An Evaluation of the Studies on Self-Regulated Learning in Primary Education: A Bibliometric Mapping Analysis

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Abstract

This research emerged to get an overview of the choices made in the field of self-regulation in primary education. The purpose of this research is to examine the bibliometric properties of studies on self-regulated learning at primary school level and scanned in the Web of Sience database. In accordance with this purpose, by using key words of "self-regulation" or "self-regulated learning" and topics of "primary school" or "primary education", 526 studies conducted between 1994-2020 have been reached. By selecting "education" or "psychology" categories, biblometric mapping analysis was performed with 392 studies suitable for the scope of the study. The bibliometric mapping analysis of the studies reached by using the Vosviewer software tool was performed, bibloyometric networks were created and presented visually. In the studies, the most used keywords, words in the abstracts, citation analysis and co-citation analysis were done. As a result, it has been revealed that the majority of the publication language of the studies within the scope of the study is English, studies have increased since 2007, the most used words in keywords are self-regulation, self-regulated learning and motivation, the most cited authors according to co-citation analysis are Zimmerman, Pintrich and Schunk, the most cited journals according to co-citation analysis are Journal of Educational Psychology, Journal of Educational Psychology, Child Development and Developmental Psychology, and the most cited countries according to citation analysis are United States, Germany and Netherlands. The results of the research provide general information about the self-regulation studies carried out at primary school level and it is thought that it will be useful for the researchers who will conduct research on this subject.

INTRODUCTION

The concept of self-regulation is available in different definitions as it has been used in different areas in recent years. *Self-regulated learning* (or *self-regulation*) is defined as "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2005, p. 14). Self-regulated learners are aware of their strengths and weaknesses. They set goals for themselves, use strategies to achieve their goals, monitor their behavior and self-reflect on the effectiveness of the strategies they have used. Effective consequences of their behaviors contributes to self-regulated learners' motivation to develop their learning methods (Zimmerman, 2002).

From a social cognitive perspective, reciprocal interactions among personal, behavioral, and environmental factors constitute self-regulation (Bandura, 1986). Although some factors predominate at particular times, in a classroom environment the three factors generally interact. For instance, as a teacher instructs students, students reflect on teaching and thus environment influence person's cognition. If students are confused, they ask questions to the teachers which show that cognition affects behavior. The teacher instruct the material rather than passing the new topic indicating that behavior affects environment (Pintrich & Schunk, 2002).

One of the components of self-regulation is metacognition which "includes skills that enable learners to understand and monitor their cognitive processes" (Schraw et al., 2006, p. 112). Metacognition is generally divided into two components which are knowledge of cognition and regulation of cognition (Brown, 1987; Schraw & Moshman, 1995). Besides, metacognitive awareness, self-beliefs and affective reactions have significant roles in individuals' self-regulation (Zimmerman, 1995), such as self-efficacy and intrinsic interest (Zimmerman, 2002). Indeed, self-regulation is an umbrella term that encompass various social, motivational, and behavioral processes (Zimmerman, 1995).

According to Zimmerman's (2005) self-regulation model, there is a cyclical and interrelated relationship between self-regulatory processes. Accordingly, three phases of self-regulation is (a) forethought, (b) performance or volitional control, and (c) self-reflection. Forethought phase precede efforts and includes categories of task analysis (goal setting and strategic planning) and self-motivational beliefs (self-efficacy, outcome expectations, value, and goal orientation) (Zimmerman, 2005). For instance, effective people believe in their abilities to perform a given task and self-efficacy influence individuals' choices, effort, and persistence (Bandura, 1986). Goal orientation, another component in forethought phase, refers to individuals' purposes of engaging in achievement behavior (Ames & Archer, 1992; Dweck, 1986). While some individuals are concerned with improving their competence and set self-referenced standards (i.e., mastery goals), some individuals focus on demonstrating their abilities to others and pursue normatively based standards (i.e., performance goals) (Ames & Archer, 1992; Meece et al., 1988).

Performance or volitional control phase involves processes that happens during the performance efforts and help individuals focus on the task and adjust their enterprise. Self-control (self-instruction, imagery, focused attention, and task strategies) and self-observation (self-recording and self-experimentation) constitute this phase (Zimmerman, 2005). For instance, focused attention is related to one's increasing his/her concentration and exclusion of external circumstances (Zimmerman, 2005). Self-observation is another component under performance phase and refers to learner's tracking of his/her own performance and its consequences (Zimmerman & Paulsen, 1995).

Self-reflection phase, on the other hand, refers to after performance processes like self-judgment (self-evaluation and causal attribution) and self-reaction (self-satisfaction and adaptive-defensive inferences) (Zimmerman, 2005). Self-evaluation is related to one's comparison of his/her performance against a standard or goal (Bandura, 1986). Individuals can make normative

comparison, social comparison, self-comparison, or collective comparison (Bandura, 1986). Furthermore, individuals make causal attributions for their performance (Zimmerman, 2005). According to Weiner (1986) these attributions can be categorized along dimensions of stability (stable or unstable), locus (internal or external), and control (controllable or uncontrollable). For instance, a student who attributes his /her performance to long-term effort is making stable, controllable, and internal attribution while a student who attributes his /her performance to chance is making unstable, uncontrollable, and external attribution (Weiner, 1986). These dimensions are related to students' expectancy beliefs (Pintrich & Schunk, 2002). For instance if a student attributes his success to aptitude, which is perceived to be generally internal and stable, his expectation to achieve in the future will be high. On the other hand, if he attributes his success to luck which is unstable, his expectation to succeed in the future will be low (Pintrich & Schunk, 2002). Moreover, these dimensions influence individuals' emotions (Weiner, 1986). Locus dimension is related to feelings of pride and self-esteem; stability dimension is related to helplessness and hopefulness; and controllability dimension is related to shame and guilt (Weiner, 1994, as cited by Pintrich & Schunk, 2002). Self-reflection processes affect forethought phase thus making up a cycle (Zimmerman, 2005).

From a self-regulation perspective, self-regulation is responsible for individual differences in students' learning (Zimmermman, 2002). Inadequacies in students' self-regulatory processes can be responsible for students' underachievement because these students are not good at setting goals and assessing their abilities, and they have low efficacy beliefs opposite to students who accurately execute self-regulatory processes (Borkowski & Thorpe, 1994). Self-regulated learners, on the other hand, set specific and proximal goals, use appropriate strategies to reach their goals, monitor their progress, make adjustments in their environment in order to ease attainment of their goals, make adaptive causal attributions for consequences of their performances, and adapt their methods of learning for future use (Zimmerman, 2002). Empirical evidence support that students who have high achievement implement self-regulatory processes more effectively than students with low achievement (e.g., Risemberg & Zimmerman, 1992; Zimmerman & Martinez-Pons, 1990). Due to its association with students' learning, self-regulation has attracted attention of researchers and numerous studies have been conducted so far at different school levels (Cleary & Chen, 2009; Cleary & Zimmerman, 2004; Dignath & Büttner, 2008; Dignath et al., 2008; Tarchi et al., 2022). In the present study, we focus on studies which were done in primary school because impotance of self-regulation has been especially emphasized in primary school. For instance, according to the results of their meta-analysis, Dignath et al. (2008) revealed that self-regulated learning education programs have a positive effect on primary school students' learning outcomes, strategy use and motivation. This study aims to provide a bibliometric mapping analysis of studies on self-regulation in primary education. Bibliometric mapping analysis allows the bibliography of scientific publications to be evaluated using mathematical methods (Zan, 2019). It also allows researchers to obtain information about the structure of their field (Al and Coştur, 2007). For example, revealing the most cited studies in the related literature can be considered as a measure of the impact or / and visibility of the relevant researchers (Lv et al., 2011). Along with biblometric studies, it can be thought that the relevant researchers will have the chance to conduct more original and new studies by evaluating the current situation (Karagöz and Şeref, 2019). In addition, clustering techniques play an significant role in biblometric research, as it allows to identify relevant publications, authors, and journal groups (Van Eck and Waltman, 2017). Thus, it is thought that this study will reveal the current situation regarding self-regulated learning and can be a guide for the researchers who will work in this field. The studies covered in the research will be examined in terms of (1) publication language, (2) publication year, (3) most cited publications, (4) the most used keywords in studies, (5) the most used words in the abstract, (5) the most cited authors, (6) the most cited journals, and (7) the most-cited countries.

METHOD

This research was conducted according to the quantitative research design. Within the scope of this study, the studies in the field of self-regulation in primary education were examined through Web of Science databases in all years. The purpose of this study is to examine the studies on self-regulation at the primary school level that are scanned in the Web of Science database, covering all years. In addition, SSCI, SCI-EXPANDED, A & HCI, CPCI-S, CPCI-SSH, and ESCI indexes in the Web of Science Core Collection: Citation Indexes were selected to ensure selection of high quality publications and to identify articles published only in refereed academic journals (Shen and Ho, 2020). In this context, 526 studies have been reached by entering the keywords in the Web of Science database (self-regulation or self-regulated learning) and (primary school or primary education) topic option (Access date: March 6, 2020). According to the categories in the Web of Science, the "education" and "psychology" areas of these studies were selected and bibliometric mapping analysis was performed with 392 studies suitable for the purpose of the research.

DATA ANALYSIS

The term bibliometric was first used by Alan Pritchard in 1969 (Leung et al., 2017). Bibliometric analysis reveals a general picture of a research that can be classified by articles, authors and journals (Merigó & Yang, 2017). With the studies obtained within the scope of the research, bibliometric analysis was carried out through the VOSviewer software program developed by Van Eck and Waltman (2010). In addition to being a software tool used to create and visualize bibliometric networks (Van Eck & Waltman, 2017), VOSviewer can also be used to aggregate publications and analyze emerging clustering solutions (Van Eck and Waltman, 2010, 2014). The data were analyzed in terms of (1) publication language, (2) publication year, (3) most cited publications, (4) the most used keywords in studies, (5) the most used words in the abstract, (5) the most cited authors, (6) the most cited journals, and (7) the most-cited countries, which were discussed within the scope of the research.

FINDINGS

Within the scope of the research, 392 studies obtained between 1994 and 2020 in the Web of Science database were examined in terms of (1) publication language, (2) publication year, (3) most cited publications, (4) the most used keywords in studies, (5) The most used words in the abstract, (5) the most cited authors, (6) the most cited journals, and (7) the most-cited countries.

PUBLICATION LANGUAGE

The numbers of the publication language of 392 studies obtained in the study are as follows: English (355), Spanish (17), German (7), Russian (6), Latvian (2), Turkish (2), Dutch (1), French (1), and Japanese (1). It is seen that the majority of the language of the publications related to the study (91%) is English.

PUBLICATION YEAR

The distribution of the 392 publications included in the study as of 6. 3. 2020 is shown in Figure 1. 8 of the publications included in the study were published in 2020; 73 in 2019; 53 in 2018; 50 in 2017; 46 in 2016; 27 in 2015, 29 in 2014; 18 in 2013; 21 in 2012; 15 in 2011; 9 in 2010; 10 in 2009, 10 in 2008; and 7 of them were published in 2007. It is seen that the number of publications per year between 2006 and 1994 varies between 1 and 3. Thus, starting from 2007, it can be said that there has been an increase in the studies on SRL at primary school level.

Figure 1. *Publication Years in the Studies Related to Self-Regulated Learning in Primary Education*
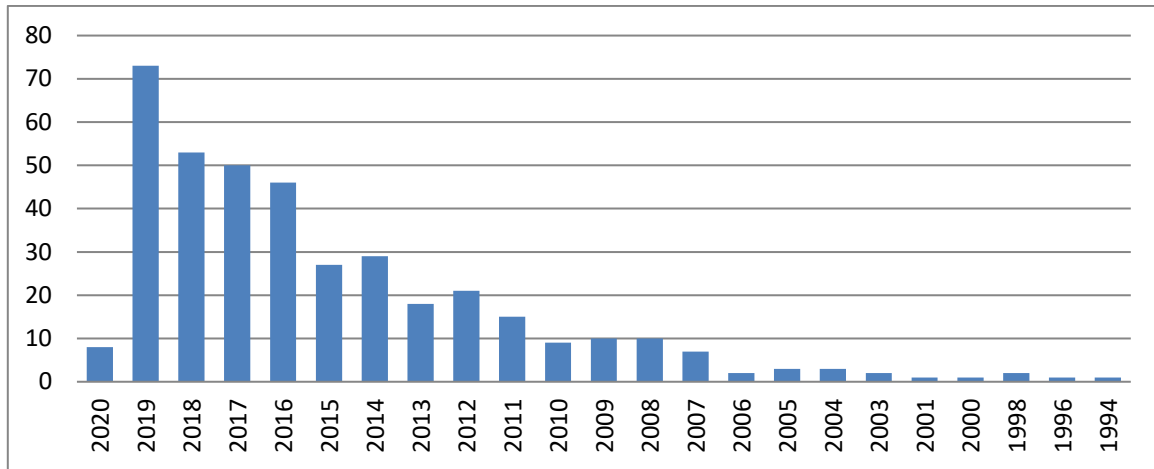
MOST CITED PUBLICATIONS

The 10 most cited publications are presented in Table 1. It is understood that the majority of the studies obtained within the scope of the study are articles.

Table 1. *Top 10 Most Cited Publications Within the Scope of the Study*

Publication Name	Journal	Year	(WoS) The Number of Citation
The development of competence in favorable and unfavorable environments - Lessons from research on successful children	American Psychologist	1998	1317
How can primary school students learn self-regulated learning strategies most effectively? A meta-analysis on self-regulation training programmes	Educational Research Review	2008	269
The contribution of children's self-regulation and classroom quality to children's adaptive behaviors in the kindergarten classroom	Developmental Psychology	2009	262
Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level	Metacognition and Learning	2008	238
Using self-determination theory to promote physical activity and weight control: A randomized controlled trial in women	Journal of Behavioral Medicine	2010	193
Motivation and self-regulation as predictors of achievement in economically disadvantaged young children	Journal of Experimental Education	2003	127
The relationship between epistemological beliefs, implicit theories of intelligence, and self-regulated learning among Norwegian postsecondary students	British Journal of Educational Psychology	2005	107
Self-regulation, motivation, and math achievement in middle school: Variations across grade level and math context	Journal of School Psychology	2009	104
Science achievement gaps begin very early, persist, and are largely explained by modifiable factors	Educational Researcher	2016	79
Self-regulation in higher education teacher learning	Higher Education	2005	78

THE MOST USED KEYWORDS IN STUDIES

To create a map based on text data for the most-used keywords, co-occurrence analysis and author keywords were selected. Minimum number of occurrences of a keyword was determined as 5 and the number of keywords to be selected was automatically stated as 33. Created map is displayed in Figure 2.

Figure 2. *The Most Used Keywords in the Studies Related to Self-Regulated Learning in Primary Education.*
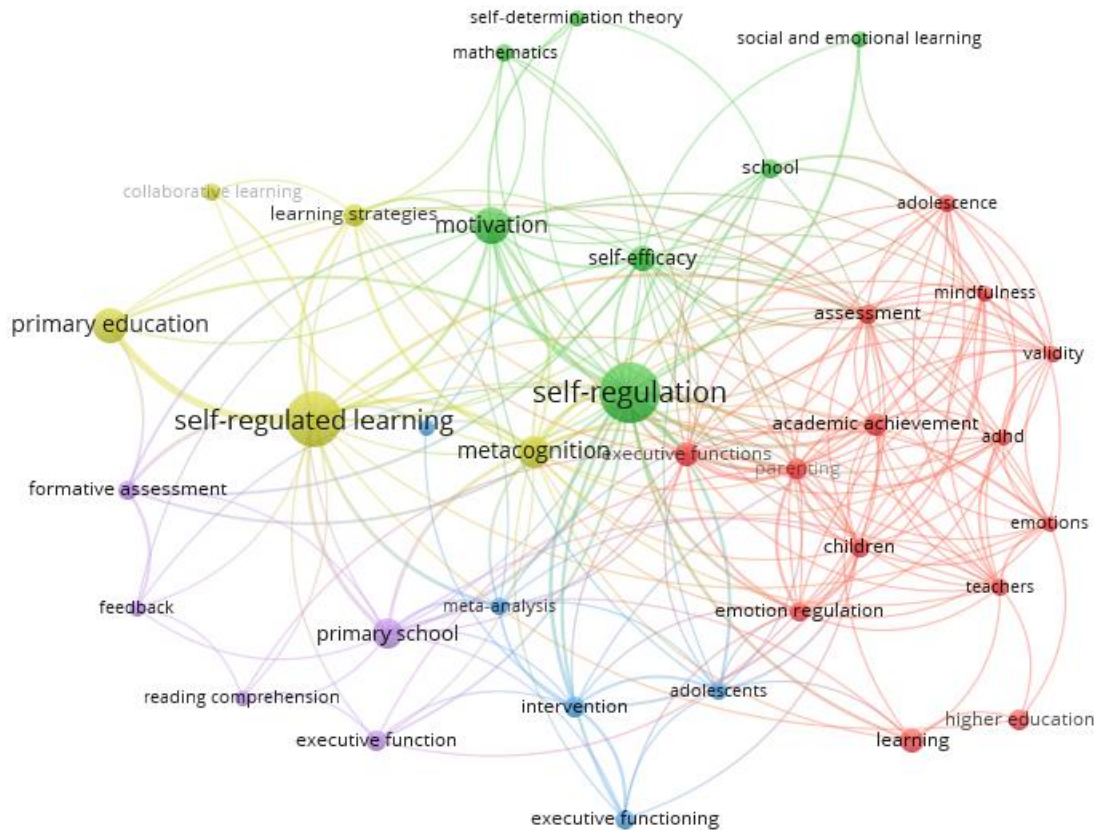
There are six clusters in Figure 2 as depicted from different colors. Some of the most used keywords are given in Table 2. The most frequently used key words are self-regulation (*f*= 71) and self-regulated learning (*f*= 60) which were followed by motivation (*f*= 27), primary education (*f*= 25), and metacognition (*f*= 21). When the keywords are examined, it is understood that the words used are directly related to self-regulation or emphasize cognitive components.

Table 2. *The Most Used Keywords in the Studies Related to Self-Regulated Learning in Primary School Education*

Keywords	*f*	Keywords	*f*
Self-regulation	71	Intervention	14
Self-regulated learning	60	Self-efficacy	13
Motivation	27	Executive functions	11
Primary education	25	Learning strategies	10
Metacognition	21	Learning	10
Primary school	18	Academic achievement	9

It is seen that the studies dealing with the research were first published in 1994 in the Web of Science database. In the analysis made through the VOSviewer program, the distribution of the keywords used in the studies conducted at primary school level was analyzed by years. The map

showing distribution of studies using the keywords according to years is shown in Figure 3. In recent studies it is understood that the frequently used keywords, which was shown as yellow color, are mathematics, teachers, executivite function.
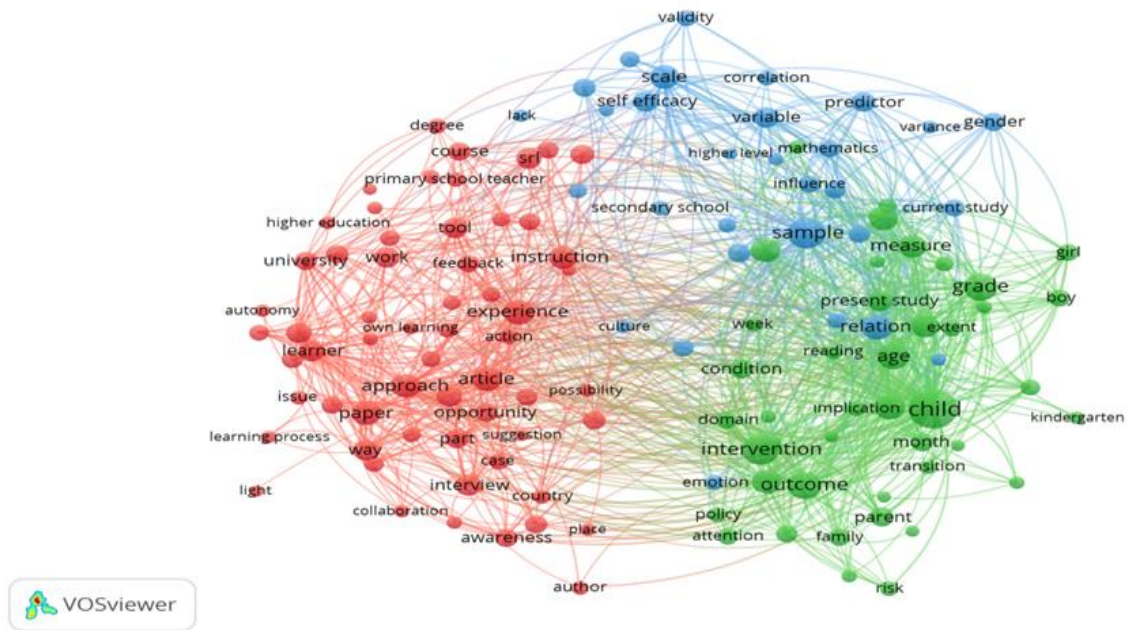
Figure 3. *The Distribution of the Studies Using the Keywords by Years (Overlay visualization).*
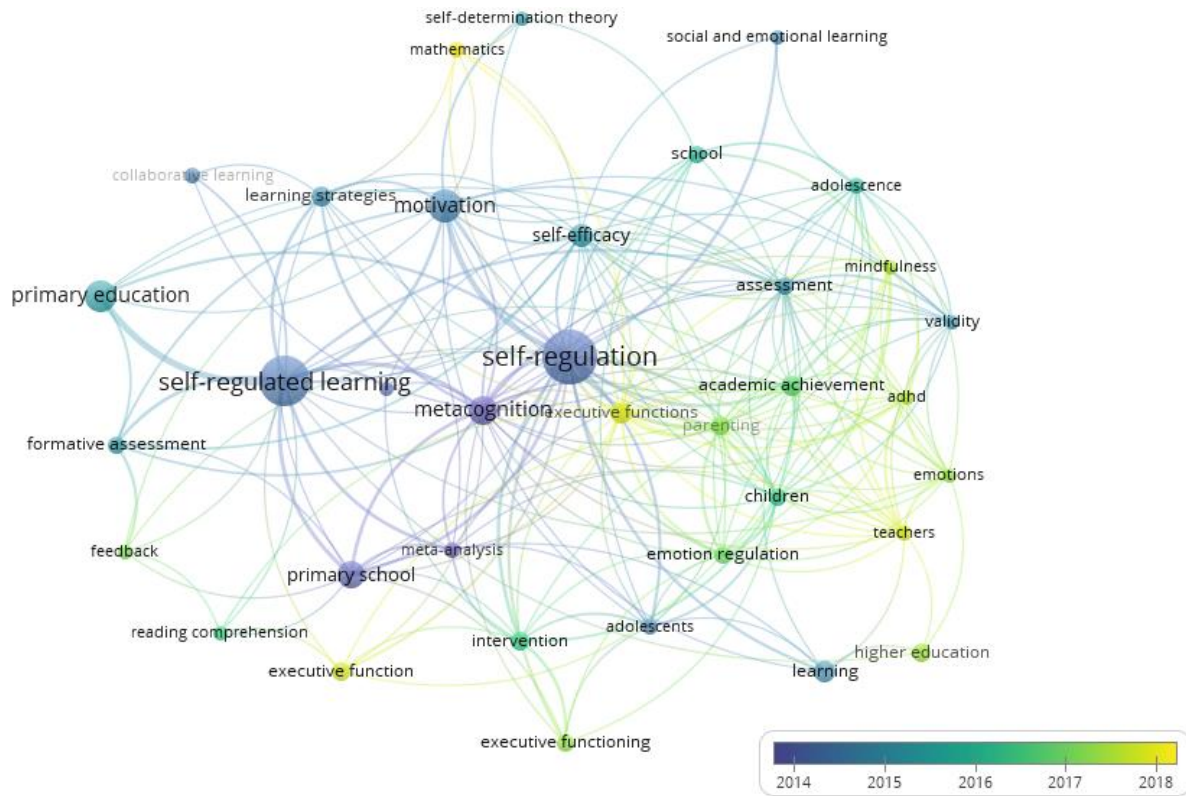
**THE MOST USED WORDS IN THE ABSTRACT**

In order to identify the most used words in the summary section of the studies, bibliometric networks were created by selecting the abstract field in the VOSviewer software tool. The map created in this context is presented in Figure 4. It is seen that the studies were collected in 3 clusters (red, green and blue) and 133 words were reported automatically. The most frequently used words in the summary section are child (*f*= 130), sample (*f*= 75), intervention (*f*=71), outcome (*f*= 62), grade (*f*= 61)

Figure 4. *The Most Used Words in the Abstract Sections of the Studies*

In addition, an analysis was carried out to determine the distribution of the words in the summary section by years. The distribution of the words used in the summary section of the studies by years is presented in Figure 5. It is seen that the words that come to the fore in the abstract section in recent years are executive functions, measure, family, improvement, positive effect.

Figure 5. *The Distribution of the Studies Using Abstract Sections by Years*
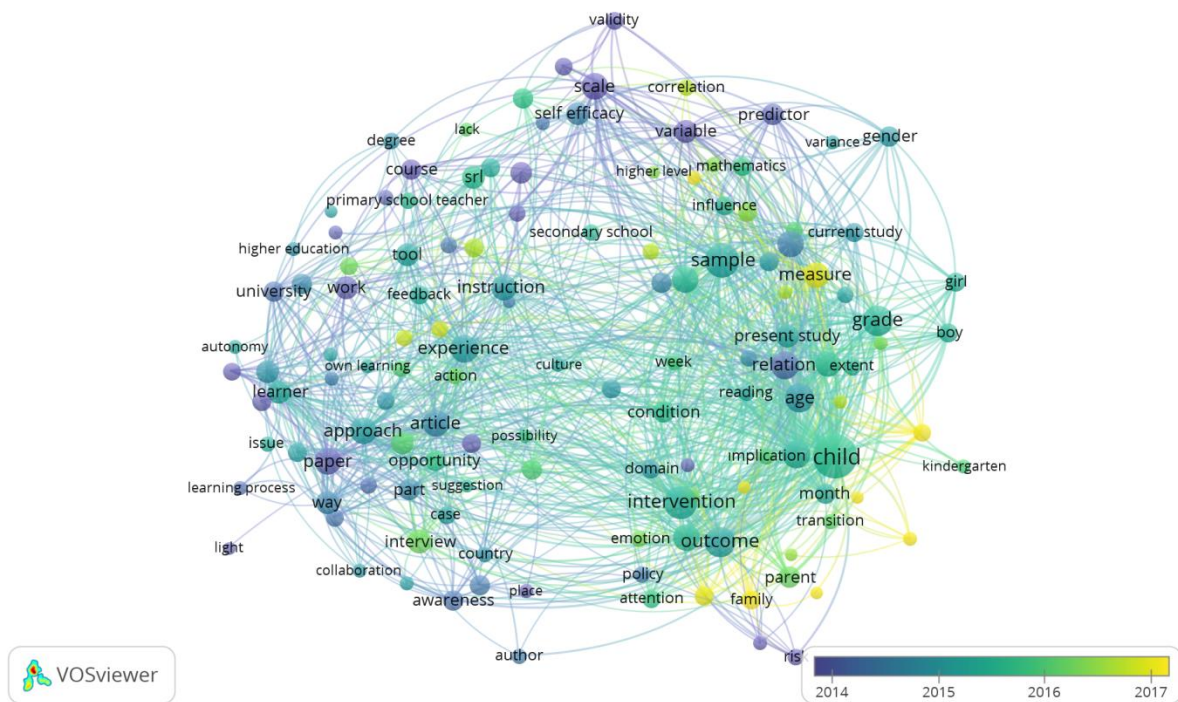
THE MOST CITED AUTHORS

Within the scope of the study, in order to determine the most cited authors, citation analysis and authors option was chosen first in the program. According to this analysis, at least three documents of an author are selected. As a result of this, information obtained from 23 authors was reported automatically. The created map is shown in Figure 6. According to the results of the report, the documents and citations information of the 16 most cited authors are presented in Table 3.

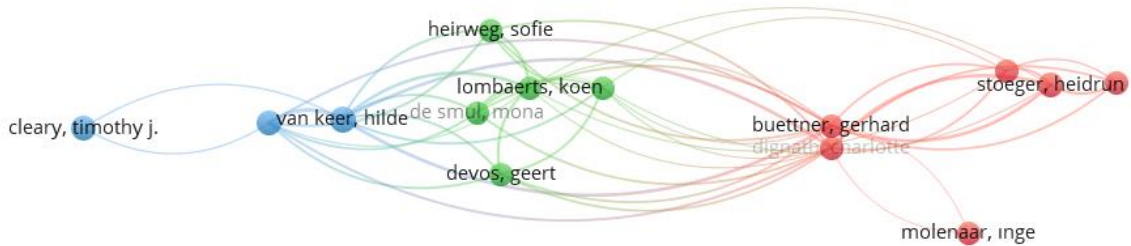**Figure 6.** *The Most Cited Authors (Citation Analysis)*

Table 3. *The Most Cited Authors (Citation Analysis)*

Author	Documents	Citations	Author	Documents	Citations
Buettner	4	521	Obergriesser	3	41
Dignath	3	517	Vandevelde	5	40
Cleary	6	217	Molenaar	4	32
Van gog	4	78	Baars	3	32
Lombaerts	4	67	De bruin	3	32
Stoeger	7	66	Paas	3	32
De backer	3	56	Melhuish	3	29
Van keer	9	43	Steinbach	3	26

Then the co-citation analysis and cited-authors option was selected. In the analysis, the minumum number of citations of an author was adjusted 23 and the number of authors to be selected was automatically stated as 64. According to the results of the analysis, it is seen that the authors are gathered in five clusters. The created map is presented in Figure 7. In addition, according to co-citation analysis, the most cited 21 authors are shown in Table 4.

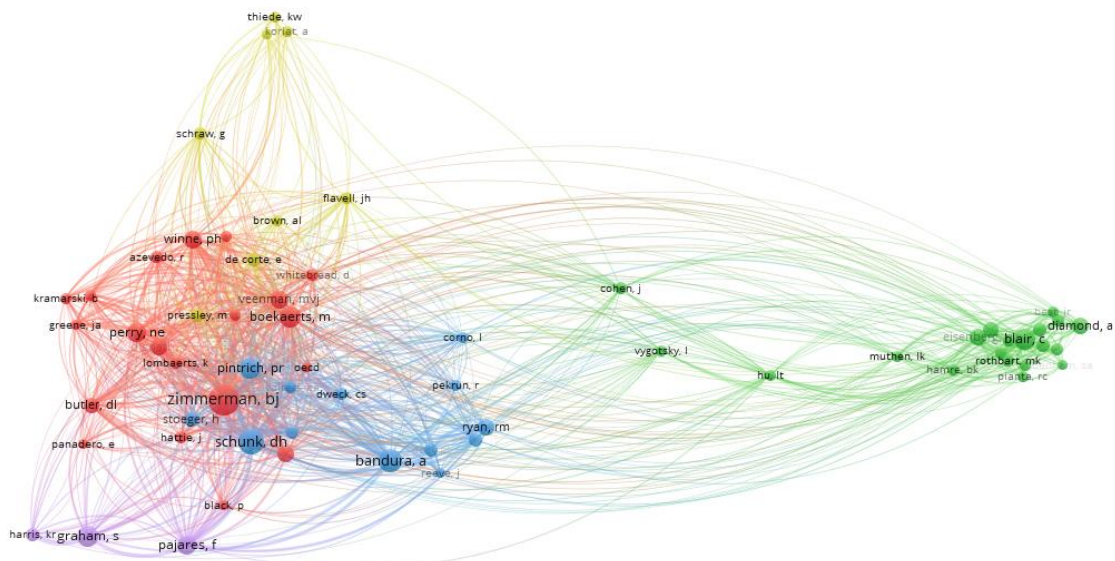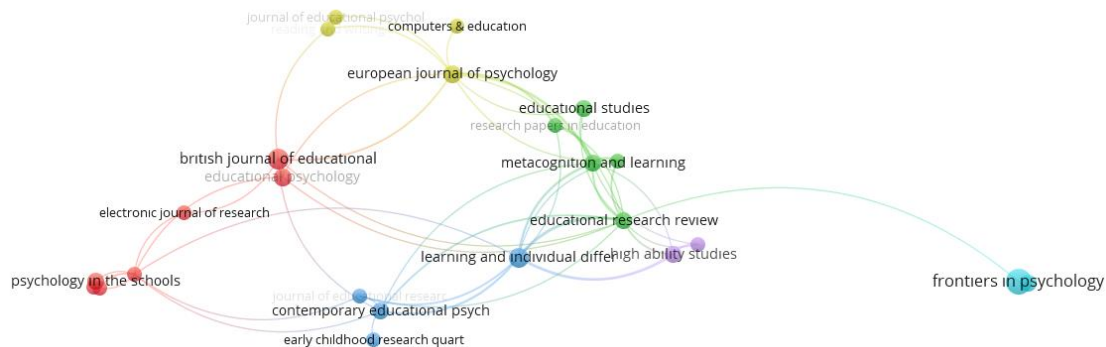**Figure 7.** *The Most Cited Authors (Co-Citation Analysis)*

Table 4. *The Most Cited Authors (Co-Citation Analysis)*

| Cited-author	Citations	Cited-author	Citations	Cited-author	Citations
Zimmerman	385	Graham	103	Cleary	63
Pintrich	185	Winne	102	Diamond	61
Schunk	174	Pajares	80	Deci	57
Bandura	139	Veenman	76	Butler	55
Blair	113	Dignath	75	Mcclelland	54
Boekaerts	109	Ryan	68	Stoeger	50
Perry	107	Eisenberg	65	Paris	47

THE MOST CITED JOURNALS

The citation anlysis and sources options are selected to determine the most-cited journal. Also, within the scope of the analysis, the minimum number of documents of a source was adjusted as 3 and the number of sources to be selected was automatically stated as 32. The map created in Figure 8 is presented. The most cited journals were Educational Research Review (Document = 4, Citations = 329), Metacognition and Learning (Document = 4, Citations = 289), British Journal of Educational Psychology (Document = 7, Citations = 195), Journal of School Psychology (Document = 3, Citations = 158), Journal of Educational Psychology (Document = 3, Citations = 146).

Figure 8. *The Most Cited Journals (Citation Analysis)*

In order to creata a map for the most-cited journal (co-citation analysis) co-citation analysis and cited sources were selected. The created map is shown in Figure 9. According to the analysis results the most cited (co-citation analysis) dergiler Journal of Educational Psychology (Citations = 698), Child Development (Citations = 505), Developmental Psychology (Citations = 347), Contemporary Educational Psychology (Citations = 275), Learning and Instruction (Citations = 265).

Figure 9. *The Most Cited Journals (Co-Citation Analysis)*
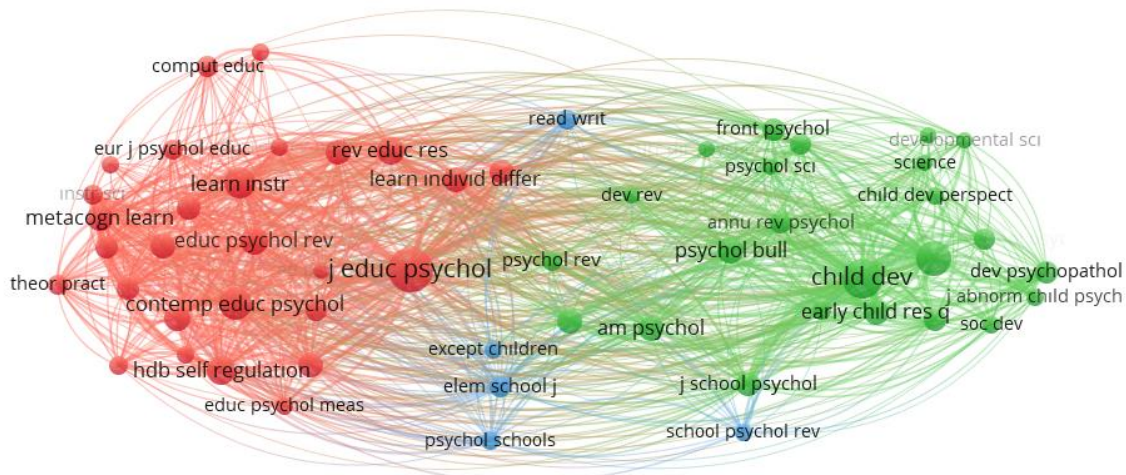
THE MOST-CITED COUNTRIES

In order to creata a map for the most-cited countries citation analysis and countries were selected. The created map is presented in Figure 10. According to the results of the analysis, the countries that the authors refer to most are United States (Document = 94, Citations = 3004), Germany (Document = 27, Citations = 769), Netherlands (Document = 34, Citations = 373), Australia (Document = 29, Citations = 294), Portugal (Document = 12, Citations = 292), Belgium (Document = 21, Citations = 196), Greece (Document = 5, Citations = 143), Norway (Document = 4, Citations = 134), Spain (Document = 39, Citations = 131), England (Document = 23, Citations = 104), China (Document = 21, Citations = 97).

Figure 10. *The Most Cited Countries*
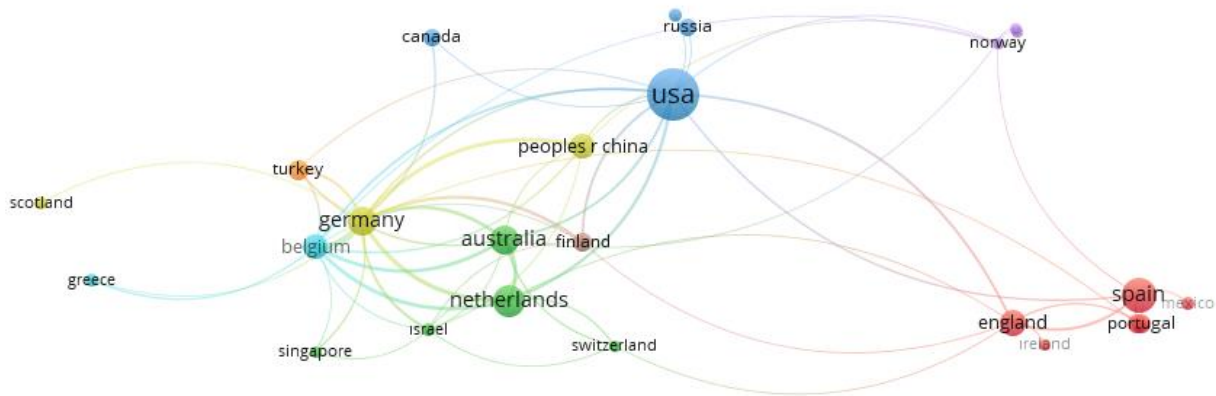
In addition, the distribution of citations by countries is examined (See Figure 11). It is seen that the countries that the authors have cited most recently are Spain, Canada and Russia.

Figure 11. *The Most Cited Countries by Years*
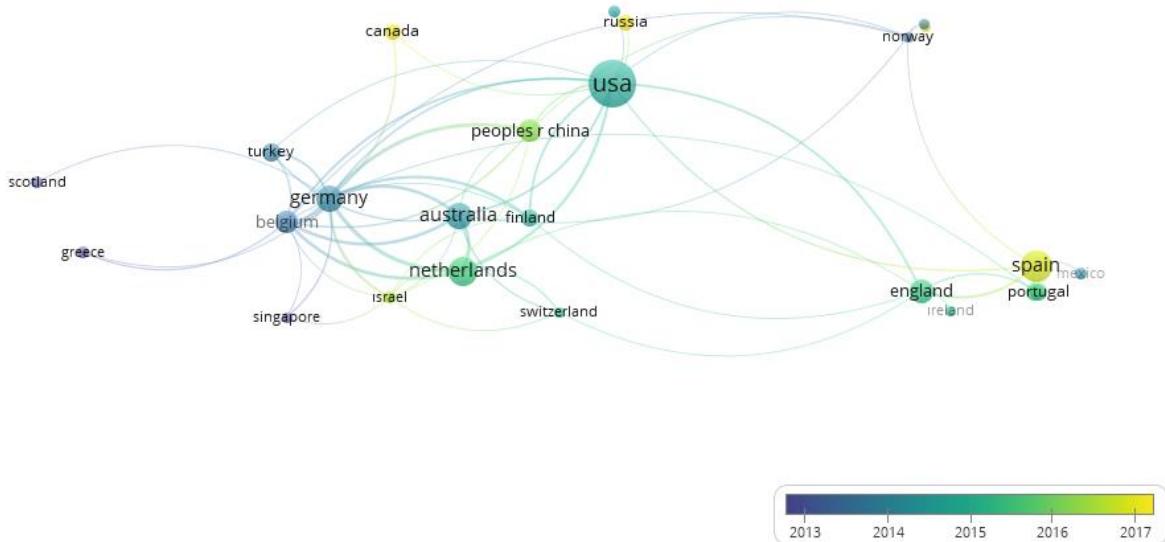
CONCLUSION, DISCUSSION AND SUGGESTIONS

Studies using bibliometric analysis with different variables were carried out at at different school levels. For instance, Aktoprak and Hursen (2022) conducted a bibliometric analysis of studies on critical thinking at primary school level. In another study, Yilmaz et al. (2021) performed bibliometric analysis of studies on foreign language teaching in early childhood education. Shen and

Ho (2020) performed bibliometric analysis in their studies on technology-enhanced learning in higher education. Moreover, Arici et al. (2019) used it in bibliometric analysis studies in the field of augmented reality in science education. The purpose of this research is to examine the bibliometric properties of studies on self-regulated learning at primary school level and scanned in the Web of Sience database.

Within the scope of this study, 392 studies on self-regulation at primary school level were examined. Studies were analyzed by bibliometric mapping analysis. Firstly, the studies were examined according to the languages of the publication and it was seen that approximately 91% of the publications made were in English (*f*= 355). This is followed by studies in Spanish (*f*= 17), German (*f*= 7) and Russian (*f*= 6), respectively. It can be said that English is the undisputed, international academic language (Altbach, 2007) in the emergence of this situation. In the bibliometric analysis of the critical thinking at primary school level field they made in Aktoprak and Hursen (2022), it was understood that the majority of the publications were in English. As a matter of fact, when the language teaching studies in the literature are examined, the most study is done on English teaching; it is reported that Spanish instruction follows (Barac et al., 2014; Hammer et al., 2014). This situation also reveals the significant given to English globally (Satria et al., 2017). When the distribution of self-regulation related studies in primary school by the year of publication is examined, it is understood that the first study was conducted in 1994 (Luminet, 1994), the studies carried out increased especially since 2017 and 73 studies were conducted in 2019. Self-regulation is becoming an increasingly popular topic in psychology (Sarikaya, 2019). This may be due to the fact that self-regulation has been working with different variables recently. For instance, in the meta-analysis study conducted it was found that self-regulation was effective in mathematics performance, motivational outcomes, and also the use of cognitive and metacognitive strategies (Dignath et al., 2008).

As a matter of fact, Farley and Kim-Spoon (2014) report that the number of studies containing the keyword self-regulation in 2012 was three times higher than in 2002 during their literature review. This indicates that studies on self-regulation will increase further in the future.

The findings of this study also reveal the self-regulation studies carried out at the primary school level in the literature (Bai & Guo, 2021; Dignath et al., 2008). Lv et al. (2011) emphasizes that the determination of the most cited studies in the literature is significant. Indeed, this is considered as a measure of both impact and visibility; It also provides access to cult publications for new works planned to be carried out. As a result of the analysis, it was seen that the most cited publication was "The development of competence in favorable and unfavorable environments - Lessons from research on successful children" (Masten, & Coatsworth, 1998) which was published in the journal American Psychologist (WoS Citation Number = 1317). Other publications are as follows "How can primary school students learn self-regulated learning strategies most effectively? A meta-analysis on self-regulation training programmes" (Dignath et al., 2008) (WoS Citation Number = 269)" published in the journal "Educational Research Review" and "The contribution of children's self-regulation and classroom quality to children's adaptive behaviors in the kindergarten classroom (Rimm-Kaufman et al., 2009)" (WoS Citation Number = 262) published in the journal "Developmental Psychology" respectively.

It is worth noting that the first two most cited studies are compilation research. In his study, Aksnes (2005) reports that review articles are cited more frequently than research articles. MacRoberts and MacRoberts (1996) and Ding et al. (2017) also emphasize the same situation. Ding et al. justifies this situation by review articles leading the researchers and contributing to the identification of original studies.

The most used keywords were also examined in the study. Keywords provide clues about the content and structure of a study (Karagöz, & Şeref, 2020). While these words summarize the study,

they can reveal the relationship between two or more concepts. Keywords can also provide information about trends in literature (Garfield, 1990). Identifying the areas where the keywords are concentrated will enable the literature to be evaluated thematically. As a result of the analysis, it was determined that the most used keywords in the studies are self-regulation, self-regulated learning, motivation, primary education and metacognition, respectively. In relation to self-regulation, the keyword self-regulated learning appears to be widely used (Stoeger et al., 2015). It is noteworthy that the keyword self-regulated learning is often used in conjunction with primary education (Vandevelde et al., 2012; Vandevelde et al., 2013). In addition, some studies show that the keywords of cognitive components are used with self-regulation (Dignath et al., 2008; Dignath & Büttner, 2008). Since there are metacognition, motivation, cognition concepts that are self-regulation learning components (Schraw et al., 2006), it can be said that these words are frequently used in studies on self-regulation or self-regulated learning. When the distribution of keywords by years is examined, it is seen that mathematics, teachers, execuitivite function are in the foreground in recent years. It can be stated that, with the understanding of the significant of self-regulation, this is especially related to the increase in the number of studies on problem solving, teacher training and teacher self-regulation. In addition, we think that the relation of self-regulation with cognition, metacognition and executive function (Efklides & Misailidi, 2010, p.14; Fox & Riconscente, 2008) is effective in keyword selection.

The most-cited and co-cited authors and journals were also examined. Buettner (Citations=521, Documents=4), Dignath (Citations=517, Documents=3), and Cleary (Citations=217, Documents=6) are the most-cited authors. On the other hand, the most-cited (co-citation) authors are Zimmerman (Citations=385), Pintrich (Citations=185) and Schunk (Citations=174). The most-cited journals are Educational Research Review (Document=4, Citations=329), Metacognition and Learning (Document=4, Citations=289), British Journal of Educational Psychology (Document=7, Citations=195), Journal of School Psychology (Document=3, Citations=158) and Journal of Educational Psychology (Document=3, Citations=146) in the studies. The most-cited journals (co-citation) are Journal of Educational Psychology (Citations=698), Child Development (Citations=505), Developmental Psychology (Citations=347), Contemporary Educational Psychology (Citations=275) and Learning and Instruction (Citations=265). When the most cited journals are examined, it is noteworthy that almost all of them are journals with educational psychology content.

Another result of the study is that the authors are related to the countries to which they refer most, and to the countries that are most frequently cited recently. The most cited countries were identified as United States (Document = 94, Citations = 3004), Germany (Document = 27, Citations = 769), Netherlands (Document = 34, Citations = 373). In the bibliometric analysis studies conducted in different fields in the field of education, it has been revealed that the most productive country is the USA (Aktoprak & Hursen 2022; Yilmaz et al., 2021). The fact that the most cited authors work in the mentioned countries is an effective factor in this situation. In addition, the countries that the authors have been citing the most recently are Spain, Canada and RussiaThese findings reveal that other countries are also conducting studies related to self-regulation in primary school and the studies are becoming more and more widespread. As a result, it is seen that studies related to self-regulation increase and become widespread in primary school. When the keywords in the studies are examined, it is understood that the studies mostly focus on cognitive and metacognitive structures that are related to self-regulation. It is seen that the citation rates of the compilation studies on the subject are high and in recent researches, citations are made to different countries and academic journals.

- Based on the results of this study, the following recommendations are presented: Self-regulation has become one of the popular concepts of today. It is possible to come across many studies on self-regulation in the literature. In this context, conducting new researches is inevitable. For this reason, researchers who will publish on self-regulation in primary school are recommended to conduct a detailed literature review. When the most cited

journals are examined, it is understood that these are journals with educational psychology content. It can be suggested to publish in journals based on primary school education or to make the journals more specific.

- When the keywords used are examined, it is noteworthy that the words focus more on self-regulation, self-regulated learning and motivation. In recent studies, it is seen that the keywords of mathematics, teacher and executivity function are used. In the studies to be designed, it can be suggested to examine the effect of self-regulation on language skills and arithmetic skills of primary school students.

- In this study, the data were examined in terms of biblometric properties. Although the findings obtained in this context presented a general trend in the field, different studies can be conducted to reach more detailed information (research pattern, data collection tools, sampling, etc.).

AUTHOR CONTRIBUTION

- First author have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data
-The second author have been involved in drafting the manuscript or revising it critically for significant intellectual content
-The third author have given final approval of the version to be published

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