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Authentic assessment: creating a blueprint for course design

Verónica Villarroel^a , Susan Bloxham^b, Daniela Bruna^a , Carola Bruna^c and Constanza Herrera-Seda^d

^aCenter for Research and Improvement of Education (CIME), Faculty of Psychology, Universidad del Desarrollo, City of Concepción, Chile; ^bFaculty of Education, University of Cumbria, City of Carlisle, UK; ^cDepartment of Biochemistry and Molecular Biology, Faculty of Biological Sciences, Universidad de Concepción, City of Concepción, Chile; ^dFaculty of Psychology, Universidad del Desarrollo, City of Concepción, Chile

ABSTRACT

Authenticity has been identified as a key characteristic of assessment design which promotes learning. Authentic assessment aims to replicate the tasks and performance standards typically found in the world of work, and has been found to have a positive impact on student learning, autonomy, motivation, self-regulation and metacognition; abilities highly related to employability. Despite these benefits, there are significant barriers to the introduction of authentic assessment, particularly where there is a tradition of 'testing' decontextualised subject knowledge. One barrier may be the lack of conceptualisation of the term authentic assessment sufficient to inform assessment design at the individual course level. This article tackles that omission by a systematic review of literature from 1988 to 2015. Thirteen consistent characteristics of authentic assessment are identified leading to the classification of three conceptual dimensions: realism, cognitive challenge and evaluative judgement. These dimensions are elaborated and used to propose a step-based model for designing and operating authentic assessment in individual higher education subjects.

KEYWORDS

Authentic assessment;
higher education; workplace

Introduction

Whilst there are different national traditions in assessment practices, we are witnessing a paradigm change (Baeten, Struyven, and Dochy 2013) involving a transformation from a culture of objective and standardised tests that are focused on measuring portions of atomised knowledge, towards a more complex and comprehensive assessment of knowledge and higher-order skills (Shepard 2000; Birenbaum 2003). This change in assessment relates to the emergence of the Assessment for Learning (AFL) movement, where all assessment contributes to helping students learn (Sambell, McDowell, and Montgomery 2013). AFL allows teachers to gather information to adjust their teaching and helps students to regulate their own learning (Wiliam et al. 2004; Wiliam 2007).

From this perspective, assessment, teaching and learning are closely related, with each one being part of the pedagogical process, and where feedback is used to adjust the learning cycle. Within this paradigm, authenticity has been identified as a key characteristic of assessment design which promotes learning and employability (Sambell, McDowell, and Montgomery 2013; Bloxham 2015). Authentic assessment is the focus of this article.

What is authentic assessment?

Authenticity is understood as realism, contextualisation and problematisation when teaching and assessing curricular content (Benner et al. 2009; Raymond et al. 2013). *Realism* involves linking knowledge with everyday life and work, *contextualisation* characterises situations where knowledge can be applied in an analytical and thoughtful way, and *problematisation* invokes a sense that what is learned can be used to solve a problem or meet a need. Thereby authentic assessment aims to integrate what happens in the classroom with employment, replicating the tasks and performance standards typically faced by professionals in the world of work (Wiggins 1990).

Benefits of authentic assessment

Studies indicate that authentic assessment has an impact on the quality and depth of learning achieved by the student (Wiggins 1993; Dochy and McDowell 1997) and the development of higher-order cognitive skills (Ashford-Rowe, Herrington, and Brown 2014). Moreover, it improves autonomy (Raymond et al. 2013), commitment and motivation for learning (Nicol, Thomson, and Breslin 2014), self-regulation capacity (Pintrich 2000), metacognition and self-reflection (Vanaki and Memarian 2009).

Furthermore, authentic assessment is a response to criticisms of higher education. Students have difficulty applying the knowledge acquired in different academic contexts (Andrews and Higson 2014). They feel unprepared for employment (Ellström and Ellström 2014) and insecure when they begin working (Ken and Chean 2012).

Employers are dissatisfied with the performance of recent graduates, who they consider rigid, unable to adapt to the demands of working life (Plump 2010) and lacking basic skills such as problem solving, critical thinking, communication skills and teamwork (Singh, Thambusamy, and Ramly 2014).

In this context, authentic assessment appears as a model that can enhance employability because it promotes abilities needed in the workplace, like problem solving skills (Wu, Heng, and Wang 2015), autonomy (Swaffield 2011), motivation (Gulikers, Bastiaens, Kirschner and Kester 2008), self-regulation and metacognition (Wu, Heng, and Wang 2015). It provides the opportunity for students to practice skills and competences that are valued in work. In undertaking the assessment they have to deploy skills and complete tasks that simulate the activities they will have to conduct in their future jobs. This consolidates capabilities that are part of employability such as: coping with uncertainty, working under pressure, planning and thinking strategically, communicating and interacting with others (Andrews and Higson 2008), as well as better command of disciplinary content knowledge and skills, workplace awareness, experience and generic skills (Dacre Pool and Sewell 2007).

Barriers to implementing authentic assessment

This research was carried out in Chile where there is a strong culture of testing as the principal form of summative assessment, particularly in lower level courses. This is common in many higher education systems worldwide, where a focus on testing risks encouraging superficial approaches to learning (Endedijk and Vermunt 2013; Beyaztas and Senemoglu 2015) and measuring decontextualised memorization and understanding of content, and not the integration or application of knowledge (Biggs and Tang 2011) indicated by authentic assessment. Such learning is unlikely to be useful beyond the classroom (Wiggins 1990; Vanaki and Memarian 2009). Teachers may use multiple-choice tests with adequate validity and reliability indexes, but not question the relevance and significance of the assessment. In such a culture, there is a reluctance to use methods that evaluate the construction of knowledge, critical thinking or problem solving (McCabe and O'Connor 2014).

Teachers are more willing to make changes where the assessment is of work place and practical skills rather than subject knowledge (Watkins, Dahlin, and Ekholm 2005; Biggs and Tang 2011). Teachers are reluctant to change formal assessments, such as examinations, because changing these practices makes great demands on time, energy and intellectual resources (Brush and Saye 2008). They can also

be perceived as risky (Dawson et al. 2017). In addition, teachers must have deep disciplinary knowledge as well as great cognitive flexibility to monitor, challenge and guide learners toward problem solutions that have disciplinary rigour (Saye 2013).

Finally, whilst many professions have well-developed approaches to assessing practice-based learning, the authentic assessment of university-based learning presents more of a challenge. Although the literature provides a broad understanding of its purposes and value, change may be hindered by a lack of conceptualisation of authenticity and authentic assessment (Kreber et al. 2007), sufficient to inform individual course design.

In answer to this challenge, this article draws on a review of authentic assessment literature to determine the essential design dimensions required to bring authenticity to the assessment of classroom (as opposed to work-based) learning. It aims to advance authentic and situated learning that encourages students to develop relevant competencies for their working lives (Segers, Dochy, and Cascallar 2003). It concludes by proposing a new four step model to implement authentic assessment derived from the authors' analysis of the existing literature.

Method

A systematic review of authentic assessment literature was carried out with the purpose of integrating, analysing and identifying central themes, following Randolph (2009). We analysed 112 articles that focused on the subject and were published between 1988 and 2015. The articles were identified in the Scielo, Scopus and Web of Science indexes, and all of them were published in English language journals. The search keywords were: authentic assessment, authentic intellectual work and authentic instruction: 36% of articles referred to higher education whereas 64% were based in other education sectors.

The analysis sought to identify the core concepts of this construct. A first read of the articles explored the main characteristics of the construct and generated 13 central characteristics. In an iterative process, a second read sought to deepen the analysis and elaborate preliminary dimensions of the concept reflected by these characteristics. This generated three dimensions. These preliminary ideas were tested in a third reading by two research assistants who completed a template for each article. This format permitted the researchers to indicate which characteristics from the list and which dimensions appeared in each article.

The assistants worked independently and in parallel, completing the template for each article. The concordance between the evaluators was analysed through the Cohen Kappa coefficient. This generated a value of 0.82, showing a high level of agreement between them. The characteristics most frequently related to authentic assessment were identified, the dimensions that make it up were determined, and, finally, a tentative model was developed to underpin authentic assessments in higher education. This model was used in a research project, funded by the Chilean Ministry of Education.

The results

The characteristics of authentic assessment

Thirteen characteristics of authentic assessment found in the literature were identified as set out in Table 1. The following text draws on indicative examples of those texts to illustrate the role of these characteristics in the development of the overall construct. The 13 characteristics are highlighted in bold.

Archbald and Newmann made the first formal use of the term 'authentic' in the context of learning and assessment in 1988. At first, these authors used the term **authentic performance**, which was associated with production of knowledge, deep understanding, integration of knowledge, and use of prior knowledge and relevant performance beyond assessment. It has also been associated with **practical use**, alluding to the purpose, utility or ultimate goal of learning, especially in primary school (Moon et al. 2005; Meisels, Wen, and Beachy-Quick 2010).

Table 1. Dimensions of the authentic assessment (AA).

AA dimensions	N° and % of articles in the dimension	Concepts and ideas associated with AA, with the N° and % of articles
Realism	79 (71%)	<ul style="list-style-type: none"> • Problems contextualised to everyday life (55/49%). • Relevance beyond the classroom (54/48%). • Authentic performance (48/43%). • Competencies for work performance (32/29%). • Similar tasks to the real/working world (28/25%). • Practical value (5/5%).
Cognitive challenge	62 (55%)	<ul style="list-style-type: none"> • Higher order thought (54/48%). • Ability to solve problems (52/46%). • Ability to make decisions (20/18%).
Evaluative judgement	42 (38%)	<ul style="list-style-type: none"> • Feedback (45/40%). • Formative sense (51/46%). • Assessment criteria known a priori (20/18%).

Later, emphasis was placed on its relationship with **higher-order thinking** (Avery, Freeman, and Carmichael 2012; Bosco and Ferns 2014;), the **ability to solve problems** (Elliot and Higgins 2005; Newmann, King, and Carmichael 2007; Wu, Heng, and Wang 2015) and **decision-making** (Newman, Bryk, and Nagaoka 2001; Ohaja, Dunlea, and Muldoon 2013).

Wiggins (1993) and Torrance (1995) introduced the concept of relevance in assessment. Authentic assessment engages students with problems or important questions, which **have worth beyond the classroom**. The tasks are replicas or analogies of the types of problems that are faced in working life. The idea is that students use knowledge to show effective and creative performances (Wiggins and McTighe 2006; Saye 2013).

In this way, researchers began to talk about authentic assessment as a strategy to relate learning and work, creating a correspondence between what is assessed in the university and what students need to do in the workplace (Gulikers, Bastiaens and Kirschner 2004). This methodology introduces **similar tasks to those faced in real life or work** (Brown 2005; Raymond et al. 2013). However, the literature does not provide much detail about these real-world elements and how this kind of assessment is properly implemented (Cummings and Maxwell 1999). Some refer to **problems contextualised to everyday life** (Ashford-Rowe, Herrington, and Brown 2014). Benner et al. (2009) consider that authentic assessment consists of asking students to tackle cases, accompanied by a rubric for its assessment. The case must be a real-life situation, where students are asked to apply their knowledge and make decisions to solve the problem.

Frey, Schmitt and Allen (2012) went further in emphasising that the context of assessment should be realistic and cognitively complex. The task should involve performance and play a **formative role** (a characteristic noted in multiple articles). From this perspective, authenticity became a crucial element for assessing **relevant skills for successful job performance** (Segers, Dochy, and Cascallar 2003; Gielen, Dochy and Dierick 2003). Assessment should be similar to what happens and what is evaluated in the professional field, including **collaborative** or peer-to-peer work (Raymond et al. 2013; Ashford-Rowe, Herrington, and Brown 2014).

Wiggins (1990) amongst others highlighted that the structure and expectations of authentic assessment ought to be transparent: the **assessment criteria should be known in advance**. In this regard, **feedback** to students was central and they could repeat the same assessment more than once, since the aim was that students learn and improve their performance effectively (Swan and Hofer 2013). Swaffield (2011) notes that wrong answers are an opportunity to diagnose what needs to be improved. Error must be worked on through mechanisms of self and peer-assessment, using formative assessment as a means of feedback (Boud and Walker 1990; Frey, Schmitt and Allen 2012; Wu, Heng, and Wang 2015).

Table 1 sets out the central characteristics associated with authentic assessment methodology found in the existing literature. It reveals that many of these are reflected in a high proportion of research articles, with the most frequent seven featuring in over 40%.

However, it is interesting to see that some characteristics with low frequency, such as ability to make decisions and teamwork/collaborative work, do not feature strongly in the authentic assessment literature, despite the reoccurring stress on these 'soft skills' for employers (Archer and Davison 2008; NACE 2016). This may be a consequence of the individualised nature of most assessment methods, but it suggests that authentic assessment approaches which do not foster these skills will have less of a potential impact on students' learning for employability.

Components of authentic assessment: realism, cognitive challenge and feedback

The second reading distinguished three dimensions that represent the essence of authentic assessment. These overarching dimensions are: (1) realism, (2) cognitive challenge and (3) evaluative judgement, and they are present in all theoretical formulations of the concept. Table 1 also lists the dimensions and their component characteristics according to the frequency of articles that refer to them as an inseparable part of the authentic assessment.

Realism

Realism can come in two forms: on the one hand, the presence of a 'real context' that describes and delivers a frame for the problem to be solved (Bosco and Ferns 2014); on the other hand, a task to be solved that is 'similar' to what is faced in real and/or professional life (Saye 2013).

In authentic assessment, the context is realistic when information about the described situation-problem comes from real and/or professional life, involving pertinent and relevant questions to solve (Swan and Hofer 2013), applicable to realistic situations (Wiggins and McTighe 2006). This transfer is possible when ideas relate to facts and skills to experiences, applying previous knowledge to new situations and tasks (Ashford-Rowe, Herrington, and Brown 2014). This realistic context can be present in examinations and written tasks when items are prepared such as case analyses, problem solving, and short or extensive essay questions, which act as a *proxy* of the real world.

The second way to create realism is through *performance-based tasks*, where students produce work or demonstrate knowledge, understanding and skills in activities that are close to the profession (Palmer 2004). Wiggins and McTighe (2006) designated as authentic assessment requirements that demand a true representation of performance in that field of employment. Teachers must know what are the typical tasks and functions that employment demands, and design assessments that are authentic simulations of real professional tasks.

Cognitive challenge

In authentic assessment, the task involves building knowledge, and using higher-order cognitive skills, such as those proposed in Bloom and Anderson's taxonomies (Wiggins 1993; Avery and Freeman 2002). Through the encouragement of assessment, it aims to generate processes of problem solving, application of knowledge and decision-making which correspond to the development of cognitive and metacognitive skills (Elliot and Higgins 2005; Newmann, King, and Carmichael 2007).

This type of assessment intends that students go beyond the textual reproduction of fragmented and low order content, and move towards understanding, establishing relationships between new ideas and previous knowledge, linking theoretical concepts with everyday experience, deriving conclusions from the analysis of data, allowing them to examine both the logic of the arguments present in the theory, as well as its practical scope (Gulikers, Bastiaens and Kirschner 2004; Ohaja, Dunlea, and Muldoon 2013). Students should not only respond well to a question, but also demonstrate performances (such as critical and reflective analysis) and concrete products (such as a diagnostic report), exhibiting genuine mastery of content (Avery, Freeman, and Carmichael 2012).

Different research has compared short, medium and long-term performances in tests that measure memory skills in closed-response items and in tests involving cognitive performances, measuring higher-order cognitive abilities using open answer items. The results show that the stability in students' performance is greater in items that measure complex cognitive abilities (Rawson, Dunlosky, and Sciartelli 2013), suggesting that assessing higher-order cognitive performance generates a level of learning that lasts over time.

Transfer of knowledge is promoted by such assessments, since they stimulate skills that can be used in contexts other than academic ones that are required and valued in the world beyond the university. This is reaffirmed by Bloxham and Boyd (2007), who argue that being able to reproduce knowledge in a decontextualised examination does not guarantee that knowledge can be used in a real-life environment. Students need to practice these applications and knowledge transfer skills to solve real problems.

Evaluative judgement

One of the aims of authentic assessment is for students to develop criteria and standards about what a good performance means, in order that they can judge their own performance and regulate their own learning; we are referring to this as 'evaluative judgement', a term which is emerging in the literature to describe these capabilities (Tai et al. 2016). Evaluative judgement is a recognition that the assessment of student achievement involves both standards (for example in rubrics) and the practice of judgement (Wyatt-Smith and Klenowski 2012). Developing the skills of evaluative judgement is also considered

beneficial to effective learning. Boud and Molloy (2013) argue that, in order to learn, students need to build a precise judgement about the quality of their work, and calibrate these judgements in the light of evidence. Thus, students can identify areas that need improvement and see changes over time, developing a growing understanding of acceptable standards of performance (Sadler 1989, 2005; Boud and Falchikov 2006).

A chief component of developing evaluative judgement is formative assessment. Students need to be exposed to a variety of tasks with diverse performance requirements, and have the experience of learning about quality, judging quality and seeking and receiving feedback. As part of this, revealing assessment criteria to students has been shown to help them compare their efforts with the desired standard and plan their work (Pandero and Romero 2014), although there is growing recognition of the limitations of published criteria alone in conveying requirements. Furthermore, recent developments in feedback research stress its potential to nurture students' capacity for independent judgement as well as problem-solving, self-appraisal and reflection (Carless and Yang 2013). Studies increasingly emphasise the use of feedback dialogues to engage students with disciplinary problems and to develop their self-regulation. They posit students as active agents, inducted into their role in creating and using feedback to help them improve their understanding of quality and to self-regulate their own work accordingly (Sadler 1989; Boud and Molloy 2013; Carless and Yang 2013). Thus, when evaluative judgement is incorporated into the assessment process, it adds to the authenticity by, firstly, helping students understand the concept of teacher 'quality' and what it means for a task to be 'of excellence' (Nicol and Macfarlane-Dick 2006; Sadler 2010), and, secondly, developing the lifelong capability to assess and regulate their learning and performance.

Turning dimensions into design

These three dimensions of authentic assessment clarify the construct in a way that holds sufficient consistency across the articles to invite adoption by the sector; but the way to implement this methodology is not sufficiently described in the literature. Of all the reviewed articles, only 11% have an authentic assessment model that involves practical conditions or principles to follow. One example is that of Gulikers, Bastiaens and Kirschner (2006), who propose that authentic assessment has five practical requirements. Ashford-Rowe, Herrington, and Brown (2014) identified eight relevant aspects to consider in designing authentic assessment. The USEM model (Yorke 2010) is probably the most respected model in this field (Brown 2005; Andrews and Higson 2008) and is an acronym for four interrelated components of employability: understanding, skills, efficacy beliefs and metacognition.

However, these examples do not entirely reflect the dimensions found in our review of literature and remain largely at the level of required characteristics, rather than a stage-based model for planning implementation of authentic assessment by teachers and programmes. Consequently, this paper concludes by drawing on the three dimensions and their component characteristics to propose a tentative four step model for building authentic assessments in higher education. The model has been developed by considering how the three dimensions should influence curriculum design. The model uses constructive alignment (Biggs and Tang 2011) where the assessment is designed to support the student in constructing relevant learning through alignment between the learning outcomes, the teaching methods and the assessment. Deriving the learning outcomes directly from the complexity of 'graduation profiles' and 'work requirements' provides the potential for both realism and cognitive challenge (Step 1). Furthermore, the model draws on evidence relating assessment design to high quality learning (Blokhman and Boyd 2007), and leads to creating a rich context, worthwhile tasks and use of higher order skills (Step 2). Finally, the model draws on the curriculum design features associated with supporting evaluative judgement particularly in steps three and four.

These four steps develop in different levels of abstraction, complexity and application of teaching practices. Step 1 takes a macro perspective linked with the relationship between undergraduate programmes and the working world, considering how the curriculum can nourish a connection with the workplace. Step 2 advances to the planning and design of assessment. Steps 3 and 4 have a micro

perspective focusing on what happens in the classroom. They identify concrete pedagogical strategies designed to give students a more active role in their learning process and help them grasp standards, practice judgement-making and receive feedback. This model has been successfully implemented in a pilot study in two Chilean universities, involving 30 teachers from six undergraduate programmes who had previously been trained in its use (see Figure 1).

Proposal: a model to build authentic assessments in the university

Step 1: considering the workplace context

Graduation profile. The first condition is that the teacher knows and understands the graduation profile of the programme that their course contributes to (often called programme learning outcomes). This profile represents the learning that all graduates must deploy once they finish their studies and enter the labour market (often formulated as a list of professional standards or competences). This will allow them to determine how their course will contribute to the graduation profile and ensure, through assessment, that students achieve the expected learning goals (Handley and Williams 2011). For this step, the teacher should ask: *How does my subject connect and contribute to achieving the competences of the graduation profile that this programme is committed to develop in students?*

Work requirements. It is necessary to nurture students' skills for employment. These may be specific professional skills, but also transferable skills demanded by the world of work and relevant whether the programme is vocational or non-vocational (Yorke and Knight 2004). The development of these skills must be part of the subjects that make up the curriculum. In this way, it can be ensured that once graduated, professionals can successfully face the typical problems of the workplace (Maxwell 2012). To respond to this stage, the teacher should ask: *How is the knowledge and skills learned in my subject related to the typical problems faced by professionals in the world of work?*

Step 2: designing authentic assessment

To accomplish the second step, teachers' pedagogical decisions regarding the assessment process must reflect the challenges that professionals of this discipline face in work. This can be seen in three areas: (a) decisions about the conditions in which the assessment is taken (for example, individual or

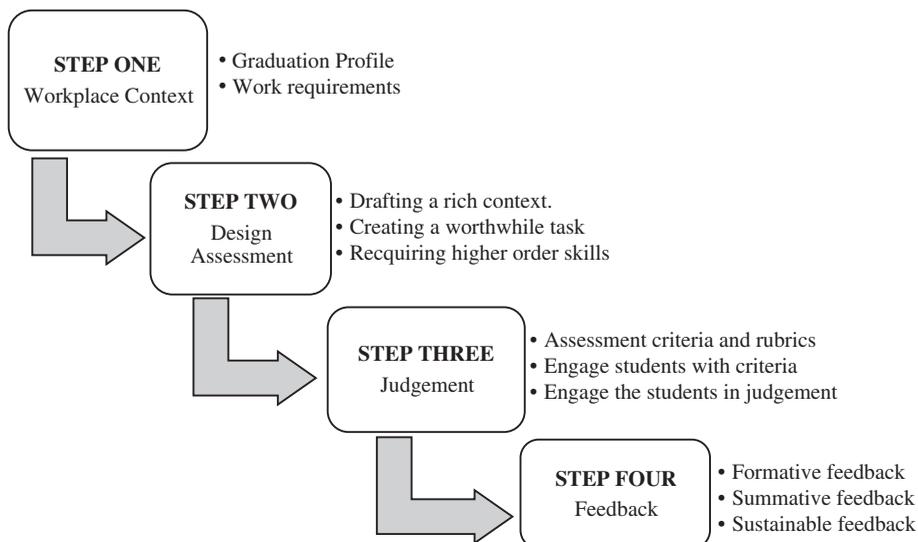


Figure 1. Model to build authentic assessment.

group, access to reading and information, time available), (b) decisions about the assessment formats (for example, online or in the classroom, open or closed construction answer, development of disciplinary knowledge or deployment of professional performance), (c) decisions about the kind of problem to which students will apply knowledge (for example, derived from employers, former students or students' experience in professional placements). In relation to c, professional problems derived from contemporary work places assist courses in keeping their assessment problems up to date with the demands of the working world for that profession.

Drafting rich context. The first dimension that distinguishes an authentic assessment is its realism (Saye 2013; Bosco and Ferns 2014). It refers to a simulation of real-work or real-world situations that function as a proxy for professional performance. In creating a problem situation, we place the student in a *real context* that urges them to make decisions about what they need to do. In this way, it is not a matter of the student reproducing course content but of discriminating what areas of their learning are needed to answer the question.

The inclusion of context in the question can also be used to bring authenticity to traditional written tests, in problem-solving items, brief and extended development questions, case analyses and even multiple-choice questions. This is done by the construction of realistic and problematising contexts that must be analysed in order to answer.

Creating a worthwhile task. One challenge of authentic assessment is to make sure that the methods go beyond academic formats and become useful for third parties (in addition to the teacher and the student). The idea is that the teacher, when designing an assessment strategy, thinks: 'to whom would it be important that my students learn this knowledge?' Based on this question, the assessment design may consider the participation of third parties in the form of clients, employers, colleagues from the same or from another profession, and/or external teachers who review and evaluate the performance of the students. Moreover, another possible role for 'third parties' is as beneficiaries of students' knowledge. For example, receiving treatment, intervention or advice (Brown 2005; Andrews and Higson 2008). This strategy gives a **purpose** to student learning, making it meaningful.

Requiring higher order skills. Authentic assessment is designed to promote the use of *higher order cognitive skills* related to using, modifying or rebuilding knowledge into something new. This is based on the higher levels of cognitive skills identified in Bloom's taxonomy (Bloom, Masia, and Krathwohl 1964) and its later formulations (Kennedy 2007; Marzano and Kendall 2008). Authentic assessment, thus, privileges the judgement of students' cognitive ability to judge, decide, criticise, suggest, design, innovate, propose or to invent.

To meet the guidelines of this second step, teachers must design assessments that test knowledge construction and application in contextualised and realistic questions. For example, assessment of intelligence theories in psychology might use, as context, a dialogue between two primary teachers. They discuss why some of their students don't learn as expected and posit different reasons, using different theories of intelligence. The questions can ask their students to infer: (a) the theory of intelligence used by each teacher, (b) possible critiques that each teacher would make of the other's reasoning, (c) possible teaching practices that each primary teacher must use. The aim is to ask students to use their knowledge to identify, analyse, apply, transfer, conclude and decide in a real situation that has an impact on others (in this case, school students).

Step 3: learning and applying standards for judgement

Steps three and four of the model are necessarily integrated as a cyclical process of guidance and feedback loops (Hounsell et al. 2008), which enable students to both improve their learning and develop evaluative judgement. They are set out separately here to emphasise the importance of the different steps. Step three focuses on helping students grasp standards and practice evaluative judgement whereas step four outlines the specific stages of feedback.

Assessment criteria and rubrics. Rubrics typically combine assessment criteria with the standards required to achieve different grades, and are challenging to write when assessment tasks require complex and divergent responses. A key characteristic of authentic assessment is that such information is known to students in order that they can gradually develop the ability to evaluatively judge their own work and that of others on the journey to becoming autonomous students and, eventually, professionals. Therefore, consideration should be given to criteria and standards and how to make these available to the student. These include not only published criteria ('explicit') but also the 'latent' and 'meta' criteria used in the act of judgement (Wyatt-Smith and Klenowski 2012). The latter two are not readily communicated because of their tacit nature and require engagement in judgement. Explicit criteria are, therefore, only a first stage in a continuum of processes to help students acquire knowledge of assessment expectations (O'Donovan, Price and Rust 2004).

Engage students with criteria. Assessment is a 'social and cultural practice' (Wyatt-Smith and Klenowski 2012, 37) where teachers acquire tacit knowledge of standards and judgement through participation, observation, imitation and dialogue (Rust, Price, and O'donovan 2003). Therefore, communicating the tacit aspects of assessment criteria to students requires similar approaches. For example, actively engaging students in marking using assessment criteria and exemplar assignments can significantly improve their performance (O'Donovan, Price and Rust 2008). Alternatively, the act of co-creating assessment criteria with students assists them in developing evaluative judgement (Fraile, Panderó and Pardo 2016), as it provides a clear opportunity for detailed dialogue about standards.

Judgement-making practice. A complementary process to engaging students with criteria is providing them with the opportunity for self and peer assessment using those criteria. Evidence suggests there is formative benefit from judgement activities, providing students with feedback both as a peer reviewer and as a receiver of peer review (Dawson et al. 2017). These activities can help to clarify the assessment criteria and better understand what is expected of student's performance level (Nicol and Macfarlane-Dick 2006). Dawson et al. (2017) stress the value of self-assessment in helping students identify criteria to use in judging their own assignments and Tai et al. (2016) found explicit benefits of peer observation and feedback in developing students' evaluative judgement. Opportunities for judgement can also be provided by engaging students with exemplars; that is anonymised examples of student work (Handley and Williams 2011, 103). Exemplars, involving different levels of accomplishment, can be marked and discussed by the students to help them discover the criteria used through concrete expressions of different levels of achievement.

Step 4: giving feedback

Feedback research is increasingly emphasising a change from a conventional approach which generally positions students as passive recipients (Carless et al. 2011). Recent work advocates 'feedback mark 2' (Boud and Molloy 2013), where feedback is part of an assessment cycle involving students as active in gathering and responding to feedback. In this model, feedback to foster evaluative judgement involves dialogue with and between students with a view to helping them clarify appropriate criteria, make increasingly accurate judgements about their own performance and decide what changes they need to make.

In this fourth step, teachers must provide formative instances, in which students assume an active role in identifying and understanding the gap between their performance and the one expected, and also analyse what action to take, discovering strategies to reduce that gap.

Formative feedback. There is a tendency to think about feedback as information provided to students in response to a completed assignment. However, the emphasis on evaluative judgement in creating authentic assessment means that students need access to feedback throughout their studies. There are numerous ways to help students acquire and consider formative feedback, including peer review, practice tasks, group test taking, observations of work colleagues and feedback on draft assignments.

Summative feedback. Summative feedback is often important for quality assurance purposes as teachers are held to account for the quality of their information to students explaining marking decisions. However, the impact of such feedback is often limited. Such feedback must provide information to students about their performance in a way that helps them understand the strengths and weaknesses of their work (Panadero, Brown and Strijbos 2016).

Sustainable feedback. Sustainable assessment, coined by Boud (2010), is intrinsically linked with the concept of evaluative judgement. It was defined as assessment that meets students' present needs and prepares them to meet their own future learning needs. The intention is that students gradually become able to make judgements about their own performance, a crucial element of professional work. Therefore, it is important that students learn how to gather, recognise and use feedback in the absence of a teacher.

Conclusion

The literature identifies multiple benefits to students (and to employers) from the use of authentic assessment. However, devising authentic assessment, particularly in systems with strong traditions of 'testing', is not easy as we lack a robust concept on which to base guidance for assessment design and operation. This article has attempted to contribute to the debate by clarifying three key dimensions of authentic assessment. These dimensions provide guidance for teachers seeking more authentic assessment, including assessment-related teaching practices which develop 'authentic' capabilities for employment. The breadth of the dimensions and their reflection in the proposed four step model encourages the integration of discipline-specific skills and knowledge with application in the workplace, but also, importantly, with the generic capacity to evaluate and improve performance. They also highlight the complexity of learning for authentic practice, and the potential of assessment to create a richer learning environment and build capability for higher order and lifelong learning.

Arguably, the step-based model guides those reluctant to adopt authentic assessment by providing concrete stages that can be applied to conventional testing methods, for example by describing a rich context for, and demanding problem-solving and decision-making in, individual questions. We recognise that comprehensive knowledge of a 'graduation profile' may be beyond most teachers. However, clarification of 'programme outcomes' reflecting the 'graduation profile' can provide the basis for a mapping exercise for individual courses, identifying how their course/s contributes to teaching and assessing the programme outcomes. This approach reflects growing efforts to encourage a programme approach to assessment design and its capacity to improve the student learning experience.

The next stage is to further test, evaluate and refine the model and consider its acceptability with those most reluctant to adopt authentic methods in assessing classroom learning. We welcome feedback from others who are interested in implementing authentic assessment, particularly in higher education systems with strong traditions of testing.

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Notes on contributors

Verónica Villarroel is an assistant professor and director of the Center for Research and Improvement of Education (CIME), Faculty of Psychology, Universidad del Desarrollo. Her research lines are linked to the assessment of learning, discursive practices in the classroom and development of perspective taking in early childhood.

Susan Bloxham is an emeritus professor of Academic Practice, University of Cumbria. Her current work explores how academics use standards in their academic judgement, particularly external examiners, and how student understand academic judgement.

Daniela Bruna is an assistant professor and researcher at Center for Research and Improvement of Education (CIME), Faculty of Psychology, Universidad del Desarrollo. She has developed research aimed in the promotion self-regulated in higher education and in learning assessment.

Carola Bruna is an assistant professor, Facultad de Ciencias Biológicas, Universidad de Concepción. Her lines of research is the study of the effect of active-participatory methodologies in the teaching of science.

Constanza Herrera-Seda is an assistant professor, Faculty of Psychology, Universidad del Desarrollo. She has developed research aimed at strengthening the teaching and learning, with special interest in studies on educational inclusion, teacher training and improvement of teaching and assessment practices in university education.

ORCID

Verónica Villarroel  <http://orcid.org/0000-0002-3000-2248>
Daniela Bruna  <http://orcid.org/0000-0001-7424-2959>

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