Co-funded by the
Erasmus+ Programme
of the European Union

VASE Report 1 part II:

Desk research on assessment activities for teaching for values in design in higher education

Co-funded by the
Erasmus+ Programme
of the European Union

This report is developed by the project Value Sensitive Design in Higher Education (VASE), co-funded by the Erasmus+ programme of the European Union (grant number 2018-1-SE01-KA203-039072) and based in a collaboration between the Malmö University (SWE), Aarhus University (DK) and Eindhoven University of Technology (NL). The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Authors:
Camilla Gyldendahl Jensen, University College of Northern Denmark, Department of Architectural Technology and Construction Management (ATCM)
Rikke Toft Nørgård and Maria O Donovan, Aarhus University

For more information about the project, and the development process:
http://vase.mau.se.

Join the LinkedIN community “Teaching for values in design”:
https://www.linkedin.com/groups/9043787.

October, 2021

Abstract

This desk research on assessment forms and activities is a contribution to the VASE project, which aims to provide students involved in design and technology with an awareness of the role values play in design. In this report, the goal is to unfold the theoretical aspects of assessment to propose a range of different assessment forms and activities developed specifically for teaching values in design. Such a framework should provide utility for guiding and informing teachers about ways of assessing learning when teaching for values in design. This entails the construction of a framework or model from which to develop and integrate different assessment forms with signs for/of learning (what is in this report called students' knowing, doing and attitudes). The report thus deals with different ways of looking at assessment forms or concepts in relation to teaching Values in Design. The purpose of this, within the project, was a theoretically grounded development of assessment activities specifically targeted to teaching values in designs. The collection of 12 assessment activities consists of summative, formative, ipsative and authentic assessment types divided into the competency types: Knowledge, Skills and Attitude.

Table of contents

INTRODUCTION

This desk research on assessment forms is a contribution to the VASE project, which aims to provide students involved in design and technology with the awareness of the role values play in design. In this report, the goal is to unfold the theoretical aspect of assessment to propose a range of different assessment forms and activities developed specifically for teaching values in design. Such a framework should provide utility for guiding and informing teachers about ways of assessing learning when teaching for values in design. This entails the construction of a framework or model from which to develop and integrate different assessment forms with signs for/of learning (what is in this report called students' knowing, doing and attitudes). This framework should simultaneously be related to considerations within values in design.

Learning processes based on teaching values in designs, reside in overarching normative directives where ethical aspects become essential in the design process (Friedman and Hendry, 2019). Also, the complexity of the design process goes beyond abstract moral theory, with a strong embedded connection to particular societies and technologies (Friedman and Hendry, 2019). Adams et al. (2017) emphasise, through the following statements, that these aspects of teaching values in design fit very well into some of the more essential discussions about how to make students partners in their learning process through active and critical participation (Adams et al., 2017; Becker et al., 2018).

> *Rather than being regarded as mere participants and consumers of knowledge, the embedding of a maker culture in higher education has made them active contributors to the knowledge ecosystem. They learn by experiencing, doing and creating, demonstrating newly acquired skills in more concrete and creative ways" (Adams et al., 2017, p. 6).*

As learning processes are changing from something stationary to something that is constantly created and changed through analytical and reflective processes, it also affects the way we assess learning outcomes (Adams et al., 2017; McConville et al., 2017; OECD, 2013; OECD, 2019; Rodrigues & Bidarra, 2017, Kennedy, 2007)). It is therefore notable that in the latter part of the twentieth-century assessment, to some degree still use summative expressions with a strong association to grading (Hughes, 2014; Rodríguez-Gómez and Ibarra-Sáiz, 2015). Teaching values in design thus challenges existing summative

assessment forms to ensure that assessment methods are aligned with teaching methods and learning goals so that teaching effectiveness might be enhanced (Pereira, Flores, and Niklasson, 2016; Wiliam and Thompson, 2019). Also, there is a general need for assessment methods within teaching in design (and elsewhere) to better accommodate a focus on both process and content (Wiliam and Thompson, 2019). According to Hughes (2014), these perspectives have started a new movement in the educational sector where assessment should be seen as being *for* learning rather than only *of* learning (Hughes, 2014). A view also expressed by Wiliam and Thompson (2019):

> *Through a series of historical contingencies, we have arrived at a situation in many countries in which the circumstances of the assessments have become conflated with the purposes of the assessment (Wiliam and Thompson, 2019, p. 9).*

Since Scriven in 1967 proposed the use of the terms "formative" and "summative" to distinguish between different roles of evaluation, especially the notion of formative assessment has gained popularity in the educational sector to accommodate some of these movements (OECD, 2013; Hughes, 2014; Wiliam and Thompson, 2019). New concepts such as "authentic assessment", "performance assessment", "alternative assessment", “ipsative assessment” and "sustainable assessment" (Hughes, 2014; Rodríguez-Gómez and Ibarra-Sáiz, 2015) have emerged over time as alternatives to the more traditional formative and summative assessment methods with the aim of better capturing learning situations that leads to *self-awareness of learning needs, self-regulation of the learning process, lifelong autonomous learning and self-determination in decision-making from an ecological and socially responsible perspective* (Rodríguez-Gómez and Ibarra-Sáiz, 2015 p. 5). According to Hughed (2014), a special interest in ipsative assessment methods as well as methods that meet the demand for supporting the development of personalised, self-directed, and lifelong learning is needed. This means getting rid of an understanding of assessment as something that is only a one-way process. We need to understand assessment in a much broader sense where no best practice applies to all learners in all situations, and evaluation or feedback is not necessarily something given by an expert to a novice (OECD, 2013; Hughes, 2014; Ashford-Rowe, Herrington and Brown, 2014). Furthermore, with these perspectives in mind, it can be argued that within the domain of values in design, it is especially meaningful to include another type of assessment, authentic assessment. Authentic assessment is referred to as **assessment *as* learning**. It has a focus on helping the students to develop their practices through the assessment activity itself, and by that reach a dimension of feedback based on self-regulation, self-efficacy, and metacognition (Shewbridge et al., 2011;

Earl, 2007; Dann, 2014; Rodríguez-Gómez and Ibarra-Sáiz, 2015). Assessment as learning, and thus authentic assessment, is an alternative to more superficial learning approaches based on decontextualized memorisation and lack of integrating or applying knowledge. Authentic assessment focuses on an approach that deals with whether knowledge can be integrated within a practice or how it will affect our society on many different levels, from individual perspectives to large-scale societal effects. In this way, authentic assessment is based on some of the ontological understandings seen in the domain of teaching values in design, as students must present their ability to translate and integrate their knowledge (Ashford-Rowe et al., 2014; Swaffield, 2011, Wiggins, 1990; Newmann, 1997). Through authentic assessment students need to reflect upon their responsibility, how they consider and intentionally work with values and the ethical implications of their design work (Søndergaard, 2017; Friedman and Hendry, 2019).

Based on the above introduction, this desk research report therefore explores how and why the use of different assessment forms can create a more varied culture for learning when students and teachers reflect and recalibrate, reassess, and change their approach. Accordingly, the report deals with different ways of looking at assessment forms: as concepts, as activities, and in relation to teaching Values in Design.

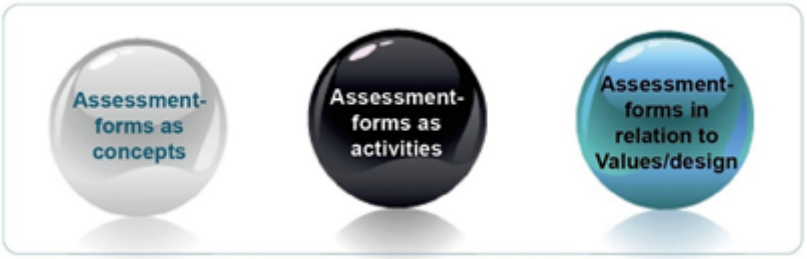

Illustration 01. Different ways of looking at assessment forms: as concepts, as activities, and in relation to teaching Values in Design.

To achieve this, we will look into how the assessment of, for and as learning creates different learning opportunities related to topics such as planning, instruction, students' own learning, teaching and assessment. The purpose is to define and describe the four selected forms of assessment - formative assessment, summative assessment, authentic assessment and ipsative assessment - and their relevance when teaching values in design and integrate this within the existing literature in the field.

Illustration 02. The four types of assessment.

First, a brief introduction of the definitions of assessment as a concept, followed by the rationale behind the concept of learning outcome as introduced by the Bologna process. Next, an elaboration of the differences between assessment of, for and as learning. This discussion will lead to the presentation of the 4 assessment concepts present in the VASE project. The next section deals with the dimension of knowing, doing and attitudes in relation to the four assessment concept. Finally, based on the definition of learning outcomes, the report presents a framework containing examples of different assessment activities that can be related to teaching values in designs and is found on the VASE Open Educational Resource (OER)[1].

The rationale for and planning of assessment

The word assessment is derived from the Latin word "assidere" meaning "to sit beside or with" (Earl, 2007, 2012). It resonates with Drummond's (2003) definition of assessment as a process of teachers looking at students' learning, striving to understand it, and using that knowledge in the interests of the students (Swaffield, 2011). In education, the concepts of assessment, feedback and evaluation are often used interchangeably. However, feedback and assessment are not the same (Kirkegaard, 2017). For instance, assessment is the practical process of deciding and judging the quantity, worth, quality or importance of something visible in a teaching situation or delivered by the students. Feedback, however, would be the information given to the students on the quantity, worth, quality, or importance of the elements being judged or measured (Kirkegaard, 2017). Likewise, there is a distinction between evaluation and assessment where the latter is an ongoing, individualised, and ungraded process aimed at improving the students' learning process.

[1] The VASE OER Teaching for values in design: creating conditions for students to grown into responsible designers: https://teachingforvaluesindesign.eu/, accessed on 2021-10-29

Evaluation, on the other hand, provides a closure through a judgement of the learning level up against institutional or educational standards.

In the last 20 years, there has been a significant movement towards criterion-referenced assessment and competence-based assessment in the educational sector based on a specification of intended learning outcome (Torrance, 2007). This rationale for learning outcomes was formalised by the Bologna Process, which has been instrumental in laying the groundwork for learning outcomes within higher education in Europe. The Ministers for Education issued a communiqué, in 2003, on the position of the Bologna Process, in which they emphasised the creation of a standard model for Higher Education in Europe. They specified that degrees (Bachelor and Masters) would be described in terms of learning outcomes, rather than only the number of hours of study (Kennedy, 2007).

The Bologna Process states that learning outcomes play an essential role, and assessment frameworks are critical to both improvement and accountability in the school system (Kennedy, 2007; OECD, 2013). The use of learning outcomes as a type of common language for describing qualifications helps to make these qualifications clearer to both students and teachers (Kennedy, 2007). Also, the use of learning outcomes as a standard method for describing programmes and modules has the potential to assist in the establishment of standards and common procedures of quality assurance in specific teaching situations (Kennedy, 2007; Torrance, 2007; OECD, 2013).

The position of the Bologna Process describes a vision for working with learning outcomes that has a potential for creating a flexible and integrated system that assists people of all ages in gaining educational qualifications. Furthermore, a systematic focus on the use of learning outcomes when describing programmes and modules makes clear to students what they are expected to achieve by the end of the programme or module. This also assists students in the choice of programmes and in actively participating in student-centred learning (Kennedy, 2007). Overall, the main purpose of assessment and evaluation is, then, to improve student learning and support students' in being reflective in relation to their own learning, what they need to learn more about, and for teachers to assist them on that path (Hughes, 2014; Pereira, et al., 2016; Darling-hammond, 2017; Wiliam and Thompson, 2019). Consequently, planning assessment and evaluation is instrumental in defining strategies for improving practices with the ultimate goal of enhancing students' outcome (OECD, 2013).

Importantly, these strategies need to have coherence, or alignment, between the teaching design and the chosen form of assessment. Back in 2003, John Biggs introduced the concept of constructive alignment, which is about creating such coherence through supporting the connection between the selected learning strategies and how the learning activities are subsequently assessed.

> *Constructive alignment draws on two significant principles of learning and teaching - that the learner builds meaning, or constructs, his or her own knowledge through relevant teaching and learning activities; and that the teaching and learning activities are also linked, or aligned, with the learning outcomes and assessment tasks (Biggs, 2003; Biggs & Tang, 2007). Biggs (2003) emphasised, "the key is that all components in the teaching system – the curriculum and its intended outcomes, the teaching methods used, the assessment tasks – are aligned to each other (Bond and Knight, 2013, p. 26).*

When thinking about planning for assessment, there are two objectives to consider: (1) the various methods should be integrated in a way that makes sense, and (2) the criteria based objectives that are being assessed. This is otherwise known as the distinction between "outcomes based assessment" and "assessment for/as learning" (Powell, 2011). Here, Wiliam and Thompson (2019) points to a number of factors that need to be considered as *educational assessments are conducted in a variety of ways and their outcomes can be used for a variety of purposes* (Wiliam and Thompson, 2019, p. 8). These factors are, among others, "what is being assessed", "what assessment form is used", and "what happens as a result". Based on this, they point towards three overall purposes that assessment may serve. A way to capture these different ways of approaching and defining aspects of assessment is to look deeper into the dimension of the purpose that is served. Here, three overall purposes are given: (1) assessments that help students gauge their own understanding *(assessment as learning),* (2) assessments that help teachers to guide students during courses *(assessment for learning)* and finally (3) assessments that help teachers compare students' progress after a completed course or duration of coursework *(assessment of)* (Earl, 2007, 2012).

Assessment for learning	**Assessment as learning**	**Assessment of learning**

Is utilised by teachers to gain an understanding of their students' knowledge and skills to guide instruction.	Focuses on teaching students' the metacognitive processes to evaluate their own learning and make adjustments.	Is primarily used to compare students and report progress accordingly. Unit tests are a commonly used form of assessment of learning.

*Illustration 03. A description of assessment as either **for, as** or **of** learning.*

Formative assessment, for instance, first becomes formative when it fulfils its *purpose*, the promotion of students' learning. That is, when evidence elicited by the assessment is interpreted and used to improve instructional decisions (William, 2018). That is a qualitative appraisal, aimed at improving learning, otherwise referred to as *assessment for learning.*

This insight provides a clear basis for distinguishing between the terms **assessment for learning** and **assessment of learning**. As defined by Black, Harrison, Lee, Marshall, and Wiliam (2004), assessment for learning is *any assessment for which the first priority in its design and practice is to serve the purpose of promoting students' learning. It thus differs from assessment designed primarily to serve the purposes of accountability, or of ranking, or of certifying competence* (Black et al., 2004, p. 10). Assessment for learning would, therefore, include the use of assessment to motivate students or to provide retrieval practice. William and Thompson (2019) explain in the following quote how assessment for learning point towards establishing a process instead of a focus on describing criteria:

> *In some contexts, assessments that are used to support learning are described under the broad heading "assessment for learning" (in contrast to "assessment of learning"). This does suggest a process, rather than being a description of the nature of the assessment itself, but the danger here is that the focus is placed on the intention behind the use of the assessment, rather than the action that actually takes place (Wiliam and Thompson, 2019, p. 11).*

Assessment for learning comprise activities that inform students about what they can already do and what they are not able to do (yet) (Gregory et al.; 1997; Wiliam and Thompson, 2019). Assessment for learning is thus about stimulating learning through the effectiveness of feedback. In that way, the design of the assessment process is of equal importance to the operational robustness of assessment (Hughes, 2014).

When dealing with assessment *f*or learning, there is a variety of assessment strategies and tools teachers to use. These strategies aim to help students recognise where they are on their learning path and encourage them to consider how to best move forward by (1) sharing learning goals and success criteria with students, (2) helping students monitor their progress through the use of tools that provide information on their understanding, (3) using assessment activities to inform the teaching situation; encouraging peer assessment etc.

These strategies or processes for **assessment for learning** contrast with the **assessment of learning** that according to Hughes (2014) *demands a focus on reliability, validity, implementation methods and quality control to ensure that marking is fair and that the assessment measures what it claims to measure* (Hughes, 2014, p. 34). The differences between assessment for and of learning can, therefore, be boiled down to the following two sentences:

– *Assessment for learning is supportive, while assessment of learning measures.*

– *Assessment for learning uses descriptions of processes, while assessment of learning uses scores.*

However, new concepts such as "authentic assessment", "alternative assessment", “ipsative assessment” and "sustainable assessment" (Hughes, 2014; Rodríguez-Gómez and Ibarra-Sáiz, 2015) have emerged to capture learning situations that lead to *self-awareness of learning needs, self-regulation of the learning process, lifelong autonomous learning and self- determination in decision-making from an ecological and socially responsible perspective* (Rodríguez-Gómez and Ibarra-Sáiz, 2015, p. 5). These new assessment forms are referred to as **assessment *as* learning**. With a focus on assessment as learning the assessment where the activity becomes the vehicle for helping students develop, practice, and become comfortable with reflection and critical analysis of their own learning (Shewbridgeet al., 2011). This implies a re-configuration of assessment practices as something positioned in between assessment for learning (formative assessment) and assessment of learning (summative assessment) (Dann, 2014). The theories behind assessment as learning argue that students with a focus on exploring their learning processes through active participation can reach a dimension of feedback based on self-regulation, self-efficacy, metacognition (Earl, 2007; Dann, 2014; Rodríguez-Gómez and Ibarra-Sáiz, 2015).

> *Assessment as learning focuses on the role of the student as the critical connector between assessment and learning, students as active, engaged, and critical assessors […] Assessment as learning emphasises using assessment as a process of developing and supporting metacognition for students […] It occurs when students personally monitor what they are learning and use the feedback from this monitoring to make adjustments, adaptations, and even major changes in what they understand (Earl, 2013, p 3).*

In the case of authentic assessment and thus, **assessment as learning**, there is a need to consider if the requirements and attendance to criteria based assessment are too constraining (Powell, 2011). For example, point to a propensity for not giving enough credit to the boundaries of domains, especially if the requirement is to meet a specified predefined behaviour/cognition. The assessment of critical and ethical thinking becomes particularly difficult in this regard, to avoid not falling into the trap of locking our assessments of students' critical thinking into default frameworks of *a priori* expected parameters, with rigid constraints. When planned learning outcomes lead to unintended outcomes, the teacher therefore encounters a problem of map versus territory where the former invades the latter and mandates a commandeered response to accountability, reducing learning to mechanical to-do lists. Yet these unintended effects are often perpetuated by planned learning outcomes. Precisely because these outcomes are pre-planned and because this focus has shifted from the teaching perspective to the competencies students should aspire to.

We arrive at a situation whereby students are not only told what they need in order to pass, but they are also shown how far they are expected to strive. Falling then, into such assumed constraints, a ceiling is placed over potential. The other, much criticised unintended effect of learning outcomes comes from its link to a constant adherence to quality assurance aspects in the management. It creates a risk of focusing too much on what can be measured, and at the same time, losing sight of the desirable outcomes that cannot be measured (Powell, 2011)

Dann (2014) argues that students and teachers must question authorities or traditional views without teacher control to create opportunities to challenge one's own tradition. The purpose is to create argumentative discussions between students with the aim of solving a problem (Dann, 2014). In fact, these areas beyond the disciplinary context, which are vaguely or not at all defined, (Powell, 2011) requires a much more complex set of skills. (Adams et al., 2017; McConville et al., 2017; OECD, 2019; Rodrigues and Bidarra, 2017). And it is not

amiss to highlight here, the principle of constructive alignment, (Powell, 2011; Bond and Knight, 2013), which means that teaching and assessment activities should be aligned with the intended learning outcomes. This means trying to create assessments activities that support the student in developing a thorough understanding of themselves across multiple disciplines. Through formal and informal reflection, students can come to recognise how their practices and beliefs are influenced by their values and experiences as well as how their personal behaviour affects their ability to build trust and credibility.

THE FOUR ASSESSMENT CONCEPTS

In the introduction an argument was made about how teaching values in design emphasises the use of **assessment as learning**, importantly however, this must not be understood as an exclusion of assessment ***of*** and ***for*** learning. Rather, the aim is to create a more holistic approach, where especially the inclusion of authentic and ipsative assessment concepts contribute with new opportunities for evaluating the more complex and demanding teaching processes and activities that characterise values in design. Furthermore, including all of the four assessment formats cater to different assessment purposes, methods and activities (Earl, 2007; Dann, 2014; Hughes, 2014; Rodríguez-Gómez and Ibarra-Sáiz, 2015; Dolin and Evans, 2018). Based on the above more general descriptions of assessment, the following sections will therefore now take a more thorough look at the connections between the four selected assessment forms briefly presented in the introduction and the descriptions of assessment as either ***of, for*** and ***as*** learning.

In the following section, the four assessment forms (summative, formative, ipsative and authentic) will be more thoroughly described.

Summative assessment

Summative assessment refers to the assessment of learning with a focus on measuring the effectiveness of a final delivery or submission. In this way, the summative concept has a strong inherent purpose towards being an assessment *of* learning. The main purpose of summative assessment is, then, to provide information about the student's level of knowledge at a certain point (Dolin and Evans, 2018). This can be at the end of a teaching unit or an entire course, module, or study. Summative assessment has traditionally been used as *regular grading for recordkeeping, informing decisions about courses to follow* […]*,*

where teachers' judgements often are informed by teacher-made tests or examinations compared against a standard (Harlen, 2005).

Summative assessment has, according to Harlen (2005), several potential advantages when teachers' judgements are used more broadly than is traditionally the case. The general definition of summative assessment is any method, activity or tool that allows a teacher to measure a student's learning against (more or less) standardised criteria by way of collecting, interpreting or reporting evidence of learning (Dolin and Evans, 2018). A problematic aspect of summative assessment can be if teachers align their teaching to the content of the test (rather than the other way around), or train students in answering the assessment. Here, it becomes challenging to create a fluid and situationally responsive learning situation that involves critical thinking or ethical and values-based discussions (Harlen, 2005; OECD, 2013; Hughes, 2014; Darling-Hammond, 2017). Something that is prominent when teaching for values in design. The deduces guidelines for how to design summative assessments activities are formulated in the table below:

Establishing where the learners are in their learning
Establishing where they are going
Establishing what needs to be done to get them there
Measuring the effectiveness of a final Delivery or submission
Provide information about the student's level of learning at a certain point
Assess progress against a goal or standardised criteria
understanding and comprehension, typically against standardised criteria
Requires clear expectations and timelines
Generates marks and grades
Uses test, questionnaire, rubrics etc.

Illustration 04. The derived guidelines for how to design Summative assessments activities.

Formative assessment

The difference between formative and summative assessment emerges from the difference in the intention and purpose of the assessment. Even though they sometimes overlap in actual practice, for example when formative feedback is combined with summative marks

and grades, there are according to Hughes (2014) some important distinctions to take note of:

> *Formative assessment has a pedagogic purpose to help the learner develop through feedback and can take place at any stage of teaching and learning, while summative assessment refers to classifying or measuring assessment which often takes place at the end of a course (Hughes, 2014, p. 34).*

Formative assessment helps students and instructors identify and close gaps. It promotes reflection about learning and charts the development of these learning processes over time. From this follows that *an assessment is formative to the extent that information from the assessment is feedback within the system and actually used to improve the performance of the system in some way* (Wiliam and Thompson, 2019, p. 12). Formative assessment includes a range of both formal and informal assessment procedures. The method provides teachers with opportunities for checking learners' progress as well as the effectiveness of their own practice. Formative assessment focuses on assessing the students' capacity and where they are in the learning process. Therefore, formative assessment "*provides information about the learning process that teachers can use for instructional decisions"* (William, 2011, p.8). It is also a way for teachers and students to communicate learning progression, challenges and needs during a lesson. The focus is on the needs, understanding, and progress of each learning activity. To be formative, the assessment needs according to Wiliam and Thompson (2019) to *contain an implicit or explicit recipe for future action. Sometimes this recipe will be explicit, for example, when the feedback identifies specific activities, the student is to undertake* (Wiliam and Thompson, 2019, p. 12).

Taken together, formative assessment is an ongoing process of gathering and interpreting evidence about students' learning. The results of this process are useful both to students in relation to improving their own learning and by teachers in regard to better guide them. A final fundamental distinction, that might seem counterintuitive, can be made about formative assessment: There is no such thing as a formative assessment, there is, however, assessments whose results can be used formatively. This distinction warrants a bit more explanation: The defining features of formative assessment, then, is not the method, activity or tool, but rather its purpose. Meaning that assessment is not carried out to pass judgment on students' learning but done to improve students' learning in a formative way (Dylan,

2018). The deduces guidelines for how to design formative assessments activities are formulated in the table below:

Feed-forward which enables learners to answer a question about where they need to go next
Engagement in the assessment process through dialogue
Recognise the full range of achievements for all learners
Focus on how students learn
Learners should receive constructive guidance about how to improve
Develops learners' capacity for self-assessment so they can become reflective and self-managing
Helps teacher modify future lesson planning based on the learners need
Formative assessment is continuous and informal in most cases
Identify key areas that need work before completing a summative assessment
Provides opportunities to close the gap between current and desired performance

Illustration 05. The derived guidelines for how to design Formative assessments activities

Ipsative assessment

In contrast to formative and summative assessment formats, ipsative assessment implies a diametrically different approach to the stances taken for formative and summative assessment. That is, to stances linked to performance criteria or course objectives. In ipsative assessment we find a decidedly new approach, i.e., an approach focusing on the learner's perspective on their own learning. Here, assessment is not concerned with assessing a performance gap linked to criteria. Rather, it is assessment carried out to help the learner see how they have progressed in their own individual learning (Hughes et al., 2014)

> *An ipsative formative assessment activity allows a learner to demonstrate progress and change through repeating activities or through comparing activities that address comparable knowledge and skills. Ipsative feedback then informs the learner of how*

> *he or she has progressed, or not, since a previous assessment (Hughes, 2014, p. 75)*

The term ipsative derives from the Latin word ipse, meaning "of the self" (Hughes, 2014). Ipsative assessment was originally applied in psychology for testing the intelligence of children and is still a relatively uncommon method in education. One reason might be that educators still discuss how much value ipsative assessment has (Hughes, 2011; Hughes, 2014). Gwyneth Hughes, one of the central figures when it comes to ipsative assessment in higher education, explains how this assessment form might offer resolutions to some of the tensions found in current assessment practice, where competitive assessment forms lead to a lack of motivation (Hughes et al., 2014). Furthermore, the ability of learners to self-review their own work is both essential for achieving learning in higher education as well as for lifelong learning where learning is not formalised (Hughes, 2014; Hughes et al., 2014)

> *When students wholly depend on teachers to set assessment and give feedback, formal assessment does not prepare them for self-reliance. Weaker students may use feedback selectively and superficially as a list of instructions to follow, and not develop the ability to think for themselves (Hughes, 2014, p. 44)*

In education, an ipsative assessment compares a learners' current performance with their previous performance – it is a form of self-comparison, either within the same field or course over time or in comparison with other fields or courses. It implies multiple rounds of assessment where learners are compared against themselves and their prior learning through progress reports (or similar) that capture the essence of the learners' progression resulting in assessment descriptors expressed in terms of learners "personal best" (Hughes, 2014). Accordingly, it is a highly personalised form of assessment where progress is measured against the needs and goals of the individual, not in comparison to external standards, course objectives or the performance of peers. In this way, ipsative assessment is inevitably subjective and not amenable to comparing students. At some point, a standard measurement might be needed to award a degree, so perhaps a "blend" of ipsative and more criteria-referenced approaches is a possible way forward (Hughes, 2014; Hughes et al., 2014).

The theoretical roots of assessment for and of learning have in the literature a diverging nature expressed by the different positions of learning theories and practices such as behaviourism, pragmatism, or social constructivism. Ipsative assessment can be seen as a

response to this theoretical disagreement, as it offers a third way, where the concept of progress is key, and where ipsative assessment can be both formative and summative (Hughes, 2014; Hughes et al., 2014).

As ipsative assessment focuses on estimating advancements in learners' progression, linked to intrinsic rather than extrinsic forces, one might argue its benefits are more than its (subjective) face value. One might argue in fact, that ipsative assessment can encourage students to tap into their own motivations for learning, and that this potential does not necessarily surface in environments where competition and control are the principal operating mechanisms (Hughes, 2011):

> *The ipsative assessment compares existing performance with previous performance. Many informal and practical learning experiences are assessed in this way such as sports coaching, music teaching and in computer games. A personal best in athletics is an ipsative assessment. By contrast, in much academic learning, where assessment is made in relation to external attainment criteria or rubrics, credit is rarely given for how far the learner has advanced since the previous piece of work* (Hughes, 2011*, p. 1)*.

Hughes emphasises that ipsative assessment should be grounded in the concept of self-review, rather than self-assessment, to ensure that self-marking or -grading does not cause concerns in relation to reliability. This also implies that students need teachers to guide them and create scaffolds to support them in becoming effective self-reviewers (Hughes, 2014). The deduced guidelines for how to design ipsative assessments activities are formulated in the table below:

Assessing their own learning in a way that is transparent and that encourages dialogue
Feed-forward as strategies to provide information about the results of the assessment in a way that enables students to take a proactive approach to make progress.
The assignments that are being assessed needs to be demanding, meaningful and authentic
Ipsative assessment has a non-competitive character
Can be formative and/or summative
Is longitudinal and cumulative
Identifies a lack of progress as well as progress

Ipsative assessment could be formative or summative or a combination of both
Students undertake an activity which is followed by students' self-judgement or their own work
Ipsative assessment can be combined with technology

Illustration 06. The derived guidelines for how to design Ipsative assessments activities

Authentic assessment

The first formal use of the term "authentic" was used in a description of *authentic performance* by Archibald and Newmann in 1988. Here they define authentic assessment as *the extent to which a lesson, assessment task, or sample of student performance represents construction of knowledge through the use of disciplined inquiry that has some value or meaning beyond success in school* (Newmann, 1997, p. 361). The term was then used in association with learning as the production of knowledge, deep understanding, integration of knowledge, and the use of prior knowledge beyond assessment. Later, the connection between authentic assessment and higher-order thinking, problem-solving and decision-making was added (Wiggins, 1990; Swaffield, 2011).

The concept of authentic assessment emerged as a response to superficial approaches to learning that employed the measuring of decontextualized memorization rather than the integration or application of knowledge (Ashford-Rowe, Herrington and Brown, 2014, Swaffield, 2011, Wiggins, 1990; Newmann, 1997). Authentic assessment, has evolved mainly in the U.S. from a reaction to summative multiple-choice testing (Newmann, 1997)

In the U.S. this kind of superficial assessment was at its height when the emphasis on multiple-choice tests was pervasive. However, it has been stipulated that such tests do not measure important competencies needed in adult education or life beyond school. Also, these tests were seen to be "*invalid indicators of genuine intellectual achievement, and since assessments influence teaching and learning they were also said to be directly harmful* (Palm, 2008, p. 2). Whereas traditional summative assessment has been grounded in the *testing* of students' learning to see whether they have required a certain body of knowledge and skills, authentic assessment has adopted what could be called an inverted approach. That is, authentic assessment determines and drives the curriculum and teaching, rather than curriculum determines, and drives the assessment as in the traditional model. This has been referred to as *planning backwards* (McDonald, 1992).

Reading through the literature on authentic assessment, we find a range of descriptions of what authentic assessment could and should entail. Generally, these descriptions overlap and are in agreement with each other even though they might differ in wording. Authentic assessment points towards that a certain body of *knowledge* and *skills* is required, for students to be properly equipped in dealing with the 'real life' of their profession. One useful way of framing this is as a combination of *realism, contextualisation* and *problematization*. More precisely, authentic assessment can be described as a combined engagement with *realism* (linking academic knowledge and professional knowledge), *contextualisation* (integrating situational contexts or tasks resembling the profession that students are being educated for and where their academic knowledge can be applied) and *problematization* (using the approach of inquiry or problem-based learning to have students utilise relevant knowledge to solve problems or meet needs within their profession). These three factors are put to use when assessing curricular content as authentic (Villarroel et al., 2017):

> *Authenticity is understood as realism, contextualisation and problematization 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 problematization 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) (Villarroel et al., 2017, p. 2)*

There are different kinds of meaning related to authentic assessment, depending upon the chosen *perspective*, the chosen *foci*: This entails that contextualised task are assessed in a "non-judgmental" way that targets *aims* and *possibilities.* In doing so, authentic assessment confines itself to a predefined sphere where the educational context consists of problems and objects belonging to "real-life practice or settings" (Ashford-Rowe et al., 2014; Swaffield, 2011; Wiggins, 1990; Newmann, 1997).

> *When performance assessment is described in terms of its characteristics, that is, by means of typical properties of such assessments, the descriptions mostly involve cognitive processes required by the students, but also the inclusion of contextualised tasks and judgmental marking in the assessment" (Palm, 2008, p. 3)*

When we shift the *perspective* from one area such as *curriculum and classroom practice to life beyond school*, the meaning changes significantly. Here, authentic assessment emphasises that *processes* and *products*, and even conditions for learning, are referred to as knowledge involving aesthetic, utilitarian, or personal value (Wiggins, 1990; Newmann, 1997).

Although authentic assessment can focus on different areas, what is being assessed stays the same. Overall, authentic assessment is conducted by paying attention to how students construct knowledge, through a particular kind of cognitive work described as disciplinary / professional inquiry where mastery is defined on the grounds of authenticity. The defining features of authentic assessment are *disciplinary/professional inquiry* and the *production of professional knowledge* (Swaffield, 2011; Ashford-Rowe et al., 2014). The deduced guidelines for how to design authentic assessments activities are formulated in the table below:

The outcome of an authentic assessment should be in the form of a performance or product (outcome)
Authentic assessment design should ensure the transfer of knowledge
The role of the assessment environment and the tools used to deliver the assessment task
The importance of formally designing in an opportunity to discuss and provide feedback
The value of collaboration
Requires students to develop responses instead of selecting them
Involve the students' own research
Assess student habits and repertories, not mere recall or plug-in.
Strike a balance between honouring achievement while mindful of fortunate prior experience
Avoid terms like "always" and "never" and use Open-ended questions

Illustration 7. The derived guidelines for how to design Authentic assessments activities

Summary

Based on the review of the four assessment forms, the below definitions can be formulated. The definitions contain and express clear differences and identifying features, especially related to the purpose of the assessment activity.

The following section, therefore, adds the concepts of Knowing, Doing and Attitudes as another dimension in creating relevant assessment activities for domains such as values in design. These concepts address the nature of the desired learning outcome, which will influence the practical design of concrete assessment activities within the four categories. Accordingly, the purpose of the following section is to be able to develop concrete examples of different assessment activities that can be connected to teaching values in designs.

Summative	**Formative**	**Ipsative**	**Authentic**
Clarifying learning intentions and success criteria. The purpose of summative assessment is to gauge students' comprehension of the material	Providing feedback that moves learners forward. The focus is on the needs, understanding, and progress of each learning activities	Activating students as owners of learning. Look at both the student's earlier work and her current work	Engineering effective questioning and discussion in an authentic setting. Demonstrate their knowledge, skills, and strategies by creating a response or a product out in the real world

Illustration 8. A description of the hour assessment activities

THE DIMENSIONS OF KNOWING, DOING AND ATTITUDES

When designing assessment activities, a clear connection is needed between assessment and desired learning outcomes. More specifically, there needs to be alignment between teaching activity and assessment activity in regard to learning outcomes, planned learning activities and assessment. The process of designing competency-based or outcomes-based education (and assessment) can be said to encompass the following tasks (Stupans, 2017):

– *Identifying the wished-for competencies and outcomes*

– *Identifying indicators that define those competencies*

– *Identifying effective ways to learn those competencies*

– *Identifying effective ways to document learners' achievement of those competencies*

Understanding competence and its specific progression within an outcome-oriented degree framework led us to "*specific statements that describe what a student will be able to do in a measurable way* (Stupans, 2017). Knowledge Skills and Attitudes (KSA) are considered as knowledge referred to:

1) Cognitive – Concepts, ideas, beliefs, and facts. If you say, "I believe that X", then you're dealing with the cognitive domain. Cognitive knowledge is "knowing that" and "knowing about", sometimes also "knowing why". It is also called "declarative" or "propositional" knowledge.

2) Performative – Skills and abilities. This covers things that people can do, generally after practicing them over a period of time, and normally goes beyond things that most people are able to naturally (normally one would not talk about the "skill" of chewing!). Performative knowledge is "knowing how". This is also sometimes called "functional" knowledge. At the post-secondary level, most performative knowledge presupposes and operationalises a base of cognitive knowledge.

3) Affective – Values, attitudes, and emotions. When we're talking about how we feel about something, our disposition toward it, or about values and principles that guide a professional identity' or 'disciplinary attitudes.

From the domain of practice theory (Schatzki, 2017) there is a division of learning outcome into three forms: 1) knowing that concerns propositional content, 2) know-how, which is characterised by being action oriented. When Schatzki talks about" know-how", he refers to the concept of **"**coming to know", which is about the student's agency, capacity, and ability to act in the learning process. Here, knowledge is something that is acquired over time through active participation in practice (Schatzki, 2017). This kind of learning outcome is characterised by statements such as the below which are characterised by being action oriented (Schatzky, 2016):

- the action, task and project that compose a practice
- The use of artefacts, thing, and arrangement
- The interaction between people and organisms

– A switching among practices

– A carrying out actions in multiple practices

The last form of learning outcomes, according to Schatzki, is 3) acquaintance, which refers to the concepts of perception, emotion, and experience (Schatzki, 2017). We also find a similar division of learning outcome into three forms in the work of Barnett and Coate (2005). Here they distinguish between knowing, acting and being as *"the three challenges of a changing world that curricula in higher education have to address*" (Barnett and Coate, 2005), that constitutes learning in higher education.

Connecting all of the above, a framework emerges from which we are able to map, develop and integrate different assessment activities with learning outcome or signs for/of learning (knowing, doing and attitudes).

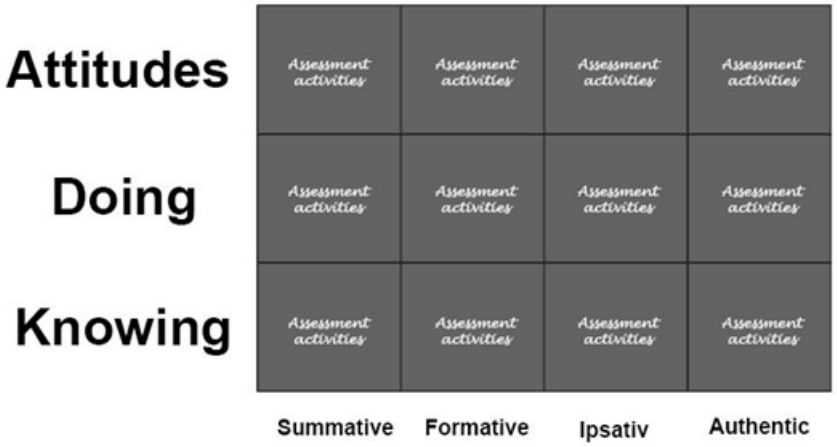

Illustration 9. The combination of aspects of learning outcomes and the four assessments forms

According to Popenici and Millar (2015) the concept of “outcome” origins from the various definitions, but it is clear that learning outcomes focus on what the student has achieved rather than merely focusing on the content of what has been taught. Learning outcomes focus on knowledge, skills or attitudes the student can demonstrate at the end of a learning activity. In this way, learning outcomes is a more student-centric than course-centric concept (Popenici and Millar, 2015).

Learning objective	Learning outcome
Students will be taught the conceptual and theoretical tools used in reasoning and problem solving, such as statistics, probability, logic, and decision theory (Popenici and Millar, 2015).	At the end of the course, students will be able to demonstrate the ability to use mathematical and statistical techniques relevant to the business subjects taught (Popenici and Millar, 2015).

Illustration 10. The differences of learning objective and learning outcome.

The twin concepts of competence and learning outcomes are closely related and might cause some confusion. In fact, in some papers within the literature, the term "competence" is used in association with “learning outcomes" (Baume, 2009). Competence is an outcome of a learning process and, from the perspective of providing a curriculum for students, sits within an outcome-oriented degree framework which encompass specific statements that describe what a student will be able to do in some form of measurable way (Stupans, 2017). The below working definitions tries to highlight this difference:

Competency	Learning outcome
A general statement that describes the desired knowledge, skills, and behaviours of a student graduating from a program (or completing a course). Competencies commonly define the applied skills and knowledge that enable people to successfully perform in professional, educational, and other life contexts (Gosselin, 2020).	A particular statement that describes exactly what a student will be able to do in some measurable way. There may be more than one measurable outcome defined for a given competency (Gosselin, 2020).

Illustration 11. The differences of competency and learning outcome.

A last aspect that might be important to consider when working with assessment or the development of assessment activities, is the student's development of knowing, doing and attitudes embedded in practice. There are a range of different taxonomic models for how one can capture and describe the student’s development from novice to competent to expert within a given subject area. In general, such models provide a way of understanding and

designing for students' incremental progression towards a given outcome. Accordingly, such models can be utilised as the basis for the development and use of specific assessment activities.

Illustration 12 adds the concepts of Knowing, Doing and Attitudes and, thus, provides us with yet another dimension when creating assessment criteria and activities or forming rubrics. Each intersection between the two axes says something about the desired learning outcome, which will influence the practical design of the assessment activities

The below model presents a composite matrix capturing the correlations between the three aspects of learning outcomes (knowing, doing and attitudes) and the four assessments forms (summative, formative, ipsative, authentic):

	Knowing	**Doing**	**Attitudes**
Summative	The assessment activities focus on measuring the effectiveness of the final draft based on achieved knowledge, concepts, ideas, beliefs, and facts.	The assessment activities focus on providing information about the level of the student's skills and abilities at a certain point in the learning process	The assessment activities focus on measuring the student's understanding and comprehension of values, attitudes and emotions, typically against standardised criteria
Formative	The assessment activities focus on the student's ability to describe where they are in are the learning process and where they are going	The assessment activities focus on providing the student's constructive guidance on how to Establish what skills and abilities they need and how to improve	The assessment activities focus on developing the student's capacity for self-assessment in order to become reflective and self-managing

Ipsative	The assessment activities focus on the student's ability to describe changes within their acquisition of knowledge Concepts, ideas, beliefs, and facts	The assessment activities focus on the student's ability to provide information about their skills and abilities to take a proactive approach to make progress	The assessment activities focus on the students to identify their learning path in a transparent way that encourages dialogue about Values, attitudes, and emotions
Authentic	The assessment activities focus on the student's ability to transfer knowledge, concepts, ideas, beliefs, and facts into an authentic setting by playing with different answers.	The assessment activities focus on student habits and repertories related to demonstrating skills and abilities through a performance, process, or product.	The assessment activities focus on the student ability to discuss Values, attitudes, and emotions through Open-ended questions and self-assessment with practice.

Illustration 12. A matrix elaborating on the correlation between the three aspects of learning outcomes and the four assessments forms.

EXAMPLES OF ASSESSMENT ACTIVITIES

This section presents examples of assessment activities that support assessment of teaching activities within the topic values in design. The matrix from the previous section, describing the correlation between the three aspects of learning outcomes (knowing, doing and attitudes) and the four assessment forms, will work as the guiding framework for developing the assessment activities.

To support teachers in assessing whether the intended learning outcomes were attained by the teaching activities, a collection of 12 assessment activities is provided. The developed collection of assessment activities consists of summative, formative, ipsative and authentic assessment types divided into the competency types: Knowledge, Skills and Attitude. The assessment activities are organised in the framework where three main pillars structure the teaching activities (see https://teachingforvaluesindesign.eu/curriculum_compass.html).

These are Ethics and Values (marked in red and with a focus on knowing), Designers and Stakeholders (marked in yellow and with a focus on doing), and Technology and Design (marked in blue and with a focus on attitudes). The three pillars aim to cover the main knowledge and skills for becoming a responsible designer. For more information, see the VASE OER (https://teachingforvaluesindesign.eu/teaching_patterns.html)

	Knowing	**Doing**	**Attitudes**
Summative	MIND MAPPING FOR RESPONSIBLE DESIGN	VIDEO PITCHING FOR RESPONSIBLE DESIGNERS	CASE-BASED ASSESSMENT FOR RESPONSIBLE DESIGNERS
Formative	REFLECTIVE VALUES REPORT	ROUND ROBIN VALUES BRAINWRITING	SELF ASSESSMENT FOR RESPONSIBLE DESIGNERS
Ipsative	PERSONAL VALUES-REFLECTION VIDEO	HISTORICAL VALUE TIMELINE	BLOGGING FOR RESPONSIBLE DESIGNERS
Authentic	APPLYING KNOWLEDGE TO REAL-WORLD EXAMPLES	PEER FEEDBACK FOR RESPONSIBLE DESIGNERS	VALUES EXHIBITION OR PUBLIC WORKSHOP

Illustration 13. A matrix presenting 12 assessment forms.

These 12 developed assessment activities for supporting teachers in assessing students' learning when teaching for values in design are in the following table briefly described in relation to their purpose and the topics of teaching values in design. An important aspect in the process of mapping and developing the assessment activities for students' learning in relation to the domain of values in design has been the concept of "constructive alignment", which supports the connection between the chosen learning strategies and how these are subsequently assessed. In the description of the assessment activity the focus must, therefore, be on what is being assessed through the use of a tool (mindmap, reflective report).

A common misconception when assessing, is to assess the use of a tool rather than the learning outcomes that has become visible through the use of said tool. One example of this could be the use of mind-mapping as a tool used to assess students' learning in relation to a teaching activity. Here, the focus of assessment should not be about whether students have created a good mindmap our used mindmapping in a correct way, but, rather, whether the learning that has become visible through the use of a mindmap is "good". The same applies to the use of reflective reports as assessment tool. Here it is not students' ability to make grammatically correct sentences, their ability to resonate, making statements etc that is the focal point, but, rather, how students through reflection can describe and unfold their learning and understanding of values in design in relation to knowledge, skills, and attitudes.

Summative Assessment		
Knowledge	MIND MAPPING FOR RESPONSIBLE DESIGN	Mind mapping for responsible design is a visual and summative method aimed at assessing the students' acquired knowledge through the making of a mind map. The method allows students to interpret and combine topics in their own way by making connections between knowledge and ideas.
Skills	VIDEO PITCHING FOR RESPONSIBLE DESIGNERS	Video pitching for responsible designers is a summative method aimed at assessing the student's acquired skills related to creating value-based designs. In this summative assessment activity, students prepare a short video pitch highlighting acquired skills in relation to values in design such as e.g., value tensions in their design, identified harms or benefits, stakeholder analysis, etc. The purpose of the activity is thus to assess the students' ability to describe their acquired skills in the form of a video pitch.

Attitudes	CASE-BASED ASSESSMENT FOR RESPONSIBLE DESIGNERS	Assessing students' learning through an analysis of a case provided by the teacher is a summative method. The students are assessed by asking them to apply their acquired skills on a case by imagining and analysing potential consequences of a design.
Formative Assessment		
Knowledge	REFLECTIVE VALUES REPORT	A reflective report is a formative assessment method which can be applied for assessing the student's understanding of the importance of addressing values in design. The students' acquired knowledge is assessed by asking them to write about how values are manifested in products, systems and services, and where these values come from.
Skills	ROUND ROBIN VALUES BRAINWRITING	Round Robin brainwriting is a formative assessment method that builds on consecutive contributions by each student about a specific question related to values in design. The assessment activity involves passing answers/reflection among students in class (or in groups) to assess the understanding of acquired skills related to e.g., creating value-based design, embedding values, or creating value for stakeholders. In a group of 4 or 5 people, each student writes down answers to an open-ended question given by the teacher on a value-related phenomenon.
Attitudes	SELF ASSESSMENT FOR RESPONSIBLE DESIGNERS	Self assessment is a formative assessment method that increases the students' awareness of how values are handled in an activity or a design process. The aim is to create conditions for students' critical analyses through a formative self

		assessment process and to improve their confidence and proficiency in working with values in design. When performing a self assessment, the students make their acquired knowledge explicit, clear and visible.
Ipsative Assessment		
Knowledge	PERSONAL VALUES REFLECTION VIDEO	Recording a personal video is an ipsative assessment method that captures the student's knowledge development. The personal video focuses on the students' reflection on what it entails to be a responsible designer and how their knowledge has changed.
Skills	HISTORICAL VALUE TIMELINE	Writing a historical timeline is an ipsative assessment of students' progress in acquiring specific skills in designing with values. The historical timeline demonstrates the lifecycle of values in the design process, where the students reflect about values within the design process, by addressing the consequences, emergence, and disappearance of values.
Attitude	BLOGGING FOR RESPONSIBLE DESIGNERS	Blogging for responsible designers is an ipsative assessment method that increases the students' awareness of how values affect design and design processes and improves their confidence and proficiency in working with values in design. The aim is to develop students' critical analysis through multiple resources. Via a series of blog posts, the students can share ideas and make their learning explicit, and visible to a community of

		practice, and thereby stimulate peer-learning.
Authentic Assessment		
Knowledge	APPLYING KNOWLEDGE TO REAL-WORLD EXAMPLES	Applying knowledge to real-world examples is an authentic assessment method for assessing the student's thoughts, knowledge and ideas on identifying values in design (their own or others'). The students' learning is assessed by applying their knowledge on values in design on real-world examples. The assessment activity allows students to elaborate on the identified values in design in relation to their own personal values, worldviews and visions on values in design.
Skills	PEER FEEDBACK FOR RESPONSIBLE DESIGNERS	Peer feedback for responsible designers is an authentic assessment method that offers a structured learning process for students to critique and provide feedback on each other's work as responsible designers.
Attitude	VALUES EXHIBITION OR PUBLIC WORKSHOP	Creating a value exhibition or a public workshop is an authentic assessment method that increases the students' awareness of how values affect the design and design process and improves their confidence and proficiency in working with values in design. The aim is to develop students' critical analyses through a dialogue with external audiences or possible stakeholders to enhance their transferable skills and attitudes. At an exhibition or a public workshop, the students can share ideas and make their acquired knowledge

		explicit and visible to a community of practice. The assessment will include more voices and build a greater capacity for student learning.

Illustration 14. A matrix presenting a brief description of the 12 assessment forms.

Each of the 12 assessment activities are in the VASE project connected to relevant teaching activities to support teachers in checking whether the activities' learning outcomes were achieved by the students (see the VASE OER, https://teachingforvaluesindesign.eu/index.html).

Assessment activities that support the more complex elements of teaching values in design will primarily be found in the intersections of doing/attitudes and formative/ipsative/authentic assessment. Whereas the intersections of knowing/doing and summative assessment will often support the dimension of acquisition of knowledge.

	Knowing	**Doing**	**Attitudes**
Summative	MIND MAPPING FOR RESPONSIBLE DESIGN Introduction to ethics in design Introduction to values in design Values clustering for developing students' value vocabularies Understanding value tensions	VIDEO PITCHING FOR RESPONSIBLE DESIGNERS Values manifested in products, system, and services Project values identification Design team's value statements manifesto Visualising values in design with mood boards	CASE-BASED ASSESSMENT FOR RESPONSIBLE DESIGNERS Introduction to cultures and values in design Introduction to ethics in design Value-based reformulation of the design brief Envisioning future scenarios
Formative	REFLECTIVE VALUES REPORT Manifestos on values and ethics	ROUND ROBIN VALUES BRAINWRITING Introduction to values	SELF ASSESSMENT FOR RESPONSIBLE DESIGNERS Project values

	Individual designer's values identification and hierarchy Understanding value tensions	in design Introduction to cultures and values in design Values clustering for developing students' value vocabularies Stakeholder values elicitation	identification Constructing value-based design requirements Public evaluations examination of values in design Contextualising values through reflection-in-action
Ipsative	PERSONAL VALUES REFLECTION VIDEO Manifestos on values and ethics Design team's value identification and hierarchy Individual designer's values identification and hierarchy Contextualising values through reflection-in-action	HISTORICAL VALUE TIMELINE Stakeholder values elicitation Project values identification Design team's value statements manifesto Design after design	BLOGGING FOR RESPONSIBLE DESIGNERS Value-based reformulation of the design brief Contextualising values through reflection-in-action Evaluating values in design with stakeholders
Authentic	APPLYING KNOWLEDGE TO REAL-WORLD EXAMPLES Values manifested in products, system, and services	PEER FEEDBACK FOR RESPONSIBLE DESIGNERS Constructing value-based design requirements Identifying and resolving value tensions	VALUES EXHIBITION OR PUBLIC WORKSHOP Envisioning future scenarios Visualising values in design with mood boards

	Design team's value identification and hierarchy Identifying and resolving value tensions	Design after design Evaluating values in design with stakeholders	Public evaluations examination of values in design

Illustration 15. Each of the 12 assessment activities are in the Vase project connected to relevant teaching activities.

REFERENCES

Adams B., S. *et al.* (2017) *NMC Horizon Report; 2017 Higher Education*.

Ashford-Rowe, K., Herrington, J. and Brown, C. (2014) 'Establishing the critical elements that determine authentic assessment', *Assessment and Evaluation in Higher Education*, 39(2), pp. 205–222.

Badea, A. *et al.* (2015) 'Competency Training in Collaborative Supply Chain Using KSA Model', *Procedia - Social and Behavioral Sciences*. Elsevier B.V., 191, pp. 500–505.

Barnett, R. & Coates, K. (2005). *Engagerende læseplanen i de videregående uddannelser,*Buckingham, SRHE & Open University Press

Baume, D. (2009) 'Writing and Using Good Learning Outcomes', p. 35.

Becker, S. A. *et al.* (2018) *Horizon Report 2018; Higher Education Edition*. EDUCAUSE.

Biggs, J. (2003). Aligning teaching and assessing to course objectives. *Teaching and learning in higher education: New trends and innovations*, *2*(4), 13-17.

Biggs, J., & Tang, C. (2007). OUTCOMES-BASED TEACHING AND LEARNING (OBTL). *Why is it, How do we make it work*.

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2004). Working inside the black box: Assessment for learning in the classroom. *Phi delta kappan*, *86*(1), 8-21.

Bond, A. and Knight, D. (2013) *Assessment @ Bond*.

Dann, R. (2014) 'Assessment as learning: Blurring the boundaries of assessment and learning for theory, policy and practice', *Assessment in Education: Principles, Policy and Practice*. Routledge, 21(2), pp. 149–166.

Darling-hammond, L. (2017) 'Developing and Measuring Higher Order Skills : Models for State Performance Assessment Systems', (March).

Dolin, J. and Evans, R. (2018) 'Transforming Assessment. Through and Interplay Between Practice, Research and Policy', 4(February 2019), pp. 53–80. doi: 10.1007/978-3-319-63248-3.

Wiliam, D. (2018). Feedback: At the heart of—but definitely not all of—formative assessment.

Earl, L. (2007) 'Assessment as learning. The keys to effective schools: Educational reform as continuous improvement', in.

Earl, L. M. (2012) *Assessment as learning: Using classroom assessment to maximise student learning.* Corwin Press.

Friedman, B. and Hendry, G. D. (2019) *Value sensitive design, shaping technology with moral imagination*. Massachusetts institute of technology.

Gosselin, D. (2020) 'Competencies and Learning Outcomes', pp. 2012–2013.

Gregory, R. L. (1997). Knowledge in perception and illusion. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, *352*(1358), 1121-1127.

Harlen, W. (2005) 'Teachers' summative practices and assessment for learning – Tensions and synergies', *Curriculum Journal*, 16(2), pp. 207–223. doi: 10.1080/09585170500136093.

Hughes, G. (2011). Towards a personal best: A case for introducing ipsative assessment in higher education. *Studies in Higher Education*, *36*(3), 353-367.

Hughes, Gwyneth (2014). *Ipsative assessment: Motivation through marking progress.* Springer.

Hughes, G., Wood, E. and Kitagawa, K. (2014) 'Use of self-referential (ipsative) feedback to motivate and guide distance learners', *Open Learning*, 29(1), pp. 31–44. doi: 10.1080/02680513.2014.921612.

Karakas, F., & Manisaligil, A. (2012). Reorienting self-directed learning for the creative digital era. *European Journal of Training and Development*.

Kennedy, D. (2007) *Writing and using learning outcomes: a practical guide*. Cork, University College Cork.

Kirkegaard, P. O. (2017) 'Feedback, selvreguleret læring og studieaktivitetsmodellen', p. 40. Available at: https://www.ucviden.dk/ws/files/46438744/Feedback_i_de_danske_professionsh_jskoler_.pdf.

Louise Juul Søndergaard, M. (2017) 'Designing With Bias and Privilege? Identities, Relations', *Design + Power*, 7, pp. 1–8. Available at: www.nordes.org.

McConville, J. R. *et al.* (2017) 'Using role-playing games to broaden engineering education', *International Journal of Sustainability in Higher Education*, 18(4), pp. 594–607.

McDonald, S. (1992). Communication disorders following closed head injury: new approaches to assessment and rehabilitation. *Brain Injury*, *6*(3), 283-292.

Newmann, F. (1997). Research news and Comment: An Exchange of Views on "Semantics, Psychometrics, and Assessment Reform: A Close Look at 'Authentic'Assessments". *Educational Researcher*, *27*(6), 19-22.

OECD (2013) *OECD reviews of evaluation and assessment in education. Synergies for better learning. an international perspective on evaluation and assessment*.

OECD (2019) *Trends Shaping Education 2019*.

Pereira, D., Flores, A., & Niklasson, L. (2016). A. (2016) 'Assessment revisited: a review of research in Assessment and Evaluation in Higher Education.', *Assessment & Evaluation in Higher Education Education*, 41.

Popenici, S. and Millar, V. (2015) 'Writing Learning Outcomes A Practical Guide for Academics', *Melbourne: Melbourne Centre for the Study of Higher Education*, pp. 1–15.

Powell, B. J. W. (2011) 'Outcomes Assessment : Conceptual and Other Problems'.

Rodríguez-Gómez, G. and Ibarra-Sáiz, M. S. (2015) *Sustainable Learning in Higher Education*, *Sustainable Learning in Higher Education. Developing Competencies for the Global Marketplace*.

Rodrigues, P. and Bidarra, J. (2017) 'Transmedia Storytelling and the Creation of a Converging Space of Educational Practices', *International Journal of Emerging Technologies in Learning*, pp. 42–48.

Schatzki, T. (2016) 'Practice theory as flat ontology', in *In Practice Theory and Research*. Routledge, pp. 44–58

Schatzki, T. (2017) 'Practices and learning', in *In Practice Theory Perspectives on Pedagogy and Education*. Springer Singapore, pp. 23–43.

Shewbridge, C., Jang, E., Matthews, P., & Santiago, P. (2011). OECD reviews of evaluation and assessment in education. *Denmark*, *2011*, 2011.

Stupans, I. (2017) 'A Curriculum Challenge — The Need for Outcome'.

Swaffield, S. (2011) 'Getting to the heart of authentic Assessment for Learning', *Assessment in Education: Principles, Policy and Practice*, 18(4), pp. 433–449.

Torrance, H. (2007) 'Assessment as learning? How the use of explicit learning objectives, assessment criteria and feedback in post-secondary education and training can come to dominate learning', *Assessment in Education: Principles, Policy and Practice*, 14(3), pp. 281–294..

Wiliam, D. (2011) 'What is assessment for learning?', *Studies in Educational Evaluation*. Elsevier Ltd, 37(1), pp. 3–14. doi: 10.1016/j.stueduc.2011.03.001.

Wiliam, D. and Thompson, M. (2019) 'Integrating Assessment with Learning: What Will It Take to Make It Work?', *The Future of Assessment*, pp. 53–82. doi: 10.4324/9781315086545-3.

Villarroel, V., Bloxham, S., Bruna, D., Bruna, C., & Herrera-Seda, C. (2018). Authentic assessment: Creating a blueprint for course design. *Assessment & Evaluation in Higher Education*, *43*(5), 840-854.

Wiggins, G. (1990). The case for authentic assessment. *Practical assessment, research, and evaluation*, *2*(1), 2.