is a within-person system where the individual reflects on past performance to determine future thoughts and behaviours (Sitzmann & Yeo, 2013; Wiley & Jee, 2011). Building on this reasoning, Bandura and Locke (2003) linked the individual's past experiences to his/her aspired goals. They stated that the level of challenge in setting new goals is dependent on the level of success experienced in previous activities. For individuals who feel mastery of a certain activity, their future goals will be more challenging due to their *a priori* experience of successful achievement driving their belief in positive future performance (Bandura & Locke, 2003; Bandura, 2015; Locke & Latham, 2013). Conversely, individuals who set challenging goals and do not achieve them are more likely to set a lower standard for themselves in the future, as they feel the "self-handicapping costs of nagging self-doubts about one's capabilities" (Bandura & Locke, 2003, p. 97). This is not to say that goal setting is shaped only by self-efficacy or that self-efficacy is only a product of *a priori* experiences, as the relationship between these constructs is dynamic and multidimensional (Day & Unsworth, 2013).

Self-efficacy is also shaped by values and attitudes. The self is constructed socially, through learning cultural expectations and values from interactions with family members (particularly at a young age) and with broader society (Habermas, 1988; Jensen, 2015). As the individual is shaped by these external sources, they internalise values and attitudes based on their experiences and socio-cultural conventions (Polkinghorne, 2015). These values and attitudes become an internal measurement of success and achievement for the individual, and are held as markers for his/her metacognitive reflection on past performance (Frith, 2012; Jensen, 2015). In this way, values and attitudes are a part of shaping an individual's self-efficacy. Understanding a cultural group's values and attitudes also gives the individual a broader benchmark against which to measure personal performance, and can also contribute to one's self-efficacy.

The effect of past experiences, goal achievement and internalised values and attitudes on self-efficacy is either increased or decreased motivation to participate in particular activities. In other words, an individual's sense of agency and motivation is affected by self-efficacy. If an individual has positive self-belief regarding his/her abilities, he/she is more likely to be motivated to engage in thoughts and actions where it is felt that one excels (Bandura, 2001). Hence, self-efficacy is linked to self-regulation theory; the individual participates in activities because he/she is intrinsically motivated to do so, based on personal interest or perceived personal benefit from their engagement (Ryan & Deci, 2006; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005). Accordingly, an individual may avoid activities where he/she feels they will not be successful based on past performance or where it is felt that the activity is of little value to the individual's personal development (Ryan & Deci, 2006).

1.1.1. Measuring self-efficacy

In recent years there has been increasing criticism about the measurement of self-efficacy, due to its highly complex nature (Avanzi et al., 2013; Bandura, 2012; Wyatt, 2014). Some concerns have centred on the actual construct being measured, for example, measuring teachers' beliefs about their students' achievements (outcome expectancy) but not teachers' personal self-efficacy beliefs about themselves (Avanzi et al., 2013; Tschannen-Moran & Woolfolk Hoy, 2001). Some researchers suggest that outcome expectancy and personal efficacy scales should be kept separate so that participants do not misunderstand the intention of each scale, or that the outcome expectancy scale should be removed altogether (Boone, Townsend, & Staver, 2010). This critique was applied to Enoch and Rigg's STEBI-B, which includes outcome expectancy as a scale alongside personal teaching efficacy (Avanzi et al., 2013; Enochs & Riggs, 1990). Furthermore, instruments that have Likert-type scales including an 'unsure' category have been criticised for their validity, as the 'unsure' category is usually coded as neutral, despite no individual having an absolutely neutral self-efficacy according to Bandura's (2001) definition of the construct (Boone et al., 2010). Nevertheless, any instrument measuring such a complex construct will have limitations, and researchers will always need to consider the validity of the selected instrument within their research design and aims (Smolleck et al., 2006; Wyatt, 2014).

Self-efficacy measures within The Arts are generally collected as qualitative reports about past experiences. Morris and Lummis (2014) reported self-efficacy findings of preservice teachers based on semi-structured interviews with participants. Garvis and Pendergast (2010) conducted a survey; however the items were open-ended questions that were coded through content-analysis. The same open-ended survey approach was conducted by Russell-Bowie (2012). Examples of the use of quantitative instruments to collect information about teachers' practices and perceptions of teaching in The Arts more generally can be found (Lemon & Garvis, 2013; Oreck, 2004), but these do not specifically measure self-efficacy.

1.1.2. Self-efficacy and the arts

Teachers' self-efficacy can have an impact on their classroom