education sciences

MDPI

*Article*

# Liberating and Oppressive Factors for Self-Directed Learning: A Systematic Literature Review

**Asta Vaičiūnienė and Aušra Kazlauskienė ***

Institute of Education, Vilnius University Siauliai Academy, 76351 Siauliai, Lithuania; asta.vaiciuniene@gmail.com
* Correspondence: ausra.kazlauskiene@sa.vu.lt

**Abstract:** Self-directed learning (SDL) is one of the key competencies that provides the conditions necessary for adjustments to changes in the social context, and it should be developed from the early years of schooling. The effect of SDL on learners' motivation and attainments has been proven, and its value in enabling learners to change has been substantiated. When applying it in practice, difficulties are faced because SDL-based pedagogy sets challenges for both school students and teachers. It is important to carry out a systematic analysis investigating factors that provide the conditions for the self-directed learning of students. A systematic analysis (applying methods of systematic reviews and meta-analysis (PRISMA)) allows us to emphasize that the liberating factors of SDL include learning environments (support/scaffolding, teaching and learning strategies, physical environment and technological resources, autonomy, assessment and self-assessment, feedback, sustainable and positive climate), obtained knowledge, abilities (self-efficacy, cognitive competence, time management, meta-learning skills), and the learner's proactivity (collaboration, meeting learners' needs, possibilities, search for learning support, and raising questions). The oppressive factors of SDL when dealing with learning environments for both learners and teachers (learning load, teaching and learning strategies, teacher power, anxiety, negative emotions, assessment, absence of feedback, control, lack of learning support) as well as educational institutions (teacher support, learning facilities, culture of encouragement and support) are discussed.

**Keywords:** self-directed learning; systematic review; liberating factor; oppressive factor; learning environment; learner proactivity



**Citation:** Vaičiūnienė, A.; Kazlauskienė, A. Liberating and Oppressive Factors for Self-Directed Learning: A Systematic Literature Review. *Educ. Sci.* **2023**, *13*, 1020. https://doi.org/10.3390/educsci13101020

Academic Editors: Carlos Pérez-González and Delfín Ortega-Sánchez

Received: 15 August 2023
Revised: 11 September 2023
Accepted: 26 September 2023
Published: 10 October 2023



## 1. Introduction

The change in education policy conditioned by globalization enables learners to proceed with lifelong learning, i.e., to not fall behind due to a rapid and unpredictably changing daily routine. In his research, Morris [1] provides a review conducted by Murtonen et al. [2], emphasizing that behaviorism-based processes of learning are still widespread across various educational contexts around the world (58 out of 90 reviewed articles were from Europe/North America). Research by Jossberger et al. [3] and Yasmin et al. [4] prove that the teacher-oriented practice of education still prevails in educational institutions of various types. Paradoxically, self-directed learning is at least one of the key competencies that provides the conditions for adjusting to a changing social context and should be developed from the early years of schooling [5–7]; its manifestation is possible from the perspective of constructivism.

Many scientific research studies on SDL have been carried out throughout the world, and it is a competence or a set of skills that is necessary for learning adults [1,5,8], preschool age children [9], or comprehensive school students [10]. The significance of self-directed learning for increasing a learner's endeavors in learning and their satisfaction has been proven [11]. Research has substantiated that self-directed learning increases a learner's motivation for learning that is retained after returning to teacher-directed instruction [12]. In the context of formal education, the value of self-directed learning is

substantiated as a learner's ability to change [1] and the achievement of higher learning outcomes other than through a teacher-led curriculum [13]. As scholars observe, self-directed learning constructs a motivating environment that does not cause anxiety and provides effective learning possibilities; however, it does not ensure that every learner becomes autonomous [4]. Scholars observe [14] that learners have different levels of preparedness for SDL. Therefore, when applying it in practice, difficulties are faced [15] because pedagogy based on self-directed learning sets challenges for both school students and teachers [5]. SDL is under-investigated and is like a "black box" [11].

There is an ongoing search for what could provide the conditions to enable the manifestation of SDL within the education process. Research [16,17] has analyzed the following dimensions of self-directed learning: learning process (management of learning tasks); personal traits of a learner; factors that influence a learner's likelihood to engage in self-directed learning; and the cognitive aspect (i.e., how knowledge is being constructed in the process of learning). According to Sawatsky et al. [17], there is especially a lack of generalized research on factors of self-directed learning (because the conducted scholarly studies only cover narrow contexts—samples are usually students or other adults). Therefore, it has become important to conduct a systematic literature review investigating the factors that provide the conditions for self-directed learning. The aim of the research is to reveal the liberating and oppressing factors of self-directed learning. The following questions are raised: what liberating factors provide the conditions for SDL? What oppressive factors are obstacles to SDL? The research aims to present these factors for the self-directed learning of all learners (from pre-school to the higher education sector).

In the present research, the SDL factors are related to three aspects: (1) learning environment [18–20]; (2) obtained (previous) knowledge and abilities [21–23]; and (3) the proactivity of a learner [23].

Freire's [24] theory of transformative learning was chosen for this study. In this theory, the individual and society are not separated: social reality is understood as the place in which a person lives and where the individual changes the society when he is free—this approach to the relationship between the individual and society is characteristic of self-directed learning. Freire's theory emphasizes maximum respect for the individual, an orientation toward personal freedom and development, and humanistic, horizontal, absolutely equal, and partnership-based relationships between teachers and students. The mentioned principles are prerequisites for self-directed learning: setting goals yourself, foreseeing the learning path, taking responsibility, self-assessment, etc. Empowerment begins when individuals define their own needs and aspirations and take responsibility. The concept of personal empowerment through liberation, examined in the paradigm of social participation—a breakthrough—is inseparable from the process of consciousness, which is the pursuit of Freire's pedagogy (the teacher using teaching methods (conversation, counseling, storytelling)). Problem-based teaching methods (analysis of symbolic material that allows the formulation of the problem) create the conditions for interactive activity, helping the person to free himself and to act by himself (MYSELF). Any self-controlled personal initiative of the student, in the social emancipatory theory of transformative learning, is evaluated as an important and significant step for learning. Freire states that dialogue, with not only others but with oneself (reflections, self-assessment), changes the human consciousness—it becomes agile. In the dialogue-based learning process, one does not try to influence the learner; at the same time, one considers what factors make it possible to act independently: to be responsible for one's own learning, to set goals and to achieve them. All barriers that do not create the conditions to act on their own (in this case, self-directed) are treated as oppressive. The aim of Freire's transformative learning theory is to free the learner from oppressive frameworks (educational culture) through autonomy: through the initiative to act on his own and to be the "master" of his own learning. In self-directed learning, the manifestation of autonomy is perceived as ideas of reciprocity and exchange, allowing the consideration of the construction of autonomy in new ways [25]. According to Ponton and Carr [26], self-directed learning must take place

in such environments which allow open and free activity. And if we are not able to liberate the educational process, we will not develop self-directedness as well as ability to engage in lifelong learning.

In order to understand more about the development of self-directed learning in education, it is important to investigate the factors that create the conditions for learners to engage in self-directed learning, as this can contribute to higher learning achievement, motivation, etc.

## 2. Methods

This systematic review is carried out according to the preferred methods for systematic reviews and meta-analysis (PRISMA). It consists of four processes known as identification, screening, eligibility and inclusion, as demonstrated in Figure 1. In order to find the related papers and resources included in this systematic literature review, two main databases, namely Web of Science (WoS) and Scopus, were referred to.

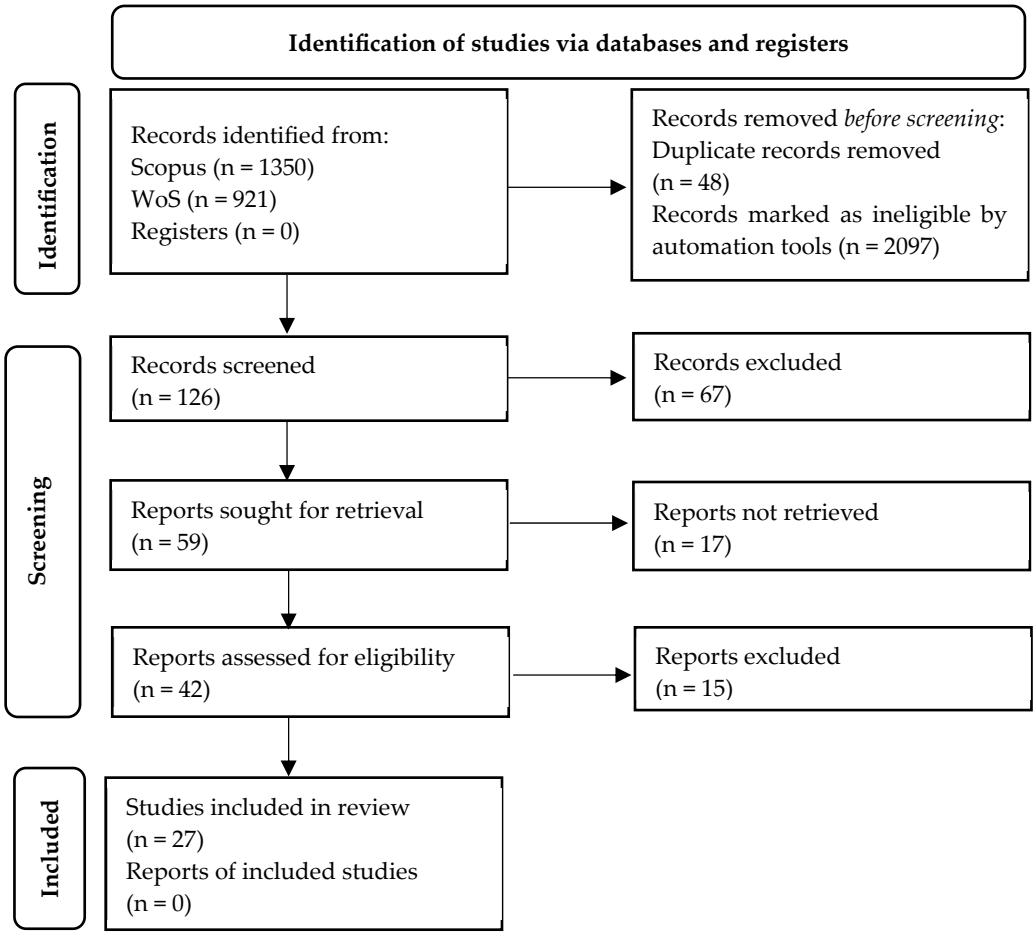


**Figure 1.** PRISMA systematic review adapted from Page et al. [27].

The search was conducted in the English language. After carrying out automated data screening in Scopus databases, the selected papers were saved in the PDF format, and those from ISI Web of Science (WoS) were saved in the Excel format. The search for scholarly publications was carried out in the period from 20 July to 30 August 2022. Based on the guidelines for systematic literature review provided by Page et al. [27], the following elements of the systematic review were applied: title (identify the report as a systematic review); abstract (abstracts checklist); introduction (the rationale; aims); methods; results; discussion; other information (registration and protocol; support; competing interests; availability of data, code, and other materials).

The four-step procedure was implemented through identification, selection, eligibility assessment and inclusion [28] (Figure 1).

The analysis of liberating and inhibiting factors for self-directed learning is based on an inductive content analysis, highlighting the essential units of meaning, which are analyzed according to the following main steps [29]: (1) multiple sequential reading of the answers; (2) extraction of the meaning codes; (3) open coding; (4) categorization and abstraction: assigning sub-categories and distinguishing categories; (5) interpretation. The initial stage involved an initial analysis of the data by two researchers to ensure validity. Subsequently, the results obtained were reflected upon with two other researchers with additions and corrections made by consensus. The segments were coded in the following categories: learning environment; knowledge, skills; learner proactivity.

### 2.1. Identification

At the stage of identification, we searched for full texts in databases ISI Web of Science (WoS) and Scopus (2013–2017) and found 921 (Web of Science) and 1350 (Scopus) information sources (2271 in total). The key concepts included in this systematic review have been deliberately constructed to reflect the problematic issues that will be analyzed. The words related to self-directed learning of individuals learning at an education institution were included. When conducting the search of resources, areas *self-directed learning* and *school* were chosen. Table 1 below presents a search line for each of the databases.

**Table 1.** Search line used in the research.

| Database | Search Line |
| --- | --- |
| Web of Science (WoS) | TS = (self-directed learning (Topic) AND school (Topic) AND Open Access AND 2018 OR 2019 OR 2020 OR 2021 OR 2022 (Publication Years) and Article (Document Types) AND English (Languages) AND Education Educational Research (Web of Science Categories) AND Self-directed (Search within all fields) |
| Scopus | ((TITLE-ABS-KEY(self-directed AND learning) AND TITLE-ABS-KEY(school))) AND (self-directed) AND (LIMIT-TO (OA,"all")) AND (LIMIT-TO (PUBSTAGE,"final")) AND (LIMIT-TO (PUBYEAR,2022) OR LIMIT-TO (PUBYEAR,2021) OR LIMIT-TO (PUBYEAR,2020) OR LIMIT-TO (PUBYEAR,2019) OR LIMIT-TO (PUBYEAR,2018)) AND (LIMIT-TO (DOCTYPE,"ar")) AND (LIMIT-TO (SUBJAREA,"SOCI")) AND (LIMIT-TO (LANGUAGE,"English")) |

### 2.2. Screening

When selecting the most recent scientific literature, papers were screened by applying the following primary criteria: published within the last 5 years (from 2018 to 2022); published in English; full-text access; paper; area of Social Sciences; field of Education Research. After narrowing down the limits of the search, the automated tools for the database search selected 61 WoS and 113 Scopus papers in the databases (174 in total). After exclusion of 48 repeating entries, 126 papers were left. After that, two researchers working in cooperation discussed every paper and carried out further steps of the systematic review. The process of screening consisted of three phases.

In the first round of screening, the abstracts and conclusions of all articles were carefully read, and those that met the inclusion/exclusion criteria were retained for further screening. Exclusion criteria included the following: a keyword "self-directed" is not included in a summary; a topic is unrelated to learning in education institutions; theoretical papers. After excluding papers which had no notion of "self-directed" in their summary ($n$ = 15); papers unrelated to the topic (analysis of efficacy of curricula ($n$ = 28); professional development of staff ($n$ = 17); experience of creating a website and hacking ($n$ = 2); personal traits required for scholars in social research ($n$ = 1); different attitudes of teachers and students to alcohol consumption ($n$ = 1); challenges of distance learning and teaching ($n$ = 1); gender medicine ($n$ = 1)) and literature reviews ($n$ = 1), 59 papers were left in total.

In the second round of screening, we focused on the research methodology: research strategy, aim and secondary search criteria of inclusion/exclusion (papers presenting empirical data; full-text access in English; in-class self-directed learning). The following papers were excluded: theoretical papers ($n$ = 14); self-directed learning in clinical environment and not in classroom ($n$ = 1); connections of experience gained during non-formal educational events with science ($n$ = 1). One more paper was excluded ($n$ = 1) after finding out that full-text access was not available in English. In compliance with the selection criteria, 42 papers were left.

In the third round, a detailed analysis of entire texts of the papers grounded on a criterion of the factors of self-directed learning took place. Papers which dealt with the efficacy of teaching methods/materials were excluded ($n$ = 15).

### 2.3. Eligibility

The selected 42 papers underwent the process of eligibility assessment. Eligibility was estimated to ensure that all selected papers were really important and could be used in the present investigation. Each of the authors and an independent expert have independently assessed the methodological quality of each of the included studies using critical appraisal tools [30]. Later, the co-authors and an independent expert coordinated their stances until a common agreement was reached. Thus, 15 papers which focused on the efficacy of teaching methods/materials were excluded. The process of screening for the systematic review is depicted in Figure 1.

### 2.4. Articles Included

The final sample of the analyzed data comprised 27 papers (from 2018 to 2022). Detailed information is provided in Table 2.

**Table 2.** Papers selected for the systematic analysis ($n$ = 27).

| No. | Source |
|---|---|
| 1. | Jossberger et al. (2018) [3] |
| 2. | Turan and Koç (2018) [31] |
| 3. | Kim and Lee (2018) [32] |
| 4. | Premkumar et al. (2018) [33] |
| 5. | Hiemstra et al. (2019) [34] |
| 6. | Choi et al. (2019) [35] |
| 7. | Pöntinen et al. (2019) [36] |
| 8. | Du Toit-Brits (2019) [37] |
| 9. | Chiu et al. (2019) [38] |
| 10. | Lim (2019) [39] |
| 11. | Bosco et al. (2019) [40] |
| 12. | Hughes and Morrison (2020) [41] |
| 13. | Hill et al. (2020) [42] |
| 14. | Annandale and Reyneke (2020) [43] |
| 15. | Indrastyawati and Wu (2020) [44] |
| 16. | Tuchina et al. (2020) [45] |
| 17. | Iguchi et al. (2020) [46] |
| 18 | Voskamp et al. (2020) [15] |
| 19. | Kim and Yang (2020) [47] |
| 20. | Yao (2021) [48] |

**Table 2.** *Cont.*

| No. | Source |
|---|---|
| 21. | Uus et al. (2021) [49] |
| 22. | Uğur and Sungur (2021) [50] |
| 23. | Alwadaeen and Piller (2022) [6] |
| 24. | Labonté and Smith (2022) [51] |
| 25. | Deepa et al. (2022) [52] |
| 26. | Schweder and Raufelder (2022) [53] |
| 27. | Choy and Cheung (2022) [54] |

## 3. Results

The investigation of SDL is relevant at a global scale. Research works selected for the systematic review were conducted in 16 countries. Out of the 27 included in the systematic review, three papers were published in the USA; three were published in the Netherlands; three were published in the Republic of Korea; two were published in Turkey; two were published in Taiwan; two were published in India; two were published in the Republic of South Africa; two were published in Canada; and one was published in Ukraine, Estonia, Finland, Spain, Germany, Singapore, Japan, the Philippines each (Table 3). In research on self-directed learning, the quantitative research strategy was applied the most frequently (14 papers). The qualitative research strategy was applied in eight papers, and the mixed strategy was applied in five papers. The following papers were selected for the systematic analysis: 14 on comprehensive education, 13 on higher education, and 1 on vocational training.

In the research works, quantitative data were collected by applying methods of survey, tests, conducting experiments, and quasi-experiments. Qualitative data of the reviewed research papers were collected by employing interviews, during discussions in focus groups, and through carrying out observations of activities, case studies, action research, and working on projects.

**Table 3.** Characteristics of research included in the analysis (n = 27).

| No. | Authors of the Source | Country | Research Strategy, Methods | Level of Education System/Sample |
|---|---|---|---|---|
| 1. | Choy and Cheung (2022) [54] | Singapore | Mixed (survey, interview) | Comprehensive education 408 school students (form 4) |
| 2. | Hill et al. (2020) [42] | the USA | Mixed (survey; thematic analysis of open-ended questions) | Higher education 131 students |
| 3. | Lim (2019) [39] | the USA | Quantitative (survey) | Higher education 140 medical students |
| 4. | Uus et al. (2021) [49] | Estonia | Quantitative (experiment) | Comprehensive education 122 school students (14–16 years) |
| 5. | Chiu et al. (2019) [37] | Taiwan | Quantitative (questionnaire) | Higher education (275 students) |
| 6. | Voskamp et al. (2020) [15] | The Netherlands | Qualitative (case study in four schools) | Comprehensive education 16 pedagogues |
| 7. | Turan and Koç (2018) [31] | Turkey | Quantitative (questionnaire) | Higher education (419 students) |
| 8. | Deepa et al. (2022) [52] | India | Qualitative (interview, 14 single case studies) | Comprehensive education 14 children (6–14 years) |
| 9. | Labonté and Smith (2022) [51] | Canada | Quantitative (survey) | Comprehensive education 320 school students (forms 5–9) |

**Table 3.** *Cont.*

| No. | Authors of the Source | Country | Research Strategy, Methods | Level of Education System/Sample |
|---|---|---|---|---|
| 10. | Uğur and Sungu (2021) [50] | Turkey | Quantitative (survey) | Comprehensive education 568 school students (forms 6–8) |
| 11. | Indrastyawati and Wu (2020) [44] | Taiwan | Quantitative (quasi-experiment) | Comprehensive education 22 school students |
| 12. | Iguchi et al. (2020) [46] | Japan | Quantitative (survey) | Higher education 124 medical students (year 4) |
| 13. | Alwadaeen and Piller (2022) [6] | the USA | Mixed: qualitative (observation of lessons/interview with a teacher); quantitative (survey) | Comprehensive education 24 school students and a teacher (form 3) |
| 14. | Kim and Lee (2018) [32] | Republic of Korea | Quantitative (test) | Comprehensive education 507 school students (forms 5–6) |
| 15. | Yao (2021) [48] | the Philippines | Quantitative (survey) | Higher education 170 students |
| 16. | Choi et al. (2019) [35] | Republic of Korea | Quantitative (questionnaire) | Comprehensive education 414 school students (12–14 years) |
| 17. | Pöntinen et al. (2019) [36] | Finland | Qualitative (case study: observation, interview) | Comprehensive education 24 school students (11–12 years) |
| 18. | Jossberger et al. (2018) [3] | The Netherlands | Qualitative strategy: semi-structured interview | Vocational training 40 students (15–16 years) |
| 19. | Schweder and Raufelder (2022) [53] | Germany | Quantitative (survey) | Comprehensive education 787 school students (forms 6–7) |
| 20. | Tuchina et al. (2020) [45] | Ukraine | Mixed: quantitative (questionnaire); qualitative (interview of 4 focus groups) | Higher education 421 students |
| 21. | Premkumar et al. (2018) [33] | India | Mixed: quantitative (survey); qualitative (interview) | Higher education 452 students |
| 22. | Du Toit-Brits (2019) [37] | Republic of South Africa | Qualitative (interview) | Higher education 12 first-year students |
| 23. | Hiemstra et al. (2019) [34] | the Netherlands | Quantitative (survey) | Comprehensive education 483 school students |
| 24. | Kim and Yang (2020) [47] | Republic of Korea | Quantitative (questionnaire) | Higher education (106 students) |
| 25. | Bosco et al. (2019) [40] | Spain | Qualitative (action research: observation, interview) | Higher education 327 students |
| 26. | Annandale and Reyneke (2020) [43] | Republic of South Africa | Qualitative (case study: observation, interview) | Higher education 6 students and a teacher |
| 27. | Hughes and Morrison (2020) [41] | Canada | Qualitative: case studies of 3 schools (photos of spaces; field/observation notes; interview with teachers; Twitter entries) | Comprehensive education 60 teachers |

When conducting the systematic review, factors of self-directed learning are related to the learning environment, obtained knowledge, abilities, and proactivity of a learner. Furthermore, Tables 4–6 display the aspects highlighted in the papers and reviewed in the present research.

An analysis of the learning environment factors that create the conditions for self-directed learning and the teaching that fosters it revealed the sub-categories of support/support, innovative learning environments, teaching and learning strategies, assessment, collaboration, and the social and emotional classroom environment (Table 4).

**Table 4.** Liberating factors in the category LEARNING ENVIRONMENTS (n = 27).

| Liberating Factors | Authors of Literature Sources |
| --- | --- |
| Support/scaffolding | Uus et al. [49]; Jossberger et al. [3]; Du Toit-Brits [37]; Voskamp et al. [15]; Labonté and Smith [51]; Tuchina et al. [45]; Schweder and Raufelder [53]. |
| Teaching and learning strategies | Chiu et al. [38]; Voskamp et al. [15]; Choi et al. [35]; Jossberger et al. [3]; Hughes and Morrison [41]; Pöntinen et al. [36]; Tuchina et al. [45]; Kim and Yang [47]. |
| Physical environment and technological resources | Hughes and Morrison [41]; Kim and Lee [32]; Alwadaeen and Piller [6]; Indrastyawati and Wu [44]; Choy and Cheung [54]; Labonté and Smith [51]. |
| Autonomy | Indrastyawati and Wu [44]; Kim and Yang [47]; Schweder and Raufelder [53]. |
| Assessment and self-assessment | Premkumar et al. [33]; Lim [39]; Alwadaeen and Piller [6]; Bosco et al. [40]. Iguchi et al. [46]; Schweder and Raufelder [53]; Du Toit-Brits [37]; Uus et al. [49]; Indrastyawati and Wu [44]; Hill et al. [42]; Voskamp et al. [15]. |
| Feedback | Hill at al. [42]; Voskamp et al. [15]; Annandale and Reyneke [43]; Jossberger et al. [3]. |
| Sustainable, positive climate | Alwadaeen and Piller [6]; Premkumar et al. [33]; Kim and Yang [47]; Deepa et al. [52]; Jossberger et al. [3]; Du Toit-Brits [37]. |

The analysis of the knowledge and skills that create the conditions for self-directed learning and foster it led to the emergence of the sub-categories of skills coherence, competence and self-confidence/self-efficacy (Table 5).

**Table 5.** Liberating factors in the category OBTAINED KNOWLEDGE, ABILITIES (n = 27).

| Liberating Factors | Authors of Literature Sources |
| --- | --- |
| Self-efficacy | Yao [48]; Uğur and Sungur [50]; Hiemstra et al. [34]; Turan and Koç [31]; Kim and Lee [32]. |
| Cognitive competence: problem-solving skills, critical thinking | Yao [48]; Kim and Lee [32]; Turan and Koç [31]. |
| Time management | Hill et al. [42]; Kim and Lee [32]; Bosco et al. [39]. |
| Meta-learning abilities | Hill et al. [42]; Uus et al. [49]; Voskamp et al. [15]. |

The analysis of learner proactivity factors that create the conditions for self-directed learning and the teaching that promotes it highlighted sub-categories of learner attitudes toward acting in a self-directed learning environment, self-assessment, and the learning experiences gained from participation in self-directed learning activities (Table 6).

**Table 6.** Liberating factors in the category related to PROACTIVITY OF A LEARNER (N = 27).

| Liberating Factors | Authors of Literature Sources |
| --- | --- |
| Meeting learner's needs, possibilities | Deepa et al. [52]; Schweder and Raufelder [53].<br>Labonté and Smith [51]; Bosco et al. [40]; Schweder and Raufelder [53]; Deepa et al. [52]. |
| Collaboration | Hill et al. [42]; Pöntinen et al. [36]; Kim and Yang [47]; Labonté and Smith [51]; Schweder and Raufelder [53]; Bosco et al. [40]; Hughes and Morrison [41]. |
| Search for learning support and raising of questions | Kim and Lee [32]; Pöntinen et al. [36]. |

Oppressive factors in self-directed learning covered personal (learner, teacher) and education institution levels (Tables 7 and 8).

**Table 7.** Oppressive factors in self-directed learning (learner and teacher).

| | For a Learner and a Teacher | | | |
|---|---|---|---|---|
| | **Oppressive Factors** | **Authors of Literature Sources** | **Oppressive Factors** | **Authors of Literature Sources** |
| Learning environments | Learning load | Uus et al. (2021) [49] | Negative emotions | Schweder and Raufelder [53] |
| | Teaching and learning strategies | Schweder and Raufelder [53]<br>Jossberger et al. [3]<br>Tuchina et al. [43] | Assessment | Premkumar et al. [33] |
| | | | Absence of feedback | Annandale and Reyneke [43]<br>Hill et al. [42] |
| | Teacher power | Alwadaeen and Piller (2022) [6]<br>Hughes and Morrison (2020) [41] | Control | Hiemstra et al. [34] |
| | | | Time | Bosco et al. [40] |
| | Anxiety | Choi et al. (2019) [35] | Lack of learning support | Jossberger et al. [3] |

**Table 8.** Oppressive factors in self-directed learning (level of education institution).

| | Education Institution | |
|---|---|---|
| | **Oppressive Factors** | **Authors of Literature Sources** |
| Teaching and learning environment | Teacher support | Yao [48] |
| | Learning infrastructure | Yao [48] |
| | Culture of encouragement and support | Jossberger et al. [3] |

## 4. Discussion and Conclusions

Liberating and oppressive factors of SDL have been put into three categories: learning environment, obtained knowledge and abilities as well as proactive performance. The conducted systematized analysis allows emphasizing that scientific research focused on the search for factors liberating self-directed learning in all of the mentioned categories, whereas oppressive factors (in aspects of learner, teacher and institution) were emphasized only in relation to the learning environment.

### *4.1. Learning Environment*

The present category includes seven liberating factors (support/scaffolding, teaching and learning strategies, physical environment and technological resources, autonomy, assessment and self-assessment, feedback, sustainable and positive climate) which provide conditions for self-directed learning.

Support/scaffolding provided by teachers. A research conducted by Uus et al. [49] in comprehensive schools substantiated that when stimulating preparation for SDL, school students need support in the planning of their learning and assessment processes. Jossberger et al. [3] conducted research with fifteen-and-sixteen-year-old students and pointed out the aspect of support to back up self-regulated learning as a condition for SDL. The researchers suggest focusing on the design of learning tasks and teacher feedback. Learning tasks must be authentic and raise challenges for schoolchildren. Instruction must be clearly formulated so that school students easily understood what they are expected to do.

To promote self-regulated learning, tasks should include planning, observation and reflection activities.. These meta-cognitive activities must be planned for each learning task so that school students would also see the use in professional practice. Teachers face a task to engage school students in constructive and critical discussions about their activities. Empowering students to jointly determine their own learning trajectory could be the next

step toward the better implementation of self-directed and self-regulated learning. [3]. As a result, the authors point out an oppressive factor—a strong support system. SDL activities and processes are insufficiently stimulated and supported. At a teacher level, there is also a need for stimulation, support system and infrastructure to apply such teaching and learning strategies which would support SDL [47]. For Jossberger et al. [3], the culture of stimulation and support affects an organization's learning potential because both the learning environment and culture significantly impact SDL [33].

According to Du Toit-Brits [36], if pedagogues encourage school students by their positive expectations, the students put in more effort while learning and are capable of controlling self-directed learning. In such an environment, school students achieve the following: take initiative in their learning; learn with or without the assistance of others; set their learning goals; articulate and render their learning aims; choose and implement the applied learning strategies; assess their own learning outcomes; self-develop social and interpersonal skills; have positive dispositions toward self-directed learning; and have experience of self-directed learning [37]. The effect of a strong, well-balanced support system on self-directedness was investigated by Voskamp et al. [15], Labonté and Smith [51], and Schweder and Raufelder [53]. Research by Tuchina et al. [45] emphasizes not only significance of support and assistance but also the resulting school students' positive emotions, which makes it easier to choose and move along the paths of their personal self-development.

Selection of teaching and learning strategies. The research conducted by Voskamp et al. [15] revealed that in order to improve SDL in comprehensive schools, specific teaching methods must be employed: from clear instructions and well-selected materials to allowing school students carry out projects that they created. It increases school students' responsibility for the process of learning. This means that self-directed learning is connected to a personalized and not an individualized approach.

Promoters of the personalized strategy [36] also highlight the priority for learners to provide conditions for their own-pace performance and assume responsibility for personal learning; whereas Jossberger et al. [3] point out the importance of instructions when performing independently, which should be clearly formulated so that school students could easily understand what is expected of them. According to research conducted by Tuchina et al. [44], the personalized approach provides conditions for becoming responsible "masters" of their own learning, and the more responsible learners adopt more flexible strategies of their learning and have a broader spectrum to choose from. As the scholars see it, learners are not very concerned with the selections that teachers offer, they feel like experiencing some restrictions of the freedom of choice, and they are not motivated enough to seek goals that someone has set for them. These are some of the oppressive factors for self-directed learning. Thus, wanting to enhance the process, it is necessary to find a proper balance between teachers' initiative and the school students' personal choice [45]. Balance is also needed in tasks given to school students [49]. It is important that learners would not be overloaded because they often lack required skills, strategies and abilities to retain attention—which are needed for self-directed learning. The authors consider cognitive load one of the more oppressive factors for self-directed learning.

Voskamp et al. [15] especially highlight phases of teaching and learning: preparation, implementation and self-reflection. Jossberger et al. [3] pay more attention to specific phases when talking about a task covering activities of planning, observation and reflection. They especially emphasize the authenticity of tasks including a challenge set for learners. In terms of the process of learning, the authors suggest giving an opportunity to jointly set a trajectory of learning.

Research conducted by Chiu et al. [38] in the field of higher education has also proven an important role of proper teaching and learning strategies: teachers should encourage deep learning in order to achieve good learning outcomes (to teach it) and avoid strategies of superficial learning.

Hughes and Morrison [41] have shown that educators should provide innovative learning environments, as the tools and materials used and the mobility in physical makerspaces, as well as the use of collaborative methods, help students create and generate ideas, leading to increased engagement and a shift in power between the teacher and the students as a result of inquiry-based teaching and learning. Choi et al. [35] are also in favor of efficient pedagogical strategies and teaching methods as a factor for self-directed learning. Schweder and Raufelder [53] indicate that the meeting of school students' need for independence to choose learning aims and strategies is itself an oppressive factor. This is connected with one more oppressive factor—the teacher power [6,41]. Teachers are still firmly attached to their traditional roles as knowledge experts and are more comfortable passing on knowledge in one direction. Alwadaeen and Piller [6] suggest to redistribute power ratios to increase school student's abilities to make firm and reasoned decisions.

Physical environment and technological resources. Indrastyawati and Wu's [44] research on comprehensive education revealed that the manifestation of self-directedness is the largest when learning through discussion and reflection, applying various technological media in learning. They include specifically designed opportunities for discussion and reflection. This method seemed to be more effective than teacher-led discussions in class. Choy and Cheung [54] and Labonté and Smit [51] found that technologies used in the learning environment, such as tablets, online writing assistant tools and online notice boards, significantly increase school students' positive attitudes toward self-directed learning. As Hughes and Morrison [41] and Kim and Lee [32] argued, the physical space of a classroom is also important in the educational process; therefore, the conditions that enable a learner to move in their physical environment and communicate are as important as what materials and means they have. In addition to the learning resources and physical equipment of a classroom, Alwadaeen and Piller [6] also underline the overall set facilities and equipment of a school. Hughes and Morrison [41] argue that the physical space of the classroom enables being an actor in the educational process, so even the way in which learners are able to move around in the physical environment, interact with each other, and the materials and tools they have at their disposal become important.

Assessment and self-assessment. Data of research conducted by Premkumar et al. [33] in the context of higher education show an important role of assessment in the process of self-directed learning. As the discussed researchers put it, assessment is a major factor that liberates the oppressive self-directed learning, too. Research by Lim [39], Alwadaeen and Piller [6] have delved more deeply into formative assessment, which they recognize as an essential factor in self-directed learning, since in such learning environments, students need to acquire the skills to monitor and evaluate their own learning progress (self-assessment)). Thus, the "assessment as learning" approach becomes even more relevant as the learner's self-assessment/evaluation will look for arguments to justify the current situation and for ways to move on. This highlights the need to focus more on the use of formative and shared assessment approaches in the learning process, as assessment/evaluation fosters learners' learning (they are able not only to take stock of what they have achieved/not achieved but also to see their own achievements and progress over time). The importance of self-assessment as a feature of lifelong learning for the development of the self-directed learning process through self-assessment of their strengths and weaknesses was investigated by Iguchi et al. [46]. Bosco et al. [40] develop the process of assessment and self-assessment as a regulated activity using group and individual journals where they reflect on what they accomplished and have learnt. Schweder and Raufelder [51] and Uus et al. [49] suggest to relate the process of self-assessment in self-directed learning to the planning and implementation of a student's goals because, in this way, learners are encouraged to regard and not undervalue their previously obtained knowledge and abilities. Thus, conditions are provided for measuring individual progress in a frame of such a system of reference [37,53]. Moreover, Hill et al. [42] and Voskamp et al. [15] highlight the importance of meta-cognition and point out the significance of reflection and self-assessment. Hiemstra et al. [34] and

Premkumar et al. [33] argue that control (frequent testing, orientation to examinations, tests) is an oppressive factor for SDL and suggest enhancing school students' self-efficacy.

Feedback. Hill et al. [42] call feedback a key component and one of the factors for the manifestation of a learner's self-directedness. In their research, Voskamp et al. [15] put more emphasis on feedback as a component of the learners' process of learning rather than as a result of it. Jossberger et al. [3] remind that teacher feedback becomes important in SDL. In Annandale and Reyneke's [43] research, an object is directed to providers and receivers of feedback (pedagogue, peer students, completed tasks), which are major catalysts of school student engagement in SDL. As a result, the authors consider improper methods used for giving feedback as well as limitations to receiving feedback from various sources oppressive factors.

Autonomy. In their works, Kim and Yang [47], Indrastyawati and Wu [44], and Schweder and Raufelde [53] acknowledge the importance of autonomy in the process of self-directed learning. Freedom to discuss and reflect as well as support teacher autonomy are especially emphasized. As these research papers demonstrate, teachers acknowledge their roles as facilitators of learning; nevertheless, they still remain supportive of their role as traditional knowledge experts because one-way rendering knowledge is still convenient.

Sustainable emotional climate. Data of a research conducted by Premkumar et al. [33] demonstrate the importance of the learning culture when preparing for self-directed learning. Research papers by other scholars [6,47] also emphasize the dimension of the emotional and social environment, because an environment that interests increases the manifestation of a school student's self-directed learning [52]. As Jossberger et al. [3] state, a sustainable emotional climate is supported by constructive and critical discussions about learners' performance and positive expectations from teachers, which is a key factor in promoting learners' self-directed learning [37]. A positive learning environment based on constructive expectations positively contributes to the self-directedness of school students: if pedagogues encourage school students by setting positive expectations, these students put in more effort when learning and are capable of controlling and mastering their self-directed performance. Meanwhile, Choi et al. [35] and Schweder and Raufelder [53] name anxiety and negative emotions as factors that oppress self-directed learning.

### *4.2. Obtained Knowledge, Abilities*

Four liberating factors (self-efficacy, cognitive competence, time management, meta-learning abilities) which provide conditions for self-directed learning have been singled out in this category.

Self-efficacy. Having conducted research in the context of higher education, Turan and Koç [31] proved that there is a significant positive correlation between preparation for SDL and critical thinking as well as overall self-efficacy.

Uğur and Sungur [50], Yao [48], and Kim and Lee [32] relate the SDL level to academic self-efficacy. Hiemstra et al. [34] explain that the motivation of individuals seeking their goals is usually stronger (self-efficacy and determination); whereas control dominates when aiming to meet external standards.

Cognitive competence. Usually, research works deal with the following components of cognitive competence, which becomes a liberating factor for SDL: cognitive thinking [32], critical thinking [31], problem solving [32,48], and meta-cognition [16,32,42].

Time management. Research papers [32,42,54] specify time management skills and the duration of time allocated for performance as factors for the manifestation of self-directedness.

Meta-learning abilities. Research papers often deal with aspects which encompass abilities of meta-learning: reflection [15,41] and self-assessment [41,49]. Self-assessment as a meta-cognitive skill is related by Hill et al. [41] to a reflective process. According to the authors, by reflecting on their ability to guide their own learning, learners demonstrate an understanding of their strengths and gaps in knowledge. As Voskamp et al. [15] underline, the aspect of meta-learning determines the concept of SDL, which can evolve

from allowing the learner to carry out assigned learning tasks independently; to taking responsibility for his/her own learning; to talking about his/her own learning process; to taking responsibility for the management of the learning process, including the content (the "what") and the method (the "how").

### 4.3. Proactivity of a Learner

This category points out three liberating factors (collaboration, response to learners' needs and capabilities, search for learning support and raising of questions) which provide conditions for self-directed learning.

Collaboration. Pöntinen et al. [36], Hill et al. [42], and Hughes and Morrison [41] revealed an important role of collaboration when engaging in SDL. Small teams where school students work in groups and watch what they need to learn to cope with a specific challenge [36] are especially highlighted [40]. Specifically, students' need for social connection can be better met in an SDL environment than in a teacher-led environment, as teachers in self-directed learning contexts facilitate students' self-directed learning processes and are responsive to individual needs. [53].

Research by Kim and Yang [47] conducted in the context of higher education proved that the unity and coherence of a group of learners, as factors stimulating preparation for self-directed learning, gradually increase when learning together and remain stable after some time. Tuchina et al. [45] proved that there is a correlation between learners' independence level and success in constructing a personal learning path. This results in an increasing level of school students' responsibility. Therefore, Labonté and Smith [51] underline collaboration support in the process of self-directed learning.

Response to learners' needs and capabilities. Hiemstra et al. [34] found out that a teaching strategy that is oriented toward their interests and not test results is of key importance. In other words, by studying subjects that are interesting to them, students emphasize their strengths rather than focusing on their weaknesses in order to receive a good grade. The environment that meets the needs of learners increases the manifestations of a school student's SDL [52]. As a result, in the SDL environment, school students more easily select their learning strategies and experience more positive emotions in comparison to the learning environment where a teacher's performance prevails [53]. Therefore, Bosco et al. [40] declare that a school student is at the center of the process as an author of his/her learning and an actor of the process, who grounds his/her experience in their own interests, deciding what to create on the basis of a given context.

SDLs are based on learners' pairs and capabilities, creating the conditions for facilitating self-directed learning processes and responding to individual needs. [53]. As a result, learners can plan and implement goals of their learning with regard to their previously obtained knowledge and abilities as well as measure their individual learning progress according to an individual system of reference [53].

Search for learning support and raising of questions. Schweder and Raufelder [53] emphasized an essential SDL factor for impacting school students' determination to act: setting learning goals, paths, conditions and types of learning outcomes themselves. Kim and Lee [32] point out learners' initiative to search for support and raise questions (i.e., in these ways regulating their learning) as a form of agency for acting [36].

To sum up, liberating conditions for SDL include learning environments (support/scaffolding, teaching and learning strategies, physical environment and technological resources, autonomy, assessment and self-assessment, feedback, sustainable and positive climate), obtained knowledge and abilities (self-efficacy, cognitive competence, time management, meta-learning skills) and the proactivity of a learner (collaboration, learners' needs, meeting capacities, search for learning support and raising of questions).

Oppressive factors for SDL as pointed out by scholars in their research works are dealt with when they cover learning environments:

- For a learner and a teacher (learning load, teaching and learning strategies, teacher power, anxiety, negative emotions, assessment, absence of feedback, control, lack of teaching support);
- For an educational institution (teacher support, infrastructure for learning, culture of stimulation and support).

Further research directions and limitations. Other studies could investigate the inhibiting factors related to learner proactivity, as SDL requires personal initiative and being active in learning processes. It would also be important to focus on factors related to the learner's existing knowledge, skills and experience in relation to age groups. No age category was distinguished in this study. All factors were explored in a general way.

When analyzing the SDL factors, it should be noted that personal learning takes place in a specific context. In further research, we would suggest focusing on the social context as a factor of SDL, as they can determine learning strategies and methods.

Due to the inclusion of different levels of education (general education, vocational training, higher education) in the study sample, the findings were presented in a generalized way. This allowed for a generalized view of the liberating and oppressive factors in self-directed learning. However, in the future, it would be worthwhile to analyze these factors separately at different levels of education.

**Author Contributions:** Conceptualization, A.K.; methodology, A.K. and A.V.; software, A.V.; validation, A.K. and A.V.; formal analysis, A.V.; investigation, A.K. and A.V.; resources, A.V.; data curation, A.V.; writing—original draft preparation, A.K. and A.V.; writing—review and editing, A.K. and A.V.; visualization, A.K.; project administration, A.K. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Data Availability Statement:** For research data, contact asta.vaiciuniene@gmail.com by e-mail.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Morris, T.H. Self-directed learning: A fundamental competence in a rapidly changing world. *Int. Rev. Educ.* **2019**, *5*, 633–653. [CrossRef]
2. Murtonen, M.; Gruber, H.; Lehtinen, E. The return of behaviourist epistemology: A review of learning outcomes studies. *Educ. Res. Rev.* **2017**, *22*, 114–128. [CrossRef]
3. Jossberger, H.; Brand-Gruwel, S.; Van De Wiel, M.W.J.; Boshuizen, H. Learning in Workplace Simulations in Vocational Education: A Student Perspective. *Vocat. Learn.* **2018**, *11*, 179–204. [CrossRef]
4. Yasmin, M.; Naseem, F.; Masso, I.C. Teacher-directed learning to self-directed learning transition barriers in Pakistan. *Stud. Educ. Eval.* **2019**, *61*, 34–40. [CrossRef]
5. Robinson, J.D.; Persky, A.M. Developing Self-Directed Learners. *Am. J. Pharm. Educ.* **2020**, *84*, 292–296. [CrossRef]
6. Alwadaeen, N.B.; Piller, B. Enhancing Self-directed Learning Readiness at Elementary Level; A Study from American Schools. *J. Curric. Teach.* **2022**, *11*, 24–38. [CrossRef]
7. Kranzow, J.; Hyland, N. Developing graduate student success self-directed learning: Developing readiness in graduate students. *Int. J. Self Dir. Learn.* **2016**, *13*, 1–14. Available online: http://docs.wixstatic.com/ugd/dfdeaf_d36be6e9da1149e0ad02eba380534903.pdf (accessed on 11 July 2023).
8. Loeng, S. Self-Directed Learning: A Core Concept in Adult Education. *Educ. Res. Int.* **2020**, *2020*, 3816132. [CrossRef]
9. Foushee, R.; Srinivasan, M.; Xu, F. Self-directed learning by preschoolers in a naturalistic overhearing context. *Cognition* **2021**, *206*, 104415. [CrossRef]
10. Morris, T.H.; Rohs, M. The potential for digital technology to support self-directed learning in formal education of children: A scoping review. *Interact. Learn. Environ.* **2023**, *31*, 1974–1987. [CrossRef]
11. Schweder, S.; Raufelder, D. Adolescents' enjoyment and effort in class: Influenced by self-directed learning intervals. *J. Sch. Psychol.* **2022**, *95*, 72–89. [CrossRef] [PubMed]
12. Schweder, S.; Raufelder, D. Adolescents' expectancy–Value profiles in school context: The impact of self-directed learning intervals. *J. Adolesc.* **2022**, *94*, 569–586. [CrossRef] [PubMed]
13. Moser, J. Creating In-class Self-directed Learning through Can Do Objectives, Portfolio use, and Formative Assessment. *J. Asiat.* **2017**, *14*, 587–836. [CrossRef]

14. Chen, C.-H.; Chen, K.-Z.; Tsai, H.-F. Did Self-Directed Learning Curriculum Guidelines Change Taiwanese High-School Students' Self-Directed Learning Readiness? *Asia-Pac. Educ. Res.* **2022**, *31*, 409–426. [CrossRef]
15. Voskamp, A.; Kuiper, E.; Volman, M. Teaching practices for self-directed and self-regulated learning: Case studies in Dutch innovative secondary schools. *Educ. Stud.* **2022**, *48*, 772–789. [CrossRef]
16. Morris, T.H. Adaptivity Through Self-Directed Learning to Meet the Challenges of Our Ever-Changing World. *Adult Learn.* **2019**, *30*, 56–66. [CrossRef]
17. Sawatsky, A.P.; Ratelle, J.T.; Bonnes, S.L.; Egginton, J.S.; Beckman, T.J. A model of self-directed learning in internal medicine residency: A qualitative study using grounded theory. *BMC Med. Educ.* **2017**, *17*, 31. [CrossRef]
18. Spear, G.E.; Mocker, D.W. The Organizing Circumstance: Environmental Determinants in Self-Directed Learning. *Adult Educ. Q.* **1984**, *35*, 1–10. [CrossRef]
19. Hammond, M.; Collins, R. *Self-Directed Learning: Critical Practice*; Routledge: New York, NY, USA, 2004; ISBN 9781138981591. First Published 1991. Available online: https://scholar.google.com/scholar_lookup?title=Self-Directed+Learning:+Critical+Practice&author=Hammond,+M.&author=Collins,+R.&publication_year=2004 (accessed on 15 August 2022).
20. Loyens, S.M.M.; Magda, J.; Rikers, R.M.J.P. Self-Directed Learning in Problem-Based Learning and its Relationships with Self-Regulated Learning. *Educ. Psychol. Rev.* **2008**, *20*, 411–427. [CrossRef]
21. Knowles, M.S. *The Modern Practice of Adult Education: From Pedagogy to Andragogy*, 2nd ed.; Cambridge, The Adult Education Company: New York, NY, USA, 1980; pp. 44–45. ISBN 0842822135.
22. Song, L.; Hill, J.R. A Conceptual Model for Understanding Self-Directed Learning in Online Environments. *J. Interact. Online Learn.* **2007**, *6*, 27–42. Available online: https://www.ncolr.org/jiol/issues/pdf/6.1.3.pdf (accessed on 9 July 2023).
23. Douglass, C.; Morris, S.R. Student perspectives on self-directed learning. *J. Scholarsh. Teach. Learn.* **2014**, *14*, 13–25. [CrossRef]
24. Freire, P. *Pedagogy of the Oppressed, 30th Anniversary ed.*; Continuum: New York, NY, USA; London, UK, 2000; pp. 43–50.
25. Ponton, M.; Carr, P.B. Understanding and promoting autonomy in self-directed learning. *Curr. Res. Soc. Psychol.* **2000**, *5*, 271–284. Available online: https://crisp.org.uiowa.edu/sites/crisp.org.uiowa.edu/files/2020-04/5.19.pdf (accessed on 15 August 2022).
26. Eneau, J. From Autonomy to Reciprocity, or Vice Versa? French Personalism's Contribution to a New Perspective on Self-Directed Learning. *Adult Educ. Q.* **2008**, *58*, 229–248. [CrossRef]
27. Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Shamseer, L.; Tetzlaff, J.M.; Akl, E.A.; Brennan, S.E.; et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Syst. Rev.* **2021**, *10*, 89. [CrossRef] [PubMed]
28. Gough, D.; Oliver, S.; Thomas, J. Introducing systematic reviews. In *An Introduction to Systematic Reviews*, 2nd ed.; Gough, D., Oliver, S., Thomas, J., Eds.; Sage: London, UK, 2017; pp. 1–18.
29. White, M.D.; Marsh, E. Content analysis: A flexible methodology. *Library Trends* **2006**, *55*, 22–45. [CrossRef]
30. Moola, S.; Munn, Z.; Tufanaru, C.; Aromataris, E.; Sears, K.; Sfetic, R.; Currie, M.; Lisy, K.; Qureshi, R.; Mattis, P.; et al. Chapter 7: Systematic reviews of etiology and risk. In *JBI Manual for Evidence Synthesis*; Aromataris, E., Munn, Z., Eds.; 2020. Available online: https://synthesismanual.jbi.global (accessed on 11 July 2023).
31. Turan, M.B.; Koç, K. The Impact of Self-Directed Learning Readiness on Critical Thinking and Self-Efficacy among the Students of the School of Physical Education and Sports. *Int. J. High. Educ.* **2018**, *7*, 98–105. [CrossRef]
32. Kim, S.; Lee, K. Development and Validation of Self-Directed Learning Ability Test (SDLAT) for Elementary School Students. *Int. Electron. J. Elem. Educ.* **2018**, *10*, 551–557. [CrossRef]
33. Premkumar, K.; Vinod, E.; Sathishkumar, S.; Pulimood, A.B.; Umaefulam, V.; Prasanna Samuel, P.; John, T.A. Self-directed learning readiness of Indian medical students: A mixed method study. *BMC Med. Educ.* **2018**, *18*, 1–10. [CrossRef]
34. Hiemstra, D.; Van Yperen, N.W.; Timmerman, M.E. Students' effort allocation to their perceived strengths and weaknesses: The moderating effect of instructional strategy. *Learn. Instr.* **2019**, *60*, 180–190. [CrossRef]
35. Choi, N.; No, B.; Jung, S.; Lee, S. What Affects Middle School Students' English Anxiety in the EFL Context? Evidence from South Korea. *Educ. Sci.* **2019**, *9*, 39. [CrossRef]
36. Pöntinen, S.; Kärkkäinen, S.; Pihlainen, K.; Räty-Záborszky, S. Pupil-Generated Questions in a Collaborative Open Inquiry. *Educ. Sci.* **2019**, *9*, 156. [CrossRef]
37. du Toit-Brits, C. A focus on self-directed learning: The role that educators' expectations play in the enhancement of students' self-directedness. *S. Afr. J. Educ.* **2019**, *39*, 1–11. [CrossRef]
38. Chiu, Y.C.; Liang, J.C.; Hsu, H.Y.; Chu, T.S.; Lin, K.H.; Chen, Y.Y.; Tsai, C.C. To examine the associations between medical students' conceptions of learning, strategies to learning, and learning outcome in a medical humanities course. *BMC Med. Educ.* **2019**, *19*, 410. [CrossRef]
39. Lim, Y.S. Students' Perception of Formative Assessment as an Instructional Tool in Medical Education. *Med. Sci. Educ.* **2019**, *29*, 255–263. [CrossRef]
40. Bosco, A.; Santiveri, N.; Tesconi, S. Digital Making in Educational Projects. *Cent. Educ. Policy Stud. J.* **2019**, *9*, 51–73. [CrossRef]
41. Hughes, J.M.; Morrison, L.J. Innovative Learning Spaces in the Making. *Front. Educ.* **2020**, *5*, 89. [CrossRef]
42. Hill, M.; Peters, M.; Salvaggio, M.; Vinnedge, J.; Darden, A. Implementation and evaluation of a self-directed learning activity for first-year medical students. *Med. Educ. Online* **2020**, *25*, 1717780. [CrossRef]
43. Annandale, M.; Reyneke, E.M. The effect of Skinny Cow Condition on first-year students' expectations of assessment and feedback. *Per Linguam* **2020**, *36*, 45–56. [CrossRef]

44. Indrastyawati, C.; Wu, Y.T. The Effects of the Synchronous Discussion and Reflection System (SDRS) in Perception of Knowledge Building and Learning Outcomes. *Int. J. Instr.* **2020**, *13*, 699–710. [CrossRef]
45. Tuchina, N.; Borysov, V.; Podhurska, I.; Kupina, I.; Borysenko, N. Developing learner autonomy via choosing a person's tducational pathway. *Rev. Rom. Pentru Educ. Multidimens.* **2020**, *12*, 209–225. [CrossRef]
46. Iguchi, A.; Hasegawa, Y.; Fujii, K. Student Potential for Self-assessment in a Clinical Dentistry Practical Training Course on Communication Skills. *Med. Sci. Educ.* **2020**, *30*, 1503–1513. [CrossRef]
47. Kim, S.; Yang, E.B. Does group cohesion foster self-directed learning for medical students? A longitudinal study. *BMC Med. Educ.* **2020**, *20*, 55. [CrossRef]
48. Yao, J.J. The Significance of Self-directed Learning Readiness, Academic Self-efficacy, and Problem-solving Ability Among Filipino Nursing Students. *Int. J. Learn. Teach. Educ. Res.* **2021**, *20*, 83–94. [CrossRef]
49. Uus, Õ.; Mettis, K.; Väljataga, T.; Ley, T. Differences in Self-Directed Learning: Middle-School Students' Autonomous Outdoor Studying. *Front. Educ.* **2021**, *6*, 718295. [CrossRef]
50. Uğur, Ü.E.; Sungur, S. Middle school students' perceptions about twenty-first-century learning practices in science classes: A multidimen-sional approach. *Hacet. Univ. J. Educ.* **2021**, *36*, 186–200. [CrossRef]
51. Labonté, C.; Smith, V.R. Learning through technology in middle school classrooms: Students' perceptions of their self-directed and collaborative learning with and without technology. *Educ. Inf. Technol.* **2022**, *27*, 6317–6332. [CrossRef] [PubMed]
52. Deepa, V.; Sujatha, R.; Mohan, J. Unsung voices of technology in school education-findings using the constructivist grounded theory approach. *Smart Learn. Environ.* **2022**, *9*, 1–25. [CrossRef]
53. Schweder, S.; Raufelder, D. Examining positive emotions, autonomy support and learning strategies: Self-directed versus teacher-directed learning environments. *Learn. Environ. Res.* **2022**, *25*, 507–522. [CrossRef]
54. Choy, D.; Cheung, Y.L. Comparison of primary four students' perceptions towards self-directed learning and collaborative learning with technology in their English writing lessons. *J. Comput. Educ.* **2022**, *9*, 783–806. [CrossRef]