

The problem they initially identified was related to workspaces that have a lot of distractions. Their solution to improve focus was implementing high-resolution VR - basically, with headsets you can transport yourself to whatever environment you'd prefer (Beach vs office VR, Open vs Closed office) to avoid interruptions. The research questions they posed were:

RQ1: Does the use of a VR headset to perform work in an open office environment improve flow?

RQ2: How close to closed office work can work in VR get?

Study participants: 35. 18 female, 17 male

Findings:

- The closed office and VR beach conditions were both significantly preferred over the open office and the VR open office conditions.
- VR can reduce distractions and increase well-being for many

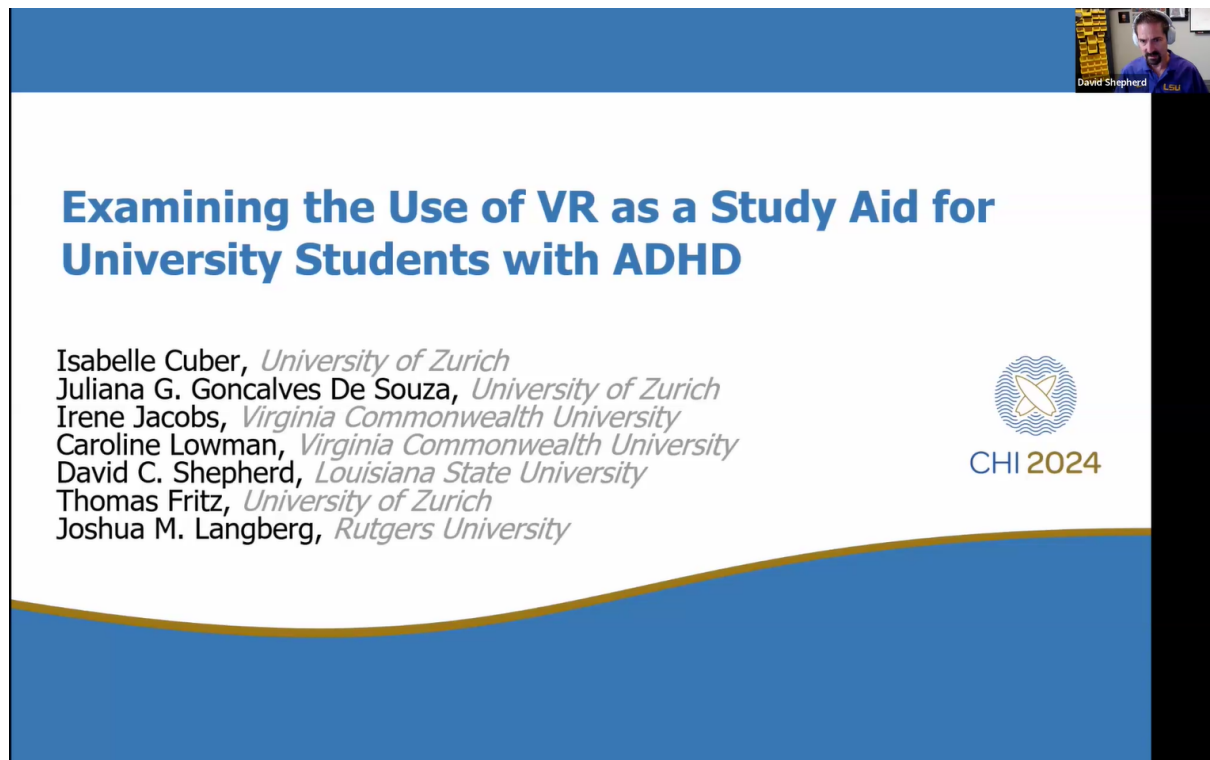
This first study focused on developers. The results were positive, but since these workers were already productive, they weren't completely satisfied with the outcome. They wanted to try it in a university setting, with the same goal: get away, see the screen, but not have distractions - block out all the university distractions.

So they tried it with a different population. They decided to test it with **ADHD students** after this comment from a student: "I have four roommates and ADHD. Getting schoolwork done at home is a nightmare. I could really use an approach like this..."

Then they started developing this new study. They pivoted from developers to this new student profile.

Challenges they encountered:

- They weren't experts in the problem domain (ADHD) and needed domain understanding. They found one: [Joshua Langberg](#). David mentioned that **finding experts like Joshua is essential for studying new populations because the time it would take you to understand the new domain would be crazy**. They had access to his team and resources. Also, working with a team more focused on psychology helped them open up to new publishing venues and funding venues, plus working with an established researcher becomes fun.
- Another challenge they had was finding and screening participants with ADHD. Studying this population is challenging in the sense that they need to have this diagnosed (there are many checks involved).
- When you do multidisciplinary research, you have to find the balance of venues for publishing. He mentions the usual CSEd ones from ACM, but also a neuropsychology journal and another on adolescent health. This brings a series of writing challenges, but there are also schools that don't value publishing in a field that's not your field as much or at all.



Examining the Use of VR as a Study Aid for University Students with ADHD

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CHI 2024

Regarding the specific paper, he commented:

Challenges of ADHD in a University setting:

High student-to-staff ratio

Little parental oversight

High workload Chaotic dorms

He mentioned related research on VR for work and education and VR use for individuals with ADHD, but their real focus is **using VR to support university students in academic tasks in their own setting - whether in a dorm room or lab** - can it help them focus?

So they arrived at the following research questions (there are more, but he went deep into these two):

RQ1: Can the use of VR increase concentration, motivation, and effort of university students with ADHD when working on academic tasks?

RQ3: Can automated feedback on users' computer interaction within the VR foster attention?

For the study they did:

- Multi-week empirical study (students came to the lab twice a week for several weeks)
- Mixed methods approach (computer interaction data, questionnaire, and interview)
- Technology probe: feedback (while students were typing and working, they got feedback like green - you're doing well, red - you need to get back on task). They do

this with an algorithm that manipulates computer interaction data that can give automatic feedback on performance. If they get distracted or go off task, it can get them back on task. [Thomas Fritz](#) from the University of Zurich was the one who explained how the algorithm worked to know when students were on task or off task based on keyboard and mouse activity - number of keystrokes, mouse clicks, scrolling distance...

Population: 27 participants

- University students
- 15 female, 5 male, 7 diverse
- Between 18 and 25 years old
- Met DSM-5 criteria for ADHD
- 17 taking ADHD medication

Procedure:

- Onboarding and baseline questionnaire (they explained how the system worked and what they had to do, then had them complete a questionnaire about how focused, motivated, concentrated, and how much effort they had put in during the experiment)



Procedure



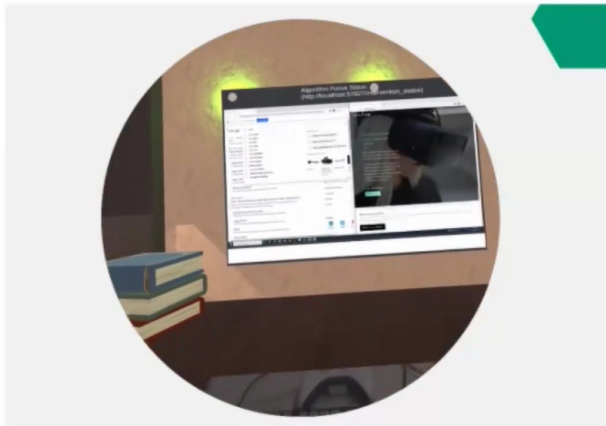
50 minutes in VR, working on academic tasks

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- VR sessions up to 12 sessions per participant (7.4 sessions per participant on average, 198 sessions total - It was difficult for this student profile to complete 12 sessions!): 50 minutes in VR, working on academic tasks (active tasks like doing online quizzes, preparing a presentation, writing...), in an open-office space at the university (completely open, not super noisy), used Varjo X3 headset + noise-cancelling headphones with low-level sounds



Procedure



50 minutes in VR, working on academic tasks

Open-office space at the university

Varjo X3 headset
+ noise-canceling headphones

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- Interview

They could type because they had a cut-up view of the keyboard - they could visually see the keyboard.

After the session, they asked the same questions (questionnaire) as in the baseline questionnaire about concentration (adult concentration inventory), motivation (homework motivation index), effort (homework effort index), and usability (system usability scale).

Regarding the results:

- Better concentration with VR compared to baseline. These positive results were repeated for motivation and effort.

Contributions:

- Reduced distractions (removing all distractions)
- Fewer self-interruptions (they couldn't check their phone)
- Scheduled working times (consistent schedule)

David shared some participant comments about the automatic feedback:

- "very useful. It helped me lock onto whichever task I was doing"
- "So that was where most of my attention went because I was so focused on like I really want it green; I want it green"

Summary:

- Solution consistently increased concentration, motivation, and effort

- Technology probe for automated feedback showed promise

He ended the session with some parting thoughts:

- Sometimes exploratory research leads to breakthroughs
- Non-researchers have interesting perspectives
- Research is more fun with friends
- There are challenges (publishing, promotion, grants, etc)