Motivation and Evaluation in Education from the Sustainability Perspective: A Review of the Scientific Literature

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Abstract: (1) Background: This paper outlines the results of a literature review of meta-analyses published on motivation and evaluation in the last five years. (2) Methods: A systematic review of three educational databases (WoS, SCOPUS and ERIC) was conducted following the PRISMA and PICO approaches. A total of 54 peer-reviewed meta-analysis papers were selected, analysed and compared. (3) Results: A significant number and variety of meta-analyses have been conducted: motivation meta-analyses focus primarily on contextual variables, self-regulation and students' academic performance, and evaluation meta-analyses examine the effectiveness of the teaching intervention, the use of teaching methodologies and technological resources for learning. (4) Conclusions: There are two important absences: on the one hand, it is necessary to develop meta-analyses that combine motivation and evaluation, also measuring their interaction, from the perspective of sustainability, and not only of educational improvement, and on the other hand, it is necessary to perform meta-analyses on the effectiveness of the formative and shared evaluation of the sustainability of learning processes.

Keywords: motivation; evaluation; learning; meta-analysis; sustainability

1. Introduction

A quality education inspired by the social value of sustainability can be established as one that is able to provide meaningful and relevant learning environments, processes and tools for all students, ensuring access, promoting retention and contributing to the educational success of all in alignment with SDG number 4 of the 2030 Agenda framework: guaranteeing an inclusive, fair and quality education, and promoting opportunities for lifelong learning for all [1]. Furthermore, this kind of education must also promote the acquisition of reflective and critical competences for the development of a citizenship committed to the current challenges from a transversal, holistic and complex perspective [2,3]. Hargreaves and Fink [4] refer to such a scenario as sustainable education systems or actions to raise learning levels for all students, reduce learning gaps and increase public commitment to financing education. Therefore, we must consider an education inspired by sustainability as a framework for ensuring experiences that can positively impact on the development of a whole person's capabilities, including lifelong learning from the capabilities perspective. Under the premise of sustainable education, shared learning spaces are to be created, where different agents can promote the development of the learner's competences. This means that educational actors can be aware of their capacity to learn, to generate change and to make policy decisions through discourses that articulate and sustain good practices, as well as innovative approaches to new educational demands.

As stated above, this approach is related to the requirement of quality education. It should make it possible to change the aspects that can be improved and maintain those that work. All of this is based on criteria of quality and equity to guarantee successful learning experiences for all. In this sense, some dilemmas arise without a simple answer. However, this highlights the importance of spaces for intersubjective construction and collaboration in order to move towards quality education for all. Thus, an education inspired by the principle of sustainability must be able to create contexts, resources and processes for all learners to succeed [5].

Three questions are central to the deployment of successful education for all from the perspective of sustainability: (1) Contexts for successful learning must favour organisational, methodological and cultural conditions connected to the pedagogical principles of any learning action. (2) Resources are useful materials and instruments at the service of learning and teaching. Every resource has the role of helping the teacher to fulfil his or her educational function and the student to learn in coherence with the needs and objectives of the teaching–learning process. (3) The design and development of effective educational processes is essential for successful learning. Within this aspect, two processes are essential: The first educational process is linked to the motivation that allows the learners themselves to be guided towards well-defined learning outcomes [6]. The second educational process refers to assessment as a learning activity that enables learners to become aware of what and how they learn as acts of metacognition and self-regulation [7–9]. Both educational elements should not be interpreted as isolated elements but as processes aimed at enabling everyone to be producers and executors in self-academic, formative and professional itineraries sustained in their life projects in coexistence with others.

The aim of this paper is to map published meta-analyses on motivation and assessment throughout the teaching–learning process. To this end, a systematic review was carried out to serve as an umbrella and closure of the sustainability monograph in which this proposal is included.

2. Materials and Methods

A systematic review brings a focused view of a relevant issue of interest for the development of educational research [10,11]. It is thus a methodological strategy to screen, evaluate, synthesise and analyse the existing literature on the topic of motivation and evaluation or assessment in education.

2.1. Search Sources

This systematic review focuses on articles published in the last 5 years (January 2016–March 2021); concretely, meta-analyses included in the WoS, SCOPUS and ERIC databases are analysed. The search strategy was based on the use of terms on the subject of the study. The descriptors used were: motivation, evaluation, assessment and education. The search operators AND and OR were used.

2.2. Criteria for Inclusion and Exclusion of Articles

Inclusion criteria were as follows: (1) meta-analysis studies; (2) English language, (3) meta-analyses referring to motivation, evaluation and assessment; (4) articles collected from WoS, Scopus and ERIC databases; (5) articles within the field of educational research.

Exclusion criteria were as follows: (1) duplicate articles, (2) articles with limited information on content and methodology and (3) articles not within the time period of our analysis (January 2016 to March 2021).

2.3. Limits and Methodology of the Search

The search procedure was based on the application of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [10]. The PICO strategy was also used to find key data on the following: year, country, studies, sample or participants, purpose, content and outcomes.

This review has at least four limitations to be taken into account, since it does not seek representativeness but rather the relevance and significance of the published works: (1) it includes studies published in the last five years; (2) the selection of articles is generic and not based on their internal content; (3) it assumes a broad sense of sustainability; (4) it only incorporates meta-analyses, ignoring articles that are systematic reviews.

2.4. Procedure

The time period for the identification and selection of articles based on meta-analyses on the research topics was between 1 December 2020 and 20 March 2021.

The stages of the research were as follows: (1) Setting criteria for inclusion/exclusion of articles. (2) Decision making on the databases to be reviewed for information extraction. Three databases were selected: WoS, Scopus and ERIC. (3) Defining the search descriptors, which was among the difficulties of the study. After an exhaustive review, it was decided to use three descriptors: motivation, evaluation and assessment. All three descriptors are widely accepted by the scientific community, and are used unambiguously and commonly in the literature. The problem was that there are a large number of papers published on these topics every year, which made the research inoperative. Even the shorter time period than the one finally chosen yielded a large quantity of publications. This suggested the possibility of separate searches but also the need to focus on a particular type of study. The results of separate searches were, on the one hand, motivation articles, and on the other hand, evaluation/assessment articles.

The search strategy combined two steps for identifying and selecting information: the first step, motivation AND meta-analysis, evaluation OR assessment AND meta-analysis, and the second step, motivation AND meta-analysis (educational research), evaluation OR assessment AND meta-analysis (educational research). (5) The articles were selected using the analysis tools of the different databases, and then incorporated into MENDELEY® to be read, analysed and compared. This process involved all the authors of this paper following an interjudge agreement procedure to make decisions on the suitability, relevance and fit of the selected articles. The result was a realistic and useful number of articles that were considered for further analysis.

The search strategy was systematised using the *PRISMA Flow Diagram* template [10]. Its usefulness lies in its visual power and coherent organisation of the flow of action with its decisions and results. Thus, for each of the descriptors, motivation and evaluation/assessment, the initial search yielded a total of 98 documents. These documents were refined according to the criteria. After eliminating duplicates and a primary analysis (title, abstract and keywords), 69 records were explored by applying the inclusion/exclusion criteria to refine the selection through a detailed reading by the researchers, individually, and then shared, of the documents suitable for study according to the objectives of this research (Figure 1).

Six categories of analysis were used:

(1) Author and year of publication: Which authors are involved in the meta-analysis? In which year was it published? The search period was the last five years in order to obtain a sufficient but manageable information base.
(2) Country: descriptive but illustrative of where this type of study is produced and prioritized.
(3) Studies: essential questions in meta-analyses. The studies used to carry out the systematic review provide information on the quality of the meta-analysis and its implications.
(4) Sample: as with the previous criterion, in a meta-analysis, it is necessary to identify the sample used, not always the number of people, but the number of studies.
(5) Purpose: the objective of meta-analysis.
(6) Content: thematic descriptors that allow concepts to be associated with the descriptors of our study; it is essential to use the Boolean data search in English and Spanish. Therefore, each data set of the two levels refers to the established search descriptors.
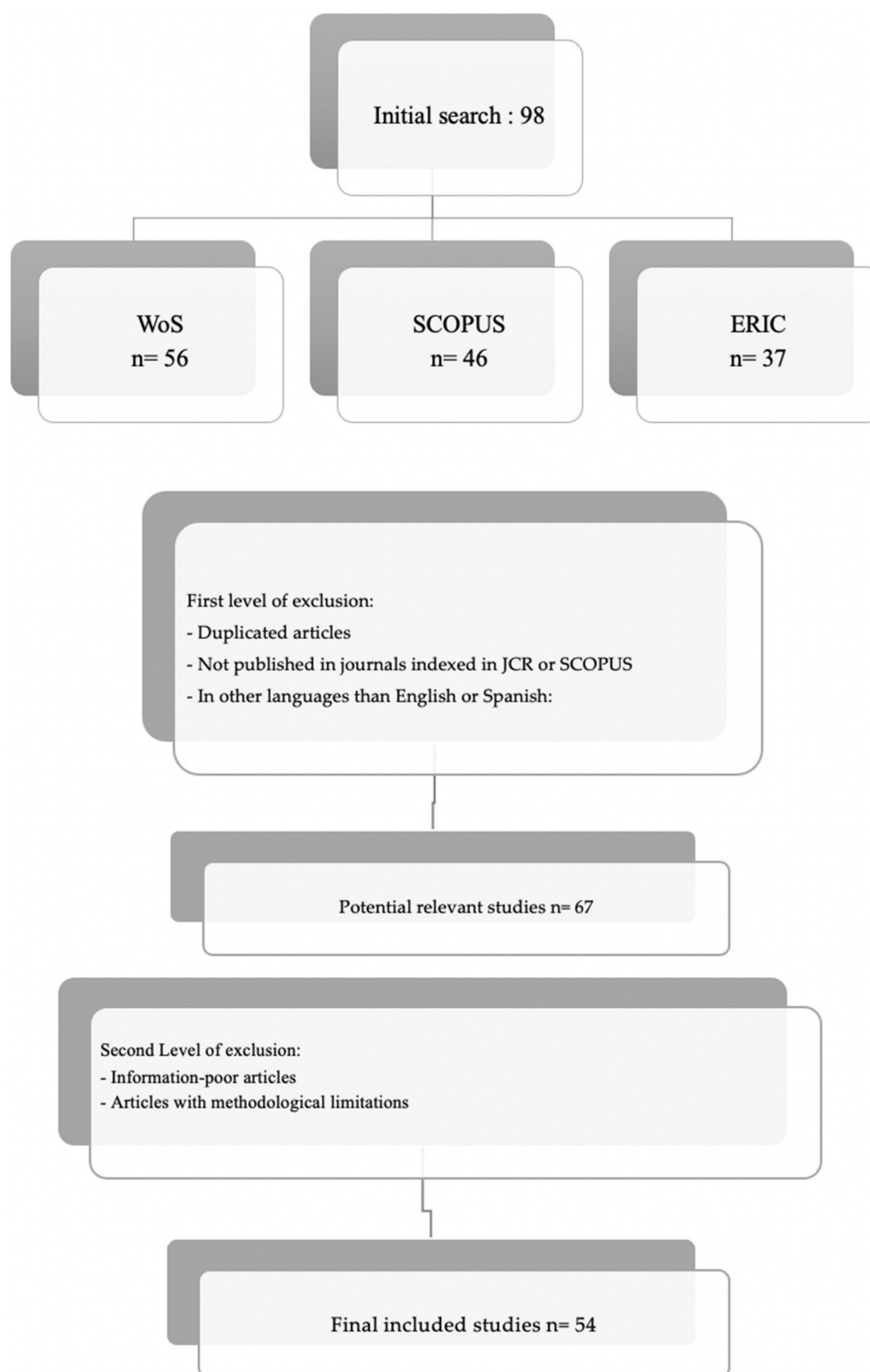
Figure 1. Flow diagram of the systematic search process.

2.5. Quality Assessment

The quality of the selection process, as well as the adequate implementation of the inclusion and exclusion criteria, was carried out by combining four strategies: (1) Inclusion of the review in PROSPERO of the Centre for Review and Dissemination. Application

of the PRISMA protocol [10]. This was also combined with the use of AMSTAR [11], an excellent tool of critical appraisal for systematic reviews. (3) The Consolidated Standards of Reporting Trials Statement [12] was used. It is a set of 25 recommendations to inform trial design, analysis and interpretation. The inherent nature of meta-analyses recommended that this strategy also be applied. (4) The search procedure was initially conducted anonymously by two investigators, and the results were discussed by interjudge agreement. In the case of doubt, the register was consulted again, and collegial decisions were made.

3. Results

The results are a descriptive and comparative analysis of 53 meta-analyses.

3.1. Descriptive Analysis

The descriptive analysis shows the main key indicators of the sample of publications selected in this study. For this purpose, a table format was chosen to summarise the descriptive information for each of them. Information on the descriptor motivation is shown in Table 1, and information on the evaluation and assessment is shown in Table 2.

3.2. Visual Comparative Analysis: Key Words

The comparative analysis informs five issues: (1) In recent years, we have witnessed a proliferation in the use of meta-analysis to provide empirical evidence on the effects of variables related to motivation, evaluation and assessment in education. (2) There is an important variety of issues concerning the topic of motivation and evaluation, although (3) motivation and assessment are jointly addressed when meta-analyses deal with the topics of testing, achievement or learning improvement. (4) Meta-analyses on motivation are mainly focused on the context and educational process variables, while meta-analyses on assessment are focused on the effectiveness of the intervention, the use of methodologies or technological resources or self-regulation in learning. (5) It is remarkable that there are very few meta-analyses on formative and shared assessment.

Figures 2 and 3 show the key descriptors related to the meta-analysis studies analysed in this article.

Figure 2. Descriptor cloud of meta-analyses on motivation.

Table 1. Summary of meta-analysis on motivation in education.

Motivation (*n* = 26)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Noordzij, Giel and Van Mierlo [13]	2021	The Netherlands	90	11,247	To study the motivational and performance effects of experimentally induced achievement goals and the moderating effects of goal standard and goal framing	Induced achievement goals, goal standards, goal framing	Goal framing and goal standard should be taken into consideration in achievement goal research and practice
Segaran and Hasim [14]	2021	Malaysia	204	—	To identify the patterns and gaps in the self-regulated learning SRL	Self-regulated learning, ePortfolio	There are significant changes in students' academic outcomes
Turhan [15]	2020	Turkey	22 8	8010 3017	To study the effect of gender on academic motivation	Gender differences in academic motivation	Low significant level ($d = -0.07$)
Lei and Chiu [16]	2020	China	96	–	To examine Chinese adolescents' academic emotions across time via a cross-temporal meta-analysis	Academic emotions, mainland China, students	Gender differences were not significant
Scherrer and Preckel [17]	2019	Germany	107	25,340	To study the effects of the levels of motivational variables and self-esteem among students during the school career	Motivation, self-esteem stage-environment fit	Change significantly differed by construct with the largest decreases in intrinsic motivation
Howard, Chong and Bureau [18]	2020	Australia	78	41,633	To examine covariates associated with three types of intrinsic motivation from self-determination theory (SDT) within the education context: intrinsic motivation (IM) to know, IM to accomplish, and IM to experience stimulation	Intrinsic motivation, education	Intrinsic motivation appears to be a relatively homogeneous construct within educational psychology

Table 1. *Cont.*

Author	Year	Country	Studies (f)	Sample (n)	Purpose	Content	Outcome
			Motivation (*n* = 26)				
Slemp, Field and Cho [19]	2020	Australia	98	40,253	A meta-analysis of teacher motivation is performed	Autonomous motivation, controlled motivation, teacher, well-being, distress, self-determination theory, basic needs	Autonomous motives predict teacher well-being and student supportive teaching styles
Li, Cho, Cosso and Maeda [20]	2020	China	73	95,872	To examine the association between K-12 students' motivation to learn mathematics and mathematics anxiety, and explored the effects of potential moderating factors	Mathematics anxiety, motivation for mathematics, self-concept, self-efficacy, intrinsic value, achievement value	The strength of the correlation between students' mathematics anxiety with competence beliefs ($r = -0.48$) was stronger than the correlation with value beliefs ($r = -0.36$)
Korpershoek, Canrinus, Fokkens-Bruinsma and Boer [21]	2020	The Netherlands	82	208,796	Examines the relationships between students' sense of school belonging and students' motivational, social–emotional, behavioural, and academic functioning in secondary education	School belonging, motivation, academic achievement, school belonging, meta-analysis	The results reveal that school belonging plays an important role in students' school life
Radkowitsh, Vogel and Fisher [22]	2020	Germany	53	5616	To study the effect of learning with a computer-supported collaboration (CSCL) script on unguided collaborative learning	CSCL script, learning, collaborative, motivation	CSCL scripts leads to a non-significant positive effect on motivation (*Hedges' g* = 0.13)
Zheng, Bhagat, Zhen and Zhang [23]	2020	Taiwan	95	15,386	To examine the overall effectiveness of the flipped classroom on students' learning achievement and motivation	Flipped classroom, motivation, learning	Flipped classroom approach had a moderate effect size for learning motivation

Table 1. *Cont.*

Motivation (*n* = 26)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Goksu and Bolat [24]	2020	Turkey	38	8690	To determine the overall effect of the ARCS (attention, relevance, confidence, satisfaction) model of motivation on students' academic achievement	Motivation, academic achievement, motivation, learning	There was not a significant effect on motivation (*ES* = 0.43)
Fernández, Abad Robles, Collado, Almagro, Castillo and Giménez [25]	2020	Spain	4	4	To review the effects of cooperative learning interventions on intrinsic motivation	Intrinsic motivation, cooperative learning, behaviour, physical education	Program duration and participant age might have some influence on conducting effective interventions (*d* = 0.38)
Mailool, Retnawati, Rogahang and Waney [26]	2020	Indonesia	30	30	To study the relationship between motivation and teacher performance	Motivation, teacher performance, quality, teaching	There is a significant relationship between motivation and teacher performance (*r* = 0.446)
Toste, Didion, Peng, Filderman and McClelland [27]	2020	USA	132	185	To investigate the relation between motivation and reading achievement among students	Motivation, reading achievement, kindergarten, K-12 grade	There is a bidirectional nature of the relation between motivation and reading: earlier reading is a stronger predictor of later motivation than motivation is of reading
Dinçer [28]	2020	Turkey	26	2140	To examine the relationship between motivation and materials based on ARCS Model	ARCS model digital materials, motivation, multimedia, learning environments	Positive effects of materials on motivation (*g* = 0.57)
Koenka, Linnenbrink, Moshontz, Atkinson, Sanchez and Cooper [29]	2019	USA	s/f	s/f	To examine the impact of grades, comments, and no performance feedback on academic motivation and achievement	Achievement, assessment, grades, motivation, written feedback, elementary education	Grades positively influenced achievement but negatively influenced motivation compared to no feedback

Table 1. *Cont.*

Motivation (*n* = 26)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Kriegbaum, Becker and Spinath [30]	2018	Germany	74	80,145	To study the predictive power of intelligence and motivation for school achievement	Intelligence, motivation, school achievement	Both intelligence and motivation contribute to the prediction of school achievement
Volk [31]	2018	Saudi Arabia	32	32,078	Meta-analysis of the L2 motivational self-system	Ideal L2 self, ought-to L2 self, L2 learning experience, L2 motivational self-system, self-guide	The ideal L2 self, the ought-to L2 self, and the L2 learning experience were significant predictors of subjective intended effort
Murthy and Jiar [32]	2017	Malaysia	19	—	To examine the effects among students' anxiety, motivation and attitudes in learning English as a second language	Anxiety, attitudes, learning, second language, motivation	There are strong relationships among these three variables
Higgins, Huscroft-Dangelo and Crawford [33]	2017	USA	24	4522	To determine the effects of technology use on student achievement, motivation, and attitude	Technology, achievement, motivation	Significant overall impact of technology on student achievement, motivation, and attitudes
Ergen and Kanadli [34]	2017	Turkey	21	5353	To study the effect of self-regulated earning strategies on academic achievement	Self-regulated learning, academic achievement, moderator analysis	Self-regulated learning strategies had a "large" effect ($d = 0.859$) on academic achievement
Lazowski and Hulleman [35]	2016	USA	34	38,377	To study the interventions in education in relation to motivation theory	Education interventions, motivation	Interventions were generally effective ($d = 0.49$)
Hagger and Chatzisarantis [36]	2016	USA	10	10	To study a proposal for a trans-contextual model in physical education	Motivation, trans-contextual model, physical education	There are important gaps in the results. The significant relationship is not sufficiently clear

Table 1. *Cont.*

Motivation (*n* = 26)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Bak [37]	2016	Korea	80	684	To examine the differences between gifted and non-gifted students on academic motivation	Gifted, academic motivation, students	The overall mean effect size of positive academic motivation was 0.705, above moderate effect
Maeng [38]	2016	Korean	74	175	To study the effect of motivation on L2 learning in Korea	L2 learning, motivation, students	The results show a weak correlation between L2 proficiency and motivation, L2 strategy and motivation, and psychological concepts and motivation.

Table 2. Summary of meta-analysis on evaluation/assessment in education.

Evaluation/Assessment (n = 28)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Zheng, Bhagat, Zhen and Zhang [23]	2020	China	37	–	To study the effects of technology-facilitated peer assessment based on two main elements: (1) technology-facilitated peer assessment, (2) the use of extra supporting strategies in technology-facilitated peer assessment	Peer assessment; learning achievement	Results indicated that technology-facilitated peer assessment had a significant and medium effect on learning achievements with an overall mean effect size of $d = 0.576$
Rios, Ihlenfeldt, Chavez [39]	2020	USA	26	11,069	To study the effectiveness of accommodations for English language learners on evidence-based state accountability assessments	English learner, accountability assessments, performance, effectiveness	Results suggest that currently employed EL test accommodations lack evidence of their effectiveness

Table 2. *Cont.*

Evaluation/Assessment (n = 28)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Li, Xiong, Hunter, Guo and Tywoniw [40]	2020	USA	58	–	To study whether peer assessment promotes student's learning	Peer assessment, learning, students	The most critical factor is rater training. When students receive rater training, the effect size of peer assessment is substantially larger than when students do not receive such training
Lee, Chung, Zhang, Abedi and Warschauer [41]	2020	USA	33	33	To review empirical studies that conducted formative assessment interventions to improve student learning	Formative assessment, learning	Small-sized positive effect of formative assessment on student learning ($d = 0.29$)
Double, MoGrane and Hopfenbeck [42]	2020	England	54	—	To examine the impact of peer assessment on academic performance	Effectiveness, peer assessment, academic performance	Results suggested that the effectiveness of peer assessment was remarkably robust across a wide range of contexts
Mortaz, Jalili, Masoomi, Shirazi, Nedjat and Norcini [43]	2020	Iran and Sweden	58	—	To examine the utility of the mini-clinical evaluation exercise (CEX) for assessing undergraduate and postgraduate medical trainees	Evaluation, education quality, clinical competence, education medical, education physical examination	The mini-CEX improved students' performance in other examinations
Hanshaw and Dickerson [44]	2020	USA	20	–	What is the effect of science on the evidence of learning outcomes in high-fidelity simulation in undergraduate nursing education?	Learning outcomes, evaluation, evidence, skills, simulation	Outcome measures reviewed include increasing levels of thinking
Lai and Bower [45]	2020	Australia	73	–	To analyse the impact of learning technology use across different aspects of evaluation	Evaluation, learning technology, tertiary	Interaction, gamification, constructivism, student-centred learning and feedback are effective approaches to learning

Table 2. *Cont.*

Evaluation/Assessment (n = 28)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Zhao, Xu, Jiang and Ding [46]	2020	China	15	816	To study the performance of virtual reality (VR) anatomy education	Augmented and virtual reality, improving classroom, teaching, learning strategies	The finding confirms that VR may act as an efficient way to improve the learners' level of anatomy knowledge
Lester, Chow and Melton [47]	2020	USA	30	–	To extend the literature by meta-analysing a comprehensive sample of studies and examine the impact of study quality on meta-analytical results	Academic success, adolescent education, program evaluation	The inclusion of lower quality studies significantly impacts overall outcomes in comparison to prior meta-analyses that have limited samples
Reyes, Dinh, Lacerenza and Salas [48]	2020	USA	73	5654	Effectiveness of educational leadership development (LD) in students	Leadership, education, effectiveness, higher education	LD programs within higher education work
Bryfonski and McKay [49]	2019	USA	52	–	To study the effects of long-term implementation of task-based language teaching (TBLT) in authentic language classrooms	Task-based language teaching, task-based learning, TBLT, language program evaluation, second language pedagogy	Results revealed an overall positive and strong effect ($d = 0.93$) for TBLT implementation on a variety of learning outcomes
Husiman, Saab, Van den Broek and Van Driel [50]	2019	The Netherlands	24	–	To analyse the impact that peer feedback has on students' writing performance	Peer feedback, peer assessment, academic writing	Formative peer feedback has significant values
Gegenfurtner and Ebner [51]	2019	Germany	5	381	To study the effect sizes and test the predictive validity of Kirkpatrick's assumption	Adult learning, computer-mediated, communication, distance education and telelearning, distributed learning environments, media in education	Kirkpatrick's model does not produce the expected effects on learning

Table 2. *Cont.*

				Evaluation/Assessment (n = 28)			
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Hurwitz [52]	2019	USA	45	24,624	To examine the effects of ready to learn (RTL)	Child, learning, literacy, preschool child program, evaluation, reading, television	Results indicate positive effects of RTL media exposure on children's literacy outcomes, especially vocabulary and phonological concepts
Castro and Tumibay [53]	2019	Philippines	50	–	To examine the efficacy of online learning in educating students	ADDIE (analysis, design, development, implementation, and evaluation) framework, efficacy, online learning course	The efficacy of online learning courses through having well-planned, well-designed courses and programs for higher education institution
Koenka, Linnenbrink-Garcia, Moshontz, Atkinson, Sanchez and Cooper [29]	2019	USA	–	–	To examine the impact of grades, comments, and no performance feedback on academic motivation and achievement in elementary and secondary school	Motivation, performance, achievement, secondary school	The overall effects varied as a function of the type of motivation
Petersen [54]	2018	USA	16	–	To examine the gender differences in US state verbal assessments	Gender, verbal performance, performance assessments	The small gender differences in verbal performance increased in a linear pattern from grades 3 to 8 and then remained steady in high school ($d = 0.29$)
Maan, Hussain and Sharma [55]	2018	India	–	–	To find the existing process of curricular delivery of physical education program	Sport, benchmarking, university, teaching, evaluation	The physical education curriculum differs from country to country and within the institutions in the country (India)

Table 2. *Cont.*

Evaluation/Assessment (n = 28)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Hamad, Elser, Tran, Rehkopf and Goodman [56]	2018	USA	25	600	The association between increased educational attainment and improved health	Compulsory schooling, educational attainment instrumental, policy evaluation	The meta-analysis demonstrated small beneficial effects for mortality, smoking, and obesity
Cui, Li, Geng, Zhang and Jin [57]	2018	China	9	1079	To assess the effectiveness of evidence-based nursing (EBN) on the development of critical thinking for nursing students	Critical thinking evidence-based nursing (EBN), nursing education	The effectiveness of evidence-based nursing was superior to that of traditional teaching on nursing students' critical thinking
Panadero, Jonsson and Botella [58]	2017	Spain	19	2305	To study the effects of self-assessment on students' self-regulated learning (SRL) and self-efficacy	Self-assessment, learning, self-efficacy	The importance of self-assessment interventions to promote students' use of learning strategies and its effects on motivational variables, such as self-efficacy
Conn [59]	2017	USA	56	345	To identify educational interventions with an impact on student learning in Sub-Saharan Africa	Education and developing countries, impact evaluation	Pedagogical programs that employed adaptive instruction or teacher coaching were particularly effective
Vo, Zhu and Diep [60]	2017	Belgium and VietNam	34	35,690	To analyse the impact of blended learning (BL) on the academic achievement of higher education students	Blended learning discipline, higher education, student performance	The effect of BL in STEM disciplines is significantly higher than that of non-STEM disciplines

Table 2. *Cont.*

Evaluation/Assessment (n = 28)							
Author	**Year**	**Country**	**Studies (f)**	**Sample (n)**	**Purpose**	**Content**	**Outcome**
Yue, Zhang, Zhang and Jin [61]	2017	China	Not access	Not access	The review and meta-analysis were to assess the effect of concept mapping on developing critical thinking in nursing education.	Concept mapping, critical thinking, education	The concept mapping could affect the critical thinking affective dispositions and critical thinking cognitive skills
Li, Xiong, Zang, Kornhaber, Lyu, Chung and Suen [62]	2016	USA	69	69	To study the effect of computer-assisted peer assessment on student performance	Assessment, computer-assisted, performance	It is moderately strong
Sung, Chang and Liu [63]	2016	Taiwan	110	4121	To study the effects of integrated mobile devices on teaching and learning	Evaluation methodologies, pedagogical issues, teaching, learning strategies	A moderate mean effect size of $d = 0.523$
Zhou, Zhou, Huang, Xu, Zhang, Zeng and Qian [64]	2016	China	16	1826	A critical overview of problem-based learning (PBL) practices in Chinese pharmacy education	Pedagogics, problem-based learning, questionnaire, skill, teaching, theoretical model, university education, problem-based learning, evaluation	PBL pedagogy is superior to traditional lecture-based teaching in Chinese pharmacy education

Figure 3. Descriptor cloud of meta-analyses on evaluation or assessment.

4. Discussion and Conclusions

This article highlighted the importance of motivation and evaluation to our understanding of educational processes from a sustainable perspective. In other words, there is evidence that both topics are of interest to the scientific community, either because of the number of publications or the diversity of aspects they deal with. This was our intention from the outset. However, in addition, this map allows us to analyse motivation and evaluation in the current context in relation to the priorities, absences and possibilities for the development of research in education.

These issues point to at least two possible directions for further research: (1) the need for more meta-analyses covering the range of topics on motivation and evaluation; (2) the absence of publications undertaking a stated and defined perspective of the sustainability of educational processes is highlighted. There are no meta-analyses that study motivation from evaluation and evaluation from motivation guided by the perspective of the sustainability of educational processes. This is undoubtedly a manifest absence.

In sum, motivation and evaluation are key to promoting successful educational processes for all. These processes must be sustainable and must contribute to the sustainability of education. Despite the remarkable increase in meta-analyses on these topics, it is evident that there is a lack of a sustainable perspective, most likely the result of experimental studies that provide evidence in this area.

The review that we carried out must also be understood in terms of its limitations: (1) It focused on meta-analyses as a criterion of usefulness and priority in the generation of knowledge based on scientific evidence, but there are a large number of other valuable works. (2) Three of all existing databases were used. It is true that these three databases are of high quality, and the impact of international publications is included in them. (3) The use of PICO (adapted according to the nature of the study) is a guarantee of the quality of the work procedure, as well as PRISMA and the other tools used.

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