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Review

Online Pedagogies and the Middle Grades: A Scoping Review of the Literature

Brooke Eisenbach [1,*] and Bridget Coleman [2]

[1] Middle and Secondary Education, Lesley University, Cambridge, MA 02138, USA
[2] School of Education, University of South Carolina Aiken, Aiken, SC 29801, USA; bridgetc@usca.edu
* Correspondence: beisenba@lesley.edu

Abstract: Online teaching and learning has had a presence in K12 public education since the 1990s. Following the COVID-19 global pandemic, there has been a surge in online learning and an increase in research surrounding the role of online teaching and learning within the K12 context. However, while the inclusion of online pedagogies flourishes throughout middle-grade educational settings, there is limited contemporary research that speaks specifically to effective online instruction of young adolescent learners. This scoping review examines the existing body of literature pertaining to online pedagogies within the middle grades in an effort to map the current trends, gaps, and overall state of research pertaining to national and international middle-level online pedagogy. Researchers screened research and pedagogically centered peer-reviewed articles published between 2013 and 2024. The reviewed articles were charted according to standardized details—e.g., author(s), publication year, research purpose, study location, participant demographics, methodology, and outcomes—to identify themes relevant to online pedagogical approaches, national or international contextual considerations, connection to the Association for Middle Level Education (AMLE) characteristics, and more. The findings speak to trends and gaps within middle-grade online pedagogical research with recommendations for additional examination of research and pedagogy specific to middle-grade online teaching and learning.

Keywords: middle level; middle school; online pedagogy; virtual pedagogy; blended learning; emergency remote teaching

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1. Introduction

Online learning, characterized by the delivery of a majority of instruction and content via the internet [1], was introduced to K12 public education in the early 1990s [2–5]. The first fully online K12 school opened in California in 1994 [6]. By the early 2000s, more than fourteen states were offering state-supported K12 online learning [7]. China initiated its first online school in 1996, and by 2011, it had noted a population of more than 600,000 students enrolled across more than 200 virtual schools [3]. Today, there are more than 700 full-time virtual schools serving K12 students throughout the United States [8], and more than 20% of all U.S. public schools offer at least one course entirely online [9].

In addition to expanding enrollments in fully virtual learning, K12 schools throughout the United States and internationally have found ways to embed aspects of online learning within traditional face-to-face instruction [3]. Blended learning, often referred to interchangeably with "hybrid" learning within educational research, is described as a combination of online and face-to-face instruction at potentially different points in time [1,3]. Though "hybrid learning" has been noted to be unique to "blended learning" in providing a more flexible schedule (i.e., students may only report to a physical school location two to three days a week compared to the five days a week of blended instruction) [10], both show promise as an effective means of enhancing traditional instruction. Such forms of online learning occur more frequently than full-time online learning on a national and international level [3] and have gained significant traction in K12 education since the COVID-19

pandemic [10]. Some countries, such as Singapore, Denmark, and Germany, actively encourage blended learning as a complement to classroom instruction [3]. However, for many countries, and across states, there remains a divide in the allowance and support of online learning [10].

Following the onset of the COVID-19 pandemic, schools throughout the world were forced to temporarily transition their face-to-face instruction to fully remote contexts. The quick pivot challenged schools and educators who were not prepared to navigate online teaching and learning. Unlike formally structured approaches to online learning, this transition required an immediate and often less structured approach to adapting curriculum and instruction for online teaching [2]. As a result, the term "emergency remote teaching" [ERT], or emergency remote learning, emerged to reflect this alternative to traditional online teaching and offer a contrast in conceptualization [2,11]. In general, this version of online teaching and learning was hastily prepared under challenging conditions for most traditional K12 schools, making the pedagogical approach unique to formal online instruction. It was intended to be a temporary solution to an immediate necessity for online teaching and learning [10]. The experiences in ERT, however, have the potential to serve as a catalyst for post-pandemic online education and research.

Contemporary research speaks to the goals and outcomes of a variety of online pedagogical approaches within K12 and higher education instruction (i.e., blended learning, full-time virtual instruction, and emergency remote teaching) [12]. "Online pedagogy", an umbrella term that encompasses any technological-based pedagogies accomplished at least partially through asynchronous or synchronous virtual instruction [13], speaks directly to the instructional approaches utilized within online teaching. However, the majority of research on online pedagogy either centers on higher education or neglects to effectively differentiate for K12 education [14] despite the variance in learner development and instructional needs. While the inclusion of online pedagogies continues to flourish throughout middle-grade classrooms, our review of the literature reveals that there is a dearth of contemporary research that speaks specifically to effective online instruction of young adolescent learners.

2. Rationale

Middle-level learners, defined as students around the age range of 10–15 years old or students enrolled in grades 5 through 8, have unique and diverse developmental needs [15,16]. The educational settings for middle-level learners around the world are varied, including middle schools, junior high schools, and primary/secondary schools.

As the leading middle-grade organization with international outreach, the Association for Middle Level Education (AMLE) promotes five essential attributes and eighteen characteristics for middle-level education. *Successful Middle Schools: This We Believe* [16] provides a framework for optimal learning environments for young adolescents where instruction fosters learning that is active, purposeful, and democratic. The key is the tenant that learning environments must be responsive to the needs of young adolescents. According to AMLE (2021), the essential attributes for effective middle-grade education should be challenging, empowering, equitable, responsive, and engaging. As educators strive for effective learning environments, considerations are necessary for traditional in-person settings, as well as virtual learning. As online learning opportunities continue to increase, middle-grade educators benefit from research that provides guidance in delivering virtual instruction appropriate to the developmental needs of young adolescent learners.

Online learning, also commonly referred to as e-learning, or virtual learning, involves the use of purposeful instructional planning, a systematic approach to course development, and thoughtful consideration of pedagogical strategies to engage learners through academic content, collaboration, and assessment to facilitate student learning online [17]. As of 2016, more than 200,000 middle-grade learners were enrolled in virtual school courses in the United States [18], and as of 2019, more than 12% of public middle schools offer at least

one course fully online (U.S. Dept. of Education, 2019). This change in context calls for consideration of a change in pedagogy.

Despite the availability of handbooks and resources that offer suggestions for effective online pedagogy, there remains limited empirical research to demonstrate the effectiveness of suggested instructional strategies [5,19–21]. It has also been noted that strategies for K12 online teaching often stem from research involving participants and settings in higher education, despite the distinct differences in the effective instruction of adults compared to adolescent learners [5,21].

Whether learners are engaged in fully online learning or some form of blended instruction (e.g., predominantly face-to-face with online supplemental instruction; predominantly online learning with face-to-face supplemental instruction; flipped classroom; station rotation), it is imperative that the pedagogy aligns with research-based practices that speak to young adolescent development. Reviewing the past decade affords us the opportunity to examine how online learning has rapidly evolved. Propelled by the pandemic and technological advances, online learning has continued to expand in terms of accessibility and engagement around the world. In most cases, educators are challenged to focus beyond technology to examine the pedagogical aspects of online learning. The timing is pertinent for considering how we are integrating AMLE's *This We Believe* [16] for young adolescents in virtual settings.

3. Objectives

For this study, we elected to utilize a scoping study approach to our review of the current literature surrounding online learning. A scoping review is known to serve as a rapid and systematic approach to mapping relevant literature pertaining to a field of interest [22,23]. This scoping review serves as a starting point to examine the existing body of literature pertaining to online pedagogies within the middle grades in an effort to map the current trends, gaps, and overall state of research pertaining to national and international middle-level online pedagogy. This review is unique among reviews of K12 virtual education because of its focus on examining peer-reviewed literature that explicitly addresses research in online pedagogy for middle-grade education.

We opted to utilize a scoping review as such reviews provide space to address broader topics throughout a variety of research study designs and non-empirical work [22]. For the purpose of this review, we attended to the following research questions as a general guide for our search and review of the existing literature:

(1) What are the current trends and overall state of research pertaining to national and international middle-level online pedagogy?
(2) What are the current gaps within the literature pertaining to national and international middle-level online pedagogy?
(3) In what ways, if any, are the AMLE essential attributes of a successful middle school (i.e., responsive, challenging, empowering, equitable, and engaging) [16] directly or indirectly addressed within the existing literature on online pedagogy for middle-level education?

Examining the current state of the literature regarding middle-level online pedagogy holds potential in identifying current themes, as well as a potential need for a systematic review of empirical research regarding middle-level online teaching and learning.

4. Materials and Methods

Scoping reviews provide space for initial reviews of conceptual, theoretical, empirical, and pedagogically focused literature that has yet to be reviewed in a comprehensive manner [22,24]. According to Arksey & O'Malley (2005) [22], and an essential reason for engaging in a scoping review is to identify the extent, range, and nature of activity in the field to identify current gaps while also affording the opportunity to disseminate findings and relevance for further systematic review. As such, we utilized a scoping study to

engage in coverage of the literature pertaining to online pedagogy specific to middle-grade education.

For this review, we utilized the five-stage scoping review framework provided by Arksey and O'Malley [22]: (1) identify the research question(s); (2) identify the relevant literature; (3) select literature for inclusion; (4) chart the data; and (5) collate, summarize, and report on the results. In utilizing this framework, we engaged in an iterative rather than linear review process to engage within each stage in a reflexive manner; repeat steps; and ensure clarity and transparency throughout our collection, screening, and review process [22].

5. The Current Review Boundaries

Our attention to the growing need for developmentally appropriate online pedagogy for middle-grade learners drew us to our identified research questions: what are the current trends, gaps, and overall state of research pertaining to national and international middle-level online pedagogy? What are the current gaps within the literature pertaining to national and international middle-level online pedagogy? As researchers focused on examining online pedagogy that speaks directly to the essential attributes of a successful middle school [16], we also incorporated a final question to further guide our search and data charting: in what ways, if any, are the AMLE essential attributes of a successful middle school (i.e., responsive, challenging, empowering, equitable, and engaging) directly or indirectly addressed within the existing literature on online pedagogy for middle-level education?

We utilized the following inclusion criteria within our scoping review:

- Published in a peer-reviewed journal;
- Published between January 2013 and June 2024;
- Specific focus on research and/or pedagogically based articles pertaining to middle-grade (5–8) online teaching and learning;
- Research explicit to middle-grade adolescent participants (grades 5–8) or middle-grade teachers;
- Pedagogically focused articles that speak specifically to pedagogical suggestions, strategies, or resources for middle-grade (5–8) online teaching (i.e., fully virtual, blended, emergency remote teaching);
- Research and pedagogical articles with a national and/or international focus;
- Schools could be public, private, charter, religious, or alternative settings;
- Written in English;
- Inclusive of theoretical, empirical, conceptual, and pedagogical articles.

We also utilized the following exclusion criteria:

- Editorials and book reviews;
- Articles that center on technological pedagogical knowledge (i.e., a pedagogical focus on ways that particular technological tools or applications can be utilized within teaching [25]) or digital pedagogy (i.e., a pedagogical focus on the strategic incorporation of contemporary digital technologies in education to enhance teaching, assessment, and curriculum [26]) rather than online pedagogy (emphasis on technological-based pedagogies accomplished at least partially through asynchronous or synchronous virtual instruction [13]).
- Books and book chapters;
- Gray literature;
- Articles that included participants or data from participants outside the middle grades (i.e., inclusive of high school, elementary, or higher education teachers and/or students);
- Dissertations and thesis papers.

We extended our timeline slightly beyond the typical ten-year boundary in an effort to incorporate additional works published within the first six months of 2024, as there remain

forthcoming publications concerning recent research surrounding the inclusion, role, and outcome of ERT. This time boundary allowed us to examine a wider array of research and pedagogical manuscripts pertaining to online pedagogy prior to the COVID-19 pandemic and following the worldwide utilization of ERT.

6. Search Process

Following an initial search of empirical research pertaining to online pedagogy between June 2023 and August 2023 as a component of prior research activity [27], Researcher 1 identified a significant gap in research specific to online pedagogy within the middle grades. As a result, Researcher 1 identified a need for a broader, more defined scoping literature review intended to encompass works outside the confines of empirical educational research. Researcher 2 collaborated with Researcher 1 on an extensive search of peer-reviewed literature pertaining to middle-grade online pedagogy for the purpose of this scoping review.

Between August 2023 and April 2024, Researcher 1 engaged in a library-based database search of contemporary peer-reviewed research and pedagogical literature centered around middle-grade online pedagogy. The university's advanced search database included the following databases: Complementary Index, Gale Academic OneFile, Academic Search Premier, Gale General OneFile, and SocINDEX with Full Text. Humanities International Complete, APA PsycArticles, Communication & Mass Media Complete, Gale Literature Resource Center, MAS Ultra—School Edition, Directory of Open Access Journals, Supplemental Index, Teacher Reference Center, JSTOR Journals, BioOne Complete, Gender Studies Database, and OAPEN Library. Researcher 1 ran searches for terms identified as relevant to online pedagogy and middle-grade education across the major academic databases to identify potential qualifying articles available through the noted search engines (see Table 1).

Table 1. Initial results for LL search engine.

Search Terms/Phrases	Number of Initial Search Hits for 2013–2024	Number of Articles Downloaded for Full Review Following Review of Initial 100 Titles and Abstracts
Virtual education or virtual learning or online learning or remote learning AND middle school or junior high or 6th grade or 7th grade or 8th grade AND pedagogy or teaching or teaching strategies or teaching methods	249,110	5
Digital pedagogy or technology integration AND middle school or junior high or 6th grade or 7th grade or 8th grade	400,476	12
Blended learning or e-learning or hybrid or elearning AND middle school or junior high or 6th grade or 7th grade or 8th grade	380,305	10
Distance learning or distance education or online learning or online education AND middle school or junior high or 6th grade or 7th grade or 8th grade	1,132,819	2
Hybrid learning or blended learning or online learning AND middle school or junior high or 6th grade or 7th grade or 8th grade	588,730	5

Table 1. *Cont.*

Search Terms/Phrases	Number of Initial Search Hits for 2013–2024	Number of Articles Downloaded for Full Review Following Review of Initial 100 Titles and Abstracts
Digital pedagogy AND middle school or junior high or 6th grade or 7th grade or 8th grade	32,484	0 *
Blended learning or e-learning or hybrid or elearning or hyflex or self-blended or flex or enriched virtual or rotation AND middle school or junior high or 6th grade or 7th grade or 8th grade	767,740	0 *
Flipped classroom or inverted classroom or flipped learning or inverted learning or blended learning AND middle school or junior high or 6th grade or 7th grade or 8th grade	80,340	1
Rotation blended learning model AND middle school or junior high or 6th grade or 7th grade or 8th grade	2798	3
Flex learning or hy-flex learning or hy-flex or flex teaching or hy-flex teaching AND middle school or junior high or 6th grade or 7th grade or 8th grade	8604	0 *
Self-blended model AND middle school or junior high or 6th grade or 7th grade or 8th grade	8	0 *
enriched-virtual model AND middle school or junior high or 6th grade or 7th grade or 8th grade	48	0 *
Emergency remote teaching or emergency remote learning AND middle school or junior high or 6th grade or 7th grade or 8th grade	28,959	0 *

Note: * No potential articles identified following removal of duplicates.

Researcher 1 read the titles, keywords, and abstracts of the first 100 article hits for each of the search term combinations. This researcher determined that reviewing the first 100 article hits was enough to reach saturation as findings resulted in duplications and suggestions outside the scope of the intended review focus. Articles were identified for additional review based on the content of the title, keywords, and abstract. After duplicates were removed, a total of 38 unique articles were identified for full review.

Between May 2024 and July 2024, Researcher 2 engaged in active collaboration with Researcher 1 to continue the search and review process of the literature. At this time, Researcher 1 engaged in a hand search of two primary educational databases (Gale Academic OneFile and ProQuest Education). Gale Academic OneFile was selected for a hand search based on the number of initial hits located within the databases throughout the library general search, and ProQuest Education was selected for a hand search as it was not included within the initial general search. This researcher utilized the same search terms and combinations as the initial library general search for the database hand search (see Table 2). Researcher 1 continued to review the initial 100 hits on each of the search combinations, which resulted in identifying 33 additional articles for full review.

Table 2. Initial results for additional database searches.

Database	Search Terms/Phrases	Number of Initial Search Hits for 2013–2024	Number of Articles Downloaded for Full Review Following Review of Initial 100 Titles and Abstracts
Gale Academic OneFile	digital pedagogy or technology integration AND middle school or junior high or 6th grade or 7th grade or 8th grade	27	0 *
Gale Academic OneFile	virtual education or virtual learning or online learning or remote learning AND middle school or junior high or 6th grade or 7th grade or 8th grade AND pedagogy or teaching or teaching strategies or teaching methods	3	0 *
Gale Academic OneFile	blended learning or e-learning or hybrid or elearning AND middle school or junior high or 6th grade or 7th grade or 8th grade	66	6
Gale Academic OneFile	distance learning or distance education or online learning or online education AND middle school or junior high or 6th grade or 7th grade or 8th grade	107	3
Gale Academic OneFile	hybrid learning or blended learning or online learning AND middle school or junior high or 6th grade or 7th grade or 8th grade	74	3
Gale Academic OneFile	digital pedagogy AND middle school or junior high or 6th grade or 7th grade or 8th grade	1	0 *
Gale Academic OneFile	blended learning or e-learning or hybrid or elearning or hyflex or self-blended or flex or enriched virtual or rotation AND middle school or junior high or 6th grade or 7th grade or 8th grade	78	0 *
Gale Academic OneFile	flipped classroom or inverted classroom or flipped learning or inverted learning or blended learning AND middle school or junior high or 6th grade or 7th grade or 8th grade	31	4
Gale Academic OneFile	rotation blended learning model AND middle school or junior high or 6th grade or 7th grade or 8th grade	0	0
Gale Academic OneFile	flex learning or hy-flex learning or hy-flex or flex teaching or hy-flex teaching AND middle school or junior high or 6th grade or 7th grade or 8th grade	1	0
Gale Academic OneFile	self-blended model AND middle school or junior high or 6th grade or 7th grade or 8th grade	0	0
Gale Academic OneFile	enriched-virtual model AND middle school or junior high or 6th grade or 7th grade or 8th grade	0	0

Table 2. *Cont.*

Database	Search Terms/Phrases	Number of Initial Search Hits for 2013–2024	Number of Articles Downloaded for Full Review Following Review of Initial 100 Titles and Abstracts
Gale Academic OneFile	emergency remote teaching AND middle school or junior high or 6th grade or 7th grade or 8th grade	6	0 *
ProQuest Education	digital pedagogy or technology integration AND middle school or junior high or 6th grade or 7th grade or 8th grade	22,256	1
ProQuest Education	virtual education or virtual learning or online learning or remote learning AND middle school or junior high or 6th grade or 7th grade or 8th grade AND pedagogy or teaching or teaching strategies or teaching methods	43,397	5
ProQuest Education	blended learning or e-learning or hybrid or elearning AND middle school or junior high or 6th grade or 7th grade or 8th grade	15,287	5
ProQuest Education	distance learning or distance education or online learning or online education AND middle school or junior high or 6th grade or 7th grade or 8th grade	62,838	0 *
ProQuest Education	hybrid learning or blended learning or online learning AND middle school or junior high or 6th grade or 7th grade or 8th grade	50,949	1
ProQuest Education	digital pedagogy AND middle school or junior high or 6th grade or 7th grade or 8th grade NOT Higher Education	348	0 *
ProQuest Education	blended learning or e-learning or hybrid or elearning or hyflex or self-blended or flex or enriched virtual or rotation AND middle school or junior high or 6th grade or 7th grade or 8th grade NOT Higher Education	1041	5
ProQuest Education	flipped classroom or inverted classroom or flipped learning or inverted learning or blended learning AND middle school or junior high or 6th grade or 7th grade or 8th grade NOT Higher Education	7794	0 *
ProQuest Education	rotation blended learning model AND middle school or junior high or 6th grade or 7th grade or 8th grade NOT Higher Education	202	0 *
ProQuest Education	flex learning or hy-flex learning or hy-flex or flex teaching or hy-flex teaching AND middle school or junior high or 6th grade or 7th grade or 8th grade NOT Higher Education	2036	0 *

Table 2. *Cont.*

Database	Search Terms/Phrases	Number of Initial Search Hits for 2013–2024	Number of Articles Downloaded for Full Review Following Review of Initial 100 Titles and Abstracts
ProQuest Education	self-blended model AND middle school or junior high or 6th grade or 7th grade or 8th grade NOT Higher Education	1	0 *
ProQuest Education	enriched-virtual model AND middle school or junior high or 6th grade or 7th grade or 8th grade NOT Higher Education	1	0 *
ProQuest Education	emergency remote teaching AND middle school or junior high or 6th grade or 7th grade or 8th grade NOT Higher Education	683	0 *

Note: * No potential articles identified following removal of duplicates.

At this time, Researcher 2 worked alongside her university media specialist to identify any additional need for a database search, additional search phrases, and other insights into the online search process that may be considered for the scoping review process. Based on this conversation, the researchers were able to identify journals for hand searches and concluded that the current search term combinations would suffice for the purpose of the scoping review search.

The researchers then identified research-based and pedagogically based education journals and educational organizations pertinent to middle-grade education and online teaching and learning. Following Arksey and O'Malley's (2005) [22] scoping review framework, the researchers collaborated to conduct hand searches of journal publications between 2013 and 2024, as well as correspondence with individuals within identified education organizations. The organizations selected for correspondence were as follows:

- The Association for Middle Level Education (AMLE) (n = 2);
- The Online Teaching and Learning SIG (OTL) of the American Education Research Association (AERA) (n = 2);
- International Society for Technology in Education (ISTE) (n = 0);
- European League for Middle Level Education (ELMLE) (n = 0).

Journals identified for a hand search included the flagship journals of middle-grade education organizations (i.e., AMLE, AERA's Middle Level SIG) and K12 online teaching and learning organizations (i.e., ISTE), as well as journals identified for inclusion based on their noted publication of middle-grade online research and instructional strategies. The same combination of search phrases was utilized throughout the hand search of each identified journal. Following the removal of duplicates found within the initial general database search, as well as the reading and review of article abstracts, the number of articles identified for downloading and full review are noted below.

- *Voices from the Middle* (n = 10);
- *Middle School Journal* (n = 5);
- *Journal of Online Learning Research* (n = 4);
- *Middle Grades Review* (n = 4);
- *Journal of Research on Technology in Education* (n = 2);
- *Research in Middle Level Education Online* (n = 1);
- *Journal of Digital Learning in Teacher Education* (n = 0);
- *Quarterly Review of Distance Education* (n = 0);
- *Educational Considerations* (n = 0);
- *Educational Media International* (n = 0);
- *Journal of Interactive Online Learning* (n = 0);

- *Online Journal of Distance Learning Administration* (n = 0);
- *Online Learning Journal* (n = 0);
- *Journal of Online Learning Research* (n = 0);
- *Education and Information Technologies* (n = 0);
- *Education Technology and Society* (n = 0);
- *MLS Educational Research* (n = 0);
- *International Journal of Online Pedagogy and Course Design* (n = 0);
- *Journal of Distance Education* (n = 0).

Combining the database, organization, and journal hand search, the researchers included a total of 88 articles for full review and analysis. Prior to the reading of the articles, the researchers engaged in chain searching in which they reviewed the articles' list of references in search of potential articles for consideration (n = 31). Utilizing an iterative process of review [22], the researchers repeated the prior protocol to review the identified potential titles and abstracts. Article abstracts were reviewed to ensure a focus on middle grades and online pedagogy. Those that did not meet the identified criteria were excluded. Following the chain search and exclusion criteria, a final total of 94 articles were identified for full review.

Both researchers engaged in full reading of the 94 identified manuscripts. Articles that did not meet the previously noted criteria were removed from consideration. For example, articles that included a focus on grades outside of 5–8 (i.e., K-4, secondary school or higher education), learners younger than 10 years of age or older than 15 years of age, or research that focused on the effectiveness of a particular online program or application rather than a general aspect of online pedagogy, were not included for final analysis. If there was a disagreement between authors regarding the inclusion of a selected article, the researchers would meet to discuss the article in greater depth until reaching a consensus.

Data charting was conducted by both researchers. For the purpose of a scoping review, "charting" is defined as a technique that utilizes a descriptive–analytical approach commonly found within a narrative review to collect common information pertaining to each article and apply an analytical framework to synthesize and interpret data through identified themes [22]. The researchers documented key components of each article that were determined to be relevant to the scope of this review. As all identified manuscripts were not reports of research, there were instances when aspects of the finalized chart were incomplete. For example, pedagogically focused manuscripts may not include information pertaining to a research methodology or study participants. When this occurs, the researchers denote this lack of information with an "N/A" to signify that the category was not applicable.

Once the identified categories were populated for each article, the authors collaborated to review the charts and ensure all data elements were accurately represented. It was at this time that the authors identified three dominant forms of online pedagogy (i.e., fully only, blended, ERT) and distributed the current chart into three distinct charts for greater clarity and preparation for analysis (see Table 3 for an abbreviated version of our "Fully Online" model chart).

Table 3. Sample spreadsheet of selected articles for "Fully Online: courses or schools" (abbreviated version).

Article Title	Author (s)	Year	Study Type	Research Question(s)/Purpose	Blending of Participants and Context for Manuscript	Connection to online Pedagogy for Middle-level Education (Dominant Themes Pertaining to Online Pedagogy)
Student and teacher perceptions of online student engagement in an online middle school	Louwrens, N. & Hartnett, M.	2016	Case Study	What do teachers perceive engages students in online courses, and why? What encourages students to engage in online activities?	Grade/Age: 11–15 yo Location: New Zealand Race: Not mentioned Gender Identity: Not mentioned Students and/or Teachers: 10 students and 4 teachers	Focused on student engagement—cognitive and emotional

Table 3. *Cont.*

Article Title	Author (s)	Year	Study Type	Research Question(s)/Purpose	Blending of Participants and Context for Manuscript	Connection to online Pedagogy for Middle-level Education (Dominant Themes Pertaining to Online Pedagogy)
Stage environment fit and middle-level virtual learners: A phenomenological case study	Eisenbach, B., & Greathouse, P.	2020	Qualitative—Phenomenological Case Study	What are the experiences of middle-level virtual learners enrolled in a fully virtual school program?	Grade/Age: 6 into 7 Location: Southeastern U.S. Race: N/A Gender Identity: Female Students and/or Teachers: Student participants only	Focus on stage–environment fit theory (aligning schooling with developmental needs) Need for connection, community, and relatedness in online teaching/learning Need for pedagogy that is engaging and motivational for online learning Need for autonomy in instructional pacing and engagement Need for positive self-efficacy for online learning

The final charts were then reviewed independently by the researchers to identify connections, dominant foci/themes, notable gaps, and reference to the identified characteristics of effective middle schools, as noted by the AMLE *This We Believe's* [16] essential attributes (i.e., responsive, challenging, empowering, equitable, and engaging). Following an independent review, the researchers collaborated to compare results and come to a consensus on the final results. The data extrapolated from the finalized charts were utilized to form the basis of the analysis. In the end, 51 articles were determined to meet all of the criteria for inclusion in the scoping review analysis (see Table 4). Of the final articles, 47 were research-based, and 4 were pedagogical texts.

Table 4. Data sources (articles) selected in the scoping review.

Fully Online
• *Asim, S., Ponners, P. J., Bartlett, C., Parker, M. A., & Star, R. (2020). Differentiating instruction: For middle school students in virtual learning environments. *The Delta Kappa Gamma Bulletin*, *86*(3), 19–31. • Cui, Y., Zhao, G., & Zhang, D. (2022). Improving students' inquiry learning in web-based environments by providing structure: Does the teacher matter or platform matter?. *British Journal of Educational Technology*, *53*(4), 1049–1068. https://doi.org/10.1111/bjet.13184 • Eisenbach, B. B., & Greathouse, P. (2020). Stage-environment fit and middle level virtual learners: A phenomenological case study. *RMLE Online*, *43*(7), 1–12. https://doi.org/10.1080/19404476.2020.1777808 • Louwrens, N. & Hartnett, M.. (2015). Student and teacher perceptions of online student engagement in an online middle school. *Journal of Open, Flexible, and Distance Learning*, *19*(1), 27–44. • Rice, M. F., Ortiz, K. R., Curry, T. M., & Petropoulos, R. (2019). A case study of a foster parent working to support a child with multiple disabilities in a full-time virtual school. *Journal of Online Learning Research*, *5*(2), 145–168. https://www.learntechlib.org/primary/p/184933/ (accessed on 12 May 2024) • Yalavaç, G., & Samur, Y. (2016). Students' and teachers' perceptions of after school online course. *European Journal of Contemporary Education*, *15*(1), 147–162.
Blended/Hybrid (Includes Flipped)
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* Pedagogically based.

7. Results

7.1. Trends in Online Pedagogical Literature

First, we give attention to our analysis regarding trends within our charting of the literature. Specifically, we identified trends in the research methodologies, study context, and participant population; the online instructional focus of the literature included within the review (i.e., fully virtual, blended, or emergency remote teaching); and the focus of the research studies (see Figures 1 and 2).

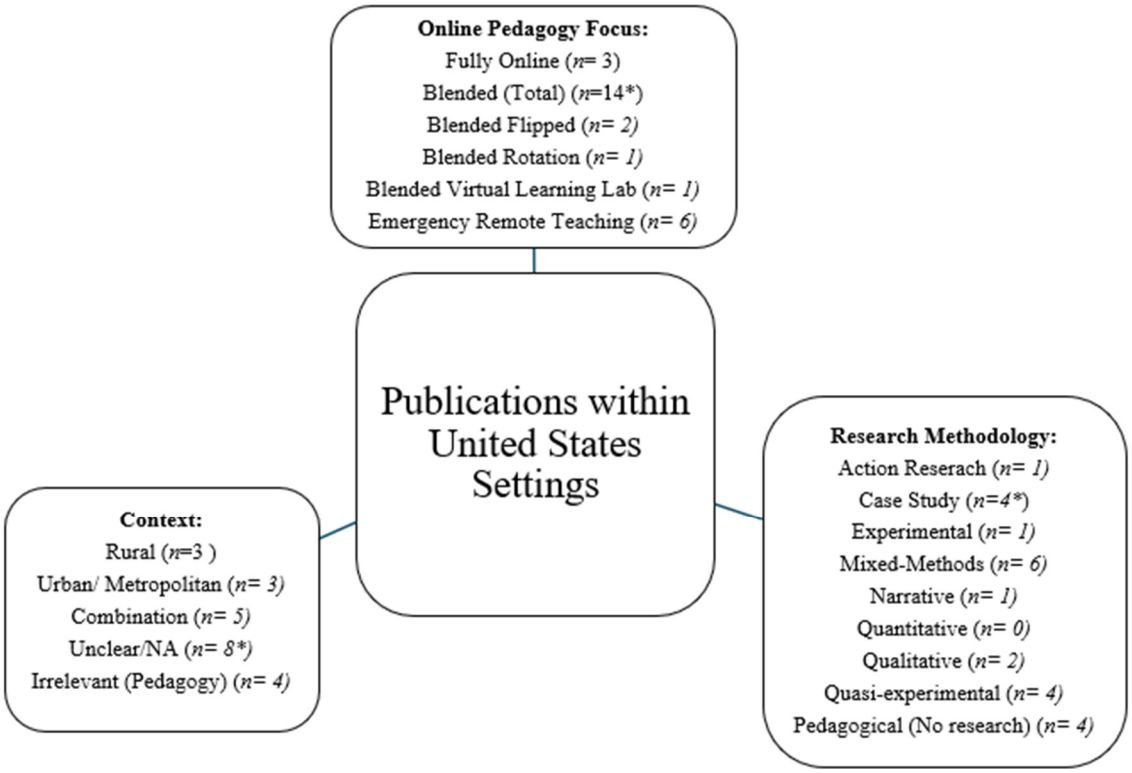

Figure 1. Data sources from United States settings. * Note: 1 additional blended study involved both U.S. and international data collection (U.S. and Finland).

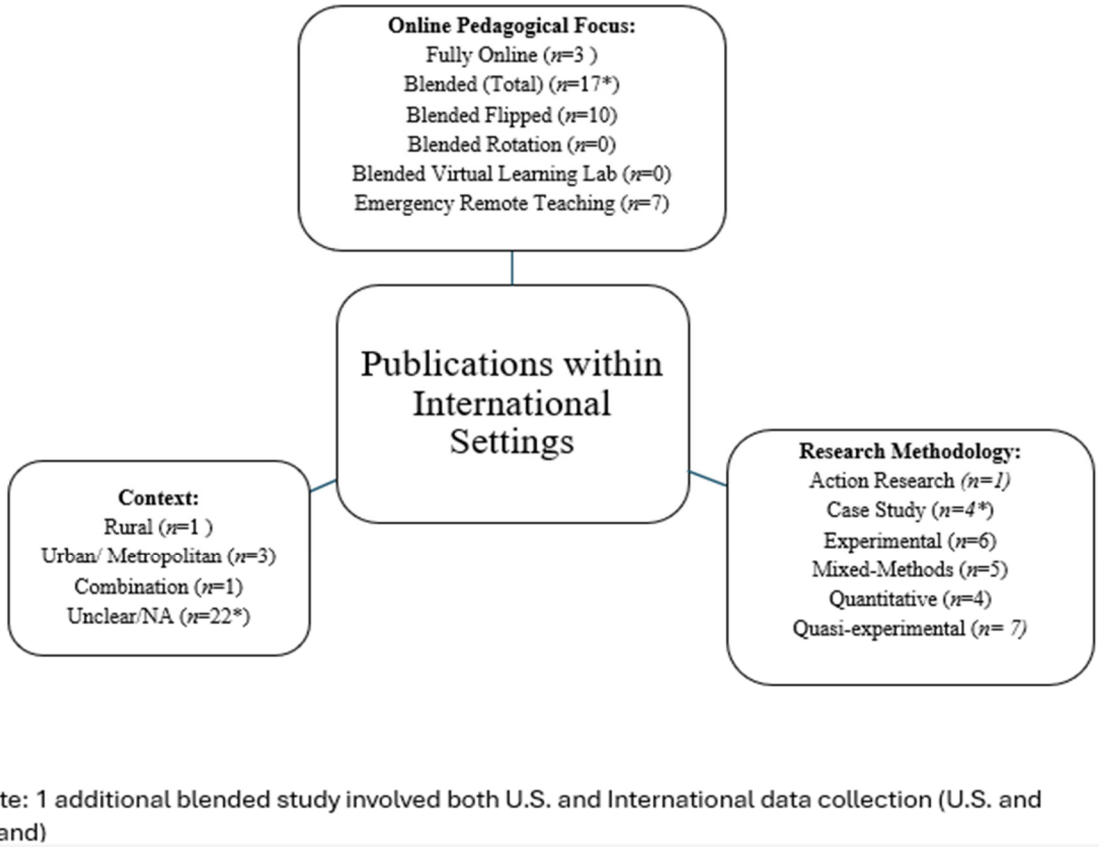

Figure 2. Data sources from international settings.

7.2. Research Methodologies

As demonstrated in Figures 1 and 2, the methodologies employed throughout the selected studies reveal diversity in the quantitative and qualitative approaches to middle-grade online pedagogies research. Scoping reviews do not call for a systematic review of research methodologies or approaches to data collection and analysis [22]. While we did not exclude studies based on the researchers' methodology, we identified some commonalities in methodological choice and approach across the literature. For example, the most frequently cited research methodologies across all of the literature utilized mixed-methods or quasi-experimental. Mixed-methods studies were evident in six publications of U.S.-based studies and five publications of internationally based studies. Of these 11 publications, 1 study centered fully on online contexts, 7 focused on an aspect of blended instruction, and 3 drew attention to ERT. Quasi-experimental research was also a frequent form of research methodology, with 11 of the identified studies utilizing this methodology. The least utilized methodology within the literature was narrative research, with just one study utilizing this approach to the research [28].

Our analysis also revealed that the most frequent methodology employed for studies involving fully online instruction was case study research [29,30]. Blended learning research leaned more toward the quasi-experimental methodology, with nine studies utilizing a quasi-experimental approach and seven studies noting an experimental research approach. Finally, survey research was the most commonly employed methodology for ERT research, with six identified publications.

7.3. Study Contexts

In addition to study methodologies, we identified trends in study contexts. Of the research publications that met our criteria for this scoping review, 23 were focused on content within the United States, and 27 were studies conducted internationally, with 1 study consisting of both national and international contexts. While there was research involving metropolitan/urban, suburban, and rural contexts (i.e., rural Iowa and metropolitan areas in the Southeastern United States), we found that the majority of publications did not identify the study context within these parameters. For example, the majority of studies spoke in greater generalities by denoting regions of the country (i.e., Southeastern United States; Central Virginia; Midwestern public schools) and schools within general international locations (i.e., junior high schools in Sukoharjo Regency; middle school in the Direct-Entering-Socialism-Ethic Communities of China; State Junior High School). Others limited the scope of contextual details (i.e., seventh grade in a secondary school with a medium socio-economic level; an international school in China; school districts in the U.S.). Given the varying research settings, greater clarification in the study context would lead to more prominent themes across demographics.

7.4. Online Learning Models

Overall, current research in middle-level online pedagogy focuses largely on studies related to blended learning models, with minimal attention on fully virtual contexts. For example, of the 51 manuscripts that met our inclusion criteria, only 5 involved research focused on fully virtual contexts and 1 offered a pedagogical view of differentiation within the fully virtual classroom. Yet, 32 papers featured the blended learning environment. Non-specific approaches to blended instruction, or approaches that were not defined by the authors by markers outside of "blended" or "hybrid" instruction, accounted for the majority of the blended research studies (n = 15), while flipped approaches to blended learning, understood in the current literature to be a pedagogical method in which students engage in the learning of new knowledge online with active engagement and collaboration through face-to-face instruction [31], accounted for 12 of the blended manuscripts. Reference to rotation-model approaches to blended learning [32] and virtual learning lab instruction [33] each accounted for one of the remaining manuscripts. Additionally, there were three pedagogical articles in the blended learning category.

Since 2020, 13 publications regarding middle-grade online pedagogy have centered on ERT compared to 18 publications focused on traditional versions of fully online instruction and practices in blended instruction. Given the time required for the research and peer-reviewed publication process, it is likely that more studies regarding the impact and role of ERT will be forthcoming.

7.5. Study Focus

Our charting process also examined the research objectives within the literature. While some researchers devoted attention to teacher and student perspectives of online teaching and learning, others chose to examine the outcomes, impact, or effect of online pedagogy on middle-grade learners.

Of the five studies conducted in fully online teaching and learning, four of the studies examined participant perceptions (i.e., students, teachers, parents) related to online learning [29,30,34,35], while one study investigated the effects of structured support for online instruction [36].

A focus on participant perceptions extended beyond fully online education. Literature on blended learning and ERT also included a clear focus on the perceptions of students [37,38] and teachers [28,39] as it related to experiences with online pedagogy. Some studies engaged in research that worked to unpack the perceptions from multiple viewpoints (i.e., students, teachers, family members) in an effort to gather a thoughtful picture and clear understanding of the role of blended instruction [40] or ERT [41,42] with regard to student engagement, motivation, learning, and more.

Researchers also examined the potential effects of curriculum [43,44], instructional approaches [45,46], or instructional and technological supports [47,48] in online pedagogy. Still, others approached the research in a way that coupled participant voice with quantifiable outcomes to gain a deeper understanding of the role of online pedagogy in student academic development [49–51], creative thinking [32], motivation [52–54], and more.

Pedagogical texts featured suggestions for effectively engaging learners in online pedagogy based on prior research [55] or the authors' own experiences and perspectives [34,56,57]. Throughout the pedagogical literature, authors speak directly to educators, offering suggestions for transitioning their face-to-face instruction to a blended approach, considerations for potential resources and learning management platforms, as well as offerings regarding means of personalizing the online learning experience for students.

Overall, while we noted diversity in specific research foci throughout the literature, there remains a tendency to examine aspects regarding the effectiveness of online pedagogy in ways that account for the individual experience, opinion, and perspective alongside quantifiable outcomes and measurable effects.

8. Current Gaps in the Literature

In addition to examining the current trends within middle-grade online pedagogical research, we sought to identify gaps that exist within the literature. The gap that stood out as we engaged in our charting of the data was a lack of emphasis on research involving diverse populations or clarity surrounding the diversity of the populations selected to participate in the research.

In our focus on study populations, we examined references to learner and teacher participant demographic data. Of the 46 studies analyzed within the review, a significant number of studies did not make explicit mention of select demographic data (i.e., gender identity, race, or ethnicity) or utilize these data as a variable in data analysis. For example, of the 28 studies conducted with international populations, there was no specific notation of participant ethnicity or race, and only 11 of the 20 studies inclusive of a U.S. context included participant race and/or ethnicity. In addition, we noted that only 29 of the 46 studies included details concerning gender distribution within the pool of study participants.

We also identified a significant gap in work with an explicit focus on students with disabilities, "giftedness", or neurological diversity. For example, only three studies noted

the inclusion of students with disabilities [41,44,47] or participants noted to be served by Individualized Education Plans (IEP), with just one manuscript giving isolated attention to this population of learners within the research focus [30]. We also identified one article with explicit reference to "giftedness" [33] and two studies specific to online pedagogy for English language learning [58,59].

9. AMLE Essential Attributes and Middle-Grade Online Pedagogical Research

Finally, by examining the articles through the lens of well-established constructs of the essential attributes of effective middle-grade education (see Figure 3) and extrapolating middle-grade/young adolescents from the broader scope of K12 literature, a more nuanced and specialized picture of the factors in online pedagogical research emerged. Given that the attributes have intersecting themes, we chose not to report on them as a set rather than as individual constructs. And, in conducting this collaborative analysis, we were able to identify ways in which the literature addresses these essential attributes in an implicit, if not explicit, manner.

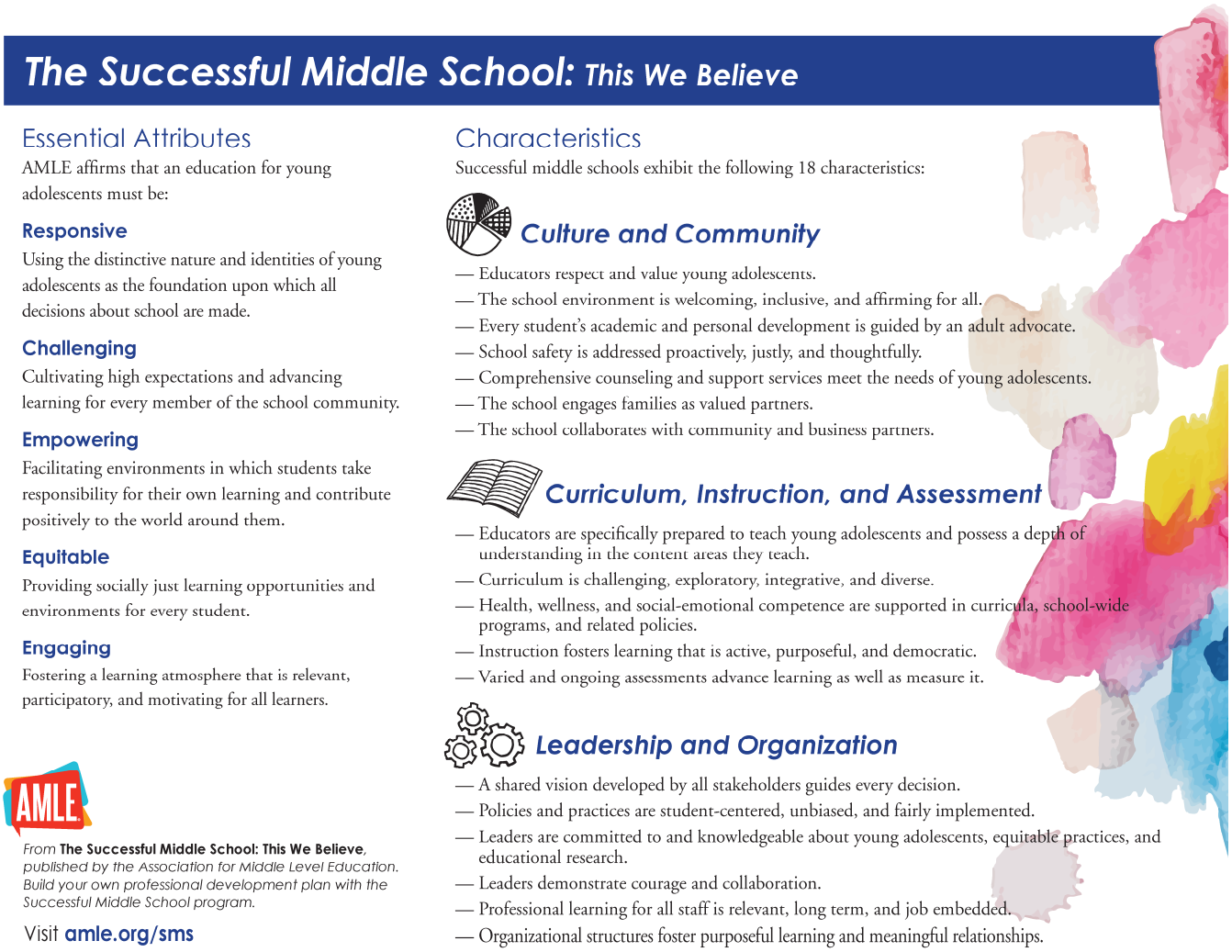

Figure 3. The Successful Middle School: This We Believe Essential Attributes (AMLE.org). eprinted with permission from AMLE.

First, we noted that explicit reference to the essential attributes only occurred in literature published within AMLE-sponsored journals [29,34,37] and one research article published outside of an AMLE-sponsored journal [54]. Yet, regardless of whether the

literature featured U.S. or international settings, there was an implicit connection found between research objectives and the AMLE essential attributes in each of the publications.

The AMLE essential attributes connect and contribute to the overall effectiveness of middle-level education. For instance, instruction that engages learners is also likely to empower students and respond to their individual interests and needs. Likewise, teaching that challenges students can, in turn, foster critical engagement and collaboration. Therefore, while it was not possible to extrapolate the occurrence of each of the five attributes throughout the literature, as the attributes often bleed into one another throughout student objectives, goals, and findings, we were able to note a demonstrated emphasis on research and pedagogical suggestions that connect to these attributes.

Some studies sought to identify means of differentiating online instruction [54,55] for a more personalized approach to addressing learner needs. Additional research attended to means of engaging and motivating students through resources, applications, and instructional approaches that speak to student interests [60] and peer-to-peer collaboration [61,62].

Other studies implicitly addressed essential aspects of responsiveness and equity through research attuned to meeting the needs of learners with disabilities in an online context [30,44]. Studies also spoke to a need for equity in instruction and access for English language learners [50,58].

There were also publications that implicitly addressed key facets of effective middle-level teaching through specific attention to the ways in which online pedagogy addresses the developmental needs of young adolescents [29,37,41], responds to the social and emotional needs of learners [40], and encourages the inclusion of learner supports [20]. Current research also implicitly speaks to a need to challenge learners in their creative and critical thinking [32,52,63] and academic development [53,64] as well as a need to understand how online pedagogy can serve the unique needs of gifted learners [33].

Overall, while the literature demonstrated gaps in explicit notations of the AMLE essential attributes, it was evident throughout our charting and data-analysis process that research seeks to examine the role of such attributes in middle-grade online pedagogies in an implicit but apparent manner.

10. Conclusions

Research over the past decade has generally focused on K12 and higher education with limited regard for specificity to middle-level education. As online learning surges worldwide, it becomes imperative that researchers focus specifically on meeting the needs of young adolescents in the middle-grade virtual context. Just as middle schools strive to meet the unique and diverse needs of young adolescents, effective online education must follow suit. Attending to AMLE's essential attributes has the potential to help more young adolescents thrive in the online learning environment. Our scoping review is unique in that it is focused on contemporary literature surrounding online learning in middle-grade education. We sought to identify the overall state of the research worldwide, identify gaps, and examine implicit and explicit connections to AMLE's essential attributes of successful middle schools. The scoping review revealed trends in research methodologies, study contexts, online learning models, and current research objectives.

Overall, we found that there is an equal distribution of studies from across the United States and international contexts, but with limited discussion regarding the specific details of study contexts and participant demographics. Within such limitations, we noted a dearth of research that speaks directly to middle-level learners with diverse physical and neurological needs and abilities. We also noticed that despite the diverse approaches to research methodology and objectives, there is a tendency toward studies that utilize mixed-methods and quasi-experimental designs, thereby limiting the depth of focus on qualitative methodologies.

Finally, our results indicate a significant need for additional research on fully online courses and programs compared to the quantity of research centered around blended learning and ERT. Specifically, there is a significant need for quantitative and mixed-

methods research that speaks directly to fully online learning, as well as a need for research that explicitly attends to the AMLE essential attributes for greater focus on how online pedagogy might ensure effective instruction for middle-level learners.

11. Limitations of the Scoping Review

We recognize that there are limitations to our scoping review. First, we sought to review the most recent decade of research, so we set parameters to limit data sources to work published between 2013 and the first half of 2024. We continue to see additional work forthcoming regarding ERT (peer review takes time). We also limited searches to peer-reviewed work published in English for efficiency in analysis. For these reasons, there may be literature that escaped the scope of our inclusion criteria.

Finally, we recognize the array of search terms that may currently be utilized and that are forthcoming related to online pedagogies. There is the potential omission of literature in our search (i.e., missed search phrases, a lack of inclusion of some open-access materials, and the need to expand the definition of middle grades as it relates to international studies). We recognize the need for additional search terms for augmented and immersive realities. Was it a gap in the literature or a gap in our search criteria? Either way, this is a rapidly growing area for future research.

12. Recommendations

As Arksey and O'Malley (2005) [22] surmise, scoping reviews are intended to map the relevant literature addressing an area of research with a broad brush. Unlike a systematic review, scoping studies offer space for a broad range of literature forms and study designs. As such, one of our initial recommendations is for an additional review of the literature with more specific, well-defined questions inclusive of a clear, narrow range of study design. Given the consistent changes within educational technology, resources, and applications in today's middle-grade classrooms, it is likely that by the time this review is published, there will be additional literature available for critical review. This enhances our call to educational researchers to continue the work of examining current trends, gaps, and implications of this change on online pedagogy for middle-grade learners.

In our review of the current literature, we identified a tremendous need for additional research centered around online pedagogy specific to middle-grade and/or young adolescent learners. A great deal of literature remains that speaks to higher education or contributes to a focus on K12 populations. However, the specific developmental needs of adolescent learners lend themselves to a call for research that addresses the means of effective online pedagogy for this population of students. With more classrooms integrating aspects of blended instruction with each passing year and the growth of fully online courses and classrooms, it is essential we identify means of meeting these unique needs within the ever-developing online context.

Finally, we recommend researchers continue to examine the potential long-term outcomes and impacts of ERT on middle-level teaching and learning. National and international research on ERT continues to be reviewed and published. And, while a great deal of this work still centers on the immediate needs and impacts of ERT on K12 student populations and educators, it is critical that we consider ways in which ERT may impact online pedagogy within fully online courses and institutions, as well as in teacher approaches to blended instruction. We recommend learning more about the ways ERT impacted teacher pedagogical approaches to online instruction, as well as how this experience has impacted student approaches to online learning and engagement. Consideration should also be given to the implications of educator preparation (or lack thereof) in online teaching.

Future trends should include prioritizing educator preparation in online pedagogies for online teaching and meeting the needs of young adolescent middle-grade learners. Research can guide the future of middle-grade online learning and education reform agendas. As more students engage in online learning, we should be intentional about

designing optimal, high-quality options specifically for young adolescents in the middle grades.

Questions raised for future research to pursue include, but are not limited to, the following:

- What is the state of the digital divide in online learning in the middle grades?
- To what extent are the AMLE essential attributes—responsive, challenging, empowering, equitable, engaging—explicitly employed in the design of online learning for young adolescents?
- What is the potential of augmented and immersive realities in middle-grade education?
- What accountability and performance measures are in place for virtual schools?
- How are teacher-preparation programs preparing middle-grade educators for effective online teaching?
- How has the use of online, blended, and emergency remote pedagogies impacted student engagement, collaboration, and learning in the middle grades?
- What are the long-term impacts of online teaching and learning on student development and academic success?

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