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A Rapid Transition from Campus to Emergent Distant Education; Effects on Students' Study Strategies in Higher Education

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Abstract: This article presents a literature review focusing on international research concerning distance education and students' study strategies during the last 20 years. As distance education in higher education is a steadily growing trend and in particular because the COVID-19 pandemic has escalated the transition from campus education to different forms of distance education, knowledge about students' study strategies and appropriate teaching strategies has become highly important. With this research review, we aimed to identify patterns and trends in research on distance education focusing students study strategies before and after the pandemic. The research synthesis identified and interpreted similarities and differences in the studies' designs and findings, which we analyzed using integrative thematic analysis. Students' study strategies seem to have changed to some extent during the pandemic, with more emphasis on their own responsibility and the need for a developed teaching strategy to align with the changing framework related to the emergency provision of distance education. We concluded that students have to develop metacognitive strategies, because self-regulated learning and a more flexible pedagogy seem to be important in teachers' transitions and competence in digitalization. Therefore, more research targeting these aspects is needed.

Keywords: COVID-19; distance education; higher education; learning strategies; study strategies

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1. Introduction

During the last 20 years, distance education has become increasingly widespread in higher education worldwide. This, in turn, means that students' study strategies probably have changed compared with those used for face-to-face, campus-based education. For instance, students and teachers require additional competencies for digital learning and teaching. Several international research articles have focused on students' study and learning strategies in distance education in higher education (see Appendix A). In this article, we focus on research on students' study strategies in distance education, because many universities, due to the COVID-19 pandemic, have had to transform their face-to-face, on-campus education to distance education, even if students' study strategies vary depending on their personal conditions.

The research contained a range of related terms for distance education, for example, emergency distance education, emergency remote teaching, online learning, online education, remote education, and remote learning, but they all targeted off-campus education. The disparities between these terms indicate slight differences in the planning and execution of courses, but they are all extensions of distance learning [1] and due to the 2020–2021 pandemic the term "emergency distance education" [2] (p. 159) also have appeared. Emergency distance education must, however, be separated from other distance education. Neither teachers, nor students, have voluntarily chosen this form of education, which is otherwise the case with distance education. As the transition forced changes over night, campus procedures may have been transformed into remote education, at least

during an initial phase of teaching and learning on-line. In this article, however, we use the term "distance education", as the umbrella term, for all variations of distance education.

The rapid transformation to distance education had noticeable impacts on students and teachers, because the preparations for distance teaching and learning were carried out in an unusually short period of time [3]. Similar situations occurred in developed countries all over the world, with slightly different results depending on the country's previous history of distance education [4]. As studies of distance education carried out under somewhat similar conditions were wished for, studied from developing countries were not included in this search.

In Sweden, universities have used on-campus education, distance education, and mixed on-campus and distance education for over 100 years [5]. As in many other developed countries, Sweden already had and used technological and online learning tools such as digital learning platforms, email, and videoconferencing, for example, via Skype, Microsoft Teams, and Zoom, but even Swedish universities had to work differently and more intensely with novel procedures and tools after the COVID-19 pandemic began [1,6,7]. Before the COVID-19 pandemic, some teachers were reluctant to try distance teaching, and some more practical subjects, or parts of them, such as laboratory work and esthetic subjects, constituted a huge challenge for the universities as a whole, the specific teachers, and, of course, the students [8,9]. During a transformation from on-campus or mixed on-campus and distance education to learning solely at a distance, students' study and learning strategies change [10]. Our interest was not only to find out which study strategies students use in distance education but also to see if strategies changed during the pandemic.

Therefore, with this research review, we aimed to understand how students adapt to distance education in view of students' study and learning strategies, to identify and classify patterns and trends in the research concerning a holistic perspective of students' learning strategies from 1990 to 2021 in distance education, and to identify gaps in the knowledge. We did not restrict the study to the Swedish academic context but aimed to cover research from different parts of the world where the transition from on-campus to distance education has occurred. The results are relevant for higher education in different settings and on different academic levels. It is important to learn from each other and from one another's experiences with obstacles and solutions in different countries. There is a need to create a space of action for the future, and to do that, researchers need to share and document their experiences. The adjustment to students' learning from a distance will grow rather than diminish in the future, and the need to shape this development with the best possible solutions for all parties, is a project teachers in higher education need to engage in.

After presenting a more in-depth statement of the aim of this article, we report on previous research and the method we used for collecting and analyzing the findings of that research. Concluding remarks and the identified need for further research ends the article.

2. Aim

With this research synthesis, we intended to go beyond the individual studies and explore the strategies students use in distance education. We also synthesized and explored the specific variables identified as affecting students' study and learning strategies in distance education. The objectives of the study were as follows:

(a) Identify and classify patterns and trends in the research concerning a holistic perspective of students' study and learning strategies from 1990 to 2021 in distance education;
(b) Identify and classify patterns and trends in the research concerning students' study and learning strategies as a result of the COVID-19 restrictions;
(c) Compare and discuss the findings in the previous research;
(d) Suggest a future research agenda.

3. Previous Research

In this section, we begin by targeting distance education as a specific form of higher education. The section is divided according to the different fields of previous research with importance for the research review.

3.1. Distance Education

When researchers talk about distance education, they do not necessarily mean the same thing or define the term unambiguously [4]. However, one characteristic these definitions have in common is that they do not tie education to any specific place such as the classroom. Teachers and students do not meet physically face-to-face. Presently, knowledge is primarily transferred via the internet. Both asynchronous and synchronous means are used such as email, learning portals, mobile phones, learning centers, and different platforms for video and web conferences such as Skype, Microsoft Teams, or Zoom [1,5,7,9]. In synchronous education all students do the same things at a similar pace. In asynchronous education students may start at different times, working through modules at their own pace. However, both forms of distance education may offer social presence, through use of chat rooms, online discussion boards, and videoconferencing [7].

Distance education has developed a great deal over the years. The overview by Zawacki-Richter and Naidu covered all articles published in the first 35 years of *Distance Education*, a major journal in the field. In this review, the history of distance education shows that theorizing about distance education started as early as the 1960s and 1970s, but in the 1980s, it was still in an early stage of development [1]. We could even trace distance education back farther. As early as the 1800s, distance education occurred as correspondence courses [9], which involved the sending of hard copy documents that were subject to long time delays [7]. The next step of development is discernable in the early 20th century, when distance education developed and was delivered via radio and as television [7,9].

Due to the employment of the internet and the web, distance education changed dramatically during the 1990s. In 1993, online, computer-delivered lectures were introduced with the help of computer programs [7,9]. During the 1990s, remote audio- and videoconferencing systems were introduced to support distance education [1]. Since the beginning of this century, learning with technological devices such as computers and video games has been advocated by Gee [11], who pointed out that games incorporate a whole set of fundamentally sound learning principles that could be used in other settings and informal learning. New developments in information and communications technologies offered new opportunities for higher education to establish electronic networks for distance education [1]. As new technologies in education, the internet and the web and their various modes are constantly evolving, it is thought that such technologies will be globally adopted for the mainstream distribution of higher education by 2025 [7].

The number of students enrolled in distance education courses has increased rapidly since 1990 [9]. Many students choose distance education courses because of their asynchronous nature, which enables them to combine education with work, family, and other commitments [6]. According to Palvia [7] one explanation for the increase in nontraditional students in distance education is that students from sparsely populated areas, far from university sites, now have access to higher education because travel time and accommodation costs are eliminated. Furthermore, these students will be able to work and stay with their families. Distance education also allows students to work at their own pace and employ the learning style of their choice.

The change from elite to mass education, partly driven by distance education [12]. has had direct implications for teachers' teaching strategies and didactical approaches in many countries. It has presented multiple challenges to pedagogy. Higher education has had to change its traditional approaches to teaching and learning. Not only younger students, often from homes where an academic education has been the obvious choice, are attracted to the universities. Additionally, students, not sharing the social conditions

historically linked to an academic trajectory see the opportunity to pursue an academic career [12,13]. Universities with distance education continuously try to find different and effective methods to facilitate the ways students learn in distance education and to evaluate those methods empirically [12].

To summarize, distance education, as a form of higher education with growing popularity, has evolved from being based in the postal system to being distributed by radio and television and now to using interactive technologies. This development also has brought about changes in the approaches to teaching and learning and has affected which students that enroll in higher education courses [7]. In the following section, we explore these aspects and the connections between them.

3.2. Study Strategies

Study strategies is an interdisciplinary topic of both theoretical and practice concerns. Cognitive, developmental, educational, and social psychology exemplify the involved disciplines. Research on study strategies has reflected on cognitive, metacognitive, and affective aspects of the learner and on the interactions between the learner, task, and content [14]. There are individual differences between students and their strategies, which may lead to differences in achievement. An A student's study strategy may differ from a C or D student's strategy. Effective study strategies usually correlate with high achievement. However, the best study strategies always rely on students' individual characteristics, the task itself, the students' engagement and interest in the task, and their familiarity with the task or content [15].

Even though "study strategies" is an umbrella term, it is sometimes equated with learning strategies. However, researchers have often defined learning strategies somewhat differently. Mayer [16] (p. 11) defined learning strategies as "behaviors of a learner that are intended to influence how the learner processes information". Others have separated and evaluated different learning strategies [17–19] according to different scales. Thus, a hierarchy exists regarding how to value and evaluate different learning strategies. Additionally, regarding learning strategies, researchers have given different definitions and added different dimensions; however, defining learning strategies as unconscious, conscious, or spontaneous choices the learner makes [20]. Oxford [21] distinguished between direct, practically used strategies such as memory, cognitive, and compensatory strategies and indirect strategies, representing metacognitive and emotional strategies. O'Mally and Chamot [22] made a similar classification of learning strategies with subgroups for cognitive, metacognitive, and socioaffective strategies. Schmeck [23], on the other hand, argued that strategies are conscious choices the learner makes to implement skills. The learning strategies of listening, questioning, speaking, thinking, intuition, acting, reading, writing, seeing, and combined knowledge paths were captured by Hellertz [20], who also questioned whether knowledge paths should be labeled. Pleijel [24] critically reflected on "deep level approaches" to learning versus "surface level approaches" an active versus passive learning process, arguing that passive learning never leads to deep-level learning. Pleijel further argued that the different learning strategies are valued uncritically, with deep-level learning seen as better than surface-level learning, which is seen as inferior. A deep-level approach is said to be a prerequisite for effective learning. Students with a deep-level approach to learning seek meaning and central content through context and principles. Students with a surface-level approach to learning try to remember as many details as possible without considering which are more important for interlinking to wholeness [25].

The concept of a learning style can include more than 70 different models with conflicting assumptions about learning and with different designs and starting points [26]. There are many different theories and models of learning styles with inconsistent dimensions and variables. They focus on different aspects: cognitive processes, talents, sensory modalities, the learning process, thought styles, and so on. Theories about learning styles simply assume that everyone can learn, albeit in different ways and at different levels. The field is extensive and deals with not only individual and group levels, but also entire organizations,

for example, regarding how the theory can be implemented in educational contexts [27]. Kolb's learning style model describes information processing as being frequently used as a starting point in problem-based learning [28]. The concept of a learning style is also a used when referring to study strategies. Evans et al. [29] defined learning styles as the way individuals respond cognitively and behaviorally to learning tasks that are changing because of the environment or the context. However, the concept of learning styles has been criticized and debated in the last 20 years from various aspects. Above all, the criticism has been based on the fact that labeling can cause stigmatization [26] and on discussions about the effects of matching teaching strategies [27,30]. However, one theory about learning styles seems to have avoided criticism, namely that of Entwistle, which focuses on study abilities in which deep-level and surface-level learning are central parts [31].

Another term referring to study strategies is self-regulated learning (SRL). Zimmerman [32] formulated a model for how students can regulate their own learning. SRL is a cyclical process wherein the student plans for a task, monitors their performance, and then reflects on the outcome. The cycle then repeats as the student uses the reflection to adjust and prepare for the next task [32,33]. Zimmerman [32] (pp. 4–5) described self-regulated learners as learners who "plan, set goals, organize, self-monitor, and self-evaluate at various points during the process of acquisition select, structure and create environments that optimize learning". Rovers et al. [34] described SRL as a learning process in which students activate and sustain cognitions, behaviors, and affects that are always oriented toward the achievements of their goals.

To summarize, "study strategies" may be seen as an umbrella term referring to a complex phenomenon with several slightly different connotations, hierarchically divided at different levels under the umbrella term. This short review shows the problems with the similarities, differences, and theoretical overlaps.

4. Method

A descriptive research synthesis relies on explicit search strategies and unambiguous criteria for selecting pertinent, high-quality studies. It is systematic, explicit, comprehensive, and reproducible and relies on knowledge, evidence, and experience to identify and interpret similarities and differences in the studies' purposes, methods, and findings [35]. This research synthesis follows the PRISMA 2020 statement [36].

4.1. Identification

Multiple phases were involved in identifying studies that dealt with the research questions in this research synthesis. An initial identification of potential studies was made via an advanced keyword search of the SCOPUS database in January 2021. We chose SCOPUS because it is the world's largest abstract and citation database of peer-reviewed research literature, with over 22,000 titles from more than 5000 international publishers, and we wished for studies from different countries. First, a broad search (using the keywords from the research questions) was used to establish the main outline of the study. Only peer-reviewed articles in English from the social sciences were included. This broad search 2021-02-12/14 resulted in 482 articles, which led to a series of more detailed searches, starting with an initial sifting of the article titles found in the broad search.

We used the following keywords and their thesaurus terms for each search:

1. "COVID-19" or "corona (SARS)" and "higher education",
2. "COVID-19" and "learning strategies" or "study strategies" and "higher education", and
3. "COVID-19" and "higher education" or "university" and "students".

Screening

The combination of the terms "COVID" and "higher education" resulted in 482 sources; the combination of "COVID," "learning strategies," "study strategies," and "higher education" resulted in 39 sources; and the combination of "COVID," "higher education" OR

"university," and "students" resulted in 60 publications in Scopus. Handsearching was also performed, when select journals were scanned from cover to cover for relevant articles missed during indexing, resulting in nine additional publications.

To fulfill the aim of research questions 1–3, searches were also conducted during the same days, namely 2021-02-12/14, in the two databases, ERIC, a database frequently used in educational research, and PRIMO, the university's own database that researchers are recommended to use, with the following keywords in different combinations: "learning strategies," "study strategies," "higher education," "university students," "distance learning," and "distance education." The keyword "COVID" was excluded from these searches to achieve the comparison before the pandemic and during/after, which resulted in 372 publications, of which 16 studies met the relevance criteria.

To determine whether the studies' findings were comparable and compatible, we used the following inclusion criteria:

- A focus on higher education students' distance learning;
- Higher education students' study and learning strategies in distance learning.

Articles on the attitudes of other categories of students and teachers were excluded, alongside with articles from developing countries.

4.2. Eligibility

The search returned 51 articles. After reading the full articles carefully, we rejected five articles because they

- Were about the attitudes of students other than those in higher education;
- Focused on teachers' attitudes towards distance education;
- Did not focus on study or learning strategies.

This led to a final database of 46 studies (see Figure 1).

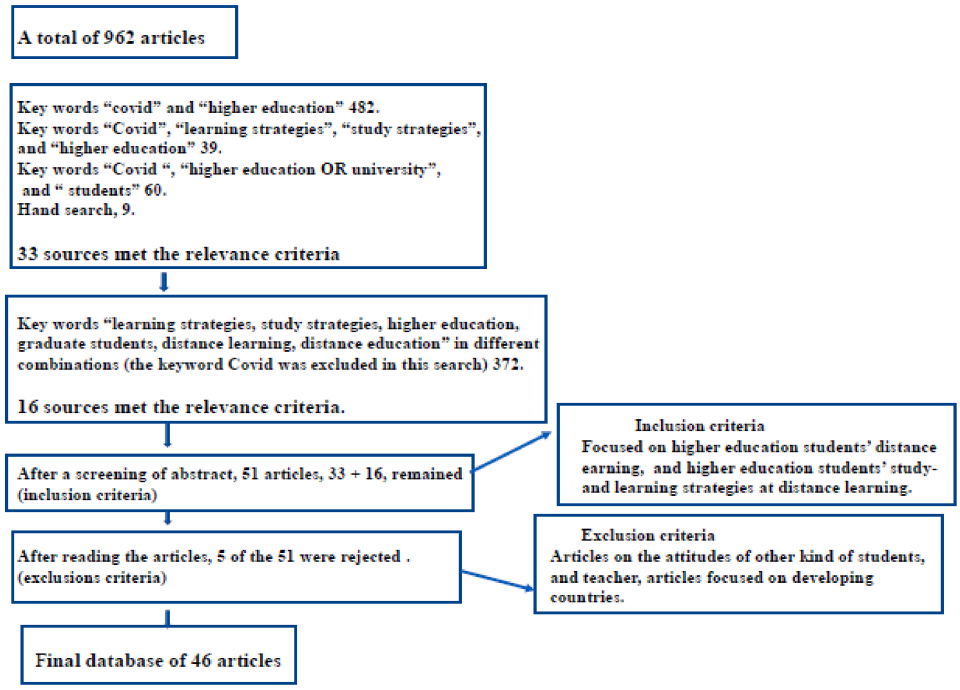

Figure 1. Overview of the review process.

Due to the lack of consensus on what counts as good-quality qualitative research and what formal criteria should be used [37], it is important to account for the criteria used. In this research synthesis, all included articles were peer reviewed and published in international scientific journals. Syntheses can differ depending on what counts as data

from the primary studies and what does not [38]. For this research synthesis, we considered any data presented in the articles that were relevant to our aims. The themes that ran across the included articles were identified inductively and were strongly linked to the data. The steps of a constructionist thematic analysis followed to identify these themes [39]. Throughout the analytical process, the included articles (in their entirety) served as points of reference when deeper understanding was needed to define the themes. Independent of each other, three researchers in the research team reviewed the quality and suitability of the included articles.

4.3. Data Analysis

We analyzed the data using an integrative thematic analysis, which includes an integrative research overview of both qualitative data and conclusions from quantitative data [40]. Thematic analysis is a method for identifying, analyzing, and reporting important themes within a data set. Thematic analysis describes, organizes, and interprets the data in rich detail [39]. The data of this study were compiled in a tableau and then processed using thematic analysis, which is about structuring data by identifying central and recurring themes. Thematization is based on bringing the codes together into common themes, which means that the analysis is further refined. Finally, summation is the last step in the process, which means that the results are compiled and the conclusions are worked out. Central topics refer, for example, to concepts or other common phenomena that were perceived to be recurring in the articles.

The articles were then compiled into a list of related topics, with the intention of getting a clearer picture of the material. The next step was to encode existing key topics into categories, where the articles were compared to each other based on content. From this comparison, similarities between articles could then be distinguished, which allowed us to form categories. The categories were divided into groups based on common denominators, which finally resulted in main themes (see Table 1). Based on sentences or phrases, we condensed the content into categories that reflected the central message. These subcategories constituted the manifest content of the texts that were ultimately used to determine the categories [41]. We put considerable effort into being detailed, and each step in the analysis process involved joint discussions on the different options for proceeding.

Table 1. Example of an inductive analysis of data.

Meaning Unit	Condensed Unit	Subcategory	Category	Objective
Deep and strategic learning approaches positively predicted GPAs, and a mediation analysis showed that the strategic learning approach also partly mediated the effect between a deep learning approach and GPA.	A strategic learning approach positively predicts GPA.	Learning approaches	Learning strategies	. . . identify and classify patterns and trends in the research concerning a holistic perspective of students' study and learning strategies from 1990 to 2021 in distance education

4.4. Validity and Reliability

To maintain scientific integrity, we paid great attention to validity during the integrative review phase. We identified articles that fit the inclusion criteria "learning strategies, study strategies, higher education, distance learning, university students, distance education, and COVID-19" and verified their inclusion in the search results to ensure the sensitivity of the search strategy (see Table 2).

The estimated contextual relevance in relation to the purpose of the study was, as Table 2 shows: high, 6.5%; medium, 43.5%; and low, 50%.

Validity was handled in the following way: the items underwent data processing, quality checks, sorting, categorization, and examination using assessment documentation (see Tables 3 and 4 in the Results section).

Table 2. Distribution of relevance for the studies' aims.

Relevance	Sources $N = 46$	%
High	3	6.5
Medium	20	43.5
Low	23	50

Table 3. Distribution of 46 sources reviewed by year.

Years	Sources $N = 46$	%
2000–2005	2	4.3
2006–2010	6	13.0
2011–2015	15	32.7
2016–2020	14	30.4
2021	9	19.6

Table 4. Distribution of methodological approaches.

Methodological Approach	Sources $N = 46$	%
Qualitative approach	16	34.8
Mixed method design	6	13.0
Quantitative approach	24	52.2

First, we compared our separate analyses and understandings of the same sources with each other. Second, we collaborated by critically comparing our analyses and understandings of the sources. Third, we reached a consensus on identifying the main themes. In terms of the data extraction, we checked the following categories according to our aims: author, year of publication, country, population, sources, methodological approach, data collection, method of analyses, such as students' health, and themes.

5. Results

This In this section, we outline the outcomes of the review. The review is structured around two levels of analysis. The first level included assessed relevance (as previously discussed), population, sources, years, methodological approaches, data collection, and methods of analysis, health aspects, and distribution of themes. The second level included thematic analysis and discussions of the data in relation to students' study strategies and distance learning.

5.1. Contextual Level of Analysis

Regarding the studies' participants, all were distance education students in some form. There were many different student groups, many from future vocational training professions such as teachers and psychologists but also future computer technicians, economists, and engineers. The number of student participants varied greatly, from 11 to over 800, which depended on the research questions and chosen scientific approach; for example, a quantitative approach may contain a larger number of respondents than a qualitative one. Students from independent courses such as academic writing and visual arts also were included in the studies. Of the texts examined, all but two were articles: One was a dissertation of high relevance, and one was a report of interest published by the Swedish United Students' Unions, both publications found in ERIC and PRIMO. Regarding health aspects, they were mentioned in only eight of the texts with a focus on students' anxiety and declining self-confidence. Table 3 shows the time of publication between 2000 and 2021.

The majority of the publications were published from 2011 and onward. In other words, there has been a rapidly growing interest in the last 15 years, especially in 2021 when 20% of the texts were published.

Concerning the methodology, the quantitative approach was slightly dominant, used in more than half of the texts (Table 4).

The data collecting strategies were many and various, including surveys, videotaping, self-assessment, blogs, observations, and interviews. The quantitative studies used different statistical analysis methods, for example, analysis of variance, multivariate analysis of variance, and regression analysis. The qualitative methods of analysis varied from content analyses to phenomenography. A small percentage (13%) used a mixed methods approach where descriptive statistics were combined with a qualitative method such as thematic analysis. Among the studies, there were one literature review and one theory-building approach.

5.2. Distribution of Themes

In the following subsections, we comment upon the articles targeting the purposes and results of distance education. Patterns and trends in the research targeting students' study strategies were given special attention. Our goal was to frame the seemingly separate aspects to provide an overview of what the literature has addressed. To analyze changes that have taken place during the pandemic, we first present a synthesis of what students' study tragedies may include. Thereafter, we describe specific strategies the pandemic has initiated.

5.3. Students' Study Strategies

The content and definitions of study strategies were both scattered and disparate. In the thematic analysis, five subthemes emerged: SRL, motivation, learning strategies, teaching methods, and integrated technology (Figure 2).

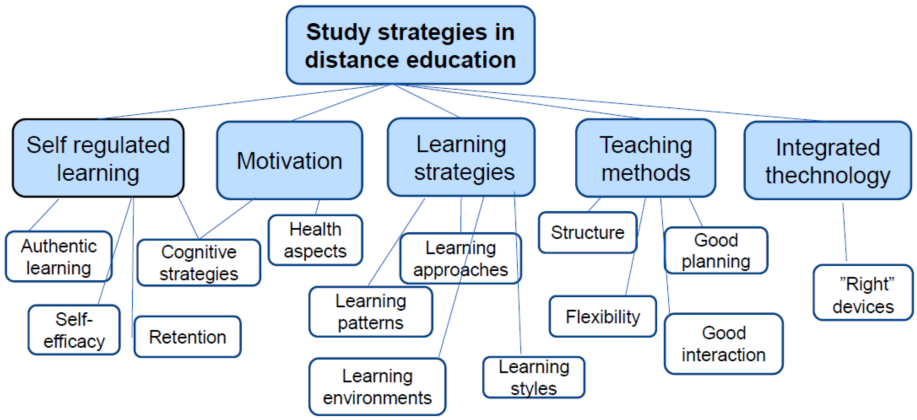

Figure 2. Students' study strategies in distance learning.

SLR is an established concept in the field of study strategies. Using SRL strategies is emphasized as central to academic outcomes [9,42]. Students tend to use different SRL strategies and cognitive learning strategies depending on their academic levels [43]. Even though SRL per se refers to students' abilities to understand and control their learning environments and includes goal setting, self-monitoring, self-instruction, and self-reinforcement, other aspects were pinpointed under this theme. When students use SRL, they may experience authentic learning, which impacts their results. Furthermore, the concepts of self-efficacy [44], retention, and cognitive strategies are imbedded in SRL. According to Peck et al. [45] (p. 1) "self-efficacy, effort regulation, and peer-learning correlated with student retention in the distance education programs". An important aspect that affects students' self-efficacy in a negative way, is courses with low findability (an aspect of usability). Using standard usability testing measures (eye-tracking, time-on-task, and think-aloud), the participants in the study by Simunuch et al. [46] were asked to

find essential course components in either a course with high findability or a modified version of a course with low findability to determine the impact on student perceptions of course quality and experience. The participants rated courses with high findability as a better overall experience. In addition, cognitive strategies can be related to both SRL and motivation [47] and can help students perform successfully in a course [48].

Sometimes associated with SRL is the concept of *motivation*. According to Yip [49] (p. 566) "Self-regulation is important to predict distance-learning students' persistence and motivation in their learning, hence improving their academic performance in the future". Especially in the beginning of courses, it is important to identify the motivational status of individual students [50]. Researchers have also noted that distance education requires more accuracy, more reading, and more work than the teachers expected from the students [51]. Health aspects has reciprocal interaction with motivation. According to Dodd et al. [52] (p. 1) "Supporting the health, wellbeing, and learning experience of all students could be accomplished by strengthening individual resources and capacities, and creating environments which are supportive, responsive and needs-orientated".

The concept of learning strategies seems to include several different aspects or sub-concepts, which sometimes overlap. According to some researchers, learning approaches involve deep, strategic, and surface learning approaches, which are crucial to students' academic success and lifelong learning [53–55]. Sæle et al. [56] (p. 757) claimed that "Deep and strategic learning approaches positively predicted GPA [Grade Point Average]". One paradox highlighted is that examinations seem to drive students toward surface learning strategies [54]. However, strategic learning appears optimal for academic achievement. Less procrastination is also associated with a strategic learning approach [54].

Learning patterns constitute a related concept, which has a wide meaning involving both different pattern and learning styles. The latter seems to be of crucial importance to students' success when their style is matched in the teaching structure [57] and through teachers' knowledge of how the students learn, given that "educators can help to develop better support for students in adapting to new environments" [58] (p. 1).

In addition, the concept of *teaching strategies* is related to study strategies. To obtain constructive study strategies, structure, flexibility, good planning, and good interaction are important, according to several studies [10,12,57,59,60]. Finally, study strategies depend on appropriate and functional technological devices, digital equipment, and digital competence, something that became particularly evident during the pandemic [52,61].

5.4. Specific Strategies during the Pandemic

In our analysis of research on students' study strategies during the pandemic, four different themes emerged (Figure 3). Overall, the research overview makes it clear that there is a great need for a comprehensive review of the pedagogy of online education that integrates technology to support teaching and learning [62]. Other evident aspects are the importance of discussing and transforming curriculum to include technical capacities and the wellness of teachers and students [3] together with the changing conditions of the didactics of higher education pedagogy. Carrillo and Flores [62] (p. 479) referred to the need to go beyond emergency online practices to provide an evidence-based approach to online teaching and learning that acknowledges the particularities of this pedagogy and its implications. There is a need to go beyond an instrumental approach to online teaching and learning and to include into the equation its ethical, political and pedagogical dimensions.

The importance of observing students' different learning patterns has grown during the pandemic. Students need to develop their own preferred learning strategies and self-regulation strategies, considering and developing metacognitive strategies. The research has not always explicitly pointed to content in the different concepts, but more to the importance of students' learning to use them. To use different learning patterns, multimodal learning and learning settings that make use of multiple sensory modalities are crucial [62].

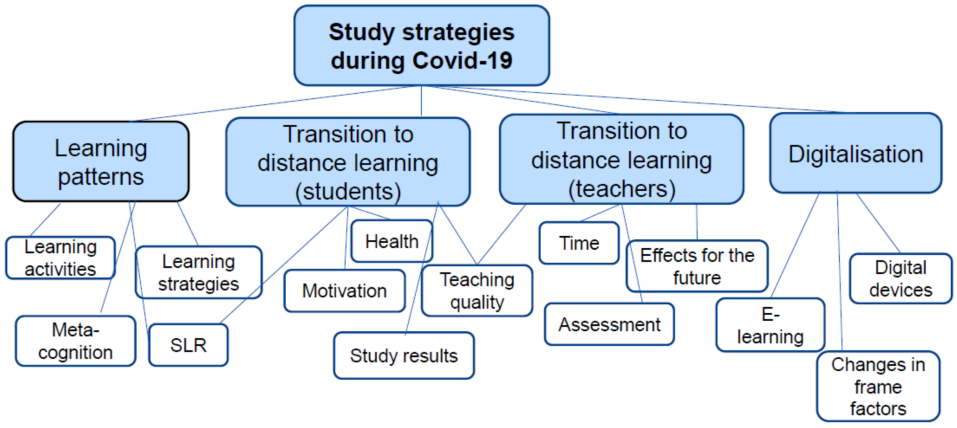

Figure 3. Changes to students' study strategies in distance learning during the COVID-19 pandemic.

The transition to emergency distance education has a direct impact on students' motivation [43,45,63]. To facilitate such a transition, it is necessary for students to embrace SRL. One implication from the explored research is an indication that students should use self-discipline strategies to deal with the change. The fact that students' health has been affected by the pandemic and the restrictions causing the transition is indisputable. According to Dodd et al. [52], one third of the students in his study reported a sufficient level of well-being, one third reported low well-being, and one third reported very low well-being. He concluded, "Supporting the health, wellbeing, and learning experience of all students could be accomplished by strengthening individual resources and capacities, and creating environments which are supportive, responsive and needs-orientated" [52] (p. 1). A Swedish study gave a clear indication of students having increased anxiety and deteriorating mental well-being during the pandemic [64]. In addition, students' results were affected by the current situation. The quality of teaching occurs in the interface between students and teachers. Particular emphasis has been placed on the importance of interaction and communication between teachers and students [60]. As in other studies, a Swedish survey displayed that many students indicated that the quality of their education was perceived as declining [65].

The transition to emergency distance education for teachers also affects students' study strategies. For example, students need emotional support during the transition to distance education [60]. Time aspects, assessment changes, structures, and flexible pedagogy seem to be important in teachers' transitions. In particular, the importance of teachers' preparedness in course and lesson plans has been emphasized [65]. Researchers also have expressed concerns and questions about what impact teachers' teaching has on students' future knowledge [59,61].

Another evident theme emerging from the pandemic situation is the real entry of digitalization into higher education and, thus, different consequences for students' learning conditions. Skulmowski and Rey [63] (p. 4) concluded, "This situation has greatly accelerated the digitalization of University teaching and may contribute to the permanent establishment of hybrid campuses that offer flexibility and autonomy for students as well as educators".

Day et al. [66] reported that many students lacked appropriate devices for practical work and encountered difficulties in securing suitable housing and workspaces, and Aktan [3] emphasized the need for improved technical capacities at universities. Some studies have indicated that students show general dissatisfaction, missing adequate methodological development and the involvement of teachers when it comes to digital devices [61].

A number of researchers [61,63] relating pedagogical changes in higher education to the effects of the pandemic pointed to changes on many levels: teachers' teaching strategies, students' study strategies, the use of digital teaching materials, and the adaptation of teaching in time and space. No one can really predict what the pedagogical landscape

will look like in the future; however, distance education, digital devices, online courses, and so on have come to stay, and the pandemic has accelerated these processes. A telling quote finishes this review of previous research: "COVID-19 has not killed the campus, but changed it" [67] (p. 20).

6. Discussion

In this section, we compare and discuss our findings. Finally, we present a summary of the areas we identified where more research is needed to close the knowledge gaps that emerged in our analyses.

First, we conclude that distance education is a growing field, which the expanding number of publications also indicate. The practice of distance education has a long history, and has developed in various institutional and national contexts. This may have contributed to the lack of cohesive terminology, a phenomenon that may be further explained by the fact that this is an interdisciplinary field exhibiting great complexity. However, of the 46 selected articles published between 1990 and 2021, no less than 20% were published in 2021, possibly reflecting the COVID-19 pandemic as a catalyst.

When it comes to methodology, quantitative research slightly dominated (52.2%) the publications. A mixed methods design was found in only one article, a finding that demonstrates a need for future research to combine or add in-depth analyses of teachers' and students' perceptions and experiences of distance education, with solid statistical pictures (see Table 4). A related finding of our review is that only one article focused on theory building, a finding that calls for further efforts.

The pandemic obviously accelerated the transition from on-campus education to distance education, which gives researchers an excellent opportunity to reinforce the knowledge base on distance education, because remote learning and teaching are expected to dominate higher education in the future [7]. The access that distance learning in higher education provides also brings new categories of students to universities [6,7,12,13]. The new categories of students attending higher education have specific needs and opportunities [12] to become successful students, which bring us to the thematic analyses we performed to highlight patterns and trends in the research concerning students' study and learning strategies and the variables affecting these strategies.

6.1. Study Strategies

As distance education entails remote learning, students' study strategies become central to the outcomes of student learning. Therefore, SRL, motivation, and learning strategies were vital themes in the selected articles. Importantly, the themes are closely interrelated, which also pinpoints how a holistic approach in research is more or less inevitable. These are themes that always are at the heart of pedagogical research. However, the pandemic has highlighted these aspects of higher education, which the analyzed articles reflect.

SRL stands out as a keyword in the context of students' remote learning. How well students succeed at managing their own learning will have tangible effects on their academic performance [9,55]. In particular, students without former academic schooling may experience great difficulties in maintaining their focus and knowing how to take on learning tasks [49,50,63]. Apart from rather obvious aspects such as avoiding procrastination, setting goals, self-monitoring, self-instructing, and self-reinforcing, the importance of the experience of authentic learning stands out in the results [11,56], linking to another closely related concept, namely that of self-efficacy.

Self-efficacy, a concept Bandura [44] originally coined, is vital when learning is remote and self-regulated. The belief students have of how well they can perform and handle the learning situation will affect how much they will invest in the learning task and, thus, the outcomes of their learning. According to Peck et al. [45], self-efficacy, effort regulation, and peer-learning intertwine and correlate with student retention in distance education

programs, in turn, indicating further areas of research important for the progress of research in the field of distance education.

Another theme, interrelated with self-regulation, is motivation. Motivation is always of interest for any educator, but regarding distance education, it is fundamental, as dropping out is always a choice for the unmotivated student. Motivation also affects students' cognitive strategies [47] and is of utmost importance for students' performance in a course [48], not least in the beginning of a course [61]. A vital linkage between the themes mentioned above and students' well-being also deserves attention. When well-being fails, the conditions for academic failure are present [3,52]. Strategies for avoiding such failures thus attracted interest in the assembled articles, leading to a field of the exploration of learning strategies and the variables affecting learning strategies.

Learning strategies may end in either surface learning or deep learning, or with both types of learning interacting, even if deep and strategic learning most often are forwarded as the most effective types of learning [24,54,56]). According to Öhrstedt [24], examinations often drive students to surface learning, thus, pointing to the design of examinations as a future development area. How quizzes and self-guided learning may activate self-guided learning emerges as another area of research that may contribute to how students reach their learning goals, where surface and strategic learning can interact.

Another variable affecting students' learning strategies is obviously teachers' teaching methods, which is profoundly affected by the transition to remote teaching, according to, for example, Aktan [3], Boström and Löfqvist [12], Carillo and Flores [62], Kee [65], Knowles and Kerkman [51], Skulmowski and Rey [62] (2020), Song and Vermunt [58], and Todri [60]. A common theme appeared in the articles: to enable the development of metacognitive strategies mentioned above, functioning interaction and communication between students and between teachers and students, findability, and well-prepared lesson plans with thought-out structure, adjusted examinations, and so on are needed. Many of the findings boil down to the creation of helpful conditions with a match between students' learning patterns and teachers' teaching structures, where flexibility stands out as a vital aspect, because one size does not fit all. To achieve this flexibility, the use of different modalities is a basic premise [62], leading to the role of integrated technology.

As can be seen from research by Knowles and Kerkman [51] at the beginning of the century, some teachers are not digital natives, and not all students are, which may partly explain the experience of an increased workload for both students and teachers. Fourteen years later, one can see that some of the resistance remains partly due to the fact that the constantly developing new digital platforms and learning resources are demanding for many to keep up with [10]. A lack of sufficient technical equipment has also been reported [66]. However, digitalization can no longer be avoided by anyone, which requires everyone to have the knowledge to handle technological devices requiring ICT competence, thereby establishing an area for skills development for universities in general. Concerns that deficient tuition may impact students' future knowledge and decreased well-being at universities [52] must be given attention but must, at the same time, be seen as growing pains which are possible to target and overcome, as the clock will not be turned back. Digitalization is here to stay. In the words of Carrillo and Flores [62] (p. 479), educators must also embrace the "need to go beyond an instrumental approach to online teaching and learning and to include into the equation its ethical, political and pedagogical dimensions". The flexibility and accessibility higher distance education offers have the potential to lead to empowerment and increased equity, both nationally and globally once the growing pains have been addressed.

6.2. Changing Conditions

An analysis of the changes in students' study strategies have been used during the pandemic. The changed conditions for learning on-line, place new and different demands on students, teachers, and technology-enhanced procedures. The transition to emergency distance education has clarified students' increasing personal responsibilities in the form of

learning activities, strategies, and self-regulated learning in a more comprehensive picture of learning patterns. Parts of these aspects existed before, but after the pandemic, the abovementioned areas seem to have become increasingly important. Other concepts under the umbrella of learning strategies have been toned down, for example, learning styles and environments.

The concept of motivation also seems to have shifted from being an overarching concept to being part of the transition to distance learning for students. Our interpretation is that during the pandemic, finding motivation for the transition to distance education has been as important as finding motivation for the studies. Thus, the focus concerning motivation shifted.

There have also been some changes in teachers' teaching methods, from being structured with good planning and interaction to being more adaptive in time and assessment. In addition, opinions about far-reaching pedagogical changes for the future have emerged.

The view of integrated technology has also been affected by the pandemic, and e-learning seems to be self-evident to both students and teachers. Whereas using the "right devices" was once the focus of distance education, it is now a matter of how to use digital devices in a constructive manner. With digitalization, the fact has also emerged that the framework of higher education is changing. How remains to be seen.

One area of students' study strategies that was not emphasized more in distance learning during the pandemic than it was before, according to research, was health aspects. This is despite the fact that national reports have shown declining health to be an area of importance [65].

6.3. Implications

The pandemic has greatly accelerated the digitalization of university teaching and may contribute to the permanent establishment of hybrid campuses that offer flexibility and autonomy for students and educators [62]. The changing conditions will put higher demands on students' awareness of their study strategies and the way education is facilitated. Our conclusions regarding the need for intensified research are as follows:

(a) There is a greater need than before for students to embrace and develop SRL strategies when studying, connecting to an urgent need to develop digital didactics;
(b) We also believe that there is a need for evaluation of the digital tools used in distance education in relation to students' study motivation and results, as Boström and Coburn [12] requested in 2013;
(c) More knowledge of students' strategic learning approaches, including students' metacognitive strategies, is needed because the boundaries between the academic learning environment and the home are blurred when studies are conducted in the home;
(d) Research on the creation of supportive, responsive, and needs-oriented study environments must increase to sustain students' self-esteem and well-being.

In short, a comprehensive view of online pedagogy, integrating technology to support teaching and learning, in line with the conclusions of Carrillo and Flores [62], would create solid conditions for further studies.

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Appendix A. Reviewed Articles

Abou-Khalil, V.; Helou, S.; Khalifé, E.; Chen, M.; Majumdar, R.; Ogata, H. Emergency Online Learning in Low-Resource Settings: Effective Student Engagement Strategies. *Educ. Sci.* **2021**, *11*, 24, doi:10.3390/educsci11010024.

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