# A Spoonful of Sugar? Emerging Tensions in a Scoping Review of Research on Digital Play in Grades 4-8 Classrooms

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## BACKGROUND

### Digital Games, Play and Learning

- Children and youth play, connect and create in digital spaces (e.g., Dezuanni, 2018; Kafai & Filelds, 2013)
- 81% of Canadian youth aged 9-17 play online games daily or weekly (MediaSmarts, 2022).
- In schools, digital game-based learning is widely understood to support a range of disciplinary learning outcomes (Clark et al., 2016) including in science (Kara, 2021), mathematics (Byun & Jong, 2018), and computer science (Ackaoglu & Koehler, 2014). Serious games can engage and motivate students to learn (Blumberg et al., 2019; Keller et al., 2021). Learning to design games supports development of systems thinking (Ackaoglu & Green, 2019).

As part of the Canadian Playful Schools Network project, we examined the ways that digital play has been studied and integrated in grades 4-8 classrooms globally. Hypothesizing that digital games might be just one approach to digital play, this study asks:

**What does digital play (broadly conceived) include, as experienced in classrooms at school, for children in grades 4-8? (age 9-14)**

## METHODOLOGY

Methods of scoping review enable the identification and mapping of evidence in a domain of scholarship (Arksey & O'Malley, 2005; Munn et al., 2018). Through an exhaustive search of extant literature, we searched 7 databases (in EN and FR) to construct understandings of how classroom-based digital play has been studied from 2012 to 2022, and to summarize trends in the findings as a way to identify and analyze knowledge gaps (Munn et al., 2018).

**Data Bases:** ERIC, Edu Source, ACM, CBCA, Cairn, Érudit

| ERIC Preliminary Search | |
|---|---|
| 1 | play/ |
| 2 | game based learning/ |
| 3 | electronic learning/ |
| 4 | (play OR playing).ti,ab |
| 5 | ("digital learning" or "electronic learning" or "online learning" or "mobile learning").ti,ab |
| 6 | (game* adj2 learning).ti,ab |
| 7 | or/1-6 |
| 8 | computer games/ |
| 9 | video games/ |
| 10 | ((online or computer or video or mobile or digital or electronic or serious or sandbox) adj2 game*).ti,ab |
| 11 | ((mobile or smartphone*) adj2 (app or apps or application*) or "new media").ti,ab |
| 12 | or/8-11 |
| 13 | 7 and 12 |
| 14 | ("digital play" or "online play").ti,ab |
| 15 | 13 or 14 |
| 16 | exp elementary secondary education/ |
| 17 | schools/ or elementary schools/ or middle schools/ or private schools/ or public schools/ or secondary schools/ |
| 18 | elementary school students/ or junior high school students/ or middle school students/ |
| 19 | children/ or preadolescents/ or early adolescents/ |
| 20 | (school* or class or classes or classroom*).ti,ab |
| 21 | ((school* adj2 student*) or children or preadolescent* or "pre adolescen*" or preteen* or "pre teen*" or tween* or adolescen* or teen* or youth).ti,ab |
| 22 | or/16-21 |
| 23 | 15 and 22 |
| 24 | limit 23 to yr="2012-current" |

*Figure 1.* Example of Search Process and Search Phrases in ERIC.

**IDENTIFICATION**

3192 records identified through database searching → 488 duplicates removed

**SCREENING**

2704 records screened (title/abstract) → 2079 records excluded

**ELIGIBILITY**

625 studies assessed for elibility (full-text) → 472 studies excluded with reasons

Wrong age group or wrong population of students and teachers (231)
No focus on classroom use (93)
Wrong publication type (50)
Focus is more on design of the game or play not a central focus (44)
Language not FR or EN (15)
Intervention conducted fully or partially outside of classroom (15)
Not a digital game or digital game not specified (18)
Full text not available (6)

**INCLUDED**
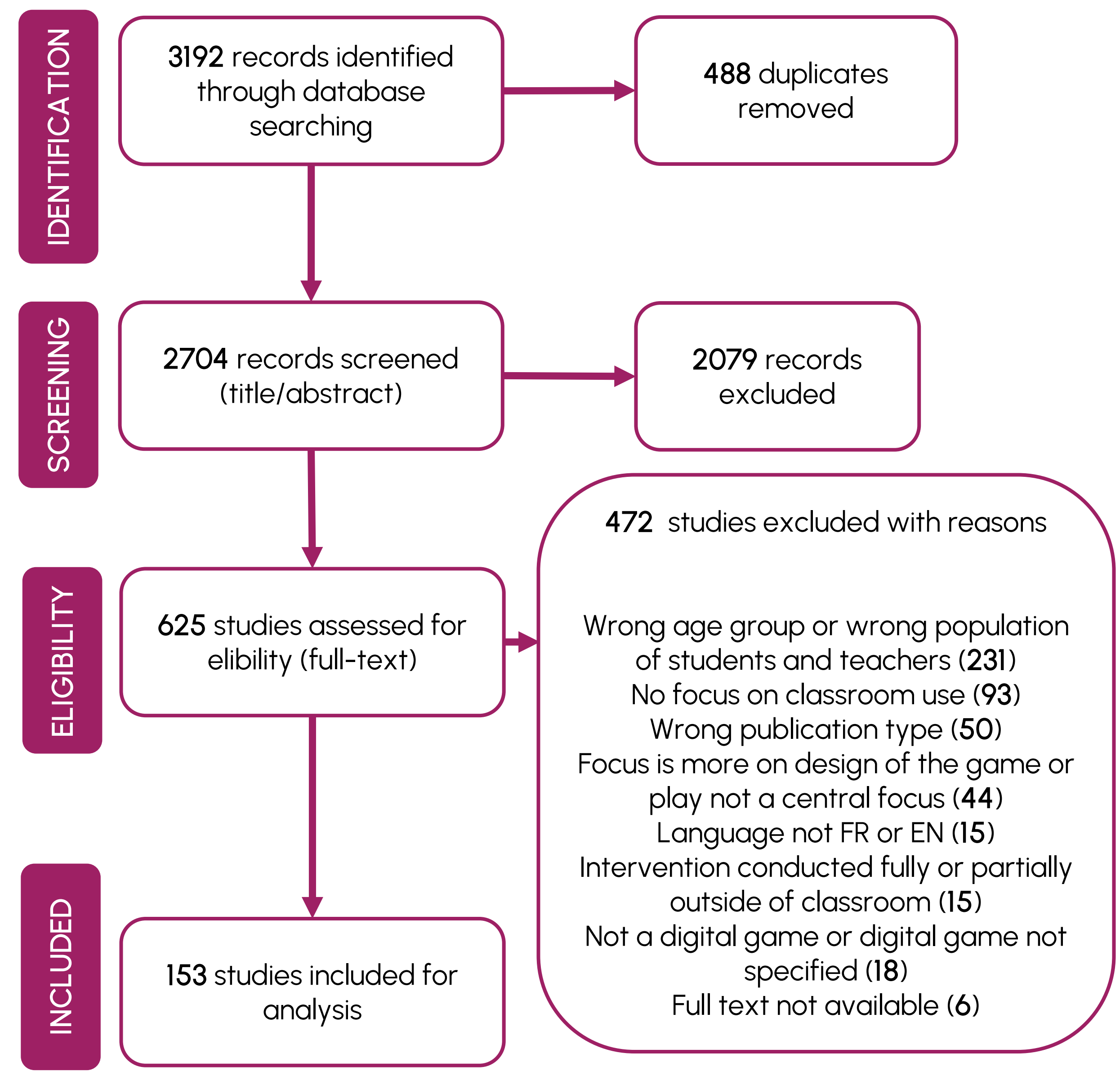
153 studies included for analysis

*Figure 2.* PRISMA protocol, generated through use of COVIDENCE to review all imported studies.

## PRELIMINARY RESULTS

Table 1. *Most frequent foci of research, by category, in corpus of 153 studies of digital play in grades 4-8 classrooms*

| Categories of research focus | | |
|---|---|---|
| Achievement (n = 75) | Student Perceptions (n = 35) | Motivation (n = 22) |

**Other research foci include:** game design by students (n=12); collaboration and interpersonal dimensions (n=14); engagement (n=7); game design elements (n=16); flow (n=5); self-regulation (n=1); tech acceptance (n=2); cognitive load (n=3); student agency (n=5); enjoyment (n=5); teacher perceptions (n=6); creativity (n=3); problem-solving (n=1); feedback (n=1); game-play orientations (n=5); teacher roles (n=1); integration with scaffolds (n=6); integration into existing practice (n=2); effectiveness of the game (n=11); anxiety (n=2)

Table 2. *Summary of findings across all studies (n=153) in relation to the most frequent categories of research focus*

| Major category | Related findings across all studies | | |
|---|---|---|---|
| Achievement | Increase in achievement (n=67) | No change in achievement (n=13) | Decrease in achievement (n=1) |
| Student Perceptions | Increased social and affective dimensions (n=14) <br> Perception of knowledge and skill transfer (n=12) | Increased Interest (n=13) | Useful with scaffolds (n=13) |
| Motivation | Increase in motivation (n=22) | No difference in motivation (n=7) | Decrease in motivation (n=1) |

## EMERGING INSIGHTS

### Tensions. Theories. Take-aways.

- **Assessment**. Most studies compare a digital game-based learning condition with a control condition in order to measure and compare the achievement of students on one or more variables related to a disciplinary curriculum.

- **The role of the teacher is rarely the focus**. Instead, games are for removing the teacher or for adding a tehnological teacher to the classroom.

- **Why digital play?** Are digital games providing playful learning experiences that cannot be achieved in other ways in classrooms?

- **Theoretical gaps.** Games leverage conceptions of serious play and constructivist principles, but play is rarely theorized as a complex, situated activitiy, and almost never theorized through the lens of playfulness, or what it means for an activity to be humanising, playful, joyful or culturally sustaining.

- **A spoonful of sugar?** Digital Games are colourful, interactive assessments - or, just school, packaged up to feel more "motivating".

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