TT&T: Bringing focus to fluid mechanics

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Introduction

Many distractions (e.g., computer, phone, food) can pull students' focus away during lecture courses. There are many strategies for student engagement (e.g., think-pair share, case studies, problem-based learning). These active approaches require students to actively participate; however, downtime exists. Strategies to keep students engaged that can be utilized in any course would be beneficial. For example, can we make simple, passive interventions to bring the focus back to the classroom? In a junior-level fluid mechanics course, the impact of the use of fidget toys on student distraction was evaluated. We hypothesized that the availability of fidgets would support student focus and provide a means to mitigate distraction.

Methods

The use of fidget toys (spinners, twisters, or wacky tracks) as a passive tool to mitigate distraction was implemented in the fall 2025 semester in an undergraduate fluid mechanics course at a land grant university. The class had 37 students and was composed of juniors and seniors. The course is required for both civil engineering and environmental engineering majors. It is a prerequisite for upper-level required courses and electives.

Three tests were distributed throughout the semester, and a cumulative final exam was given during final exam week. No intervention was provided before Test 1 (August 20–September 22). Before Test 2, fidget toys were distributed to all students at the beginning of class and collected at the end of class (September 26–October 20). Fidget toys were available but optional before Test 3 (October 24–November 17); fidget toys were collected at the end of each class period.

At three points during the semester (before Test 1, before Test 2, and before Test 3), three class sessions were observed by an independent observer for student distraction and focus. During each class session, the observer used the FOCUS codes (Table 1) to code behavior of each student three times during the class session, following guidance by Campbell et al. [1].

Table 1. FOCUS codes and definitions

FOCUS Code	Definition
Focus	No observable distraction
Phone	Observable phone distraction
Computer	Observable computer distraction
Other	Observable distraction other than phone or computer.
Toy	Interacting with fidget toy

At the end of the semester, after Test 3, students were asked to participate in an optional survey distributed via the learning management system. Students were asked to respond to six items on a Likert scale (Table 2). Survey items were adapted from surveys reported by Bidermann et al. [2] and Park et al. [3]. Two open-ended, text-entry questions were also included:

- Share your thoughts on incorporating fidget toys in lecture courses.

- Please provide any additional feedback or suggestions regarding managing distractions in the classroom.

West Virginia University Institutional Review Board (WVU IRB) approval is on file.

Table 2. Survey items

Survey items	Scale
1. How often do you distract yourself during class?	1=Never, 2=Rarely, 3=Now and then, 4=Often, 5=Very often,
2. I would like tools to help manage my use of distractions during class. 3. The fidget toys helped me to manage distractions during class. 4. The fidget toys helped me to focus on lecture information during class. 5. I would like to have access to fidget toys during class. 6. I would like to have access to fidget toys in other classes.	1=Completely disagree, 2=Disagree; 3=Neither agree nor disagree; 4=Agree, 5=Completely agree

Note: An option "Does not apply to me" was available for all questions

Results

Less observable distraction was recorded at the beginning of the semester. Approximately 9% of the observations were related to interacting with fidget toys when the toys were distributed at the beginning of class (before Test 2); this number reduced to 3% when the toys were available but not distributed (before Test 3). The implementation of fidgets did not substantially impact the observations of phone, computer, and other distractions. Observations of phone distraction remained consistent through the three observation periods at 5%-6% (Figure 1).

Survey results suggested that a large portion of students self-reported distraction and would like tools to manage distractions during class (Figures 2 and 3). Fifteen percent of students reported very often distraction; none reported no distraction (Figure 2). Fifty-nine percent of students reported that fidget toys helped to manage distractions, and 41% of students reported that the fidget toys helped to focus on lectures. Approximately 45% of students would like to have access to fidget toys in their classes (Figure 3).

Qualitative feedback was mixed. Twenty-two students provided narrative feedback responding to the following prompt: Share your thoughts on incorporating fidget toys in lecture courses. There were 15 occurrences of fidgets helping with distraction, and there were 7 occurrences of fidgets causing distraction; four students further noted that the fidgets prevented them from checking their phone. Noise was noted as a cause of distraction to the user and to others.

Several example positive responses included the following:

> "I found that the toys allowed me to focus better when my attention was needed and there was nothing to write."

> "I was in support of the idea of using fidget toys in class, but I was shocked by just how well they helped me stay engaged."

"I very rarely do get on my phone during lectures. However when I did have a fidget, I did not get on my phone at all…"

Some representative negative responses included the following:

"I found that the fidget toys distracted me more than my phone."

"It provided an alternative to having my phone out during class as a distraction, but the toys themselves were sometimes found as a distraction."

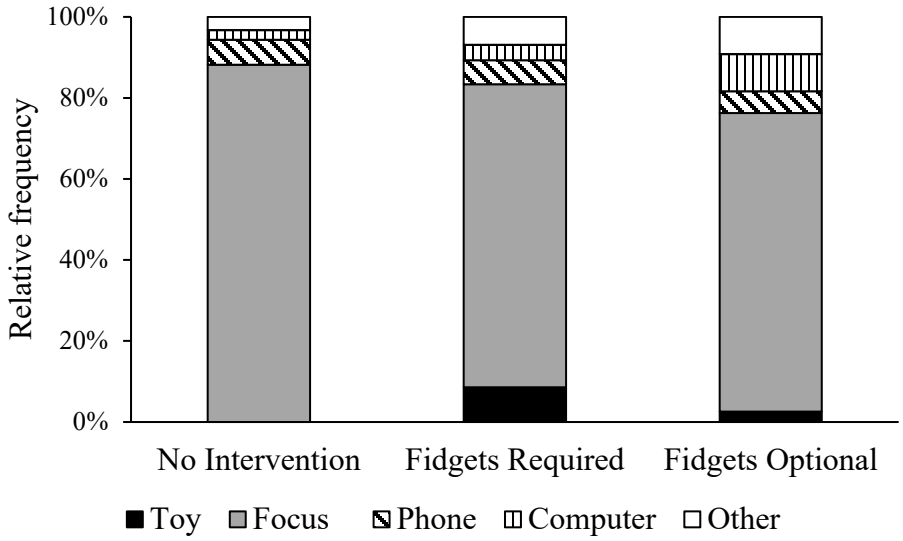

Figure 1. Mean relative frequency of classroom observations.

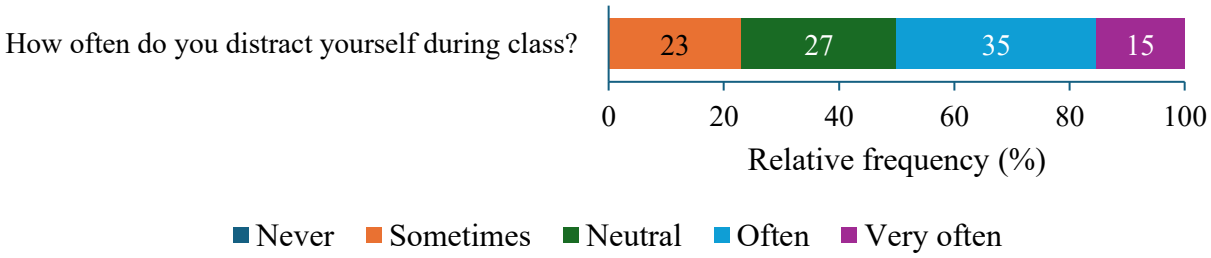

Figure 2. Relative frequency of survey responses of student distraction (*n*=26)

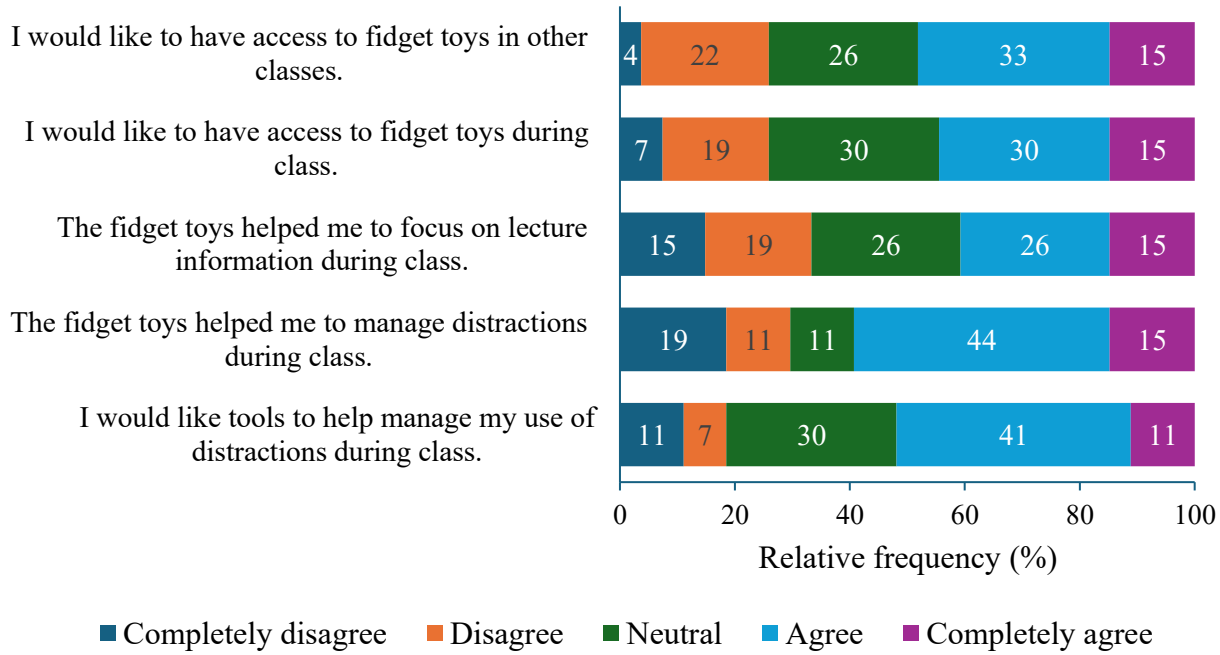

Figure 3. Relative frequency of survey responses (*n*=27)

Conclusions

The use of fidget toys provided mixed results. On average, the implementation of fidget toys did not decrease the overall extent of distraction; however, most students responded that fidget toys helped to manage distractions in class. In addition, a large portion of students would like tools to manage distraction during class. The results did support that implementing fidgets might help some students focus. It is an intervention that can be applied to any course. Choose quiet toys that can be manipulated with one hand to allow for taking notes.

References

[1] P. B. Campbell, C. Kussmaul, C. Mayfield, H. H. Hu, and S. Campbell-Mortman, "Variation in Engagement Behaviors among Student-Centered Pedagogies," in *Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 1*, Pittsburgh PA USA: ACM, Feb. 2025, pp. 185–191. doi: 10.1145/3641554.3701894.

[2] D. Biedermann, S. Kister, J. Breitwieser, J. Weidlich, and H. Drachsler, "Use of Digital Self-Control Tools in Higher Education -- A Survey Study," *Education and Information Technologies*, vol. 29, no. 8, pp. 9645–9666, Jun. 2024, doi: 10.1007/s10639-023-12198-2.

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