Overview

- Team and Purpose
- Conceptual Framing
- Instructional Design
- Implementation
- Findings
- Discussion and Conclusions

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Team Members

UniSA Education Futures	Chung-Ang University	i-VR Module Developers
Dr Greg Restall	Prof Kyung-Whan Cha	Ms Ada Yao
Dr Min Pham	Prof Jin-Hwa Lee	Ms Belle Niu

Collaboration

Limitations of EFL settings for spoken communicative competence development

- Building linguistic knowledge and competence is the primary focus of language development in the EFL classroom

- Lessons include reading, listening and writing activities and tasks that focus on grammar and vocabulary development from on a prescribed textbook.

- Lessons are limited by time constraints and English is assessed using tests and exams.

- Limited opportunities for communication in English in or beyond formal classroom interactions

Project Purpose

- Communicative competence development from textbook learning

- Low-cost immersive situated experience

- Multimodal language supports

- Instructional guide

- Australian lifestyle

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VR Learning modules
Conceptual and Theoretical Underpinnings
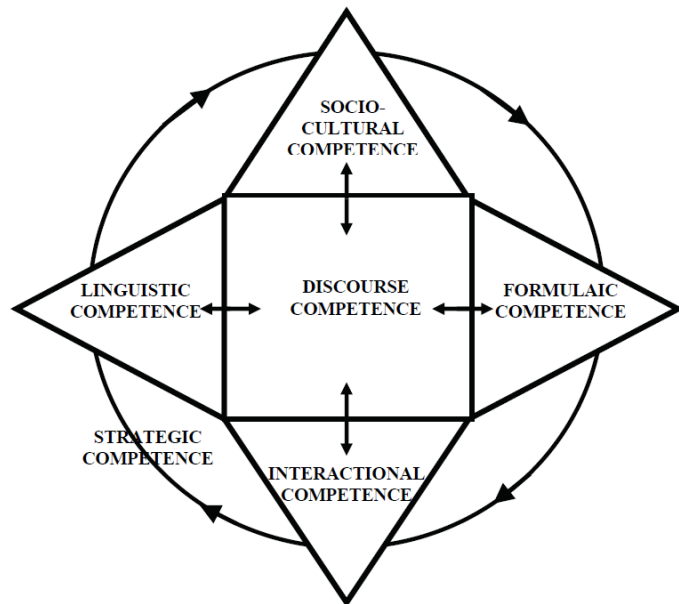
Models of communicative competence

Figure 3.3 Revised schematic representation of 'communicative competence'
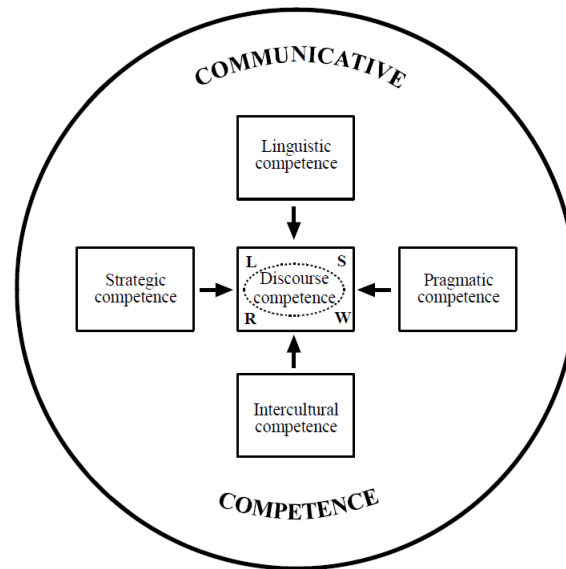

Figure 1: Components of communicative competence[1]
(Usó-Juan and Martínez-Flor, 2006a: 16).

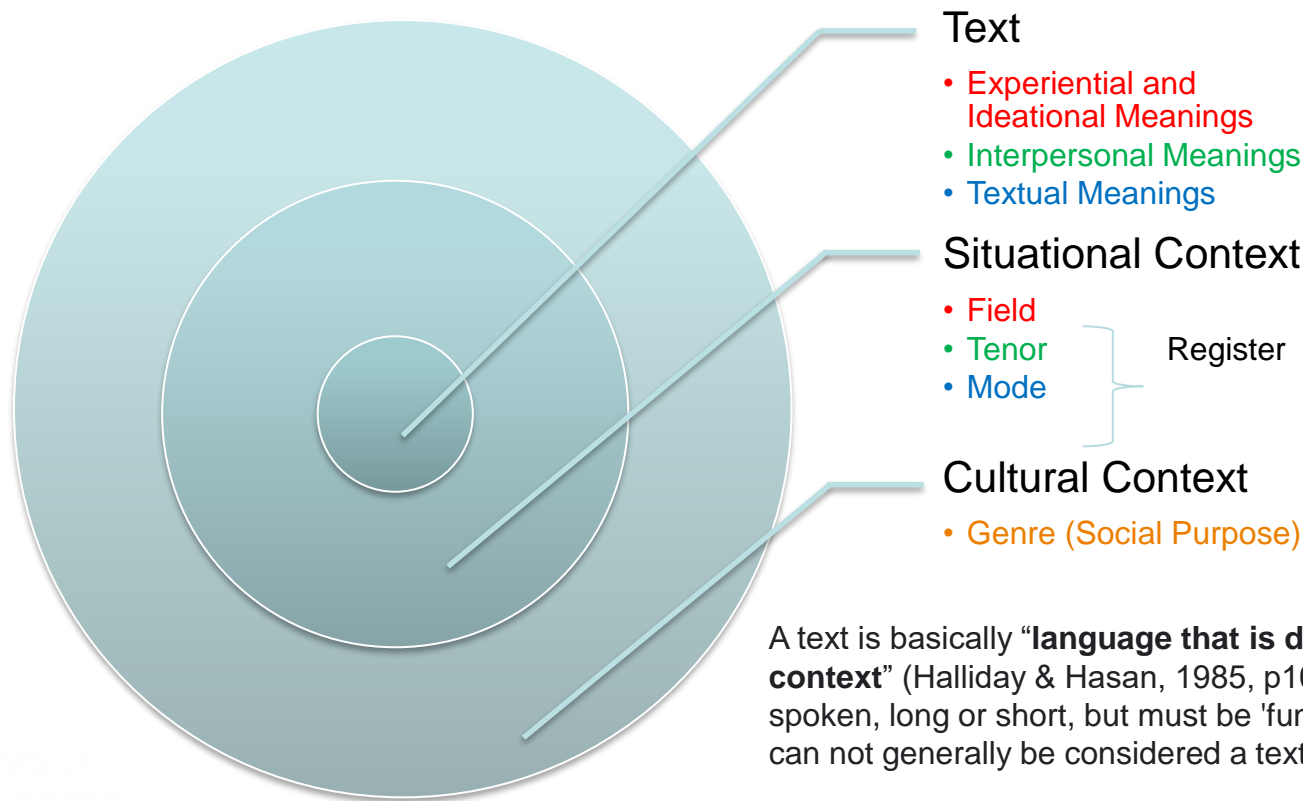Celce-Murcia (2007) Chapter 3: Rethinking the Role of Communicative Competence in Language Teaching in E. Alcón Soler and M.P. Safont Jordà (eds.), *Intercultural Language Use and Language Learning*, 41–57. Springer.

Usó-Juan and Martínez-Flor. Teaching Intercultural Communicative Competence through the Four Skills. *Revista Alicantina de Estudios Ingleses.* 21: 157-170

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Meaning Making in Communication

Text
- Experiential and Ideational Meanings
- Interpersonal Meanings
- Textual Meanings

Situational Context
- Field
- Tenor   Register
- Mode

Cultural Context
- Genre (Social Purpose)

A text is basically "**language that is doing some job in some context**" (Halliday & Hasan, 1985, p10). A text may be written or spoken, long or short, but must be 'functional'. A single sentence can not generally be considered a text.

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Register Scales

Field continuum

everyday fields	specialised fields	highly technical fields
everyday typically concrete and specific	combination of specific and non-specific, technical and non-technical	typically generalisations and abstractions
Shared by nearly all members of the culture (eg shopping, using public transport, eating)	Not shared by all members of the culture (eg gardening, surfing, cooking, ICTs)	Shared by few members of the culture and often take many years develop, typically in senior secondary or tertiary institutions

Tenor continuum

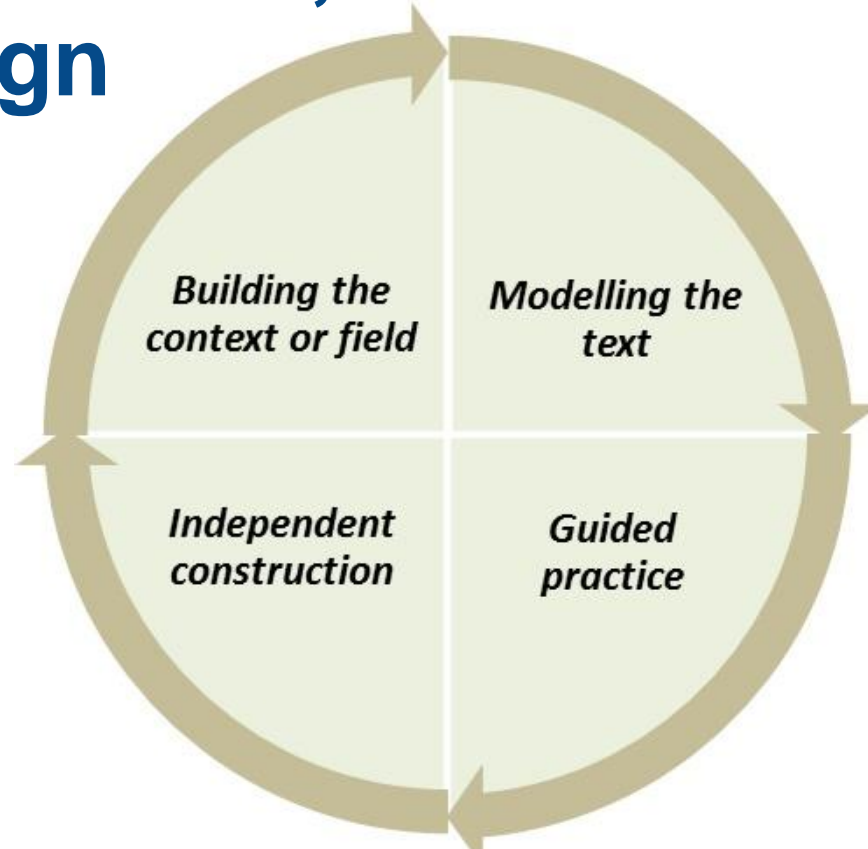| informal	increasing formality	formal
familiar: greatest contact status differences are least relevant uninformed	decreasing contact neutral status	unfamiliar: least contact status differences are most relevant informed
Child to adult, sibling to sibling or personal contact with familiar individuals	Student reporting to familiar or unfamiliar audiences	Student or adult positioned as expert, institutional relationship

from SA Department of Education and Child Development (DECD) ESL Scope and Scales document

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Register Scales

Mode continuum

most spoken	spoken texts written down and written texts spoken aloud	most written
language accompanying action close	language as recounting and reporting	language as reflection distant
Face-to-face, dialogic, spontaneous: concrete and specific to the context shared by the speakers	Unshared experiences, recounting generalising, debating, formal oral presentations	Monologic and reflective, precise, planned, edited, organised and coherent

from SA Department of Education and Child Development (DECD) ESL Scope and Scales document

Relation to Mission, Tasks and Module Design

The Teaching and Learning Cycle

Building the context or field

Modelling the text

Independent construction

Guided practice

Adapted from Derewianka, B. & Jones, P. (2016). *Teaching language in context* (2nd Ed.). Oxford University Press.
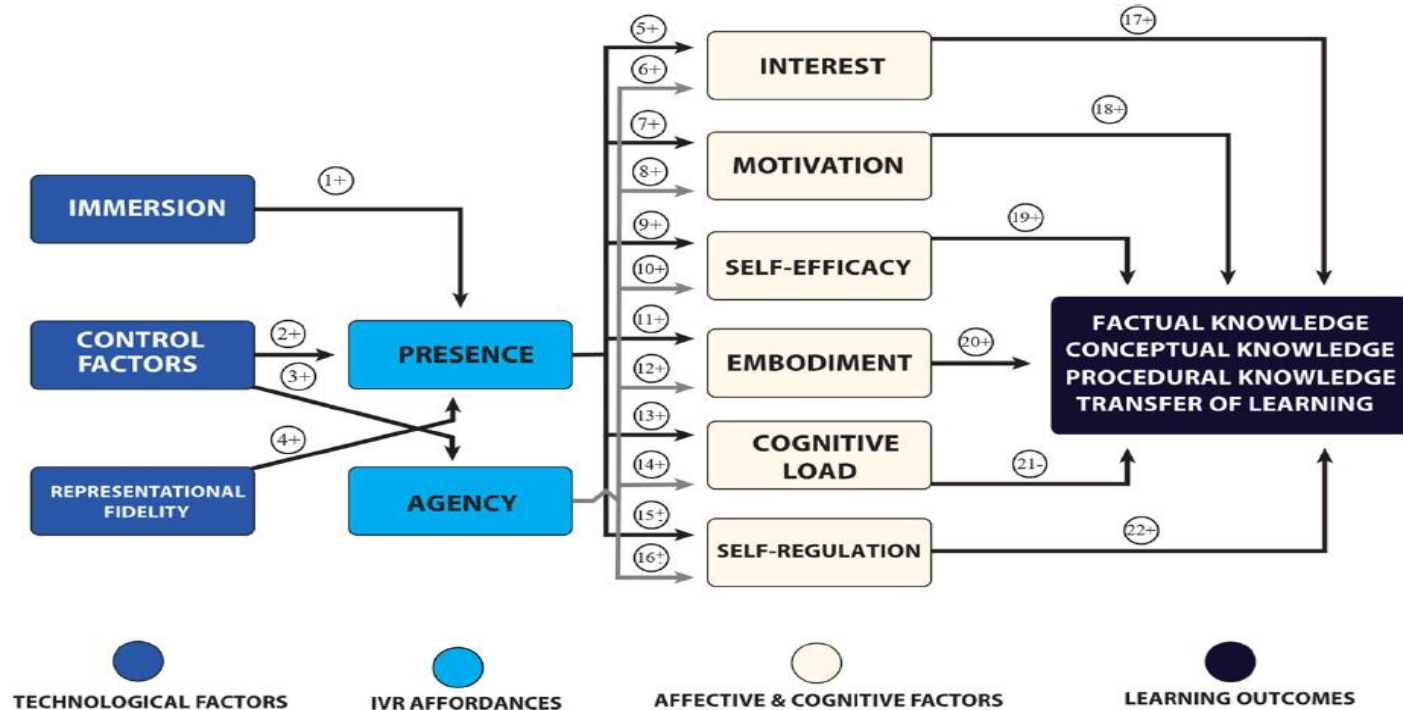
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Texts and Tasks

- Features of Procedural Text
  - Imperatives ('you' as subject is often implied)
  - Sequential Development (First, next, finally) of processes
- Features of Explanatory Text
  - Objective noun groups and simple present tense
  - Thematic Development of factual information
- Features of Personal Recount
  - Subjective and simple past tense
  - Chronological Development of experiences

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The Cognitive Affective Model of Immersive Learning (CAMIL): a Theoretical Research-Based Model of Learning in Immersive Virtual Reality

Makransky and Petersen (2021)

The making and design of VR learning modules

VR footage

– *Belle*

Swimming with sealions at Langton Island

"Storyline" or "teaching plan"

– *Belle and Ada*

Embedding/editing the multimodal learning resources into the VR footage

– *Ada*

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Filming location

Port Lincoln, South Australia

250km flight from Adelaide

650km drive from Adelaide

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VR Footage And Choice Of Teaching Content

Choice of equipment:
360° Camera and Cardboard Goggles

Storyboard making process:
Choice of sequenced modules

Choice of lifestyle activity:
Snorkelling with Sealions

Multimodal resources

- Text Panels
- Images
- Audio
- Videos

Jarvis – the artificial bot

- Roles:
  - To explain
  - To instruct
  - To interact

- Developed a personality and adopted humour so students could relate on a more personal level
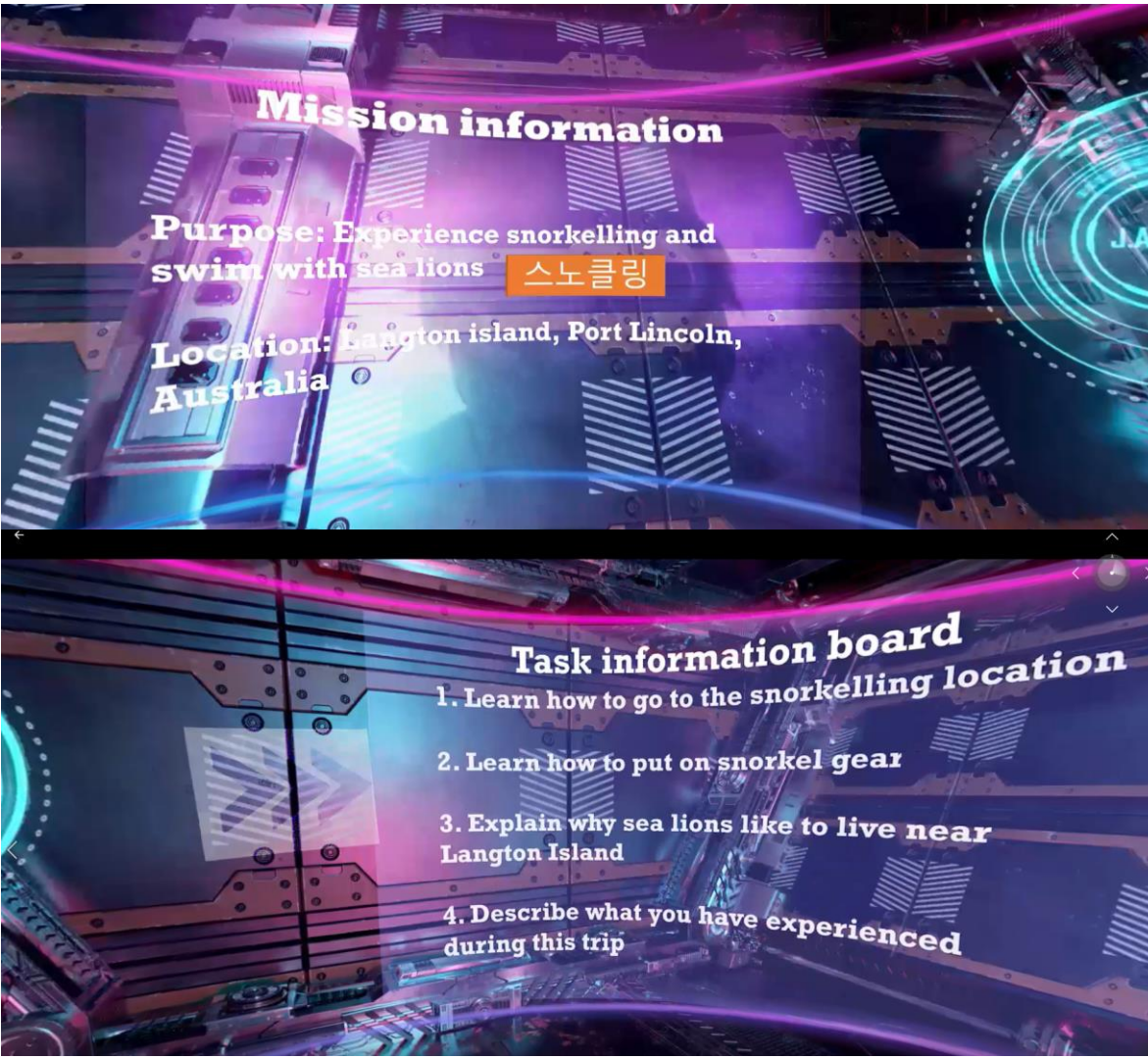
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Design of the VR modules (Game-like interface)

Students are asked to complete a language mission with the assistance of an Artificial intelligence – Jarvis

Using a sequenced and scaffolded task-based learning goal or output
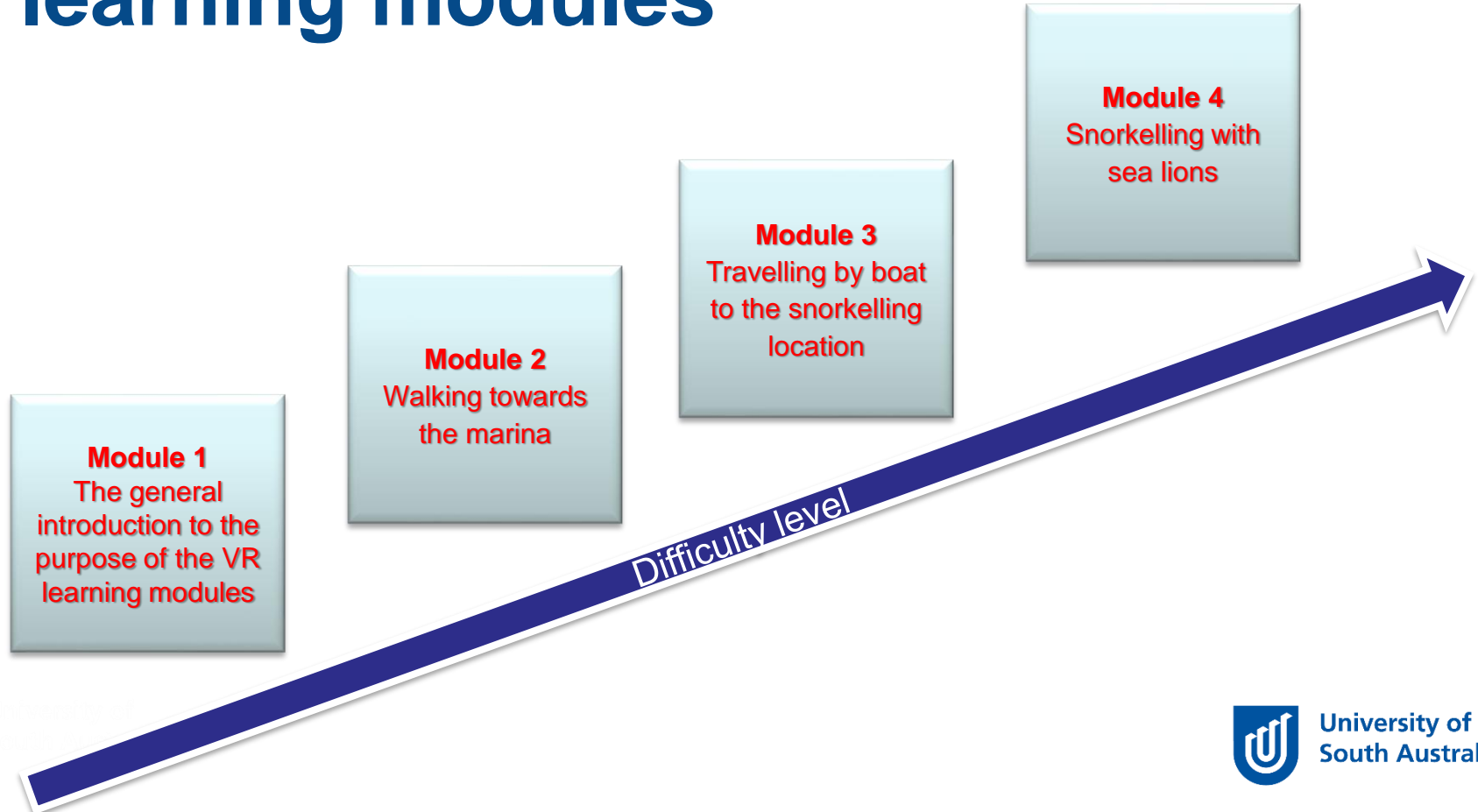
Age-appropriate and culture-appropriate rationale

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Mission chamber and portal

- Mission control centre – where tasks were given and learning content was revised

- Portal led to the real world scenarios and situated language learning

4 learning modules

Module 1
The general introduction to the purpose of the VR learning modules

Module 2
Walking towards the marina

Module 3
Travelling by boat to the snorkelling location

Module 4
Snorkelling with sea lions

Difficulty level

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Module 1

A general introduction to the purpose of the VR learning modules

Learning outcomes

- The correct way to navigate in a VR environment

- Introduction to Jarvis as a learning guide/personal assistant

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Module 2

Walking towards the marina

Learning outcomes

First half (learning goals for traditional textbook)

- Purpose & location of the language mission

- Language structures with communicative functions

Second half

- Learn how to go to the snorkelling location" (**procedure text input**)

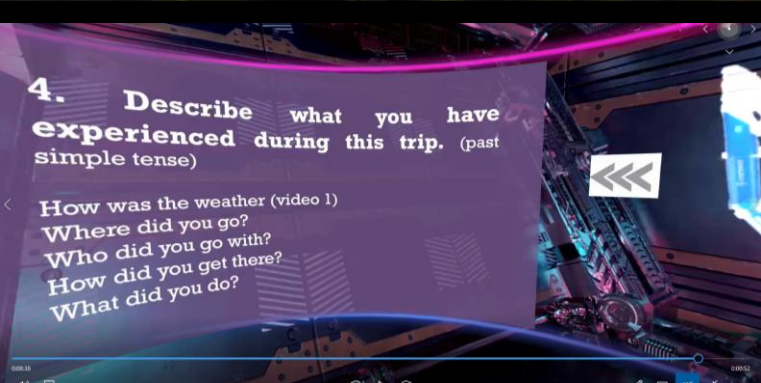- Walk towards the marina virtually (**learning by doing virtually**)

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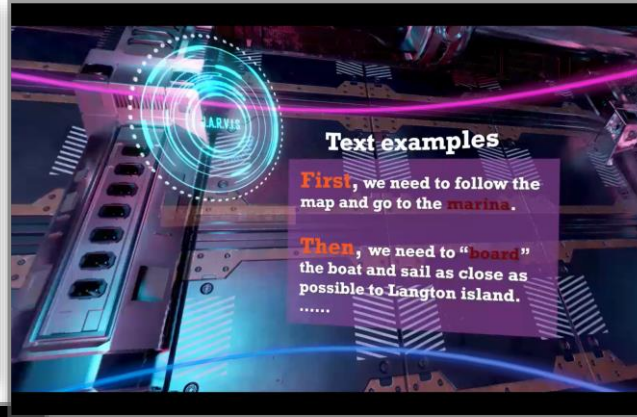
Module 3
Travelling by boat to the snorkelling location

Learning outcomes

- Travel to the snorkelling location virtually.
  (learning by doing virtually)

- Learn to put on the snorkelling gear.
  (procedure text input)

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Module 4
Snorkelling with Sealions

Learning outcomes

- Put on the snorkelling gear.
  (learning by doing virtually)

- Learn about the living habitats of sea lions.
  (explanatory text input)

- Experience swimming with sea lions.
  (learning by doing virtually)

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Implementation

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Implementation – Group 1

- 50 students – Year 10 English – from one school in Seoul
- Self-directed learning in the home environment
- Cardboard goggles supplied to view the four modules
- Self-paced over two weeks with opportunities for revision
- A spoken output to one of the four tasks was recorded and uploaded to a secure research server
- An online questionnaire was completed by the students about their experience and perceived improvements
- The English teacher was interviewed for further insight into the learning challenges for her students and on the perceived usefulness of the VR experience
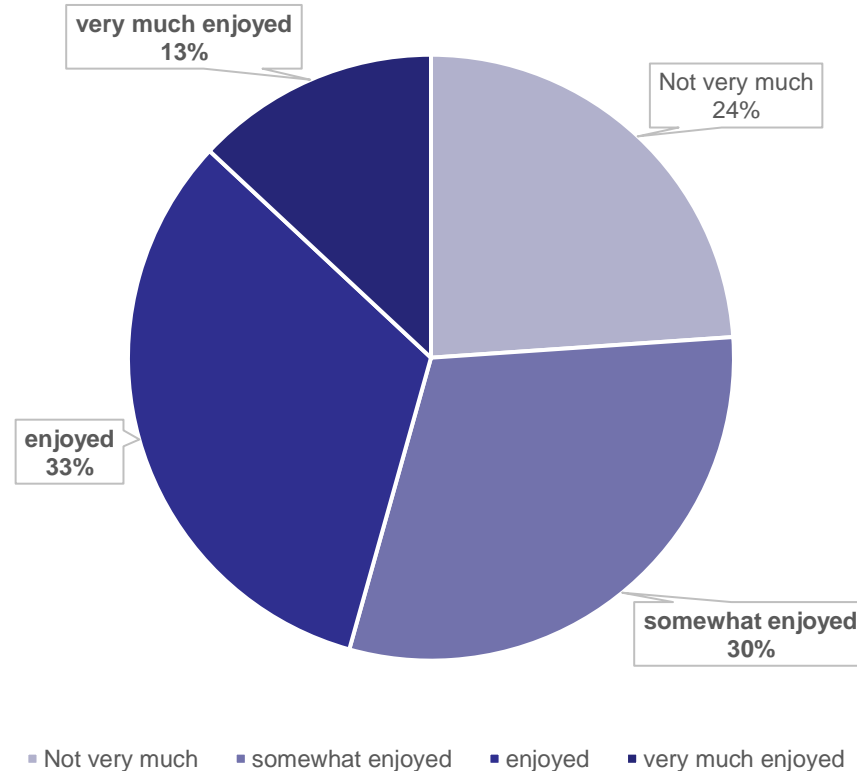
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Implementation – Group 2

- 32 students – Year 10 English – from one school in Seoul

- Teacher-directed learning in the school classroom environment

- Quality plastic goggles supplied to view the four modules

- In class over two weeks with limited opportunities for revision

- A spoken output to one of the four tasks was recorded and uploaded to a secure research server

- An online questionnaire was completed by the students about their experience and perceived improvements

- The English teacher was interviewed for further insight into the learning challenges for her students and on the perceived usefulness of the VR experience

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Findings
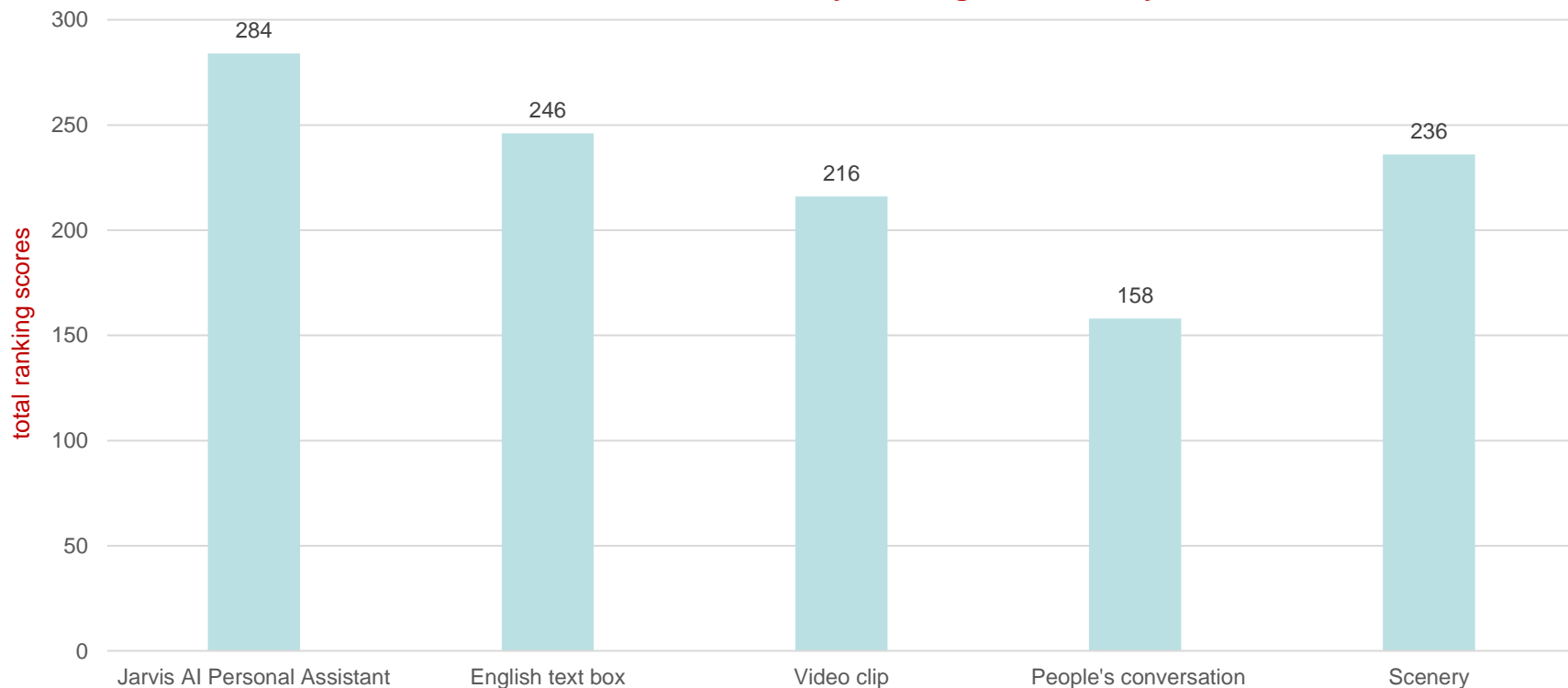
Students' learning experience

Overall satisfaction

How much did you enjoy the learning experience in the virtual reality learning module of this project?

Pie chart showing:
- very much enjoyed 13%
- Not very much 24%
- somewhat enjoyed 30%
- enjoyed 33%

Legend: Not very much ▪ somewhat enjoyed ▪ enjoyed ▪ very much enjoyed

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What did you like about the experience? (Q22; Q13)

13. Which element of the immersive virtual reality learning module did you like the most?

22. What did you like the most about the immersive virtual reality learning experience? Reason?

1 I love virtual reality
2 video space, because it's pretty well made
6 You can have a wonderful experience, because it is an experience I don't usually do.
7 development potential
8 When I turn my body, the scenery also rotates, because it's real.
11 snorkeling, realistic
12 sight, it was beautiful
13 can experience new things, because it is miraculous
15 It is very fun. Because it is fun
17 snorkeling, I enjoy explore the water
21 When snorkeling with seals. This is because the seals were clearly visible as if snorkeling in real life.
26 sight.I felt like I was in the real sea.
28 sight. I like the scenery
29 Because it's VR.   Because it was exciting.
30 It was my favorite to see the seal cubs. because it was so cute
31 sea lion, because it's cute.
32 swimming with seals. I realized

33 The scenery was nice.It was because I was able to appreciate the natural environment that I could not easily see around me.
34 Being able to study freely while looking around
35 dung beetle description. good at explaining
36 being able to do new things .It was fun doing something new
37 detailed video, well immersed
38 Scenic and fun content
39 swimming .I feel like I'm actually snorkeling
40 The detailed video The sea was beautiful
                    the scenery was nice
41 beautiful scenery   It is fun to see the scenery.
42 to be able to see the scenery. It is because you can see the scenery like real reality.
43 the scenery was nice. It was nice to see Korea and other countries.
44 Sight .almost like reality
45 to swimIt is interesting
47 It was nice to have realistic video material.
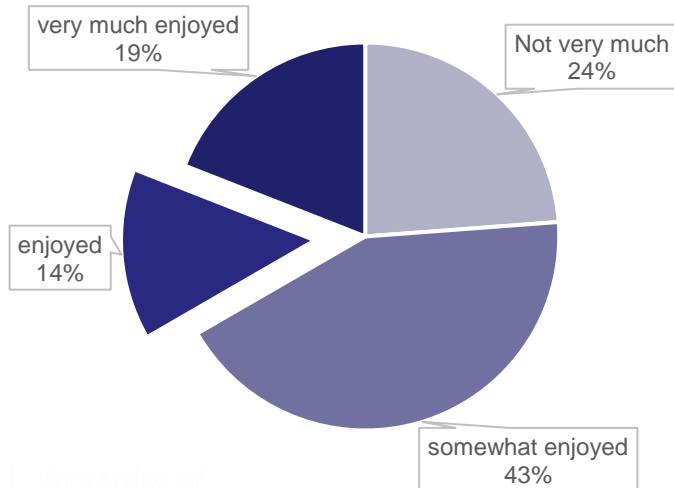48 It was good to study without books, and it was good to see the video in class
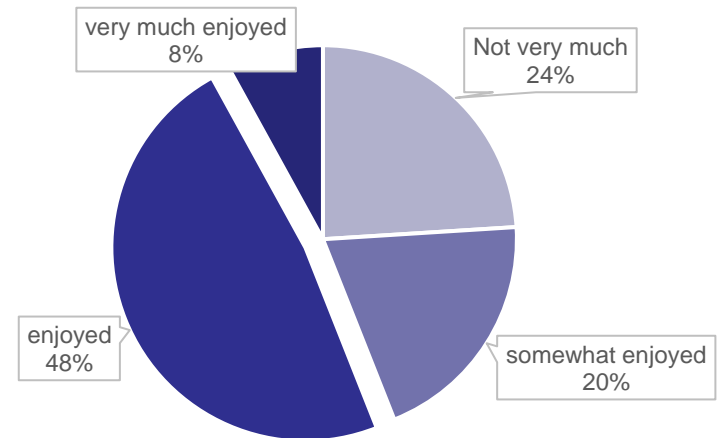
I-VR factors and students' learning experience
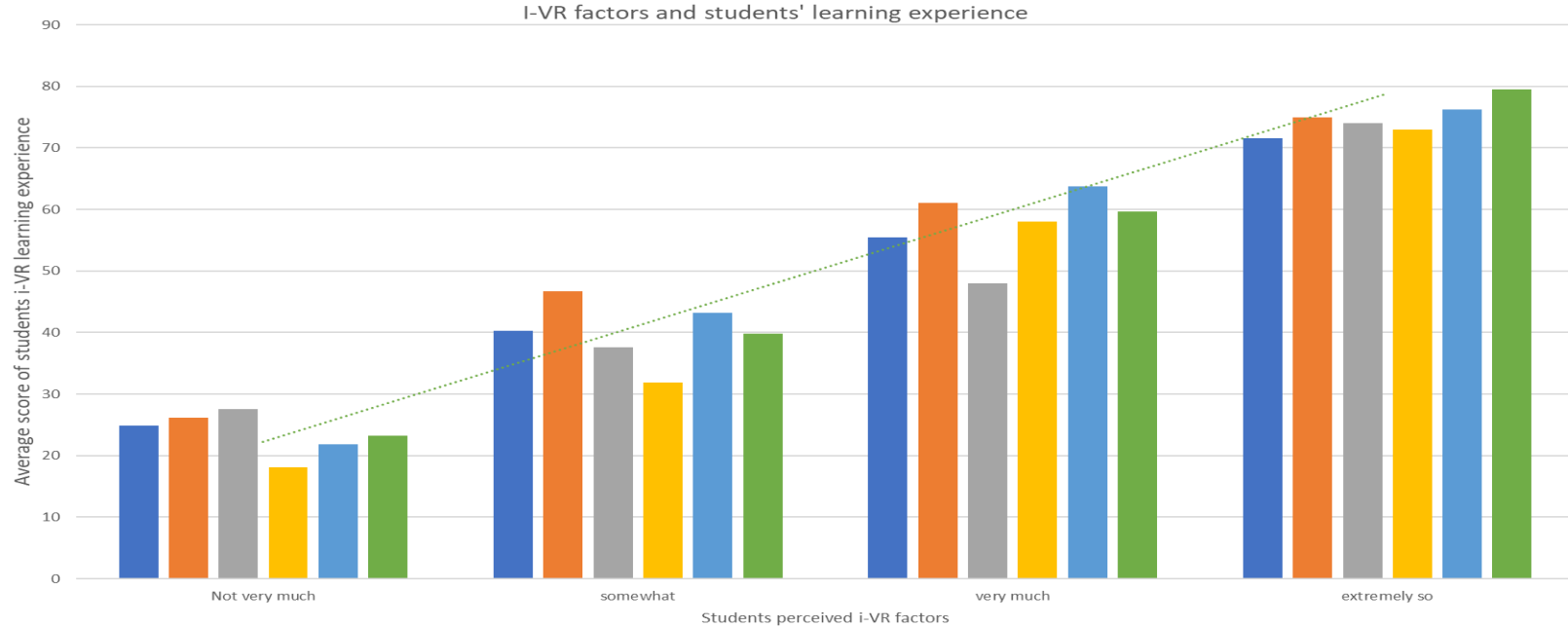
Comparison of overall satisfaction

**How much did you enjoy the learning experience in the virtual reality learning module of this project? – After class**

How much did you enjoy the learning experience in the virtual reality learning module of this project? – In class
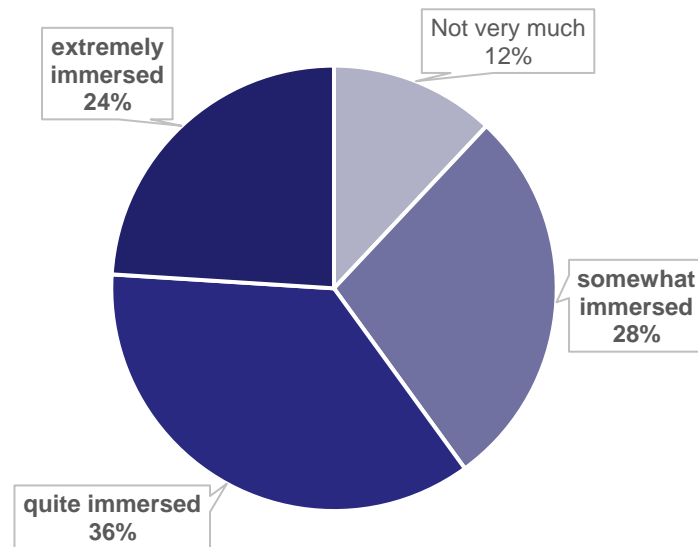
How immersed? Problems with cardboard goggles

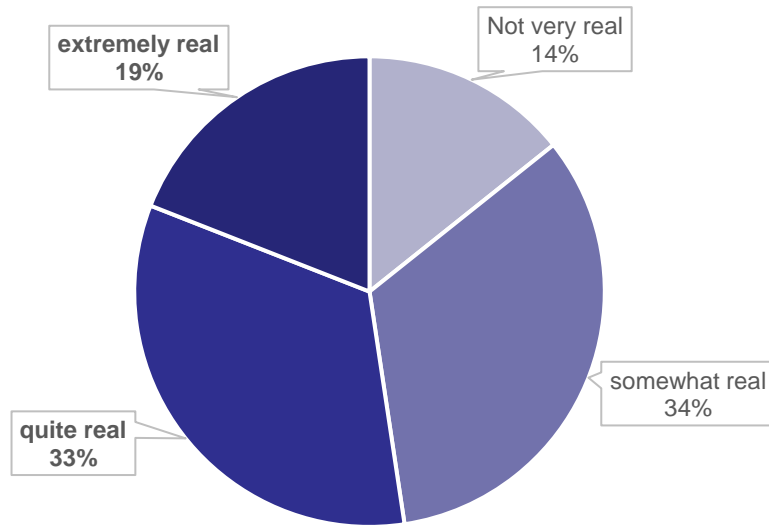14. How immersed are you in the learning environment? – After class

- extremely immersed 27%
- Not very much 27%
- quite immersed 14%
- somewhat immersed 32%
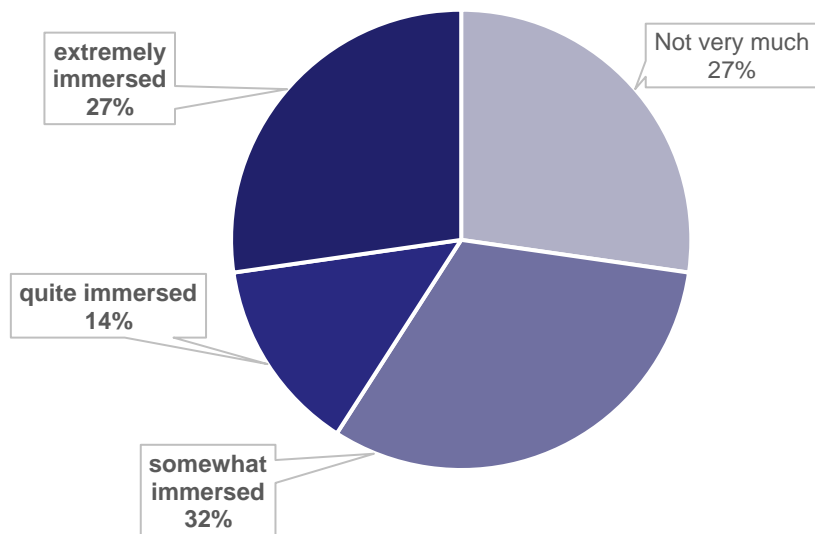
14. How immersed are you in the learning environment? – In class

- extremely immersed 24%
- Not very much 12%
- somewhat immersed 28%
- quite immersed 36%

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How realistic?

15. How realistic did you feel the virtual environment was? – After class

- Not very real 14%
- somewhat real 34%
- quite real 33%
- extremely real 19%

15. How realistic did you feel the virtual environment was? – In class

- Not very real 9%
- somewhat real 26%
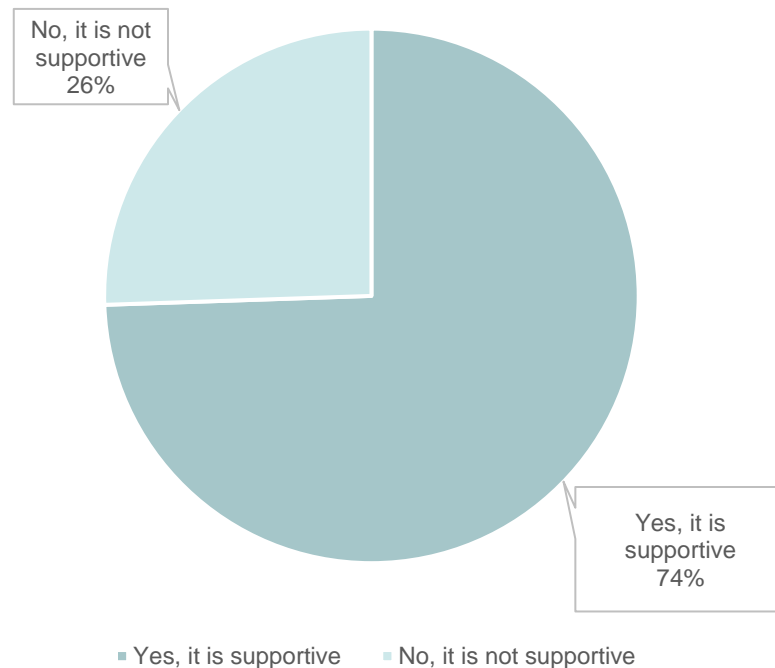- quite real 48%
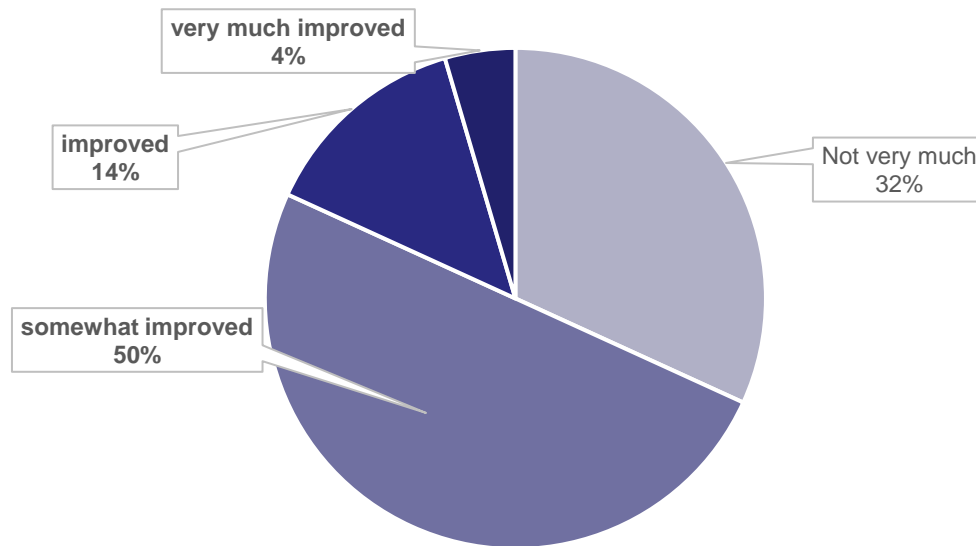- extremely real 17%
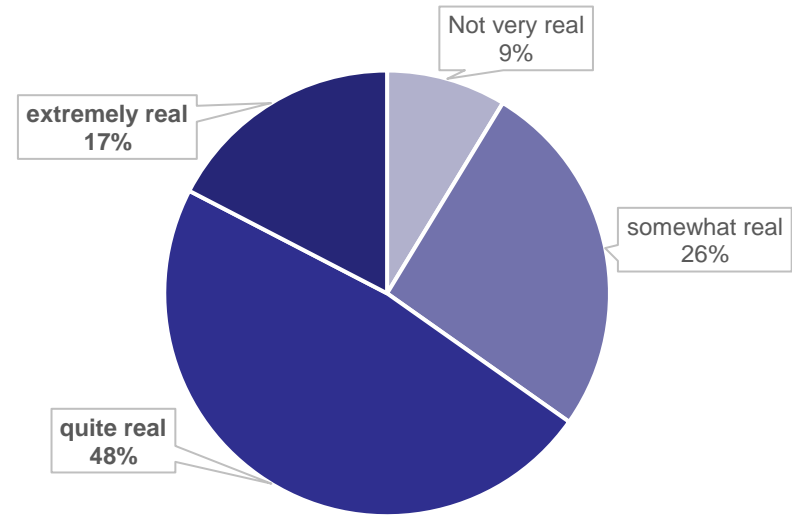
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Findings

Perceived learning from the i-VR modules

Overall, do you think virtual learning experiences can support your English speaking skills?
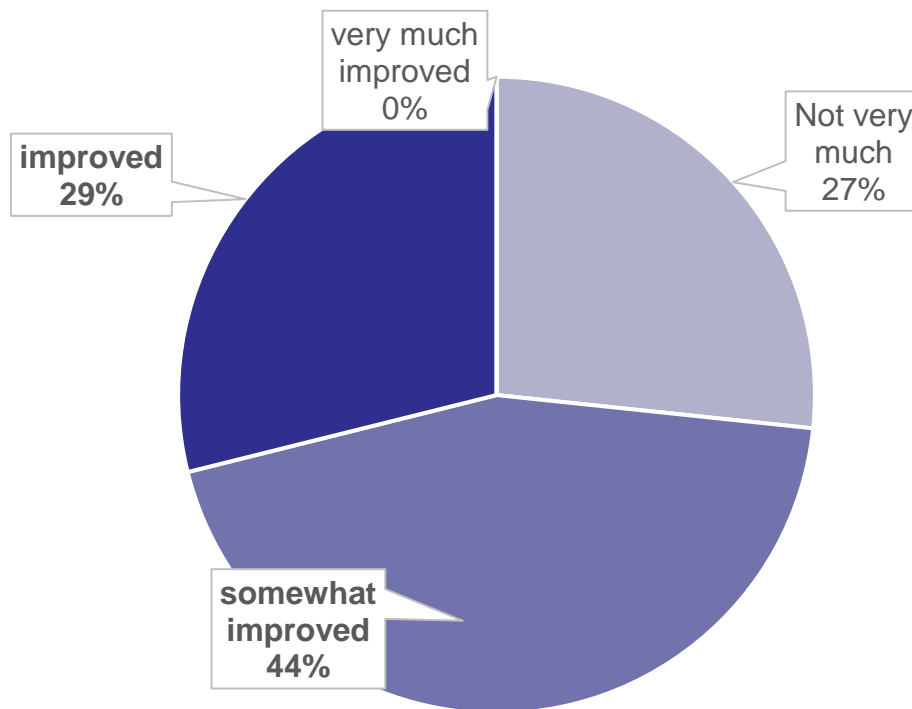

No, it is not supportive 26%

Yes, it is supportive 74%

- Yes, it is supportive
- No, it is not supportive

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Improvement of spoken competence

Improvement in confidence of speaking English

very much improved 0%

Not very much 27%

improved 29%

somewhat improved 44%

Students' self-reported spoken competence compared to peers

After class & In class combined
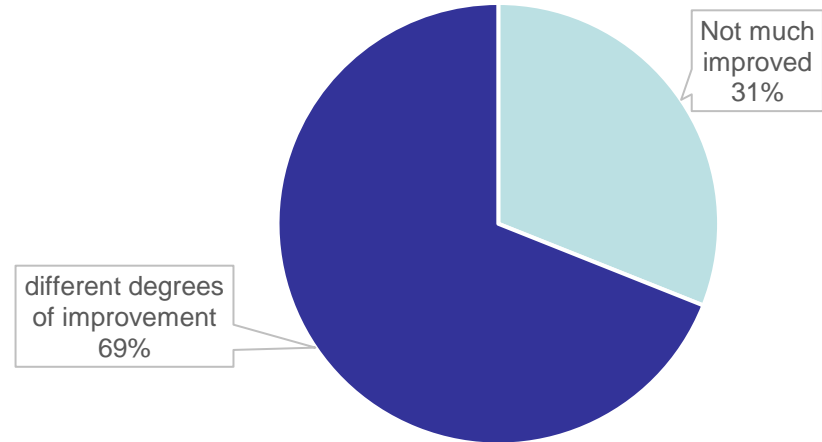
64% students can only speak English at "single words or phrases level"

Students with low spoken competence and their perceived competence and confidence improvement

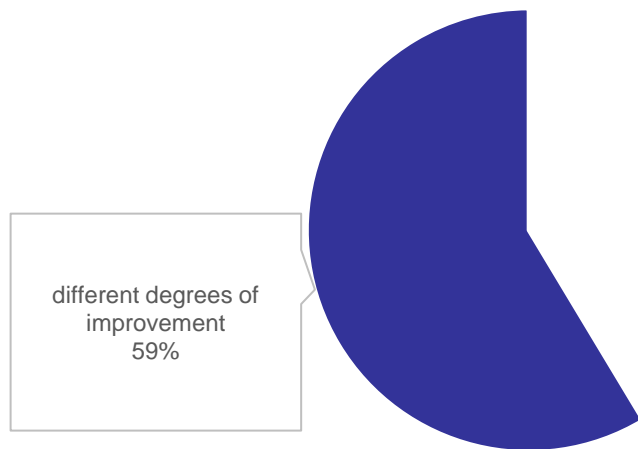Students with low spoken competence and their perceived spoken **competence** improvement

- Not much improved 41%
- different degrees of improvement 59%
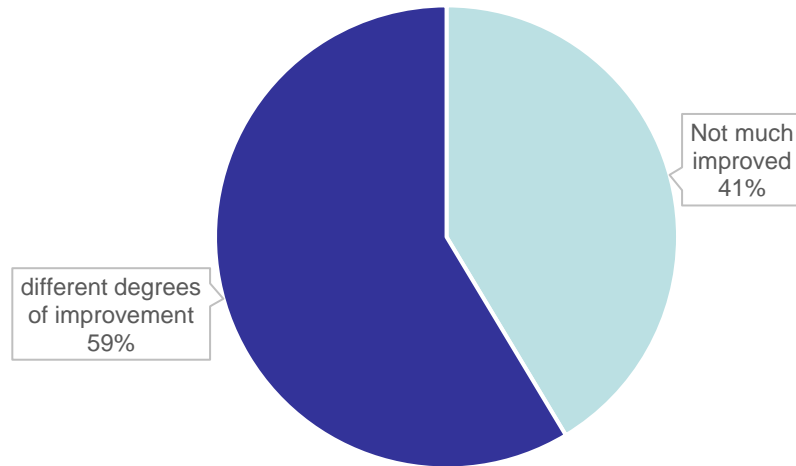
Students with low spoken competence and their perceived spoken **confidence** improvement

- Not much improved 31%
- different degrees of improvement 69%

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Why improved? – Spoken competence and confidence

Students with low spoken competence and their spoken competence development

Students with low spoken competence and their spoken confidence development

different degrees of improvement 59%

different degrees of improvement 69%

List of Reasons
- Immerse in real life
- hear different words.
- I can learn the different meanings for words
- More exposure to conversations in real life situations helps my speaking skills improvement.
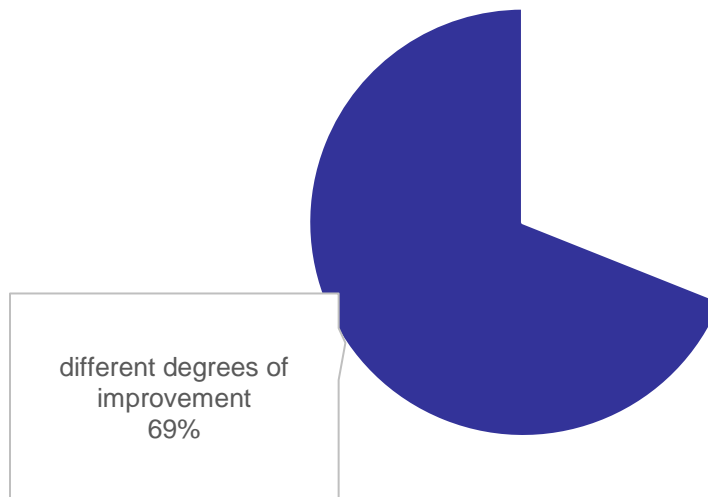
"I feel like I'm having a more natural conversation because it makes me feel like I'm directly in the situation."

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Why not improved? – Spoken competence

Students with low spoken competence and their perceived spoken competence improvement

Students with low spoken competence and their spoken confidence development
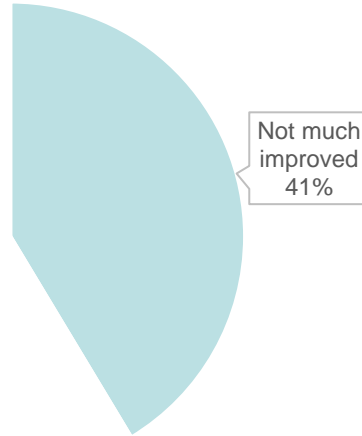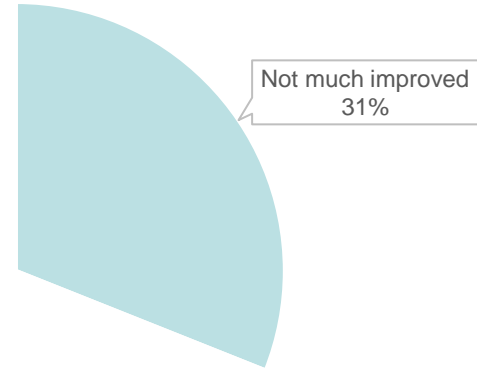
Not much improved
41%

Not much improved
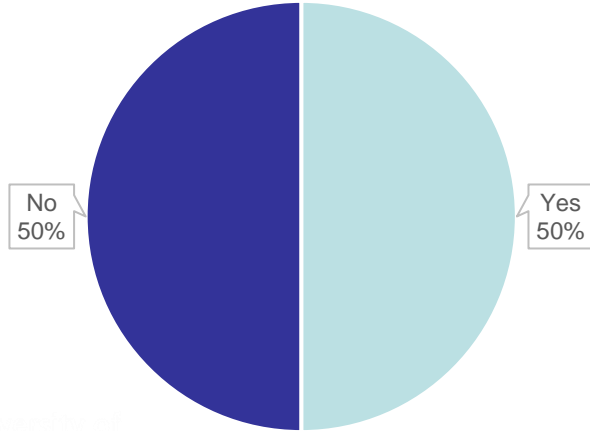31%

List of Reasons
- It is not easy.
- Full English instruction
- Not an fun experience

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Task completion

10a. Have you ever tried to complete the tasks in the VR learning video (e.g. explain what you experienced on this trip and why seals like to live near Langton Island)?
– After class

10a. Have you ever tried to complete the tasks in the VR learning video (e.g. explain what you experienced on this trip and why seals like to live near Langton Island)?
– In class
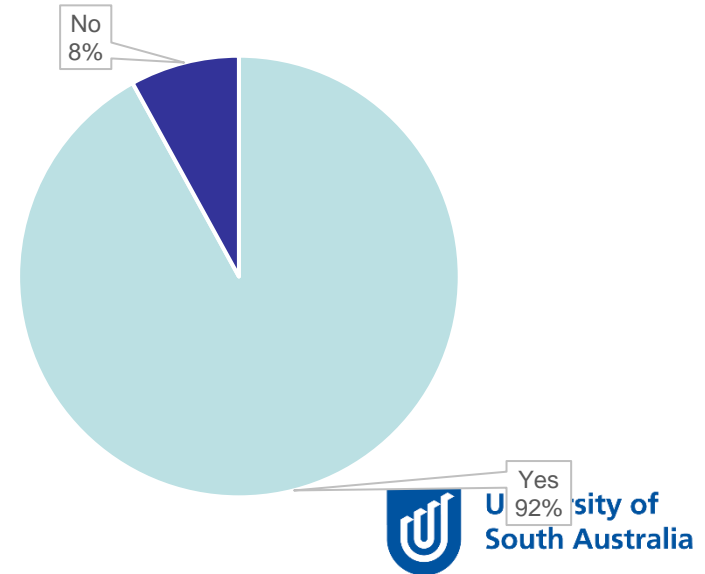
No
50%

Yes
50%

No
8%

Yes
92%

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Task completion – Modelled Texts

Task 1

Learn how to go to the snorkelling location (procedural text)

Task 2

Learn how to put on snorkelling gear (procedural text)

Task 3

Explain why sealions like to live near Langton Island (Explanatory Text)

Task 4

Describe your experience during this trip (Personal Recount)

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Task completion – Modelled Texts

Task 1 Learn how to go to the snorkelling location (procedural text)

First, we need to follow the map and walk to the Marina.

Then, we need to "board" the boat and sail as close as possible to Langton Island.

After that, we have to take a tender to the coast of Langton Island area.

(And that is where we can experience snorkelling and swim with sealions)

Task 2 Learn how to put on snorkelling gear (procedural text)

First of all, you need to wear a snorkel mask which fits on your face like this.

Then you need to attach the snorkel to your snorkel mask like this.

After that, you need to put on a pair of snorkel fins that fit your feet size like this.

Finally, if the weather is cool or cold, you need to wear a snorkelling wetsuit to keep yourself warm.

Task completion – Reality

After class group – spoken text transcript

Task 1 *Learn how to go to the snorkelling location (procedural text)*

Student 9:

The first thing we need to do in order to get to the Langton Island is to follow the map and walk to the marina. Then we need to board the boat and sail as close to the Langton Island. After that, we need…we have to take a tender to the coast of Langton Island area.

Task 2 *Learn how to put on snorkelling gear (procedural text)*

Student 1:

All you need to prepare for snorkelling is a suit, flippers and mask equipment.

Student 2:

We need to prepare snorkelling equipment in advance

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Task completion-Reality

In class group – spoken text transcript

Task 1 *Learn how to go to the snorkelling location (procedural text)*

Student 30:

First, go to marina. Second, boat (board?)…get on the boat and go to Langton Iceland (Island). Then, tender…then take a tender and go to snorkelling location and then dive to…diving to sea and meet the sealion and swim with sealion.

Task 2 *Learn how to put on snorkelling gear (procedural text)*

Student 12:

First, wear a snorkel which fits on your face. Second, attach to the snorkel mask. Third, wear a pair of fins. Fourth, if cold, wear a snorkel wetsuit.

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Task completion – Summary

Because tasks 1 and 2 have comparatively lower difficulty level and we have also embedded more learning support for students to finish tasks 1 and 2, we have higher expectations for students to finish those tasks at a reasonably good level compared to tasks 3 and 4. According to the recordings we gathered from both groups of students, their spoken output has mostly matched out expectation.

For task 1, students who tried from both groups have done a reasonably good job. For task 2, students from the In class group outperformed students from the After class group.

As to tasks 3 and 4, due to the higher difficulty level of the two tasks, they were designed for students with more advanced English levels. We did not expect students to complete these two tasks to a good level. Students' performance matched our expectation from both groups. However, more students from the In class group tried to finish tasks 3 and 4 than students from the After class group.

Teachers' perceptions of i-VR

- i-VR has the pedagogical potential to offer the kind of immersive situational learning required for the development of spoken competence.

- i-VR offers more entertainment and motivational value over textbooks

- i-VR has cultural value in allowing students to 'visit' another country and view aspects of lifestyle and scenery.

- i-VR has pedagogical advantages in-built that other unstructured immersive environments are less likely to offer

Teachers' recommendations for improvement

- i-VR requires authentic conversations with real people in situational context and with interactional opportunities embedded to have real educational benefits

- A human with natural speech as a conversational agent and instructional guide

- The viewing goggles had to be of better quality than the cardboard goggles to create a better immersive and more realistic experience

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Teachers' recommendations for improvement

- A concentrated focus on a situational event of interest to the students without too much preparatory content

- Students needed processing time or time to view without too much continual instruction and guidance from Jarvis

- Some kind of speech input would be of value for recording and comparing spoken outputs

- Noise-cancelling headphones required in a classroom setting to increase the sense of immersion and to avoid disturbance/interference from others.
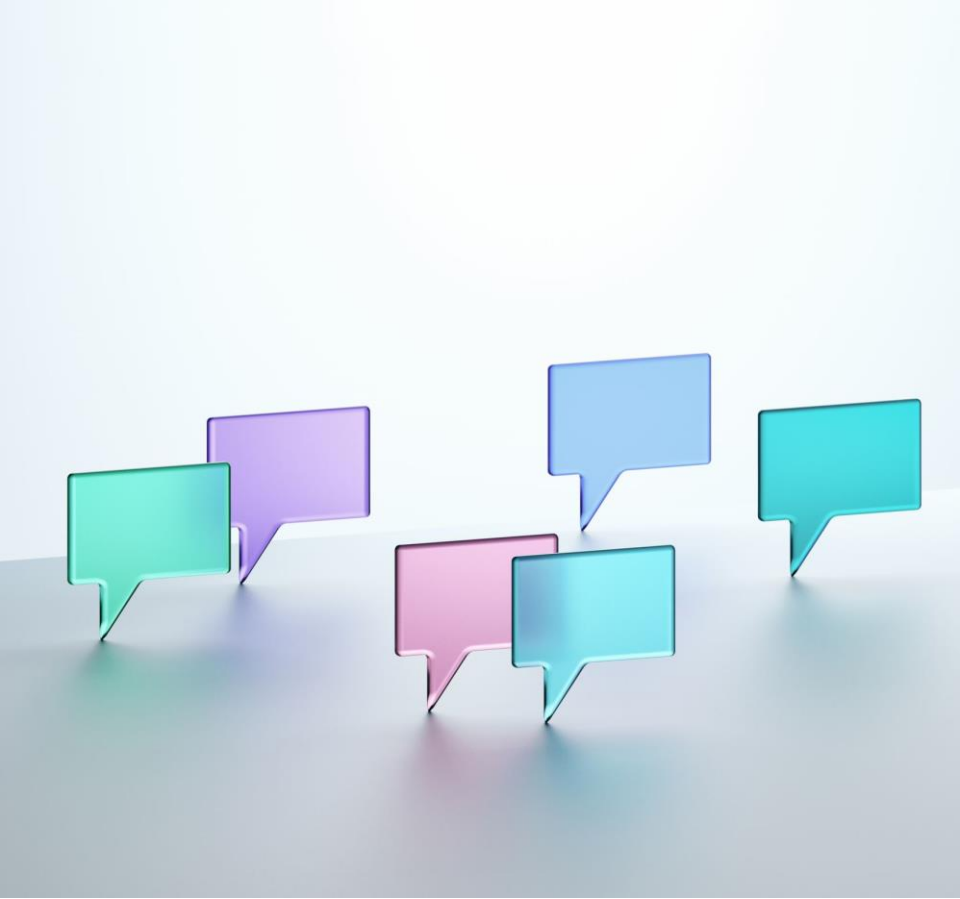
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Where to next?

- Choice of suitable environment for recording authentic conversations without the additional expense of high-fidelity audio recording devices

- Choice of quality viewing goggles that will accommodate large sizes of mobile phone without too much expense

- A real person with natural accent as an instructional guide with sufficient interaction in the learning process

- An environment with interactional opportunities and voice recording/recognition capabilities

- Focus on one interactional scenario without too much preparatory material and with differentiated choices to suit a variety of learning levels.

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Comments or Questions

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Project website: https://lo.unisa.edu.au/course/view.php?id=24477

Contact: greg.restall@unisa.edu.au