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Curriculum guidelines for the development of student agency in secondary education: A systematic review

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Abstract
To prepare students for lifelong learning, and their role in society, student agency has been foregrounded as an important aim of secondary education. In general, student agency is seen as the will and skill to intentionally transform one's functioning or circumstances. Yet, research on promoting student agency in secondary education is based on a fragmented view of both agency and the curriculum. This study reviews 86 empirical articles to establish guidelines for a curriculum that supports student agency in secondary education. Using Bandura's framework for student agency and Van den Akker's curricular model, this systematic review highlights how various curriculum elements influence student agency. It presents a curriculum model to inform teachers' choices in promoting student agency. Implications for future studies on the interplay between curriculum elements, student agency, learning and citizenship are discussed.

KEYWORDS
curriculum design, learning, secondary education, student agency, systematic review

INTRODUCTION

Student agency is increasingly foregrounded in educational reforms as a way of empowering students as agents of change, preparing them for lifelong learning, and as a way to promote their personal development (Charteris & Smardon, 2018; Koskela & Paloniemi, 2023;

OECD, 2019; Raffo et al., 2015). The perspective of agents of change is based on a transformative approach, encouraging students to use their creativity to effect change in their circumstances (Matusov et al., 2016; Stetsenko, 2019). From a lifelong learning viewpoint, student agency is based on the idea that students become lifelong learners when they learn how to structure their own learning, based on their interests and intentions, and their recognition of the relevance of what is to be learned (De Lissovoy, 2012; Vaughn, 2020b). The personal development perspective is based on the notion that students should become aware of who they are and of their potential (Bandura, 1986, 2001, 2006; Frankel et al., 2019; Gowlett, 2014).

Vaughn (2020b), in her article on how student agency should be fostered, emphasises the important role of teachers in recognising and nurturing students' agentic potential within the learning environment. This is a challenge for teachers, as there is ambiguity about what agency truly means (Matusov et al., 2016; Stetsenko, 2019). Researchers often used fragmented operationalizations when exploring student agency (Matusov et al., 2016; Nunes et al., 2022). Others advocate for a more holistic approach, acknowledging its multifaceted nature (Brod et al., 2023; Martin, 2007; Vaughn, 2020b). This requires insight into the different facets of student agency, along with know-how about creating conducive spaces for its development over time (Brod et al., 2023; Martin, 2007).

Therefore, curricula explicitly designed to nurture student agency are essential; the agency does not develop sustainably with sporadic interventions (Dabbagh & Castaneda, 2020). Also, the curriculum should be well-considered in terms of finding an optimal balance between guidance and freedom for students (Frazier et al., 2021). A teacher-led environment might hinder students' agentic development as they do not learn to take responsibility for their own actions (Erss, 2023; Frazier et al., 2021; Garcia et al., 2015; Leo et al., 2020; Stewart, 2013); a fully autonomous environment might hinder students' academic achievements since, without teachers' guidance, students might not learn to question their own assumptions and become knowledgeable citizens (Bahou, 2012; Frazier et al., 2021; Leo et al., 2020). Van den Akker (2006) developed the curricular spiderweb to align multiple elements of the curriculum, such as aims and objectives, content and the teacher's role. Aligning these elements results in a balanced curriculum in which learning activities contribute to the desired aims, which is essential for effective education, and helps teachers evaluate which elements need improvement when results are not satisfactory.

The current study aimed to provide curriculum guidelines specifically targeting the development of student agency, along with guidelines and examples that might assist teachers in incorporating the notion of student agency in their practices.

STUDENT AGENCY

Student agency is a multifaceted concept that is conceptualised in different ways, depending on the three different perspectives on student agency that have been proposed in the literature and were mentioned in the introduction. The perspective of 'equipping students for their future role in society' emphasises transformational capabilities: being able to use knowledge to shape the world around us (Boyte & Finders, 2016; Shanahan, 2009). In this perspective, the teaching of student agency includes collaborative activities for human betterment (Boyte & Finders, 2016; Stetsenko, 2019). This could start with students' active participation in decision making in school (Gillett-Swan & Sargeant, 2019), and develop into working on a sustainable future for society (Koskela & Paloniemi, 2023). From the perspective of 'agency for learning', the emphasis lies on students' ability to intentionally structure their own learning experiences, based on their interests and needs (Vaughn, 2020b). In this perspective, teaching is dominated by giving choice and voice to students, aiming for

students' autonomous, self-determined learning (Cook-Sather, 2020; Vaughn, 2020b). From the perspective of 'agency as part of students' identity', the focus is on development as independent human beings (Brod et al., 2023). Teaching from this perspective aims to raise awareness in students about their values, identity and possible future (Brod et al., 2023; Shanahan, 2009). Reflective activities are used to make students aware of themselves, their competencies, affections, and inner states, and to enable them to recognise themselves as agents (Arnold & Clarke, 2014; McCombs & Marzano, 1990).

The three perspectives combined represent the 'will' and 'skill' for transformation (cf. Bandura, 2001, 2006). Bandura (2001, 2006), in his conceptualisation of student agency, contends that will and skill can be recognised as 'features' and 'foundations' of agency; this was confirmed in a recent study by Koskela and Paloniemi (2023) as a useful frame for education. The four core features of agency distinguished by Bandura (2001) are intentionality, forethought, self-reactiveness, and self-reflectiveness.

Intentionality is the mental representation of the future and the commitment to make this future a reality. Intentionality discriminates 'agents' from 'doers' (Bandura, 2001). Teachers can help students become aware of their intentions by challenging them, and by providing standards for their performance (Bandura & Cervone, 2023).

Forethought connects intention with action, and refers to goalsetting and plan-making (Bandura, 2001, 2006). Teachers should help students formulate their goals by keeping them focused on the connection between the task and its higher purpose and aims, and by explicating what is needed to reach the higher purpose and aims (Bandura & Cervone, 2023).

The actions, including self-regulating processes to keep going and check if one is on the right track, are called self-reactiveness. This can be stimulated through reflective questioning, modelling, and providing feedback (Bandura & Cervone, 2023).

Self-reflectiveness is the ability to evaluate the results of these actions, compared with the initial intention and with respect to what the students value and their moral standards (Bandura, 2001, 2006). The teachers' role is to help students learn to evaluate in the light of their intentions, to help them align their actions with their original goals and plans, and to help them to think of alternative pathways when needed (Bandura & Cervone, 2023).

These four features of student agency rely on three foundations: consciousness, self-efficacy, and values/morals (Bandura, 2001, 2006). Consciousness involves information processing as well as a certain mindfulness. Consciousness can be predictive of self-reactiveness. When students notice, for example, that they do not understand a subject, this can lead to making a conscious decision to become better (Martin, 2004; McCombs & Marzano, 1990). It can be stimulated, for example, through teachers' modelling, reflective questioning, and aligning 'the why' of learning, with 'the how' (Bandura & Cervone, 2023). Self-efficacy is the belief people have in their capabilities and is seen as the most important foundation of human agency (Bandura, 1982, 2001). Self-efficacy predicts how challenging the goals are that students set for themselves (forethought), and how they persevere in the face of difficulties (self-reactiveness) (Bandura, 1986). Teachers should design tasks for mastery, and correct students' misjudgments of their capacities (Bandura & Cervone, 2023). Values are the things people feel are important to them, such as doing well in school or, in a broader sense, striving for social justice and making a positive change in the world (Arnold & Clarke, 2014; Bandura, 2001; Eccles, 2008; Godwin & Potvin, 2017). Morals refer to the judgement of rightness or wrongness of things and the personal standards on which people judge their actions (Bandura, 2001). Values/morals are important for students to form an intention for their learning, for the near or distant future (Eccles, 2008; Stetsenko, 2019). They also form their reference for reflection (Arnold & Clarke, 2014; Bandura, 2001). Students depend on their teachers to become aware of educational standards and link them to their own (Bandura & Cervone, 2023).

CURRENT STUDY

Despite extensive research into student agency, there is no unified view on how curricular choices could promote the different facets of student agency. Some studies, for example, focused on learning activities aimed at enhancing student engagement, while others emphasised reflective activities to promote students' self-efficacy and consciousness. Combining insights from earlier studies on student agency can help shed light on how the elements of the curricular spiderweb (Van den Akker, 2006) can be aligned to create optimal circumstances for the development of student agency. Therefore, the aim of the current study was to provide an overview of curriculum guidelines for supporting the development of student agency in secondary education, taking into account the multifacetedness of this complex construct. This study was guided by the following question:

- What curriculum guidelines can be provided for supporting the development of student agency in secondary education?

METHOD

We conducted a systematic literature review, aiming on identifying patterns in the data, critically interpreting them, and offering an enriched version of the original guidelines Bandura provided for promoting agency (Zawacki-Richter et al., 2020). Empirical articles that addressed the development of student agency in secondary education were identified, screened, and analysed to develop guidelines for a curriculum. We used two conceptual frameworks for analysing the relation between curricular choices and student agency in the empirical articles. In review studies, conceptual frameworks can guide the analyses to identify relations between a construct and interventions (Zawacki-Richter et al., 2020). In this review study, for the purpose of establishing curricular guidelines for promoting the development of student agency, we used Bandura's (2001, 2006) framework for student agency and Van den Akker's (2003, 2006) framework for curriculum design. As mentioned in the introduction, Bandura's work is recognised as a useful framework for understanding agency in education. Van den Akker's framework for curriculum design is acknowledged as a useful framework for analysing how curricular elements could be aligned by design, to establish a strong and coherent curriculum.

Selection criteria

The criteria for inclusion were based on the context (secondary schools), the language (English and Dutch), and the definition of agency provided in the article. To ensure a basic quality of the studies in the search, we exclusively selected peer-reviewed, empirical articles, focused on student agency. We adopted a backward snowballing method to find more publications by checking the references from the literature base of our initial search (Figure 1).

Search

We used the Leiden University Catalogue, which contains all mainstream databases, like Web of Science, Scopus, Eric, and PsycINFO, for our search. The keywords we used were, respectively, Agency (title) AND agency for learning (any field); Agency (title) AND secondary
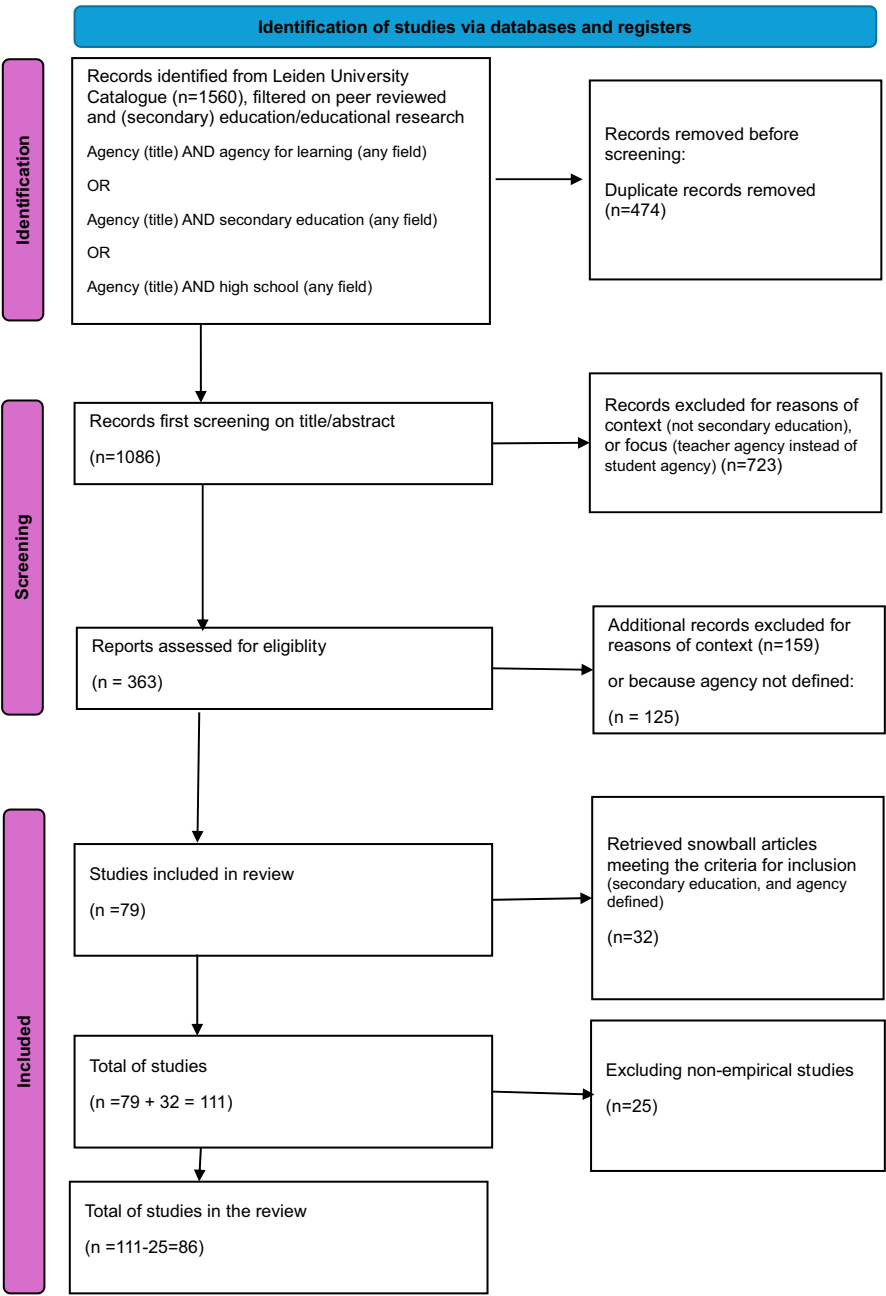
Identification of studies via databases and registers

Identification

Records identified from Leiden University Catalogue (n=1560), filtered on peer reviewed and (secondary) education/educational research

Agency (title) AND agency for learning (any field)

OR

Agency (title) AND secondary education (any field)

OR

Agency (title) AND high school (any field)

Records removed before screening:

Duplicate records removed (n=474)

Screening

Records first screening on title/abstract (n=1086)

Records excluded for reasons of context (not secondary education), or focus (teacher agency instead of student agency) (n=723)

Reports assessed for eligiblity (n = 363)

Additional records excluded for reasons of context (n=159)

or because agency not defined:

(n = 125)

Included

Studies included in review (n =79)

Retrieved snowball articles meeting the criteria for inclusion (secondary education, and agency defined) (n=32)

Total of studies (n =79 + 32 = 111)

Excluding non-empirical studies (n=25)

Total of studies in the review (n =111-25=86)

FIGURE 1 Identification of studies.

education (any field); Agency (title) AND high school (any field); Agency (title) AND middle school (any field); Agency (title) AND student (any field). The final search was done in June 2023.

Data analysis

The data analysis was conducted in two iterations, during which coding was based on two theoretical frameworks (i.e. student agency and curriculum elements). In the first iteration of analyses, we coded the operationalisations of student agency in Excel, using Bandura's features and foundations of agency to comprehend the multifacetedness of student agency (Bandura, 2001, 2006). The operationalisations of values/morals, consciousness, self-efficacy, intentionality, forethought, self-reactiveness and self-reflectiveness found in the studies were summarised in an overview document, which contained all the studies analysed. In the second iteration, we coded fragments related to the curricular elements found in the studies, based on the 'curricular spider's web' (Van den Akker, 2003, 2006). Van den Akker (2003, 2006) developed the curricular spider's web as a theoretical framework that reflects how curricula not only comprise learning content, learning activities, and curriculum objectives, but may also contain other components that are equally important for concretising the curriculum, such as group composition, teacher role, and physical environment. The spider's web consists of ten elements (Figure 2). The coded results of the search for curricular elements were also added to the overview document in Excel. When, for example, researchers provided information on the length of a learning activity, this was coded as 'time'. When researchers mentioned collaborative activities, this was coded as 'grouping'. In the Excel document, more details were added, such as how much time the activity took and how many students were working together per group.

To finalise the summaries of the results and the implications for the curriculum design, we coded Bandura's guidelines for the development of agency features and foundations (Bandura & Cervone, 2023), using the curriculum elements of Van den Akker (2003, 2006). To enrich these guidelines with the results of the empirical studies, we examined for each study which curricular elements were described, and how these were related to operationalisations of the features and foundations of agency. The authors ensured the quality of the coding through iterative discussions, where codes of fragments were reviewed and refined
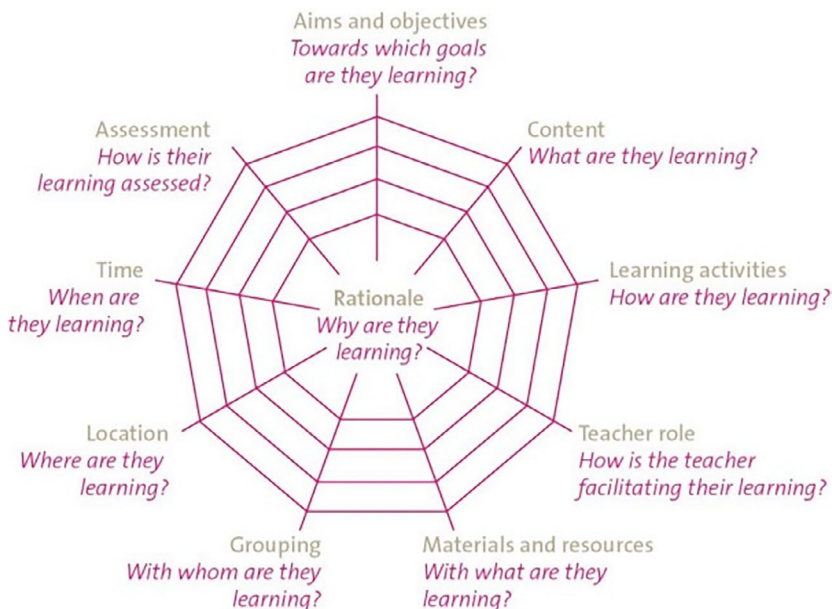

FIGURE 2   Retrieved from 'The spider web: Framework for assessing student participation' (p. 1) by Van der Laan and Bron. SLO.

until a consensus was reached (Hemmler et al., 2022). See Appendices A and B for the coding scheme, along with coding examples.

Although we included all results in the findings, we explicitly elaborated on the findings in the results section when the curricular choices were mentioned in five or more studies, and when four or more of the seven facets of agency were described, to ensure a solid substantiation of the relationship between the curricular choice and student agency.

In order to inspire practitioners in the field, such as teachers, to apply the findings in their own teaching context, we followed Van den Akker (2006) advice to incorporate examples for each finding.

FINDINGS

The 86 articles included in our study span the period from 1998 to 2023, with 80% of the articles from the last decade (Figure 3).

Concerning the level of education, 24 studies were situated in middle schools, 51 in high schools, and 11 in middle and high schools. Most articles originate from Western countries with a shared cultural background, with 41.6% from North America, 27% from Europe, and 14.6% from Oceania. Other studies were conducted in Asia (10.1%), Southern America (3.4%), and Africa (3.4%). Most empirical studies did not entail a newly developed intervention, but a description of how the normal classroom situation provided space for agency. Eleven studies could be described as intervention studies.

The analyses of the studies using the curricular spider's web show that most studies address the question of why agency is important, and what is required of teachers to stimulate the development of agency (Figure 4).

In a study by Basu et al. (2008), we found alignment of most curricular elements. In this study, high school students were examined as they developed their agency within a self-selected subject. The rationale behind this approach was that students should become aware of what is important to them, and how they can impact the world.

The approach involved open assignments in which students could incorporate their aims and values. Two cases were examined: one student explored gravitational pull and the future of the universe; another focused on building a robot. The students co-designed a learning activity for their peers in five lessons of 50 min. One student developed lessons for a class debate and the writing of a paper on the gravitational pull of black holes. The other student
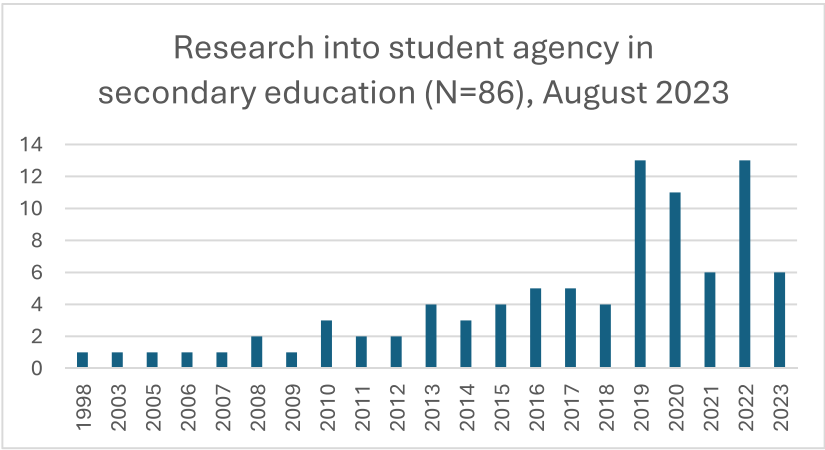

FIGURE 3 Number of studies per year on student agency in secondary education (August 2023).
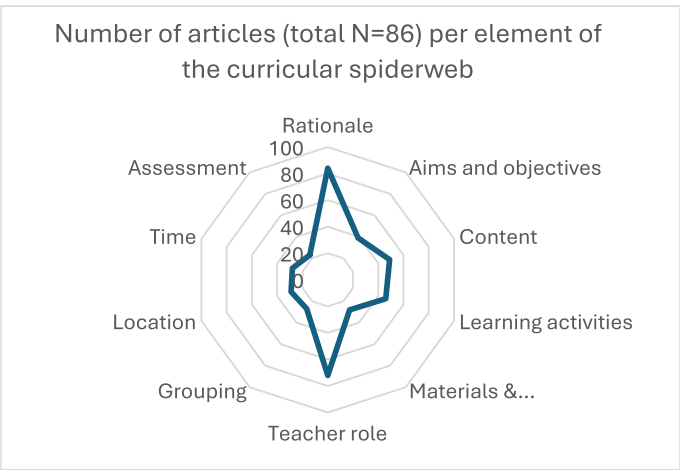
FIGURE 4 Graphic representation of the number of articles per element of the curricular spider's web.

TABLE 1 Rationale in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Rationale (80) What is the higher aim of focusing on student agency in secondary education?	Academic success/learning (39) Personal development/identity (32) Citizenship (26) Engagement in class (12) Higher-order thinking (5) Well-being (5) Self-efficacy (4) Lifelong learning (2) Positive school climate (1)

helped his peers build a robot. The teacher had a supportive role, adapting to the students' needs throughout the learning process.

Assessment of agency was retrospective, with students reflecting on what they wanted to learn, why it mattered, and how they achieved their goals; this was documented in portfolios. This approach allowed the students to structure their own learning experiences, fostering a sense of purpose and accountability.

Below, we report the findings per element of the curricular spider's web, and how they were related to the development of the features and foundations of student agency.

Rationale

In the 80 articles describing why incorporating student agency in the curriculum is important (Table 1), the main aims mentioned corresponded with the perspectives from the theoretical literature described in the introduction: learning, citizenship, and personal development. Deakin Crick et al. (2015) and Heron (2003) discovered that working towards personally meaningful goals spurs students' self-reactiveness in the form of engagement in learning. This engagement gives students more reason to attribute success to themselves, fostering fulfilment and efficacy in learning, ultimately leading to improved academic achievements. Garcia et al. (2015) and Basu et al. (2008) showcased curricula that challenge students to

critically engage in knowledge-building, fostering awareness of values and transformative capacities. Rasa et al. (2023) emphasised the importance of equipping students with the necessary knowledge and skills to tackle life challenges, countering the feelings of hopelessness and apathy often prevalent among students when faced with societal problems.

Assignments that stimulate students' learning and transformative capacity should be connected to a higher cause, such as learning facts in order to use the knowledge to develop environmentally friendly packaging (Basu & Barton, 2010), creating a multimedia presentation to make people aware of educational injustice (Garcia et al., 2015), or finding a solution for a polluted creek in the school environment (Vaughn, 2020a).

Aims and objectives

The 39 articles mentioning aims and objectives (Table 2) primarily set subject-related goals, such as scientific thinking, literacy skills, and collaborative skills. Notably, explicit goals for developing agency were absent; however, teachers adopted an approach termed 'epistemic agency'. This approach positions students as active contributors to shaping knowledge and practices within their learning community (Lai & Campbell, 2018; Zimmerman & Weible, 2018).

Conrad and Andrews (2023) combined literacy skills with collaboration. They reported a poetry project, designed to develop an appreciation for poetry and to promote learning to express feelings and values (Conrad & Andrews, 2023). The collaborative tasks facilitated students' agentic development by providing an opportunity for the students to share their own values and feelings through poetry and to become inspired by the values and feelings other students shared with them. Reflecting on the project, one of the students said, 'It actually expanded my thinking' (Conrad & Andrews, 2023, p. 294).

Tayne et al. (2021) described a program of lessons aimed at promoting students' learning about the history of climate change, its causes, and its impact on the community. The objective was that students would write their own storyline and create their own film to raise awareness of climate change in other people. This was aimed to position students as agents of change.

This positioning of students as agents of change requires a broad language register, for the students to be able to communicate with others. Beck and Jones (2023) aimed to

TABLE 2 Aims and objectives in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Aims and objectives (39) What are the learning goals in the curriculum?	Scientific thinking (19) Literacy skills (7) Collaborative skills (5) Argumentation skills (3) Learning skills (2) Digital literacy (2) Understanding of physics (2) Becoming aware of and expressing feelings, values, and ideas (2) Programming skills (1) Problem-solving skills (1) Active learning (1) Well-being community (1) Principles of electricity (1) Computational thinking (1) Political engagement (1) Religious perspective development (1)

develop this register by having the students write an essay. This required doing research, choosing the right words, and finding the right tone. Galloway et al. (2019) specifically aimed at academic language development, with goals like being concise, being authoritative yet nuanced, and structuring the text coherently. The teacher positioned the students as agents through dialogue by providing prompts to spur the students' own thinking about the task, instead of telling them what to do.

Content

In the 41 reviewed articles concerning content within the curriculum for student agency (Table 3), a variety of authentic content domains were observed, primarily in science-related fields. Engaging students with authentic problems, and exploring why these issues are valuable to solve, empowers students to translate their values into actionable solutions (Basu et al., 2008; Gale et al., 2022).

What stands out is that, in most examples, the teacher was not the only one responsible for providing content. In a science literacy project, Rappa and Tang (2017) mention that the teacher stimulated students to choose an out-of-school text themselves (for example, from a magazine, video, TV episode) and to use the curriculum content to analyse it. In this case, the students applied the notion of force, equations, and electrons within the nervous system to the resource they found.

Some studies mentioned teacher-led content, with authentic topics to work with: for example, developing a tool to filter polluted water in a developing country (Godwin & Potvin, 2017). This matched the rationale of this project, which was promoting citizenship and deeper learning.

Other studies combined the contents of subjects. Gale et al. (2022), for example, reported a project in which science, music, and digital knowledge were combined. Students were encouraged to create a website showing their scientific findings, with background music.

Learning activities

The 44 articles mentioning learning activities within the curriculum for student agency predominantly featured research-based activities, conducted collaboratively among peers (Table 4). Engaging in research activities, particularly when students formulate their own questions for inquiry, sparks learning engagement (Heron, 2003; Leo et al., 2020). Collaborative work not only enhances students' awareness of their values but also fosters trust in collaborative problem-solving for critical issues like climate change (Garcia et al., 2015; Tayne et al., 2021). Conrad and Andrews (2023), Leo et al. (2020), and Tang and Yang (2017),

TABLE 3 Content in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Content (41) What are students learning?	Science (23) Literacy (8) ICT (5) Art (4) Topic of students' choice (3) Maths (3) Social skills (1) History (1) Politics (1)

TABLE 4   Learning activities in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Learning activities (44) How are students learning?	Inquiry-based learning (22) Collaborative activities (21) Discussions/classroom talk (7) Writing assignments (6) Scientific experiments (6) Shared knowledge building (4) Film making (3) Talk about the assignment (3) Peer assessment (2) Teacher's instruction (1) Game design (1) Reading (1) Co-designing lessons (1) Text analyses (1) Homework (1) Doing a presentation in class (1) Self-assessment (1) Quiz (1) Taking photos during the task (1)

reported that interaction with others is also important for students, to become aware of their own world views, norms, and (cognitive) development.

Garcia et al. (2015) developed an action research program in which students gathered data by creating and analysing surveys, and by interviewing people. The students synthesised the information and created a multimedia presentation. The guiding lessons covered topics like research methods and social theory. Sharing their findings with stakeholders contributed to a meaningful learning activity for the students. Gale et al. (2022) reported the following statement from a student who created a website to present the results of their inquiries: 'Well, anxiety and stress is like one of those disorders that are common to basically every high school student or adult, child. And we wanted to make a mini website about how to prevent or help people that are in anxiety and stress situations' (Gale et al., 2022, p. 285).

Writing assignments have multiple aims: for students to learn to synthesise information, to adapt their language to their audience, and to reflect on their values and writing (Conrad & Andrews, 2023). Beck and Jones (2023) incorporated these goals in a writing task and reported how teachers guided students' thinking. Students could choose from different assignments, varying from analysing a poem by Coleridge to writing about what became of Eliza in Shaw's Pygmalion, or identifying Scott Fitzgerald's view of the American dream. In all assignments, students were required to adapt their tone to their audience. The students were given feedback, and used this to formulate their own learning goals for writing. They worked on these goals in an iterative writing process. Writing assignments can also help students become aware of their intentions, values, and knowledge gaps (Conrad & Andrews, 2023; Galloway et al., 2019), and can be used to reflect on what was learned (Garcia et al., 2015) or to communicate findings with others (Basu et al., 2008; Beck & Jones, 2023).

A classroom discussion might promote scientific reasoning, stimulate students to express their values (Heron, 2003; Lindahl & Linder, 2013), or challenge them to reconsider their beliefs when new information comes to hand (Clarke et al., 2016). Controversial themes, like gene technology, are fit for classroom discussion, allowing students to share their beliefs, findings, and values (Lindahl & Linder, 2013).

Materials and resources

The 23 studies that mentioned materials and resources (Table 5) mainly reported authentic online resources. Using diverse authentic online resources aids students in synthesising information and constructing conscious knowledge systems (Lai & Campbell, 2018; Rappa & Tang, 2017). Online resources are easy to use in inquiry-based activities and can be used to find information, produce knowledge, and share it with others (Lai & Campbell, 2018; Yang, 2019).

Jang (2022) reported a writing assignment where online resources, in combination with the textbook and a dictionary from school, were used to scaffold students' writing. Conrad and Andrews (2023) used an online blank document for a collaborative writing task, so teachers could monitor each student's contribution.

Lai and Campbell (2018) found it effective to use an online Knowledge Forum, where students could share and build knowledge together, making the results visible using a knowledge web.

Teacher's role

The 68 articles on the role of teachers shed light on the pivotal role of teachers in fostering student agency (Table 6). Key guidelines are finding a balance between student-led and teacher-led learning, guiding collaboration, clarifying the purpose behind assignments, encouraging higher-order thinking, and maintaining high expectations for students.

In a student-led learning environment, the teacher co-creates the learning trajectory with students (Leo et al., 2020; Vaughn, 2020b). This raises students' awareness of an activity's purposes (Godwin & Potvin, 2017; Lanas & Corbett, 2011). This awareness aids student engagement and perseverance (Godwin & Potvin, 2017; Lanas & Corbett, 2011; Reeve, 2013).

Teachers' high expectations, coupled with support, aid students in overcoming difficulties (Anderson et al., 2019; Godwin & Potvin, 2017; Verhoeven et al., 2021). Some students might need assistance in seeking additional information, connecting ideas, and developing cooperation skills (Deakin Crick et al., 2015; Godwin & Potvin, 2017; Lai & Campbell, 2018; Yang, 2019). Some might need help to develop coping mechanisms for stress (Parker et al., 2022).

Garcia et al. (2015) found that teachers' guidance of interaction, in class or with the world, helps students become aware of their own values and morals. This guidance could take different forms: helping students to formulate research questions, providing information, facilitating cooperation with peers from other schools, asking questions to guide students' thinking, or helping them to reflect (Garcia et al., 2015). Awareness can also be raised by

TABLE 5 Materials in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Materials and resources (23) What are students using to learn?	Online resources (12) Textbooks (6) Video (5) Experimental sets (3) Stories (2) Peers (2) Literature (2) TV (1) PowerPoint (1) Online document (1)

TABLE 6 Teacher's role in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Teacher role (68) How can a teacher support the development of student agency?	Encouraging student-led learning (32) Adapting to students' needs for support (emotionally, cognitively, and socially) (27) Guiding classroom talk (22) Explaining the why of assignments (14) Encouraging higher-order thinking (13) Guiding collaboration (13) Helping students to reflect (12) Being a source of knowledge (8) Relating to students through dialogue (7) Having high expectations of students (4) Working with 'big ideas', a framework of bigger themes in a subject (4) Modelling (4) Creating meaningful learning experiences (4) Helping students to build their identity (3) Adapting the curriculum (3) Co-regulating learning (2) Checking homework (2) Treating students fairly (2) Using students' input to improve the learning environment (2) Aiming for inclusiveness (2) Giving instruction (2) Asking for feedback on their role (1) Using Vygotsky's double stimulation (1) Explaining success criteria (1) Focusing on mastery (1) Focusing on life skills (1) Assessing students' future perspectives (1) Promoting self-efficacy (1) Focusing on process instead of results (1)

using conflicting worldviews to stimulate independent thinking, or promoting debate on controversial themes. The teachers' role in this situation is not to tell students what to think, but to help them to think independently (Lindahl & Linder, 2013; Tang & Yang, 2017).

Yang (2019) found that helping students become aware of their knowledge gaps in topics of their choice helps students' intentional learning. The teacher can scaffold this by visualising what students know already, what they should know, and what questions they have. In this process, the teacher has the important function of staging the learning activities in increasing complexity, and frequently reflecting on the process of learning (Yang, 2019).

Grouping

The 25 articles addressing grouping strategies indicate that it is important to vary individual assignments with group work, according to the aims of an activity (Table 7).

Individual tasks enable teachers to assess students' personal development (Galloway et al., 2019; Jang, 2022), while collaboration enhances students' collective efficacy, particularly in addressing critical issues like climate change (Gale et al., 2022; Tayne et al., 2021). In an era that emphasises individuality, nurturing this collective sense of agency remains crucial (Tayne et al., 2021).

Collaboration stands out as a crucial skill for fostering agency (Gale et al., 2022; Leo et al., 2020). Within collaborative efforts, roles like Project Manager, Server Administrator, Quality Assessment Manager, or Layout Designer ensure individual contributions with

TABLE 7 Grouping in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Grouping (25) How are students collaborating in class?	Collaboration in pairs or small groups (21) Individual learning (9)

TABLE 8 Time in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Time (28) How much time is planned for the learning trajectory? When are they learning?	Hours (9) Days (2) Weeks (9) Months (3) Year(s) (5)

shared responsibility (Gale et al., 2022). Assigning various roles not only enhances students' commitment to cooperation, but can also ensure equity when roles are rotated, offering each student an opportunity to contribute meaningfully (Gale et al., 2022; Leo et al., 2020).

Individual tasks play a vital role as well, especially in assessing students' specific abilities and personal characteristics. For instance, Galloway et al. (2019) explored students' academic language and metalanguage skills through individual writing assignments. Similarly, Jang (2022) used individual writing tasks to evaluate students' personal ideas and interests, emphasising the value of such assignments in gauging individual capabilities and unique perspectives.

Time

The 28 empirical studies referring to time span a spectrum from single lessons to multiple years (Table 8), reflecting the range of research methods more than a deliberate concern for agency. The development of student agency cannot be confined to isolated interventions; rather, it develops and matures over a student's time in school (Basu et al., 2008; Dabbagh & Castaneda, 2020). Scholars emphasise the importance of adopting a comprehensive, whole-school approach to effectively foster and promote agency throughout a student's educational journey (Bahou, 2012; Lanas & Corbett, 2011).

In the intervention studies, the designs predominantly spanned a series of lessons, given over several weeks. Students participated actively in identifying knowledge gaps, conducting information searches, synthesising information, engaging in reflective discussions, and enhancing their ideas and work. An intervention by Gale et al. (2022) encompassed a year-long program, rooted in a problem-based learning curriculum. This approach facilitated students in acquiring both knowledge and skills, empowering them to tackle real-world challenges and needs. Additionally, it prompted students to envision their potential future, while imagining actionable steps to turn their aspirations into reality.

Location

Of the 29 articles mentioning location, most report learning activities in classrooms, although some activities combined classroom work with field trips for authentic and meaningful

TABLE 9 Location in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Location (29) Where does the learning take place?	Classroom (25) Field trips (6) Flexible learning space, for example, a symposium or open learning centre (5) Online (2)

learning experiences (Table 9). The classroom allows for a variety of learning activities in one lesson, from an introduction to the topic, to working on an assignment and classroom talk, all with multiple resources at hand (Garcia et al., 2015; Yang, 2019). Field trips in addition to this can make learning more authentic and meaningful (Garcia et al., 2015; Godwin & Potvin, 2017).

Godwin and Potvin (2017) investigated a project in which students developed a water filtering system. This was delivered to a developing country by some students. The students felt very proud that they could improve the situation of people abroad. Garcia et al. (2015) combined classroom activities with field trips in their action research. Students followed courses on doing research at a university, visited other schools, interviewed people online, and were allowed to present their findings at the AERA.

Technology made it possible for Conrad and Andrews (2023) to have students cooperate with students from a distant college, allowing for meaningful interaction without having to leave the classroom.

Assessment

In the 22 articles concerned with assessment (Table 10), learning assessment primarily involved tests of factual memorisation, which, although not explicitly linked to agency, is intertwined with consciousness as it measures information-processing abilities (Galloway et al., 2019).

To effectively assess learning while nurturing agency, a combination of formative and summative assessment strategies is recommended. Formative assessments provide ongoing feedback that guides students and teachers in shaping the learning process (Galliott & Graham, 2014; Ko et al., 2021; Raffo et al., 2015).

Assessment of students' sense of agency can be achieved through surveys and reflective questions (Deakin Crick et al., 2015). Dialogue serves as another valuable tool for assessing students' interests and thoughts, and for identifying their needs (Basu et al., 2008; Yang, 2019). Additionally, writing assignments offer insights into students' ambitions, dreams, emotions, and interests (Conrad & Andrews, 2023; Rasa et al., 2023).

An example of formative assessment was provided by Basu et al. (2008) and Beck and Jones (2023), who promoted reflection on growth and values. Students reported their learning trajectory and related this to explicating new goals. Conrad and Andrews (2023) used poetry to assess agency, in the sense that students expressed their intentions and values in poetry.

Studies including surveys used different operationalisations to assess agency, with items like, 'If my homework is difficult, I keep working at it trying to figure it out.' (Anderson et al., 2019), 'I can generally predict how long it will take me to learn something.' (Deakin Crick et al., 2015), or 'When it comes to figuring out a new lesson, I am smart enough to figure it out' (Walls & Little, 2005).

TABLE 10 Assessment in a curriculum for student agency.

Curricular theme	Findings with the number of articles included between brackets
Assessment (38) How is progress in learning and agentic development assessed?	Surveys (17) (Reflective) dialogue (6) (Reflective) writing (6) Tests (5) Presentation (4) Portfolio (3) Classroom talk (2) Multimedia presentations (2) Film as representation of what is learned (2) Game (1) Wiki page (1) Observations (1)

DISCUSSION

The reviewed literature, along with Bandura and Cervone (2023), confirms the importance of agency for the purpose of learning, personal development and human betterment.

Most articles originate from Western countries. Although student agency is embraced worldwide, the understanding of the concept and the degree of autonomy schools have to make their own choices vary by country (OECD, 2019). Even within individual countries, scholars have adopted different approaches, ranging from developing entirely new lesson series to identifying conducive spaces for agency within prescribed curricula. Some studies emphasise the impact of the curriculum on students' engagement in the classroom, while others aimed at students acting upon their own values and interests. Synthesising these perspectives reveals a comprehensive view of how a curriculum can be designed to support the core features and foundations of student agency, as well as to contribute to the higher purposes of the curriculum, as discussed in the work of Deakin Crick et al. (2015) and Gale et al. (2022).

Key elements, such as the teacher's facilitation, diverse learning activities, authentic content, and assessment strategies, play a significant role in cultivating student agency. For example, teachers who explain 'the why' of learning activities and design tasks aim at mastery foster students' commitment to achieving goals (intentionality) and enhancing their self-efficacy (e.g. Anderson et al., 2019; Bandura & Cervone, 2023; Deakin Crick et al., 2015). Teachers' high expectations, combined with supporting effective learning strategies, support students' intentions and self-reactiveness (e.g. Bandura & Cervone, 2023; Parker et al., 2022).

Table 11 highlights the main results from the extended review (mentioned in five or more articles and related to four or more facets of agency), showing how curricular elements support both the foundations and features of student agency. Results that extend Bandura's earlier guidelines (Bandura & Cervone, 2023) are noted in italics.

The seemingly contradictory results on the teacher's role is worth mentioning. While recent literature emphasises student-led learning, Bandura and Cervone (2023) underscore the importance of observational learning, modelling, and direct instruction. This apparent dichotomy is often topic of debate. On one end of the spectrum is argued that too much student autonomy may harm their academic achievement (Bahou, 2012; Frazier et al., 2021; Leo et al., 2020). On the other end, strictly teacher-led learning has been associated with students' passivity and disengagement from learning, which negatively affects academic outcomes as well (Anderson et al., 2019). While students require guidance to develop effective learning strategies and to maintain attention in class (Frazier et al., 2021), they also need the freedom to engage with personally meaningful topics (Deakin Crick et al., 2015).

TABLE 11 Curricular spider's web for student agency: Main results of review added in italics.

	Foundations agency	Features agency
Elements curricular spider's web		
Rationale	Values/morals, self-efficacy, consciousness: Transformation (human betterment/environmental sustainability), academic success, higher-order thinking, personal development, *citizenship, well-being*	Self-reactiveness: Learning/*academic success, engagement*
Aims and objectives	Consciousness: Reasoning, understanding causality, information processing, learning to observe, developing awareness, developing language proficiency, *scientific thinking, literacy skills, learning to synthesise information, independent thinking, identifying learning gaps* Values/morals: Developing standards, *expressing feelings and values* Self-efficacy: Making correct judgements of capacities, *feeling empowered as agents of change*	Intentionality: Developing commitment to reach a goal Forethought: Setting goals, choosing strategies, making plans Self-reactiveness: Active learning, *collaborative skills, developing knowledge and skills students need to respond to challenges and opportunities in life* Self-reflectiveness: Learning to evaluate in the light of students' intentions, thinking of alternative/future pathways
Content	Values/morals: *Authentic topics* (e.g. *literacy, science, ICT*)	Forethought, self-reactiveness: *Authentic topics* (e.g. *literacy, science, ICT*), *interdisciplinary tasks*
Learning activity	Consciousness, values/morals, self-efficacy: Observation, collaborative activity, *writing, inquiry-based learning, classroom discussion* Self-efficacy: Design tasks for mastery, *tasks that empowers students as agents of change (f.e. climate issues)*	Intentionality: Generating ideas, *writing* Forethought: Formulating goals/subgoals, strategies, plans, *formulating their own questions* Self-reactiveness: Note-taking, *writing, inquiry-based learning, collaborative knowledge building* Self-reflectiveness: Reflection, *reflective writing*
Materials and resources	Consciousness: *Online resources*	Self-reactiveness: *Online resources*

TABLE 11 (Continued)

	Foundations agency	Features agency
Teacher role	Consciousness, values/morals, self-efficacy: Modelling, reflective questioning, raising awareness of 'the why', identifying knowledge gaps, providing feedback, direct instruction, explicating standards and linking them to students' standards, *encouraging student-led learning, encouraging higher-order thinking, guiding students' (independent) thinking, providing conflicting worldviews to think about* Self-efficacy: Knowing students, correcting misconceptions, designing tasks for mastery, *having high expectations, identifying and adapting to students' needs* Values/morals: *Guiding interaction, linking classroom activities to students' personal, meaningful goals, linking the aims to the rationale*	Intentionality: Challenging students, providing standards for performance, *having high expectations of students* Forethought: Communicating educational goals, scaffolding student's goalsetting, guiding students, keeping students focused on connection between task and higher purpose, *helping students identify knowledge gaps and learn how to address them* Self-reactiveness: Modelling, guiding students, providing feedback, *encouraging student-led learning, guiding classroom talk, guiding collaboration, being a source of knowledge, stimulating students to find their own resources/connecting these to school knowledge, providing tailored scaffolding, staging tasks in increasing difficulty, guiding their inquiries, providing choice* Self-reflectiveness: Aligning students' actions with intentions, goals, plans, results, correcting misjudgements, reflective questioning, *helping students to reflect*
Grouping	Consciousness, values/morals: *Individual assignments, small groups*	Self-reactiveness: *Individual assignments, small groups*
Time	*Facets of student agency can be recognised and stimulated in one lesson, but for sustainable development, the curriculum should be designed for a substantial series of lessons, with space for development over the years*	
Location	Values/morals: *Field trips*	Self-reactiveness: *Classroom, flexible learning space* (e.g. *symposium/open learning centre*), *field trips*

TABLE 11 (Continued)

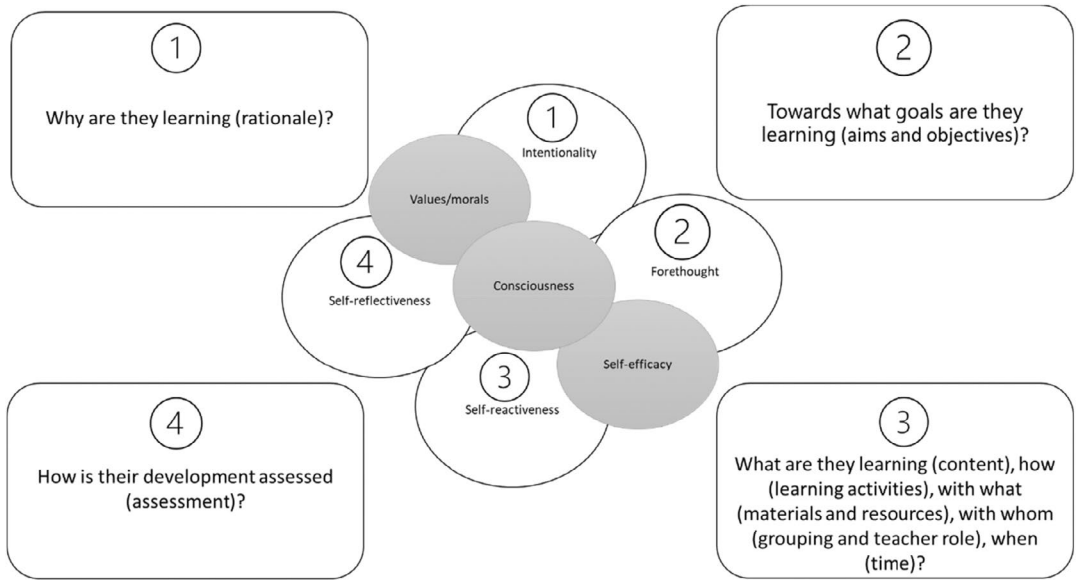|	Foundations agency	Features agency
Assessment		Self-reflectiveness: *Surveys, (reflective) dialogue, tests (formative/ summative), (reflective) writing, website, presentation, creating a knowledge web, portfolio*

FIGURE 5 Model for designing a curriculum for student agency (numbering is used to identify the relation between curricular choices and agency features, not to suggest a necessary order, as curriculum design is an iterative process).

Achieving a balance between structure and freedom is crucial for fostering agency for learning, personal development, and societal contribution (Basu & Barton, 2010). The appropriate level of scaffolding is determined not only by curriculum goals but also by specific needs of students for their development (Vaughn, 2020a).

IMPLICATIONS

When designing a curriculum for agency, it is best to combine content with positioning students as agents, with the ultimate aim being to enhance their academic achievement as well as to stimulate their personal development and empower them as agents of change. Alignment between the rationale of the curriculum and the other nine curricular elements is needed to stimulate the features and foundations of agency, which themselves need to be aligned too, as the foundations of agency predict its features (Figure 5). Associating 'the why' of what students are learning (1) with their own values and morals spurs students' commitment to achieving learning goals (intentionality). Aligning students' aims and objectives with the prescribed aims of the curriculum (2) supports conscious goal-setting

and planning (forethought). Structuring activities for mastery (3) enhances students' self-efficacy, which fosters persistence in learning (self-reactiveness). Integrating assessment of learning (4) with students' reflection on whether they have reached valued goals helps them identify their successes (for self-efficacy) or gaps in learning, thereby stimulating future learning. Regarding the teacher's role, some activities can be planned in advance, while others emerge organically during the learning process as teachers respond to students' evolving needs.

We suggest that teacher education includes knowledge on how student agency emerges in adolescence and how the development can be promoted through explicitly designed activities. This is intended to strengthen teachers' capacity to adapt a prescribed curriculum to their own context and to their students' needs.

LIMITATIONS AND FUTURE RESEARCH

The broad diversity of the reviewed literature, encompassing various contexts, educational settings, methodologies, and operationalisations of agency, may constrain the generalisability of the findings. As students' agentic capacities develop over time, the curriculum design should take into account how to stage the tasks, alligned to students' level of agency (Brod et al., 2023). Although previous studies underscored the importance of learning activities such as collaboration or inquiry-based learning, guidelines for developing such activities were not included. Consulting additional research is crucial, as demonstrated by Baucal et al. (2023), who found that collaborative activities may falter due to poorly designed assignments, inadequate student skills, or insufficient guidance by teachers. Similarly, Kranz et al. (2023) warn of the challenges students encounter when their inquiries lack proper guidance. It is essential to draw upon the literature dedicated to specific learning activities when designing a curriculum fostering agency.

The implications of these findings prompt further inquiry into how educators can apply these guidelines to design agency-focused curricula. Pieters et al. (2019) advocate for collaborative curriculum design among teachers, fostering adaptability to individual contexts, mutual learning, enhancement of curriculum design skills, and the establishment of sustainable reforms aligned with the school's vision. Similarly, Charteris and Smardon (2018) and Deakin Crick et al. (2015) underscore the necessity of teacher cooperation in curriculum design to strengthen collective efforts and thereby significantly impact students' agentic development.

Action research, preferably including teachers and students, emerges as a powerful tool to examine teachers' and students' beliefs about and understanding of agency, while at the same time providing both teachers and students the agentic space needed to co-design interventions and systematically evaluate their impact within their own school context (Vaughn, 2020a). Incorporating students' voices in curriculum decisions might advance teachers' confidence in students' abilities to express their needs and interests, and is helpful for students' development as well (Gillett-Swan & Sargeant, 2019; O'Neill, 2014). Future research in cooperation with students as co-researchers aligns with the notion of students as agents (Cook-Sather, 2020).

Uptaking an approach of collaborative curriculum development, future endeavours should explore the sustained impact of curricular interventions promoting student agency over extended periods. This entails investigating the progression of student agency itself with a coherent assessment instrument, as well as its effect on other aims of the curriculum. Although most studies claimed student agency would enhance academic success or deeper learning, evidence for such a claim was scarce. Future research is needed to provide evidence of how foundations and features of agency relate to academic achievement.

CONFLICT OF INTEREST STATEMENT
No potential conflict of interest was reported by the authors.

DATA AVAILABILITY STATEMENT
Supplemental online material—Additional reference list: Empirical articles included in the review.

ETHICS STATEMENT
This study does not involve human participants or data collection. Therefore, ethical approval is not applicable as it is a systematic literature review.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

APPENDIX A

CODING SCHEME STUDENT AGENCY WITH EXAMPLES

Agency construct (codes)	Definition Bandura (2001)	Examples
Intentionality	A mental representation of the future and a commitment to make this future reality	Desires, motives for action (Arnold & Clarke, 2014; Matusov et al., 2016; McCombs & Marzano, 1990; Mirón & Lauria, 1998) Projection of the future (Den Heyer & Fidyk, 2007; Galloway et al., 2019; Lanas & Corbett, 2011; Mäkelä & Kalalahti, 2020; Sharma, 2007; Stetsenko, 2019) Purpose (Deakin Crick et al., 2015; Reeve & Tseng, 2011; Sannino et al., 2016; Vaughn, 2020a) Acknowledgement of what is to be learned and why (Charteris & Eryn, 2017; Gordon, 2006; Yang, 2019) Knowing of what is necessary to reach a career of choice (Basu et al., 2008; Galliott & Graham, 2014; Gowlett, 2014)
Forethought	Goals and plans	Goalsetting (Arnold & Clarke, 2014; Basu et al., 2008; Burger & Walk, 2016; Charteris & Eryn, 2017; Clarke et al., 2016; Dabbagh & Castaneda, 2020; Matusov et al., 2016; McCombs & Marzano, 1990; Miller et al., 2018; Yang, 2019) Making plans to achieve goals, like making a time schedule, adjusting learning strategies or preparing questions for class (Bahou, 2012; Deakin Crick et al., 2015; Gowlett, 2014; Mameli et al., 2019; Miller et al., 2018; Rappa & Tang, 2017)

Agency construct (codes)	Definition Bandura (2001)	Examples
Self-reactiveness	Actions, including self-regulating processes to keep going and to monitor if one is on the right track	Engaging in dialogue (Arnold & Clarke, 2014; Bahou, 2012; Charteris, 2013; Clarke et al., 2016; Deed et al., 2014; Galloway et al., 2019; Garcia et al., 2015; Gillett-Swan & Sargeant, 2019; González-Howard & McNeill, 2020; Gowlett, 2014; Hjelmér et al., 2010; Ko & Krist, 2019; Lai & Campbell, 2018; Leo et al., 2020; Lund et al., 2019; Mameli et al., 2019, 2020; Mameli & Passini, 2019; Martin, 2004, 2007, 2016; Passey et al., 2018; Reeve, 2013; Reeve & Tseng, 2011; Sharma, 2007; Stroupe, 2014; Tang & Yang, 2017; Zimmerman & Weible, 2018) Using of and searching for resources (Arnold & Clarke, 2014; Bahou, 2012; Dabbagh & Castaneda, 2020; Dahlstrom, 2019; Deed et al., 2014; Engeness, 2020; Galloway et al., 2019; Garcia et al., 2015; Lund et al., 2019; Rappa & Tang, 2017; Reeve & Tseng, 2011; Shanahan, 2009; Tang & Yang, 2017; Zimmerman & Weible, 2018) Taking initiative (Arnold & Clarke, 2014; Ko & Krist, 2019) Creating and sharing content (Dabbagh & Castaneda, 2020; Lai & Campbell, 2018; Miller et al., 2018; Sannino et al., 2016; Yang, 2019) Making choices and decisions (Charteris, 2015; Dabbagh & Castaneda, 2020; Dahlstrom, 2019; Gillett-Swan & Sargeant, 2019; Gowlett, 2014; Ko & Krist, 2019; Leo et al., 2020; Lin & Chen, 2020; Matusov et al., 2016; McCombs & Marzano, 1990; Passey et al., 2018; Shanahan, 2009; Tang & Yang, 2017; Vaughn, 2020b; York & Kirshner, 2019) Collaborating with others (Charteris & Eryn, 2017; Dabbagh & Castaneda, 2020; Deed et al., 2014; Engeness, 2020; Lund et al., 2019; Martin, 2016; Stetsenko, 2019; Yang, 2019) Using learning strategies (Deakin Crick et al., 2015; Deed et al., 2014; Mameli et al., 2019; Matusov et al., 2016) Making notes (Mameli et al., 2019) Exploring possibilities and follow one's interest (Anderson et al., 2019; Vaughn, 2020a) Persisting in the face of difficulties (Anderson et al., 2019; Vaughn, 2020b) Application of lessons to social situations (Den Heyer & Fidyk, 2007)

Agency construct (codes)	Definition Bandura (2001)	Examples
Self-reflectiveness	The metacognitive ability to monitor one's actions and thoughts, comparing the results of these actions with the initial intention and moral judgement about the quality of the actions, based on personal standards	Monitoring during the process of learning which is a reflection of how one proceeds in alignment with one's values and goals and might lead to adjustments in one's approach (Arnold & Clarke, 2014; Bahou, 2012; Basu & Barton, 2010; Charteris, 2015; Charteris & Smardon, 2018; Dabbagh & Castaneda, 2020; Deakin Crick et al., 2015; Deed et al., 2014; González-Howard & McNeill, 2020; Lindahl & Linder, 2013; Mäkelä & Kalalahti, 2020; Mameli et al., 2019; Martin, 2004; Matusov et al., 2016; Vaughn, 2020a) Reflection on the results of the learning process which contributes to a student's self-efficacy and/or personal identity (Anderson et al., 2019; Basu & Barton, 2010; Basu et al., 2008; Charteris & Eryn, 2017; Clarke et al., 2016; Dabbagh & Castaneda, 2020; Deakin Crick et al., 2015; Den Heyer & Fidyk, 2007; Garcia et al., 2015; Godwin & Potvin, 2017; Jeziorski & Therriault, 2019; Millet et al., 2018; Yang, 2019)
Consciousness	Purposive accessing and deliberative processing of information for selecting, constructing, regulating, and evaluating courses of action	Inner mental processes or mental state of students (Arnold & Clarke, 2014) Paying attention (Mameli et al., 2019) Reasoning (González-Howard & McNeill, 2020) Active interpretation of experiences (connecting past, present and future) (Clarke et al., 2016; Deakin Crick et al., 2015; Den Heyer & Fidyk, 2007; Garcia et al., 2015; Martin, 2004; Sharma, 2007) Sense-making processes (Deakin Crick et al., 2015; Rodriguez, 2013) Process of meaning (Dahlstrom, 2019; Frankel et al., 2019; Fu & Clarke, 2019; Tayne et al., 2021) Knowledge creation (Jeziorski & Therriault, 2019; Lund et al., 2019) Awareness (Basu et al., 2008; Charteris & Eryn, 2017; Deakin Crick et al., 2015; Gordon, 2006; McCombs & Marzano, 1990; Yang, 2019) Information processing (Galloway et al., 2019) Trying to understand an assignment (Rappa & Tang, 2017) Concentration (Stewart, 2013)

Agency construct (codes)	Definition Bandura (2001)	Examples
Self-efficacy	The belief people have in their capabilities	Perceived abilities and affordances (Dabbagh & Castaneda, 2020; Leo et al., 2020; Lindahl & Linder, 2013; Reeve, 2013) Positive self-image as a learner in a specific context or education in general (Anderson et al., 2019; Charteris, 2015; Deakin Crick et al., 2015; Godwin & Potvin, 2017; Martin et al., 2017; Matusov et al., 2016; McCombs & Marzano, 1990; Shanahan, 2009; Vaughn, 2020a; Walsh & Cordero, 2019; Zimmerman & Weible, 2018) Confidence (Burger & Walk, 2016) Believe they can make a difference (Clarke et al., 2016; Tayne et al., 2021) Feeling of control of academic achievement (Heron, 2003; Walls & Little, 2005)
Values/morals	Values are the things we feel are important or interesting to us. Our moral is our judgement of rightness or wrongness of things and the personal standards on which we judge the things we undertake	Things worth pursuing (Arnold & Clarke, 2014; Deakin Crick et al., 2015) Feeling responsible (Arnold & Clarke, 2014) A students' belief system (Dabbagh & Castaneda, 2020; Splitter, 2011; Tang & Yang, 2017; Walsh & Cordero, 2019) A student's interest or affect (Anderson et al., 2019; Charteris, 2013; Dabbagh & Castaneda, 2020; Frankel et al., 2019; Godwin & Potvin, 2017; Martin, 2004; McCombs & Marzano, 1990; Sherma, 2007) Norms (Dahlstrom, 2019; Ko & Krist, 2019; Lindahl & Linder, 2013; Matusov et al., 2016; Shanahan, 2009) Work ethic (Basu et al., 2008; Burger & Walk, 2016; Mäkelä & Kalalahti, 2020) Ideals (Den Heyer & Fidyk, 2007; Sannino et al., 2016; Stetsenko, 2019; Tayne et al., 2021) Experienced meaning and relevance of the subject to be learned (Deakin Crick et al., 2015; Fu & Clarke, 2019; Heron, 2003; Walls & Little, 2005) Wish to become independent or being recognised as independent actor (Charteris & Smardon, 2018; Gordon, 2006; Gowlett, 2014; Heron, 2003; Martin et al., 2017)

APPENDIX B

CODING SCHEME CURRICULUM ELEMENTS WITH EXAMPLES

Curricular theme	Codes (with the number of articles per code between brackets)	Examples
Rationale What is the higher aim of focusing on student agency in secondary education?	Academic success/learning (39) Personal development/identity (32) Citizenship (26) Engagement in class (12) Higher-order thinking (5) Well-being (5) Self-efficacy (4) Lifelong learning (2) Positive school climate (1)	Students' grades (Anderson et al., 2019) Increased students' self-development (e.g. confidence) (Basu et al., 2012) Creating a caring, friendly, peaceful community (Basu et al., 2009) Engagement, collaboration, making use of resources (Engeness, 2020) Develop higher-order competencies such as metacognition (Yang, 2019) Students proud of their work (Walsh & Cordero, 2019) Confidence in their ability (Zimmerman & Weible, 2018) Developing key competencies for lifelong learning (Charteris, 2015) Creating an inclusive, positive school climate (Ko et al., 2021)
Aims and objectives What are the learning goals in the curriculum?	Scientific thinking (19) Literacy skills (7) Collaborative skills (5) Argumentation skills (3) Learning skills (2) Digital literacy (2) Understanding of physics (2) Becoming aware of and expressing feelings, values, and ideas (2) Programming skills (1) Problem-solving skills (1) Active learning (1) Well-being community (1) Principles of electricity (1) Computational thinking (1) Political engagement (1) Religious perspective development (1)	Gain deep understandings of physics (Basu et al., 2009) Learning to write, f.e. choosing the right words (Beck & Jones, 2023) Connect and interact (Deed et al., 2014) Learning how to support claims with evidence (Garcia et al., 2015) Using various strategies to shape their learning (Deakin Crick et al., 2015) Produce digital products meant to promote change (Gale et al., 2022) Magnetism (Cherbow, 2023) Becoming aware of feelings/values through writing, expressing them (Conrad & Andrews, 2023) Design and create a digital game (Deed et al., 2014) Develop problem-solving skills (Deed et al., 2014) Learn to be active learners (Leo et al., 2020) Solving a problem that is important for community (Sannino et al., 2016) Learning facts, definitions, and principles of electricity (Sharma, 2007) Computational thinking (Gale et al., 2022) Develop an interest in politics, active participation (Datzberger et al., 2019) Understanding the diversity within religions (Khalili et al., 2022)

Curricular theme	Codes (with the number of articles per code between brackets)	Examples
Content What are students learning?	Science (23) Literacy (8) ICT (5) Art (4) Topic of students' choice (3) Maths (3) Social skills (1) History (1) Politics (1)	River polution (Jeziorski & Therriault, 2019) Coleridge's poem 'The Rime of the Ancient Mariner' (Beck & Jones, 2023) Programming language (Deed et al., 2014) Music (Gale et al., 2022) Gene technology (Lindahl & Linder, 2013) Calculating sizes of rooms of a house (Nieminen et al., 2022) Programme for socialisation (Leo et al., 2020) Rennaiscance period (Lai & Campbell, 2018) Political situation in Uganda (Datzberger et al., 2019)
Learning activities How are students learning?	Inquiry-based learning (22) Collaborative activities (21) Discussions/classroom talk (7) Writing assignments (6) Scientific experiments (6) Shared knowledge building (4) Film making (3) Talk about the assignment (3) Teacher's instruction (1) Peer assessment (2) Game design (1) Reading (1) Co-designing lessons (1) Text analyses (1) Homework (1) Doing a presentation in class (1) Self-assessment (1) Quiz (1) Taking photos during the task (1)	Thinking of questions and strategies to answer them by doing research (Bahou, 2012) Students helping each other, solving problems together (Deakin Crick et al., 2015) Critique and examination of discourse practices (Galloway et al., 2019) Writing a paper (Basu et al., 2008) Measure the density of a candle (Martin, 2016) Build upon each other's ideas (Gale et al., 2022) Making a film about a polluted river (Sannino et al., 2016) Students asking questions (Sharma, 2007) Explanation by the teacher (Sharma, 2007) Identifying strengths and areas for improvement (Charteris & Eryn, 2017) Creating a storyline, design the game (Deed et al., 2014) Reading for pleasure (Stewart, 2013) Develop lessons for their classmates (Basu et al., 2008) Analysing an out-of-school text (Rappa & Tang, 2017) Homework check (Sharma, 2007) Presenting results of inquiry (York & Kirshner, 2015) Assessing their own learning (Charteris & Eryn, 2017) Quiz on students' understanding of a topic (Gitari, 2009) Digital photography to caputre observations (Zimmerman & Weible, 2018)

Curricular theme	Codes (with the number of articles per code between brackets)	Examples
Materials and resources What are students using to learn?	Online resources (12) Textbooks (6) Video (5) Experimental sets (3) Stories (2) Peers (2) Literature (2) TV (1) PowerPoint (1) Online document (1)	Online community of game designers (Deed et al., 2014) Textbook (Engeness, 2020) Videos of college students for inspiration (Gale et al., 2022) Robotics equipment (Basu et al., 2008) Short stories about poverty and racism (Heron, 2003) Ask peers (Deed et al., 2014) Shakespeare (Leo et al., 2020) TV (Rappa & Tang, 2017) PPT (Engeness, 2020) Google doc (Conrad & Andrews, 2023)

Curricular theme	Codes (with the number of articles per code between brackets)	Examples
Teacher role How can a teacher support the development of student agency?	Encouraging student-led learning (32) Adapting to students' needs for support (emotionally, cognitively, and socially) (27) Guiding classroom talk (22) Explaining the why of assignments (14) Encouraging higher-order thinking (13) Guiding collaboration (13) Helping students to reflect (12) Being a source of knowledge (8) Relating to students through dialogue (7) Having high expectations of students (4) Working with 'big ideas', a framework of bigger themes in a subject (4) Modelling (4) Creating meaningful learning experiences (4) Helping students to build their identity (3) Adapting the curriculum (3) Co-regulating learning (2) Checking homework (2) Treating students fairly (2) Using students' input to improve the learning environment (2) Aiming for inclusiveness (2) Giving instruction (2) Asking for feedback on their role (1) Using Vygotsky's double stimulation (1) Explaining success criteria (1) Focusing on mastery (1) Focusing on life skills (1) Assessing students' future perspectives (1) Promoting self-efficacy (1) Focusing on process instead of results (1)	Provide students with choices (Basu et al., 2008) Adapting curriculum to build on students' funds of knowledge (Basu & Barton, 2010) Provide space for students to teach their peers (Basu et al., 2008) Expliciting the learning intention of tasks (Charteris & Eryn, 2017) Reflexive dialogues (Deed et al., 2014) Enable collaboration (Engeness, 2020) Create opportunities for reflection (Frankel et al., 2019) Providing information (McNeill & Vaughn, 2012) Take interest in their students (Stewart, 2013) Ambitious instruction, trust in students (Stroupe, 2014) Discussing evolution in light of creationism (Tang & Yang, 2017) Modelling (Charteris & Eryn, 2017) Authentic practices (Gale et al., 2022) Character education (Parker et al., 2022) Listen to students' interests (Basu et al., 2008) Co-regulation (Deed et al., 2014) Check that participants entered a poem for the deadline (Conrad & Andrews, 2023) Treating students fairly (Mameli et al., 2022) Make responsive deviations from the materials (Cherbow, 2023) Acknowledge the inherent right of human beings to be different (Correia et al., 2022) Giving instruction (Charteris, 2016) Asking for feedback on their role (Charteris, 2015) Using Vygotsky's double stimulation (Lund et al., 2019) Being clear of success criteria (Charteris, 2015) Focus on mastery in stead of grades (Anderson et al., 2019) Focus on life skills development (Parker et al., 2022) Assessing students' future perspectives (Rasa et al., 2023) Help students see themselves as successful learners (Verhoeven et al., 2021) Aim not primarily on the product, rather on the creative process (Sheridan et al., 2022)

Curricular theme	Codes (with the number of articles per code between brackets)	Examples
Grouping How are students collaborating in class?	Collaboration in pairs or small groups (21) Individual learning (9)	Cross pairs (Conrad & Andrews, 2023) Express oneself in writing (Jang, 2022)
Time How much time is planned for the learning trajectory? When are they learning?	Hours (9) Days (2) Weeks (9) Months (3) Year(s) (5)	One lesson (Charteris, 2013) Five lessons of 50 min (Basu et al., 2008) Eleven lessons of 60 min (Lund et al., 2019) Ten days (Galloway et al., 2019) Sixteen days (Bahou, 2012) One week (Tayne et al., 2021) Three weeks (Zimmerman & Weible, 2018) Four to eight weeks (Walsh & Cordero, 2019) Ten weeks, flexible use of time (Deed et al., 2014) Five months, one lesson per week (Yang, 2019) Three semesters (Godwin & Potvin, 2017) A year (Gale et al., 2022) A year, 45 min per day (Sharma, 2007) Three years, 2 months per year (Conrad & Andrews, 2023)
Location Where does the learning take place?	Classroom (25) Flexible learning space, for example, a symposium or open learning centre (5) Field trips (6) Online (2)	Classroom (Jang, 2022) Flexible use of spaces (Deed et al., 2014) Outside the classroom, in the neighbourhood (Charteris, 2016) Trip to a local stream (Zimmerman & Weible, 2018) Online, distant education (Lai & Campbell, 2018)
Assessment How is progress in learning and agentic development assessed?	Surveys (17) (Reflective) dialogue (6) (Reflective) writing (6) Tests (5) Presentation (4) Portfolio (3) Classroom talk (2) Multimedia presentations (2) Film as representation of what is learned (2) Game (1) Wiki page (1) Observations (1)	Survey on motivation and self-efficacy (Anderson et al., 2019) (Reflective) dialogue (Bahou, 2012) (Reflective) writing (Garcia et al., 2015) Pretest/posttest (Galloway et al., 2019) Presentation (Basu et al., 2008) Portfolio (Lai & Campbell, 2018) Classroom talk (González-Howard & McNeill, 2020) Multimedia presentations (Galloway et al., 2019) Film as representation of what is learned (Tayne et al., 2021) Game (Deed et al., 2014) Wiki page (Zimmerman & Weible, 2018) Observations (Charteris & Eryn, 2017)