



Epistemic agency: a link between assessment, knowledge and society

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Abstract

In this conceptual article, we discuss the idea of students' epistemic agency as an overlooked link between assessment, knowledge and society. We transcend the contemporary discourses around assessment that focus on its authenticity and student-centredness and instead investigate assessment from the viewpoints of knowledge and knowing. This approach sees assessment as functioning not only as a promoter of student learning but also as a means to prepare students to be responsible graduates and citizens as epistemic agents. First, we adapt the theory of epistemic agency—that is, students' capability to agentially evaluate, produce, use and transform knowledge—by situating it within the specific context of assessment. Second, we suggest practice-oriented ideas for assessment and feedback design to nurture epistemic agency. Overall, we do not depict epistemic agency as yet another 'soft skill' in higher education but as a necessary focal point for assessment that aims to nurture a transformative relationship between students and knowledge. We suggest epistemic agency as a powerful concept in understanding and nurturing the three-way engagement between assessment, knowledge and society. This concept allows us to understand whether and how assessment shapes students as epistemic agents.

Keywords Assessment · Student agency · Epistemic agency · Social justice · Epistemology

Introduction: assessment and knowledge in changing societies

Assessment plays a more prominent role in students' engagement with knowledge than we might realise. In the so-called 'knowledge societies', knowledge production has vastly expanded; digital technologies enable us all to access this knowledge base in the blink of an eye (see e.g. Välimaa & Hoffman, 2008). Our graduates must operate with knowledge in the changing landscape of the 'post-truth world' with the increasing presence of Artificial Intelligence, fake information and polarization of knowledge. The role of universities in

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equipping students with the skills to critically evaluate, use and transform knowledge is as vital as ever. Yet, how and why we assess student learning may not have kept up with the pace of the changing societies. This paper explores whether and how assessment could prepare students to navigate this evolving context of knowledge *agentially*.

There are several reasons to anticipate that assessment does broadly not promote students' role as 'epistemic agents'. First, assessment often *diminishes* students' transformational relation with knowledge, as phrased by Ashwin (2014, 2020a). Assessment—grades, numbers, metrics, competition and rankings—characterises contemporary universities. The increasing focus on assessment is both a symptom and driver of neoliberal academia in which students are positioned as customers rather than as critical users of knowledge (McKenna, 2022; Nieminen & Yang, 2023). For example, Macfarlane (2016) argues that assessment upholds cultures of performativity that reward 'game-playing behaviours' (p. 851) rather than critical engagements with knowledge. Second, the prominent role of assessment is to validate students' skills and knowledge. Such a summative approach may leave little room for students' own agency as 'active knowers' to develop (Nieminen & Lahdenperä, 2021). Third, the surge of student-centred assessment practices may not have, in the words of Shay (2005, 2008), centred academic knowledge. Ashwin (2020b) has critically examined how student-centred pedagogies may undermine knowledge and knowing in their emphasis on employability and soft skills (see also Van Heerden, 2020; Walton & Wolff, 2022). We thus firmly believe it is essential to follow Shay's (2008) footsteps and place knowledge at the very centre of assessment.

However, higher education research and practice lack the conceptual tools to situate assessment within the so-called knowledge societies – particularly with their recent emphasis of post-truth politics. In this conceptual paper, we suggest one way forward. We propose *student epistemic agency* as a mediating concept that enables us to rethink students' positioning in assessment in the context of knowledge societies. Our work builds on the thesis that it is imperative to position students as epistemic agents in *assessment*, given that assessment powerfully signals what is valued in higher education. Through assessment, students come to understand what counts as knowledge, how one's knowledge can be measured or determined and who has the say in these questions. Assessment is one of the most influential structures in higher education that forms students as social agents (Nieminen & Yang, 2023). Thus, the role of assessment in shaping students' relationship with knowledge (see Ashwin, 2014, 2020) warrants further investigation. As we will discuss in greater detail in the remainder of the paper, placing epistemic agency in the centre of assessment does not only centre knowledge and knowing (Shay, 2005, 2008; Walton & Wolff, 2022) but students' active agency as well. We propose considering assessment as something that ideally forms students as epistemic agents: responsible citizens who critically engage with knowledge in future societies.

In this conceptual study, we suggest theoretical tools to help understand how assessment influences students' transformative relationship with knowledge. We do this by formulating the idea of students' epistemic agency in the specific context of assessment. Our study consists of two parts. In the first part, we adapt the concept of epistemic agency in the context of assessment from the epistemological standpoint of critical realism. We do not introduce epistemic agency as yet another 'soft skill' but as a necessity in a world where universities often fail to meet their one crucial purpose of promoting social well-being through academic knowledge. This part includes a theory adaptation, in Jaakkola's (2020) terms, as we build upon earlier studies on epistemic agency that have taken a somewhat different approach to university education. In the second part of the study, we introduce theory-based ideas for assessment design to support the development of epistemic agency.

This part consists of a conceptual synthesis (Jaakkola, 2020) as we bring together relevant literature from the fields of assessment, higher education studies and sociology. We aim to inspire researchers and practitioners working with assessment in various disciplinary fields in which the idea of ‘knowledge’ is built differently.

Setting the scene: assessment, knowledge and society

Before our conceptual endeavour, we discuss some key texts that have discussed the three-fold interconnections between assessment, knowledge and society. We situate our central concept of epistemic agency—the capability to evaluate, produce, use and transform knowledge agentially—within the centre of this three-fold connection. While various important texts have addressed each of these connections and their interactions, more work is needed to pull these all together. The concept of epistemic agency, we argue, does precisely this. It addresses this three-fold connection from the viewpoints of student formation and agency.

The first connection is the one between knowledge and society. Following Ashwin (2020a), we understand that engagement with academic knowledge not only enhances students’ skill sets but also shapes ‘their sense of who they are and what they can do in the world’ (p. 3). Higher education plays a crucial role in preparing graduates for unknown futures in digital knowledge societies (Välilmaa & Hoffman, 2008).

The second link is the connection between assessment and knowledge. As Shay (2008) argued, knowledge must be put at the very centre of assessment. Traditionally, the function of assessment has emphasised the credentialing and the promotion of learning; until recently, the link between assessment and transformative engagement with knowledge has been overlooked in research (see, for example, Walton & Wolff, 2022; Van Heerden, 2020). Critical research on assessment reveals that assessment has often been portrayed as a barrier to knowledge and knowing. For example, Macfarlane (2016) has argued that assessment promotes performativity cultures more than it does one’s relationship with knowledge. In the measured university, knowledge becomes ‘a product to be packaged, bought, and sold’ (McKenna, 2022, p. 1), and assessment becomes a way to assign a value to such commodities. This commodification undermines the connection between assessment and knowledge. ‘Student-centred’ forms of assessment might further strengthen the economic purposes of assessment by focusing on students’ employability skills (Macfarlane, 2016; Marginson, 2019). Assessment in the current university context may thus profoundly disrupt students’ orientation towards knowledge by positioning them as ‘customers’ who engage with assessment in economically strategic ways rather than encouraging them to develop transformative relationships with knowledge (Knight et al., 2014; McArthur, 2022; Nieminen & Lahdenperä, 2021; Shay, 2008).

The final link is that between assessment and society. This link is often distorted by the performativity cultures that orient students towards their own achievement over the social good that higher education could promote (McKenna, 2022; Macfarlane, 2016; Nieminen & Yang, 2023). Assessment tasks are most commonly produced for the purposes of learning and accreditation, only to be read and assessed by teachers (McArthur, 2022). In such situations, the benefits of transformative engagement with knowledge remain within the boundaries of the classroom, neglecting the potential connection between assessment and broader society. Instead, when the practice of assessment views students as epistemic agents, the focus is shifted to ‘the world in which they will use that knowledge’ (McArthur

et al., 2022, p. 709) and to the crucial role that assessment can play in ensuring this world is truly reflected in higher education.

Reconsidering epistemic agency within assessment through an ecological approach

In this section, we reformulate the concept of epistemic agency in the particular context of assessment in higher education. In doing so, we answer the question: What exactly does ‘transformative relationship with knowledge’ consist of in assessment (see Ashwin, 2014, 2020a, b; McKenna, 2022)? Such a reformulation needs to unpack both parts of the concepts, namely, the ideas of ‘epistemology’ and ‘agency’. Both parts of the concept are important and neither can be neglected. Without centring knowledge, agency might remain within the realm of ideas such as employability skills, student engagement and active participation. On the other hand, knowledge alone is not enough if students do not see themselves as meaningful agents who can use their knowledge as responsible graduates in society. Without agency, students’ role in assessment might remain as the passive receivers and demonstrations of knowledge. Thus, the concept of epistemic agency allows students’ role in assessment to be rethought, imagining students as active users, producers and transformers of knowledge.

Let us start with the first part of ‘epistemic agency’, namely, the idea of epistemology. Our epistemological approach to ‘knowledge’ follows the work of Shay (2005, 2008), who largely drew on Bernstein’s (2000) and Maton’s (2006) writings. We take a realist position towards knowledge in assessment by recognising it has ‘an identity distinct from knowers and knowing’ (Shay, 2008, p. 603). This position considers knowledge to be objective, albeit always socially produced and mediated¹. To be precise, assessment is then understood to target not knowledge but *students’ demonstration of knowing*.

The critical realist approach to knowledge can accommodate disciplinary differences in assessment practices and cultures, as the very underpinnings of ‘knowledge’ and ‘knowing’ differ in contexts such as mathematics, business and arts education (Forde-Leaves et al., 2023; Quinlan & Pitt, 2021). To illustrate these epistemological differences, we draw lightly on the specialisation plane of Maton’s Legitimation Code Theory (LCT; 2014).² Specialisation denotes what is considered legitimate knowledge (epistemic relations) and who can claim to be a legitimate knower (social relations) (Maton, 2014). We distinguish between disciplinary knowledge structures that typically have strong epistemic relations and those with strong social relations. In the former, such as the natural sciences, the possession of knowledge is emphasised. In the latter, knowers are the focus instead of knowledge: in the arts and humanities, for example, the question of ‘who knows’ might be emphasised. Drawing on LCT, assessment can now be reconceptualised as epistemic practices that denote strong/weak epistemic/social relations. Epistemic agency is a necessity in disciplinary fields with various kinds of knowledge structures. Assessment in both

¹ We take a pluralist stance towards the questions of knowledge by noting that critical realism provides the means for conversations between different philosophies of knowledge, such as positivism and poststructuralism (for an elaboration see Luckett & Blackie, 2022).

² We have chosen to only refer to this framework lightly as we hope to keep our argumentation as accessible as possible. For a full account of how LCT has been applied in assessment and feedback, see Van Heerden et al. (2017), Van Heerden (2020) and Forde-Leaves et al. (2023).

‘hard’ and ‘soft’ sciences can either emphasise or de-emphasise the connection to society (McArthur et al., 2022).

Next, we clarify how we conceptualise student agency. Traditional sociological texts drawing on critical realism have conceptualised human agency in relation to broader social and societal structures (e.g., Archer, 2003). Higher education studies and policies commonly introduce student agency—one’s ability to act meaningfully and autonomously—as a crucial graduate outcome (Stenalt & Lassesen, 2022). Such agency is seen as a necessity ‘in the modern work market’, making agency a core component in ‘coping with uncertainty and changes in working life, thus playing a key role in lifelong learning’ (Jääskelä et al., 2017, p. 2062). Assessment research has also proposed similar ideas regarding students’ active roles and engagement (Nieminen et al., 2022).

What these common approaches lack is the focus on *knowledge*. As such, they may ‘fail to take account of the ways in which students are transformed by their engagement with knowledge’ (Ashwin, 2020b, p. 73). Our conceptualisation of *epistemic* agency highlights the connection between the individual learner and the wider surrounding societal structures of assessment. Overall, epistemic agency focuses on ‘the type of agency that can lead to knowledge-related outcomes and innovative ideas’ (Yang & Markauskaite, 2021, p. 4). When participating in activities that develop epistemic agency, ‘the student must see oneself as a productive participant in knowledge-laden activities’ (Heikkilä et al., 2020, p. 2). This viewpoint has been notably absent in assessment research. For example, a conceptual study by Nieminen and colleagues (2022) introduced four different frameworks for understanding students’ agency in assessment and feedback, yet none addressed the viewpoint of disciplinary knowledge. Likewise, the review study on student agency by Stenalt and Lassesen (2022) discussed knowledge production and assessment separately without paying attention to the intersections of these ideas.

In work that draws on school-level studies of knowledge-building activities (Scardamalia & Bereiter, 1991), epistemic agency has been most commonly introduced as a socio-cognitive construct that emphasises students’ responsibility to ‘take control and ownership of their own processes of learning and inquiry’ (Odden et al., 2021, p. 5). In the higher education context, Damşa and colleagues (2010) described shared epistemic agency as having two dimensions: a knowledge-related dimension (e.g. sharing and producing ideas) and a regulative dimension (e.g. setting and monitoring goals). Such views understand epistemic agency as a socio-cognitive ‘construct’, as Damşa and colleagues (2010, p. 143) put it. This dominant view has been particularly prevalent in science and teacher education (e.g. Chuene, 2022; Heikkilä et al., 2020; Oshima et al., 2018).

We transcend these socio-cognitive approaches by taking an ecological viewpoint (Emirbayer & Mische, 1998; Nieminen et al., 2022). The ecological perspective sheds light on the sociocultural, socio-material and socio-political underpinnings of human agency (Damşa & Jornet, 2016). This perspective views epistemic agency as a relation between individuals and their surroundings: ‘This concept of [ecological] agency highlights that actors always act *by means* of an environment rather than simply in an environment’ (Biesta & Tedder, 2007, p. 137; original emphasis). As an ecological concept, epistemic agency is not something that individuals possess. Instead, epistemic agency is constructed as a set of relations between various epistemic tools and materials and between human and non-human agents (Spence, 2020). The ecological underpinnings of epistemic agency denote students’ personal histories and aspirations. It sees higher education as an important part of one’s life course, as it is indeed in university where students develop a critical relationship with knowledge unlike in any other societal institution (Ashwin, 2020a). Moreover, we see assessment as a part of the ecologies of higher

education, which is itself situated within the broader systems of educational policy, public discourses and historical continuums. Connecting the idea of ecological agency with the specialisation plane of LCT, we can conceptually explore how students may be shaped as epistemic agents within various knowledge structures, and how such varying knowledge structures may influence students' lifecourses in differing ways.

We consider *epistemic objects* central to the development of epistemic agency (e.g. Yang & Markauskaite, 2021). Epistemic objects are the goal of collaborative knowledge work, the meaningful material outcomes of knowledge construction processes (Muukkonen et al., 2010). As Spence (2020) argued, 'Although students are not pushing the boundaries of science, the epistemic objects they produce help shape their understanding of concepts—the objects both represent understanding and are agents for developing that understanding further' (p. 17). The epistemic objects in the context of assessment might include materials such as rubrics, self- and peer assessment forms, digital formative assessment tasks, exam papers and marking instructions, as well as assessment policy documents. However, although knowledge objects are commonly produced in assessment tasks (e.g. exams, essays and group projects), the purpose of these objects tends to be framed only from the viewpoint of learning. It is rare to encounter assessment practices that prepare students to produce and transform knowledge objects in the sense of having a meaningful and useful purpose for broader audiences (McArthur, 2022)³.

An approach to assessment that builds on the ecological perspective of epistemic agency foregrounds its *transformative element*. In such an approach, knowers transform knowledge and are transformed by knowledge as they engage in assessment tasks (see Nieminen & Yang, 2023). This idea ties ecological learning theories to the idea of epistemic agency:

Acknowledging that learning is an achievement of whole (eco-) systems, and not primarily of individuals alone, educational settings should orient not towards individuals but towards transformational potentials. If learning is not about acquiring knowledge but about changing the world, then providing tools and opportunities for that change should become primary (Damsa & Jornet, 2016, p. 45).

Here, the difference between 'learning' and 'agency' becomes clear, as 'epistemic agents should think of themselves as, and act as, legislating members of a realm of epistemic ends: they make the rules, devise the methods, and set the standards that bind them' (Elgin, 2013, p. 135). Because of the transformative element of epistemic agency, students are not only capable of mastering knowledge but also bending, evaluating and transforming it if needed. Thus, assessment practices that view students as 'non-knowers' can be seen as epistemically unjust (Nieminen & Lahdenperä, 2021). The transformative element underscores that academic knowledge always changes, as epistemic agents critically contest existing knowledge if necessary. Attempts to decolonise higher education curricula offer a powerful example of the transformative power of epistemic agency (Walker, 2020).

To summarise, epistemic agency allows us to understand the interconnections of assessment, knowledge and society from the student point of view. We now fully formulate our reconceptualisation of epistemic agency in assessment.

Epistemic agency in assessment refers to students' transformational relationship with knowledge in the particular context of assessment. The extent to which assessment nurtures knowledge-specific agency depends on how well assessment prepares students to evaluate,

³ Here, we refer to usual coursework in higher education. Such assessment practices are more likely to be found in the context of theses and dissertations (Mantai et al., 2023), as well as in the context of service learning or community-based learning (Salam et al., 2019).

produce, use and transform knowledge critically. These processes are notably diverse in different disciplinary fields with varying knowledge structures. Our ecological conceptualisation acknowledges the crucial role of assessment as a part of students' academic growth in higher education: assessment provides a structure for epistemic agency to occur and develop. Our conceptualisation is transformative in the sense that through assessment that promotes epistemic agency, students are formed as *epistemic agents*.

How can assessment design nurture epistemic agency?

In this second part of our study, we outline assessment design principles for developing students' epistemic agency. First, we note that from the ecological perspective, *promoting student agency is an oxymoron*. Rather, assessment design may offer affordances for epistemic agency to develop (Biesta & Tedder, 2007). Thus, we see assessment as a crucially important structure surrounding the development of individual students' epistemic agency. A rigid assessment structure in which every detail has been predetermined might support students' learning of knowledge but not their agency. Such a design might even train students to depend more on their teacher and assessment design. At the same time, a lack of supporting structures might hinder the exercise of epistemic agency. Developing assessments that facilitate students' epistemic agency thus requires a careful balancing act.

Here, it is worth emphasising why it is important to focus on assessment while discussing epistemic agency. As Ashwin (2020a, b) has noted, fostering students' transformational relation with knowledge is a quest for the whole teaching and learning sector in higher education. Indeed, many similar ideas to ours have been explored (albeit not by using the concept of epistemic agency) in terms of, for example, service learning (Salam et al., 2019), undergraduate research (Mantai et al., 2023) and student-staff partnerships (Bovill, 2019). Nevertheless, such approaches are relatively uncommon in assessment. Given how profoundly assessment characterises student life in higher education (see Nieminen & Yang, 2023), we believe it is of utmost importance to nurture epistemic agency in assessment. After all, assessment shows students what is valued. If epistemic agency is not considered in assessment, it may remain a hollow promise.

In the following sections, we synthesise relevant theoretical literature on the topic from various research fields. We focus on three key areas of assessment: assessment criteria, assessment practices and feedback.

Assessment criteria: making knowledge structures transparent

Our exploration begins with assessment criteria. Assessment criteria embody the disciplinary norms for what counts of knowledge. At the same time, what is not formulated in assessment criteria is often deemed as 'non-knowledge' in a given context. In this way, learning objectives link assessment with the curriculum. Knowledge-driven assessment requires a knowledge-laden curriculum as its companion. At the same time, they are linked with the needs of society, as in the case of regulated professions (e.g. the education of teachers and doctors). Any assessment design requires a functional curriculum as its backbone, yet we also recognise that it is not uncommon for carefully planned curricula to be accompanied by misaligned assessment tasks. Following Shay (2008), we argue that assessment, in many cases, may not always be the appropriate place to start if the goal is to improve the quality of teaching and learning, at least when it comes to knowledge and

knowing: ‘A better starting place may be curriculum and its constituent forms of knowledge’ (Shay, 2008, p. 603). Shay (2008) argues that the curriculum should uphold discipline-specific knowledge and challenge socio-constructivist approaches to assessment that may abridge the curriculum to broader skills and competencies. There is a vast amount of research on the relationship between higher education curriculum and knowledge (see Annala, 2023; Shay, 2008, 2013). Our purpose is not to repeat these words but to ponder how assessment criteria, in particular, could strengthen students’ epistemic agency.

We start by discussing a typical format for embodying assessment criteria in higher education, namely, *rubrics*. While there has been much argument over whether and how rubrics could promote transparency of assessment and student learning (Bearman & Ajjawi, 2018; Panadero & Jonsson, 2020), it is surprisingly rare to discuss rubrics from the viewpoint of disciplinary knowledge. We see rubrics as epistemic tools that embody disciplinary knowledge structures. A substantial understanding of this structure allows students to situate novel knowledge within the structure (Bernstein, 2000; Maton, 2014). Rubrics efficiently communicate learning objectives: they function as ‘agentic tools’ that shape students’ learning experiences (Harris et al., 2022, p. 10). They are commonly introduced as tools that make nurturing epistemic agency in assessment transparent and more objective (Bearman & Ajjawi, 2018). We supplement this view by noting that, likewise, rubrics make the knowledge structure of one’s discipline more transparent to all stakeholders of assessment. By using Maton’s (2014) idea of specialisation, rubrics can be seen to embody what knowledge is considered powerful and legitimate (epistemic relations) and who can claim to be a legitimate knower (social relations). For example, in natural sciences, rubrics may embody strong epistemic relations as knowledge is seen as something cumulative and separate from ‘the knower’ (Nieminen & Lahdenperä, 2021). Alternatively, rubrics may seem rather different in disciplinary contexts with strong social relationships, such as in creative arts. As ‘the knower’ is centralised, the rubric should clarify who can be seen as ‘a knower’.

The question is what kind of affordances rubrics—or any other artefact representing learning objectives—provide for epistemic agency to develop. If rubrics ought to promote students’ transformative relation with knowledge, their use needs to be facilitated in a way that portrays students as a part of the knowledge ecologies of academia. Much has been written about how students could be engaged with rubrics by, for example, clarifying their content to students and by coupling them with exemplars that denote the quality of work by comparing it with the rubric (e.g. Bacchus et al., 2020). However, their power to facilitate the development of epistemic agency relies on whether they serve as *invitations* for students to engage in dialogues about the nature of knowledge in their discipline (Bearman & Ajjawi, 2021). This way, rubrics may facilitate knowledge-laden dialogues between the main agents in the ecologies of higher education, students and teachers, and curriculum designers. Following Bearman and Ajjawi’s (2021) metaphor of invitation, rubrics can be reconceptualised as social tools that facilitate students’ understanding of disciplinary knowledge (see also Harris et al., 2022).

Another example of using rubrics in this way is allowing students to co-construct assessment criteria with their teachers across different subject areas. Beyond assessment, student partnership in curriculum design has been proposed to directly provide students agency over what gets taught and how (see, e.g. Hall et al., 2021 for decolonising higher education curricula through student partnership). In assessment, student partnership provides an opportunity to promote communities of practice, as Chan and Chen (2023) put it, by framing assessment as a thoroughly social and co-constructed activity. However, so far, student partnership in rubric design has been scarcely discussed from the viewpoint of knowledge. For example, the recent review on student partnership in assessment by Chan and Chen (2023) does not refer to disciplinary knowledge, and ‘essential knowledge’ in partnership is only discussed from the

viewpoint of assessment literacy (p. 7). A notable exception is the study by Morton and colleagues (2021), who discuss rubrics as epistemic tools. Transparent rubrics in disciplines with strong epistemic relations look quite different from those with strong social relations, which also heavily influences rubric co-design. For example, in language education, rubrics might communicate to students that there is not only one correct way to communicate an idea but that various factors (e.g. grammar and tone) must be considered for effective communication. Similarly, in another discipline, rubrics might be used to assess various sources of knowledge to evaluate false information and its creation (i.e. ‘fake news’). Morton et al. (2021) remind us that rubric co-design may be preferable in knowledge structures with strong social relations:

This study found that some mathematics and science subjects, where there are precise right or wrong answers, do not necessarily lend themselves well to rubric use, while research tasks, including written works, oral presentations and projects are considered ideal for rubric use. (...) A further consideration in suitability is the level at which the subject is offered. Subjects offered to first-year students may present challenges on several fronts. Since students are just beginning their studies, it may be difficult to contact them prior to the beginning of the semester. First-year students enrolled in higher education are also less likely to understand higher education or discipline-specific discourse and expectations than students who are more advanced in their studies (...). Co-construction may therefore be better suited to subjects which are taught in, or after, the second year of programs, and confined to just one of the assessment tasks (Morton et al., 2021, p. 10).

Rubrics are not, of course, the only way to organise assessment criteria. There is a plethora of research critiquing rubrics as overly simplistic tools that may promote ‘spoon-feeding’ and criteria compliance (see Panadero & Jonsson, 2020). Due to these reasons, rubrics may *hinder* students’ rich and transformative engagement with knowledge. Another way to consider how assessment criteria are constituted and presented is holistic assessment. Royce Sadler’s (2013) work needs to be mentioned here. Sadler characterises holistic assessment that, instead of breaking assessment into discrete pieces, considers the quality of an assessed task as a whole. Holistic assessment is compelling in contexts where the assessed tasks or products can be diverse, when no two students may produce a similar outcome. As such, holistic assessment provides intriguing affordances for assessing knowledge objects that rarely aim to be identical. Holistic assessment may thus provide particular affordances for developing students’ epistemic agency.

To sum up, we see assessment criteria as an important link between assessment and the curriculum that constitutes the backbone for developing epistemic agency. We have proposed dialogue and co-creation of assessment criteria with students, which presents an intriguing affordance for promoting epistemic agency. Ideally, engaging students with understanding and modifying assessment criteria does not only make the criteria themselves more transparent but the very structures of disciplinary knowledge as well. Understanding these structures is at the heart of epistemic agency.

Assessment practices: from authentic tasks to meaningful tasks

Choosing appropriate assessment tasks and practices is central to epistemic agency. This choice determines the degree to which the tasks provide affordances for students to exercise and develop their epistemic agency. Assessment tasks denote students what knowledge counts as legitimate in their own disciplinary context (Nieminen & Lahdenperä, 2021). We

discuss three ideas for promoting epistemic agency through assessment tasks and practices: alignment with disciplinary knowledge structures, transformative potential, and temporal assessment over time.

First, we discuss how assessment practices could embody the disciplinary knowledge structures and thus provide affordances for epistemic agency. The idea that assessment should reflect students' specific disciplines and professions is similar to the vast amount of literature on *authentic assessment* that uses authentic tools and practices that students are likely to encounter after their graduation (e.g. software that will be used in the workplace; Esterhazy et al., 2021). Authentic assessment is largely studied from the viewpoint of whether and how it promotes employability skills (Sokhanvar et al., 2021). We supplement this literature by shifting the main locus of such work from employability and competencies to disciplinary knowledge. Of course, there is room for all these ideas, but the viewpoint of knowledge tends to be marginalised in authentic assessment literature. With a seemingly minor tweak, the 'authentic' tools and practices in assessment could be reframed by considering whether and how they represent authentic epistemic tools used to operate with knowledge in a given disciplinary context. Providing students with experiences using these epistemic tools in assessment may promote their sense of self as epistemic agents, too. This is exemplified in the study by Esterhazy and colleagues (2021), who discussed the epistemic dimensions of using professional artefacts in authentic assessment in radiology education. They report how authentic artefacts enabled the teacher to 'assess and help students to develop self-awareness, both on the practical and epistemic dimension of looking at radiographs through the eyes of an experienced oral radiologist' (p. 143). As this study considers students as users of knowledge in their future profession, we see it as representing epistemic agency, too.

On the other hand, any assessment practice, whether 'authentic' or not, represents an epistemic dimension. As assessment is about making judgments about quality, it always denotes '[a]ssumptions about what constitutes knowledge in a discipline and how it is generated and validated' (Quinlan & Pitt, 2022, p. 195). Epistemic agents, we argue, should be able to identify and operate with such assumptions. Although student-centred forms of assessment, such as self-assessment, peer assessment and e-portfolios, might foster students' agentic learning, these forms of assessment might fail to promote the development of *epistemic* agency if they shift the main focus of assessment from knowledge to skills, employability and competencies. At the same time, such forms of assessment provide affordances for students to operate with knowledge through multiple means and modalities.

The specialisation place of LCT (Maton, 2014) provides opportunities to understand how assessment may either fit or clash with the overall disciplinary knowledge structures in a given context. Many practices that centre 'the knower' may be considered unfit in disciplines with strong epistemic relations. For example, in the positivist field of mathematics, self- and peer-assessment may be seen by students and staff alike to be a misfit for mathematical knowledge and knowing (Nieminen & Lahdenperä, 2021). In contexts where knowledge is considered objective and cumulative, epistemic agency may be supported with *content assessment*, as Forde-Leaves et al. (2023) put it (e.g. unseen exams), as long as students know why assessment is conducted as it is. On the other hand, in disciplinary contexts with strong social relations, assessment 'embraces the individual as integral to assessment itself; individual dispositions or attributes are foregrounded' (Forde-Leaves et al., 2023, p. 11). This is why unseen exams—practices that uphold the value of objectivity—may be a poor fit to, for example, cultural studies if they do not allow students to develop a transformative relationship with knowledge. We do not promote normative approaches here (e.g. such as 'exams should not be used in certain disciplines') but call for

an enhanced understanding of the functioning of assessment and agency amidst different disciplinary structures of knowledge (see Forde-Leaves et al., 2023 for an elaboration).

Secondly, we discuss the transformative potential of assessment. By this, we mean that assessment tasks should be *meaningful* in terms of their potential to *change the world*. In order to promote students' epistemic agency, assessment needs to connect assessment with society by having a purpose beyond student learning: the task should be useful to other people. Meaningful tasks lead students to use their knowledge in action, thus providing them with experiences of acting as epistemic agents. On a small scale, assessment tasks can be designed to ask students to transform existing knowledge or at least have a minor yet *real* contribution to it. While this is often the case with theses and dissertations, regular assessment tasks rarely offer students opportunities to use their epistemic agency in action. Using relevant epistemic tools, students can produce knowledge objects that critically bend or transform scientific knowledge. A practical example is an assessment task that asks students to write a Wikipedia article to create new knowledge for the wider public (see Johnke, 2020 for elaboration).

On a larger scale, assessment tasks might ask students to wield their epistemic agency for societal change and social good (McArthur, 2022). Meaningful tasks might not only provide social good for wider audiences but also transform social contexts, whether on a small or large scale. Potential examples of this are an assessment task that asks initial teachers to use their theoretical knowledge about assessment for learning to shape their departmental assessment policies, one that asks statistics students to collect a large-scale dataset for the benefit of their region or community and one that asks political science students to use their theoretical knowledge about political behaviour to design a social media campaign that challenges misinformation (see, e.g. Thompson, 2009).

We emphasise the importance of tangible knowledge objects in developing students' epistemic agency (Muukkonen et al., 2010; Yang & Markauskaite, 2021). We propose that it is essential to provide university students with experiences of producing meaningful knowledge objects, the appropriate form of which depends on the discipline and its accompanying knowledge structure: these might be reports, artwork, material, speeches, performances, social media campaigns, policy briefs or experiments. Such assessment tasks may differ in terms of the intended audiences and the scale of the knowledge object. For example, students might create a knowledge object that benefits their coursemates and their teacher (i.e. a 'miniature society'), or they might reach beyond this imminent context to create a knowledge object that benefits their friends and families (e.g. an evidence-based training programme for one's relatives for a sports and health studies course). However, it is also possible to assign assessment tasks that benefit society at large, such as authentic assessments through which students can help real communities solve real-world problems (Thompson, 2009) or writing tasks whereby students must draw on existing knowledge to produce public opinion pieces or news articles (Fulton et al., 2021).

We consider experiences promoting social good and justice beyond the imminent classroom context to be important for developing epistemic agency. According to McArthur et al. (2022), merely having a socially relevant theme for an assessment task does not guarantee that students experience the task as a bridge between the classroom and society. Carefully designed essays and exams might effectively promote student learning, but as knowledge objects, they fail to promote social good beyond the classroom. The link, therefore, between the task and society must be tangible: the task should have real, meaningful significance. Without such transformative potential, the affordances for students' epistemic agency may be limited, as it is only through these transformative experiences that students may experience a *real* sense of epistemic agency. In this way, students can experience being a part of the ecologies of higher education as epistemic agents.

Thirdly, we stress the importance of understanding assessment and epistemic agency from an ecological point of view. We see *temporality* and *continuity* as crucially important features of an approach to designing assessments that promote epistemic agency. From the ecological viewpoint, any assessment encounter provides students with opportunities to experience epistemic agency in action. Although agency can only ever be exercised in the present, it builds upon students' previous life experiences and affects their future (Emirbayer & Mische, 1998). Any experience occurs within the life course of the agent: students' earlier assessment experiences foreshadow attempts to promote epistemic agency. For example, in test-driven contexts, students might resist alternative assessment practices that aim to help them develop their epistemic agency because they might believe that assessment should objectively measure their 'knowing' rather than develop their epistemic resources (Nieminen & Lahdenperä, 2021). At the same time, experiences of epistemic agency in assessment might shift students' orientation towards assessment in the future.

One powerful example is programmatic assessment, which considers not only unit-specific learning objectives but also programme-level objectives (Torre et al., 2020). Each assessment encounter is then seen as a data point that reflects students' development in terms of both sets of objectives. Such design approaches can be seen to both restrict and promote student agency (Nieminen & Yang, 2023). From a sociological point of view, programmatic assessment may provide the structure for student epistemic agency to occur; the question then is whether the design provides adequate affordances for epistemic agency. While programmatic assessment systems are widely used and reported in medical education, their implementation elsewhere in higher education has been scarce. Suppose the curriculum is rooted firmly in knowledge, and the programmatic assessment system is epistemically aligned with the curriculum. In that case, this idea seems intriguing for future research and practice from the viewpoint of student epistemic agency. Ideally, programmatic assessment prepares students to exercise their epistemic agency after graduation when no rubrics, tests or self-assessment forms are designed to guide their way. In the workplace and beyond, students should now be able to use and develop their epistemic agency and assess the outcomes of such agency.

Feedback processes: teaching the rules of the game

Feedback has frequently been identified as one of the most influential factors in student learning. Much less attention has been paid to how feedback is connected to the ideas of knowledge and knowing (Forde-Leaves et al., 2023; Van Heerden et al., 2017; Van Heerden et al., 2020). Recently, higher education research has noted that feedback might be different in disciplinary contexts such as natural sciences (which emphasise strong epistemic relations) and the social sciences (which emphasise strong social relations), indicating a growing interest in the disciplinary differences in feedback practices (Dawson et al., 2021; Pitt & Carless, 2022). These contributions pave the way for understanding how feedback can be designed to help students develop their epistemic agency within specific knowledge structures. Moreover, epistemic agency fundamentally develops in interactions with other knowers, either directly or through the mediation of epistemic tools and objects. This is integral to our ecological approach to epistemic agency that places students amidst the complex ecosystems of higher education. The evaluation, usage and transformation of knowledge are all ultimately interactions with the creators of earlier knowledge. This is why feedback interactions must be placed at the centre of developing student epistemic agency.

Following Van Heerden et al. (2017) and Van Heerden (2020), we reframe assessment feedback as a way to reveal to students ‘the rules of the game’ (Maton, 2014, p. 11) of a given discipline. Rather than understanding feedback as a universal cognitive intervention, we describe it as a disciplinary practice that is always tied to an existing knowledge structure. Feedback promotes students’ epistemic agency if it develops ‘a particular kind of ‘knowingness’ to cultivate the kinds of thinkers and writers who can legitimately produce knowledge in the field’ (Van Heerden et al., 2017, p. 972). Such knowingness enables students to agentially analyse and possibly contest the alignment or misalignment of feedback with the prevailing knowledge structure. Similarly, if feedback actively frames students as ‘non-knowers’, it hinders the formation and development of epistemic agency (Nieminen & Lahdenperä, 2021). However, even in disciplines with strong social relations, a similar form of epistemic injustice may occur if students perceive the teacher to be in charge of their learning. For example, in a test-driven language classroom, students may misperceive learning to mostly be a process of correcting mistakes, making them dependent on their teachers for their language learning (see Van Heerden et al., 2017).

In the current literature, feedback is seen to promote student agency if it encourages students’ uptake through iterative design. Student agency has been connected to ‘the new paradigm of feedback’ that frames feedback as a process rather than information (Nieminen et al., 2022). However, we contest this view. Feedback transmission can help students develop their epistemic agency in disciplines with strong epistemic relations. In contexts where knowledge is considered to be cumulative, corrective feedback ensures that students have mastered a certain form of knowing needed to become a professional (i.e. an epistemic agent). An example of this is a physics laboratory where undergraduate students’ basic knowledge is tested through an online quiz before they can fully wield their epistemic agency. At the same time, though, epistemic agency may be undermined in such contexts if feedback emphasises ‘correctness’ even when the students are expected to go beyond merely repeating disciplinary practices.

In disciplines with strong social relations, the role of feedback is not simply to correct but to develop what Luckett and Hunma (2014) called a cultivated gaze. As ‘the knower’ is emphasised over ‘knowledge’, feedback does not only develop a ‘knower-ship of the subject’ but also ‘a sustained relationship between students and disciplinary insiders’ (Van Heerden et al., 2017, p. 973). One example is a teaching practicum, where a student teacher converses with a university lecturer and a supervising schoolteacher. Together, the two authorities may discuss the student’s teaching skills, giving the student the tools needed to become a future teacher whose job is built on knowledge work. Epistemic agency in this context is hindered if the feedback makes the student feel helpless—indeed agency-less—by promoting extreme forms of relativism: *anything goes* (Maton, 2014). Similarly, in disciplines with strong social ties, feedback that overemphasises correctness may be misaligned with the purpose of developing epistemic agency. In such cases, higher education might not be able to produce ‘ideal knowers’ and thus fail in its very purpose (Ashwin, 2020b).

Future citizens will operate within complex and networked knowledge societies. Assessments that allow students to produce knowledge collaboratively may thus help them develop their epistemic agency. Collaborative forms of assessment, such as group assessment and peer assessment, offer opportunities for social interactions, feedback and agency to occur in tandem (see Wood, 2022). Asking students to give peer feedback within interdisciplinary project groups might provide them with the experience of being in the professional position of a ‘knower’, communicating and acting through that position in collaboration with learners from disciplines with different knowledge structures.

Educators who design assessment tasks may want to consider creating opportunities for interaction beyond the classroom ecology within the broader university institution and society. The wider world can be brought into the classroom through topical knowledge objects, such as reports, newspaper articles or social media conversations. Alternatively, assessment tasks can be designed to require students to interact with the world beyond academia, such as through digital media (see Nieminen et al., 2023). For example, in Scott and Stanway's (2015) study, students on a sports marketing course used social media to practise science communication with wider communities, including the sports management industry. Although such tasks connect assessment directly to society, they have potential downsides. As Nieminen and colleagues (2022b) noted, engaging the wider public in assessment tasks has potential risks for the learners. Ethics concerning data management and the publicity of assessment are only some aspects an assessment designer needs to consider; online trolls and harassment are other obvious risks for learners.

Assessment that entails the creation of knowledge objects may allow students to engage in feedback processes with authentic stakeholders from beyond academia. We see such authentic feedback interactions as important for epistemic agency to occur. For example, physiotherapy students may be asked to produce a fitness programme based on the latest scientific knowledge and then test it with actual patients. This is an example of authentic assessment that includes the real-life application of academic knowledge. In such an example, the students might engage in feedback dialogues with the patients—and the patients themselves may lack the knowledge base that the students have. Such authentic feedback situations can potentially develop students' epistemic agency because students are asked to *use* authentic feedback and balance it with academic knowledge. Authentic feedback is at the heart of knowledge work because it requires students to evaluate different knowledge claims and decide which claims have 'greater explanatory power than others' (Maton, 2014, p. 11; see also Heikkilä et al., 2020). Moreover, authentic feedback situations provide students with direct experiences of practising their positioning as epistemic agents within these interactions.

Concluding remarks

In this study, we have proposed the idea of student epistemic agency as a way to nurture the three-fold interconnections between assessment, knowledge and society. First, we have adapted the concept of epistemic agency in the specific context of assessment. Second, we have proposed practice-oriented ideas about how assessment design could promote students' epistemic agency.

Given the profound influence of assessment on students' learning processes, we suggest that assessment must be harnessed for the quest of nurturing epistemic agency. This is necessary given the profound role of assessment in guiding and regulating students' relationship with knowledge. If epistemic agency is nurtured in teaching and learning more generally but not in assessment, it may remain a secondary and empty goal. Consequently, when promoting students' epistemic agency *begins* from assessment design, epistemic agency is tied to the learning process from its beginning until the end.

We see three potential risks if epistemic agency is not brought to the centre of assessment research and practice. First, the crucial role of assessment may be underplayed in

the overall goal of promoting students' transformational relationship with knowledge. Second, assessment may be designed to promote students' agency, activity and engagement in ways that neglect knowledge. Third, assessment may be developed to consider disciplinary knowledge in ways that neglect the idea of student agency. The concept of epistemic agency, we propose, allows higher education communities to consider these risks and strive towards more knowledge-laden assessment.

Final reflection 1: promoting epistemic agency is risky

Promoting students' epistemic agency is risky. When students' agency is supported through assessment, students might use their increased agency for purposes that educators might consider non-beneficial or maladaptive. They might, for example, wield their agency for ethically suspicious purposes. Throughout the history of academic knowledge production, scholars, teachers and students have used their epistemic agency for questionable and problematic purposes: this history includes, for example, pseudosciences such as phrenology, the promotion of racist and ableist ideas in the human sciences and beyond, and unethical uses of power in othering marginalised human populations through research. On a smaller scale, students might exercise their epistemic agency to question and resist the assessment practices of their institution (e.g. by demanding higher quality assessment practices), which might not always be received well by these institutions.

However, the risks of *not* promoting epistemic agency in assessment may be even more significant. If epistemic agency is promoted in the curriculum and instruction but not in assessment, students might not learn to use their knowledge in practice, particularly for the greater good (McArthur et al., 2022; McArthur, 2022). Powerful knowledge will remain in books and libraries without a broader connection to society. Most of the time and resources students put into assessment tasks will only produce objects for teachers to evaluate. Imagining the potential benefits of those resources points to the power of assessment to promote specific ways of knowing: assessment shows what is really valued.

Final reflection 2: epistemic agency is a necessity, not a luxury

We call for critical reflection on the current purposes and practices of assessment from the viewpoint of knowledge (following Shay, 2005, 2008). This mission does not mean that other important aspects such as skills, competencies and attitudes should be overlooked, but that the questions of knowledge should be seriously considered. We argue that higher education fails its mission to educate epistemic agents if assessment design does not provide students with explicit opportunities to develop and exercise their epistemic agency. As such, epistemic agency is not a luxury but a necessity. It is not yet another generic skill in an already long list but a critical link that connects assessment to knowledge and society. Assessment can train students to evaluate and transform knowledge agentically. This idea is well worth considering in this time of 'post-truth politics' with widespread false information and a growing distrust in science.

Declarations

Conflict of interest The authors declare that there exists no competing financial interest or personal relationships that could have appeared to influence the work reported in this paper.

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