

JALTCALL 2024 Conference
Meijo University, Nagoya
May 18, 2024



- Exploring the Impact of Virtual Reality vs Video Conferencing on Students' Learning Outcomes: A Comparative Study

Mehrasa Alizadeh – Otemon Gakuin University
Neil Cowie – Okayama University

- *In This Talk ...*

- VR & language learning
- Pilot study
- Main study
- Key findings
- Discussion
- Future directions

1

VR & Language Learning

A brief introduction and review of the literature

- ***VR & Language Learning***

- VR benefits for language learning

- Contextualized language practice

(Yamazaki, 2018)

- Enhanced engagement and motivation

(Nicolaidou et al., 2021)

- Safe and risk-free environment

(Chen, 2022)

2

Pilot Study

2021-22

- ***Pilot Study Overview***

- Small group of students (N=5)

- Three stages

- Meta Quest 2 HMDs – Engage VR app
- PC – Mozilla Hubs platform
- PC – Virtual tours on ThingLink

(Alizadeh & Cowie, 2021; Cowie & Alizadeh, 2022)

Main Findings of the Pilot Study

- Communicating in a VR environment can be engaging to students.
- VR can potentially lower anxiety levels.
- VR headsets may cause feelings of cybersickness.

- ***Also Before the Main Study***

- ***Scoping review*** (Alizadeh & Cowie, 2022)

1. In general, ***positive findings*** about the impact of VR on learners' psychological state and learning outcomes
2. Need for more ***longitudinal studies*** with ***larger numbers of participants***
3. Need for more studies with ***rigorous research designs***

3

The Main Study

Participants, Learning context, Platforms, Data collection

- **Overview of the Study**

- **Quasi-experimental** study with a **pre-, mid-, post-test** design

- **Research Questions:**

- How does the mode of delivery, comparing Zoom and VR, impact students' **learning outcomes** in online courses?
- How does the mode of delivery, comparing Zoom and VR, impact students' **anxiety** and **engagement** in online courses?

- **Study Timeline**

Zoom Group 2022

9 weeks



VR Group 2023-24

11 weeks



- ***Participants***

- ***Zoom Group***

Initial N = 37

Final N = 30

19 F & 11 M

- ***VR Group***

Initial N = 29

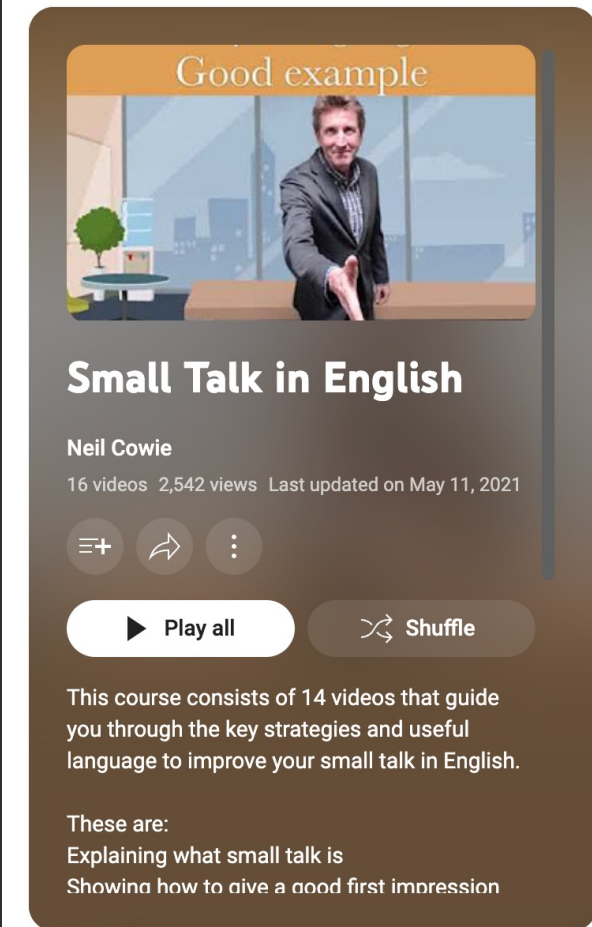
Final N = 25

16 F & 9 M

- Intermediate to higher intermediate level
- Purposive sampling
- Informed consent
- Compensated for participation

● *Learning Context*

- Online flipped lessons
- Video lessons on *small talk*
- Group discussions
- Small talk practice in pairs



Good example

Small Talk in English

Neil Cowie

16 videos 2,542 views Last updated on May 11, 2021

⋮ ↻ ⋮

▶ Play all Shuffle

This course consists of 14 videos that guide you through the key strategies and useful language to improve your small talk in English.

These are:

- Explaining what small talk is
- Showing how to give a good first impression

- **Platforms**

- **Zoom Group**

- Zoom
- Breakout rooms
- Zoom recordings
- Audio & video

- **VR Group**

- Frame
- Private voice zones
- Snagit screen recordings
- Audio & avatar

- **Choice of Environment**

- Size
- Complexity
- Performance rating



Atrium

An office space with some ...

[SELECT](#)



Resort

A large resort, complete wit...

[SELECT](#)



Campus

A sprawling, toon-style ca...

[SELECT](#)



Holiday

A place for holiday magic.

[SELECT](#)

● *Frame Environment: Atrium (1)*



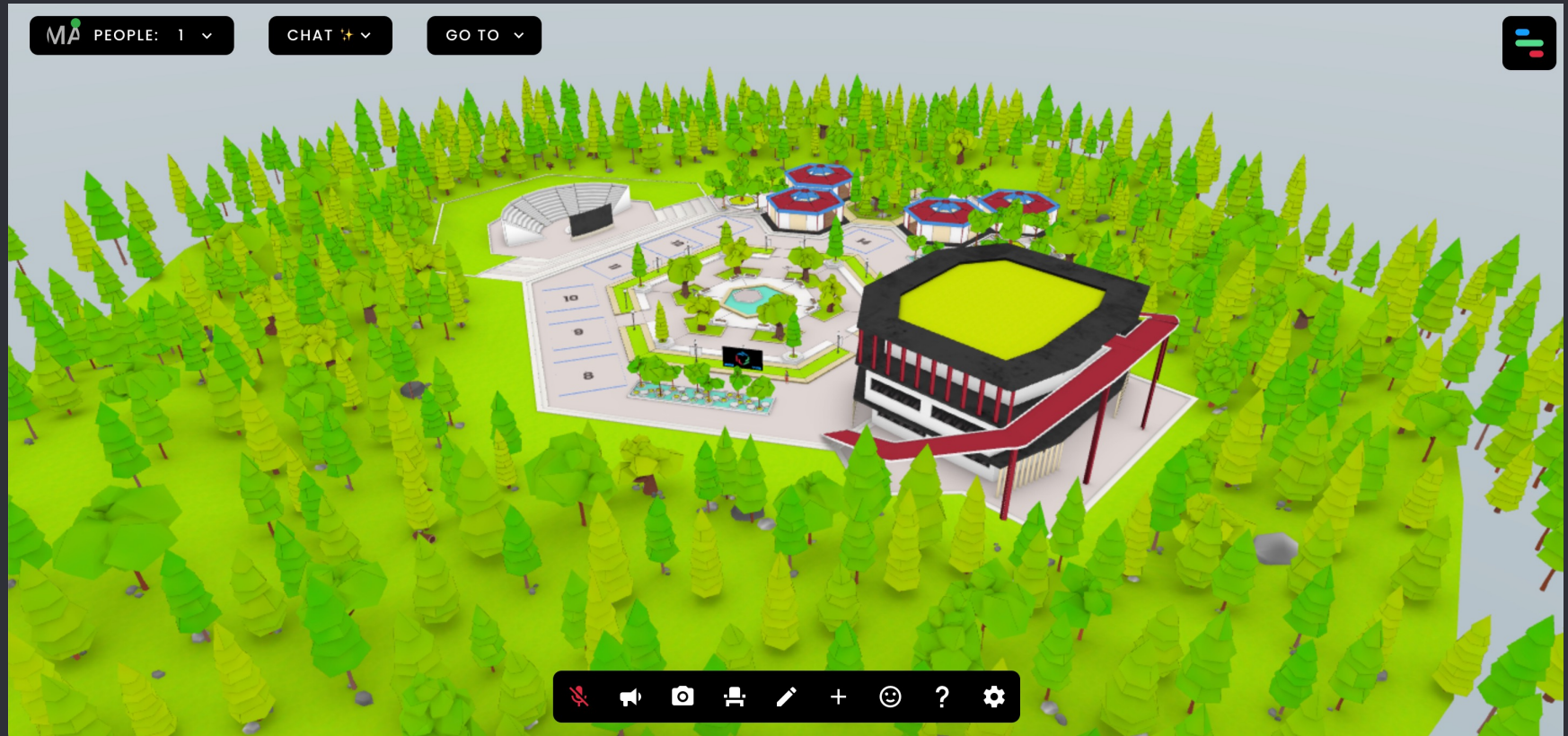
● *Frame Environment: Atrium (2)*



Frame Environment: Resort



Frame Environment: Campus



● *Frame Environment: Holiday*



- *Technical Setup*

- 10 PCs for screen recordings
- An iPad for teacher-tech staff communication



● *Technical Setup*

○ Google Site as the course portal

The screenshot shows the homepage of the 'Small Talk in English' course portal. The navigation bar at the top includes links for 'Home', 'Frame Tutorial', 'Course Introduction', 'Lesson 1 (10.25)', 'Lesson 2 (11.01)', 'Lesson 3 (11.08)', 'Lesson 4 (11.15)', and a 'More' dropdown menu. The 'More' menu is open, showing links for 'Lesson 5 (11.22)', 'Lesson 6 (11.29)', 'Lesson 7 (12.06)', and 'Lesson 8 (12.13)'. The main content area features a blue geometric pattern background with the title 'SMALL TALK IN ENGLISH' in large white letters, underlined with a yellow bar. Below this, a yellow banner contains the text: 'Welcome to Small Talk in English! In this course, you will learn about the different aspects of small talk, why it is important and how to get better at it.'

- **Data Collection**

Learning outcomes:

- Student interactions in pairs rated independently by two teachers

Engagement:

- Engagement Scale (Sun & Rueda, 2012)

Anxiety:

- Foreign Language Classroom Anxiety Scale (Yashima et al., 2009)

Rubric: 5 × 5 Grid

	<i>1-Not able to perform</i>	<i>2-Inadequate</i>	<i>3-Needs improvement</i>	<i>4-Meets expectations</i>	<i>5-Exceeds expectations</i>
<i>Fluency and coherence</i>	Speaks very little	Speaks with a lot of hesitation which interferes with communication	Speaks with occasional hesitation which can interfere with communication	Speaks with some hesitation but it does not interfere with communication	Speaks very smoothly
<i>Lexical resources</i>	Very limited vocabulary	Limited vocabulary	Can talk about familiar topics but has limited flexibility.	Good range of vocabulary and can paraphrase well. The occasional inappropriate choice	Wide range of vocabulary. Good use of idiomatic language
<i>Grammatical range and accuracy</i>	Limited success at basic sentences	Basic structures and frequent errors	Limited structures and a number of errors	Good variety of structures and occasional errors	Excellent variety of structures and almost no errors
<i>Pronunciation</i>	Unable to be understood	Listener frequently has difficulty understanding	Listener occasionally has difficulty understanding	Listener seldom has difficulty understanding	Listener has no difficulty understanding
<i>Interaction and communication strategies</i>	Cannot interact with partner	Poor at interacting	Tries to interact but needs a lot of help communicating	Responds appropriately most of the time and tries to interact positively	Interacts very smoothly, initiating, asking follow up questions

- *Procedure*

- Trimming the videos
- Selecting videos for rating
- Establishing inter-rater reliability
- Running statistical tests
- Comparing the results

4

Key Findings

Statistical analysis results

- **Descriptive Statistics**

- **Zoom Group**

Score Range: 5-25

	Pre-test	Mid-test	Post-test
Mean	17.88	18.46	20.02
STD	2.54	2.72	1.80

- **VR Group**

Score Range: 5-25

	Pre-test	Mid-test	Post-test
Mean	17.50	18.54	19.83
STD	1.60	2.05	1.40

- **Hypothesis Testing**

- **Null Hypothesis:** There is no difference in the learning outcomes between students taking an online course on Zoom and those taking an online course in VR.
- **Repeated Measures ANOVA** for a within- and between-subjects design
 - Within-subjects factor: **time** (pre-, mid-, post-test)
 - Between-subjects factor: **treatment** (Zoom vs VR)

- Repeated Measures ANOVA Results**

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Time	Pillai's Trace	.684	56.359	2.000	52.000	<.001	.684
	Wilks' Lambda	.316	56.359	2.000	52.000	<.001	.684
	Hotelling's Trace	2.168	56.359	2.000	52.000	<.001	.684
	Roy's Largest Root	2.168	56.359	2.000	52.000	<.001	.684
Time * Treatment	Pillai's Trace	.016	.423	2.000	52.000	.657	.016
	Wilks' Lambda	.984	.423	2.000	52.000	.657	.016
	Hotelling's Trace	.016	.423	2.000	52.000	.657	.016
	Roy's Largest Root	.016	.423	2.000	52.000	.657	.016

- Pairwise Comparisons**

(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
1	2	-.809	.247	.006	-1.420	-.197
	3	-2.228	.209	<.001	-2.744	-1.712
2	1	.809	.247	.006	.197	1.420
	3	-1.420	.255	<.001	-2.050	-.790
3	1	2.228	.209	<.001	1.712	2.744
	2	1.420	.255	<.001	.790	2.050

Adjustment for multiple comparisons: Bonferroni

- *Mean Comparisons*



5

Discussion

- **Discussion**

- **There was a main effect for *time*.**
= The participants improved their small talk skills over time.
- **There was no main effect for *treatment*.**
= The platform, Zoom vs VR, did not make a significant difference in students' learning outcomes.
- Null hypothesis confirmed

Discussion

“

Overall, there was *relatively little evidence that the use of VR promoted language gains* with the exception of short-term vocabulary retention. Instead, there was more support for students finding VR fun, enjoyable and motivating but these positive feelings were not consistently linked with successful language learning outcomes.”

(Alizadeh & Cowie, 2022)

6

Future Directions

- ***Future Directions***

- ***To continue this study:***

- Analyze students' engagement and anxiety level in relation to learning outcomes
- Analyze students' focus group interview responses in relation to engagement, anxiety and learning outcomes

- ***In the future:***

- Do a similar study with students interested in VR
- Conduct a COIL study in VR
- Leverage the benefits of GenAI & VR

● *References (1)*

Alizadeh, M., & Cowie, N. (2021). An exploratory student-centred approach to immersive virtual reality: Reflections and future directions. In S. Gregory, S. Warburton, & M. Schier (Eds.), *Back to the Future – ASCILITE '21*. Proceedings ASCILITE 2021 in Armidale (pp. 131–136). <https://doi.org/10.14742/ascilite2021.0117>

Alizadeh, M., & Cowie, N. (2022). Language learning and virtual reality: A scoping review. In S. Wilson, N. Arthars, D. Wardak, P. Yeoman, E. Kalman, & D.Y.T. Liu (Eds.), *Reconnecting relationships through technology. Proceedings of the 39th International Conference on Innovation, Practice and Research in the Use of Educational Technologies in Tertiary Education, ASCILITE 2022 in Sydney: e22258*. <https://doi.org/10.14742/apubs.2022.258>

Chen, Y. C. (2022). Effects of technology-enhanced language learning on reducing EFL learners' public speaking anxiety. *Computer Assisted Language Learning*. <https://doi.org/10.1080/09588221.2022.2055083>

Cowie, N., & Alizadeh, M. (2022). The affordances and challenges of virtual reality for language teaching. *International Journal of TESOL Studies*, 4(3), 50-65. <https://doi.org/10.46451/ijts.2022.03.05>

● *References (2)*

Nicolaidou, I., Pissas, P., & Boglou, D. (2021). Comparing immersive virtual reality to mobile applications in foreign language learning in higher education: A quasi-experiment.

Interactive Learning Environments, **31**(4), 2001–2015.

<https://doi.org/10.1080/10494820.2020.1870504>

Sun, J. C.-Y., & Rueda, R. (2012). Situational interest, computer self-efficacy and self-regulation: Their impact on student engagement in distance education. *British Journal of Educational Technology*, **43**(2), 191-204.

<https://doi.org/10.1111/j.1467-8535.2010.01157.x>

Yamazaki, K. (2018). Computer-assisted learning of communication (CALC): A case study of Japanese learning in a 3D virtual world. *ReCALL*, **30**(2), 214–231.

<https://doi.org/10.1017/S0958344017000350>

Yashima, T., Noels, K., Shizuka, T., Takeuchi, O., Yamane, S., & Yoshizawa, K. (2009). The interplay of classroom anxiety, intrinsic motivation, and gender in the Japanese EFL context.

Journal of Foreign Language Education and Research, **17**, 41–

64. <http://hdl.handle.net/10112/768>

This research is funded by the Japan Society for the Promotion of Science Grants-in-Aid for Scientific Research.

(Project Number: 22K13756)

Thanks!

○ **Any Questions?**

mehrasa.alizadeh@gmail.com

ncowie2012@gmail.com