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Review of Flexible Learning Spaces in Education

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Flexible Learning Spaces

Purpose Statement

This review focuses on research showing how Flexible Learning Spaces create the affordances that impact teaching and learning. Flexible Learning Spaces are unique learning spaces that can take on various forms. Flexible Learning Spaces deviate from traditional classroom spaces designed for direct teacher instruction consisting of rows of desks with the teacher as the focal point. The following questions guided the research review:

- How does pedagogy in K-12 classrooms shift with the affordances of Flexible Learning Spaces?
- How do K-12 teaching and learning experiences shift with the affordances of Flexible Learning Spaces?

Definition of Terms

Affordances are all the perceivable possibilities for using a space (or object) (Gibson, 1977; Norman 1988). Designers should create space affordances that conform to users' needs based on capabilities, goals, and experiences. Users map the possibilities of a design according to conceptual models (Interaction-Design.org, 2021)

Flexible Learning Spaces are learning spaces designed to promote student interaction, student-centered learning, and the ability to shift furniture arrangements to create new affordances as needed by teachers and students.

New Generation Learning Spaces are learning environments that blend flexible furniture, digital technologies, and visual technologies, creating multiple centers of focus in the classroom (Byers, Imms, & Hartnell-Young, 2014).

Pedagogy is the method and practice of teaching.

Classroom Community: A classroom where all members work together toward common goals. Students feel valued, appreciated, respected, and have the sense of the classroom is their space with the teacher.

Study Eligibility Criteria

To be included in the review, studies needed to be:

- **Publishing.** We included studies from peer-reviewed journals in English about the impact of flexible learning spaces.
- **Grade range.** We included only studies that focused on teachers and students in grades K-12 to ensure outcomes generalizable for elementary, middle, and high schools.
- **Measures.** Studies had to include relevant outcome measures for students, teachers, or the classroom community.

Major Findings

The review of Flexible Learning Spaces' research revealed school life's inner workings, particularly on teachers' and students' work. This review's findings were grouped into three themes: 1) impact on teachers, 2) impact on students, and 3) impact on the classroom community.

Impact on Teachers

Flexible Learning spaces have shown positive influences on teachers' pedagogies, practices, and mindsets (e.g., Bradbeer, 2017; Byers et al., 2014; Byers, 2015). Types of pedagogies used in Flexible Learning Spaces differed from traditional classrooms. Teachers engaged in less direct instruction, and there was more active learning, hands-on experiences, teacher demonstration, and facilitation in Flexible Learning Spaces (Byers, 2015). Woolner and colleagues (2012) studied how teaching and learning changed during a week-long Flexible Learning Space experimental week. During this week-long experience, Woolner et al. (2012) found that teachers spent more time facilitating learning rather than direct instruction. Bradbeer and colleagues (2017) surveyed schools and teachers to learn about the learning spaces in New Zealand schools. Like Woolner et al.'s (2012), Bradbeer et al. (2017) found that the affordances of the space influenced instruction in New Zealand. When Bradbeer et al. surveyed schools in New Zealand and then conducted teacher workshops, they discovered that the majority of instruction was small group discussion and explicitly teacher led instruction (Bradbeer et al., 2017). Although these findings were not used to make comparisons, the findings illuminate that Flexible Learning Spaces are a factor in how teachers design learning experiences and teach students. Flexible Learning Spaces have fostered more collaborative learning patterns.

On the other hand, Flexible Learning Spaces present challenges for teachers to overcome. For example, Kariippanon and colleagues (2018) showed that teachers had to carefully consider how they presented new information to help students stay on-task in a new environment. Another challenge was managing noise levels and setting clear expectations for student behavior. It is necessary for teachers to explain and show students how to learn and work Flexible Learning Spaces (Kariippanon et al., 2018). This means teachers cannot assume students will know how to learn within a new Flexible Learning Space. Teachers need to carefully consider the expectations for the ways the Flexible Learning Spaces will be used for teaching and learning.

Impact on Students

Student learning and perceptions also shifted during learning experiences within Flexible Learning Spaces. Byers, Imms, and Hartnell-Young (2014) compared student perceptions of learning experiences and engagement between traditional classroom setups and Flexible Learning Spaces. Byers and his colleagues (2014) showed positive shifts in students' perceptions of learning in Flexible Learning Spaces. Another positive factor was that students' feelings of well-being improved. Kariippanon et al. (2019) found that students' well-being was better in Flexible Learning spaces because they felt more comfortable, had a variety of furniture choices, and were able to move more.

Flexible Learning Spaces contribute to students' learning by shifting the way students are engaged in learning, increasing self-directed learning. Woolner et al. (2012) discovered that in the week-long Flexible Learning Space experience, students felt that they learned more than with textbooks and traditional methods. Many researchers have found that students spent more time interacting and engaging with classmates leading to student-centered learning (Kariippanon et al., 2018; Karriippanon, Cliff, Lancaster, Okley, & Parrish, 2019). Similarly, Byers (2014) found that students were participating in more hands-on learning with teacher facilitation.

Although students have reported positive aspects when using Flexible Learning Spaces, some students experienced difficulties. Woolner et al. (2012) reported that some students found it challenging to work in groups with less teacher direction to guide them. Other students emphasized a desire for quiet spaces to work independently on project components.

Byers et al. (2014) found positive links between Flexible Learning Spaces and student learning outcomes. More research is needed to explore how Flexible Learning Spaces influence students' academic achievement.

Impact on Classroom Community

Flexible Learning Spaces positively impact classroom communities and foster collaboration can occur between learners. In Woolner et al. (2012), students highlighted working in collaborative teams, specifically referencing teamwork, sharing a common purpose with others, and creating a collaborative project with their peers. Kariippanon et al. (2019) found that students spent more time working, collaborating, and engaging with each other in student-centered learning when Flexible Learning Spaces' affordances were enacted.

Students appreciated having more space within the classroom community. Kariippanon (2018, 2019) found that Flexible Learning Spaces showed positive shifts in students' well-being. Woolner et al.'s (2012) findings that students benefited from having more room to move around an ample, communal space or go into an outdoor space was appreciated by students, while some still desired to have a quiet space for themselves to work. Kariippanon et al. (2018) echoed this finding stating that students felt more comfortable to move around within Flexible Learning Spaces to refocus, better their learning, or move away from distractions.

Flexible Learning Spaces provide important affordances that impact the classroom community. Bradbeer and colleagues (2017) surveyed schools in New Zealand for room arrangement and conducted teacher workshops to learn more about teaching practices. From this research, Bradbeer et al. (2017) found that when classrooms were set up in traditional formats, that they found the "factory model," teacher-centered instruction was more prevalent. Woolner et al. (2012) found that students described interactions with their teachers' as more relaxed during learning experiences in Flexible Learning Spaces. Finally, Kariippanon et al. (2018) noted that the atmosphere, ambiance, and inclusiveness were among the outcomes of Flexible Learning Spaces.

Summary

Research has shown that Flexible learning spaces have benefits in educational settings. The space has an impact on teachers' pedagogies and mindsets. In turn, instruction can be more student-centered promoting more interaction and engagement with each other and content. These findings imply that Flexible Learning Spaces can contribute to positive shifts in mindsets for

teachers and students, as well as disrupting the dynamics of traditional classroom settings and instruction.

Table 1

Author & Year	Participant Groups	Location	Methodology	Outcomes
Bradbeer et al. (2017)	Schools (337) Teachers & School Leaders (99)	Self-selected, New Zealand	Mixed: Survey & Regional Workshops	Most learning environments had direct instruction happening. Teaching consisted of 30% small group discussions, 23% explicit, teacher-led instruction and 21% collaborative learning. Schools with team teaching had a higher proportion of spaces designed for flexible learning.
Byers et al. (2018)	Teachers (21) Design Technology & Visual Arts Students (385)	Parochial, Brisbane, Queensland, Australia	Quantitative: Quasi-Experimental Single Subject	Classroom teachers' ability to understand their classroom environment is a key factor in how various spaces can be used or designed for pedagogically using technology. Physical classroom layouts can be avenues or obstacles for raising the possibilities of digital technologies in the classroom.
Byers et al. (2014)	Students (164)	Parochial, Brisbane, Queensland, Australia	Quantitative: Quasi-Experimental Single-Subject	Positive shifts in students' perceptions of learning experiences & engagement in New Generation Learning Spaces. Positive link between types of learning spaces and student learning outcomes.
Byers (2015)	Teachers (11) Classes (14)	Parochial, Brisbane, Queensland, Australia	Quantitative: Quasi-Experimental, Repeated Measures Paired Observation	NGLS had more active, hands-on learning, teacher demonstration & facilitation, and provided more feedback. Positive increases in student engagement in higher-order thinking. More instances of students working in groups.
Kariippanon et al. (2018)	Schools (8) Administrat	New South Wales, Australia	Qualitative: Case Study	Five Themes Emerged: Student-Centered Learning - pedagogy shifted from

	<p>ors (12)</p> <p>Teachers (35) -primary (18) -secondary (17)</p> <p>Students (85) -primary (45) -secondary (40)</p>			<p>student led instruction to student-centered with more self-regulation, collaboration between students, and use of technology with higher-order skills.</p> <p>Student Engagement - Students had more autonomy and motivation in their learning. Teaching & Learning Challenges - Teachers needed to address obstacles in FLS such as some students being more distracted, the noise level being too high for some students, and managing student behavior with expectations.</p> <p>Social & Emotional Well-Being - Students and teachers perceived the ambience of FLS to be beneficial in interactions with others and students felt valued in these spaces.</p> <p>Physical Well Being - Physically, students were more comfortable to learn in due to flexible seating, having a wide range of furniture to meet students' needs, and was designed for movement within the space.</p>
Kariippanon et al. (2019)	<p>Schools (12)</p> <p>Students -grades 7-9</p>	New South Wales, Australia	Quantitative: Quasi-Experimental	<p>Students spent significantly more time in large group settings.</p> <p>Students spent more time engaged in collaboration and interaction with peers.</p> <p>Whole class learning settings were used significantly less time.</p>
Woolner et al. (2012)	<p>Students (13) -12-13 years old participated in interviews</p>	Non-selective secondary school, United Kingdom	Qualitative: Case Study	<p>Some students appreciated the more self-directed and independent learning that occurred while others struggled without more direction from their teachers.</p> <p>Students participated in collaborative projects working towards a central goal. Students positively spoke about working in teams and appreciated creating a collaborative project with peers.</p> <p>Students noted that they appreciated a larger area within which to learn and move, as well as have access to an outdoor learning space. Students noted</p>

				<p>they were able to move around the space more easily. Students perceived that these would not be able to happen in a traditional learning space.</p> <p>Physical learning spaces can influence what activities are done in classrooms as well as how successful they might be.</p>
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