2024-25 HIVE Summer Internship Project

Curtin's hidden treasures: How biodiversity at Curtin can be experienced virtually using visual tech

13FBL_MM_HiddenTreasures

Primary Academic Supervisor
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Project Background

Currently, study tours are only accessible to students who meet specific criteria and are available to travel. This excludes many students due to family and work situations, financial constraints, or other personal reasons, creating a gap accessibility. Virtual study tours offer a solution by providing more students access to immersive experiences that enhance global understanding and intercultural skills. The internship project proposed below will contribute to an Australia Africa Universities Network-funded project with partner universities in Africa, Mauritius, and Western Australia to develop virtual study tours. In creating a virtual study tour, it is important to understand how technology can effectively be utilised to deliver engaging and immersive experiences for prospective students. The successful intern will create visual and immersive examples that may be featured in a virtual study tour. The intern will produce a 2-minute short film that can then be converted to suit three alternate visualization technologies available through the HIVE (2D, 180 Dome, 180 cylinder) built around one experience (e.g., biodiversity on Curtin campus, Bentley). These visual examples/snippets should be engaging and immersive and mimic a traditional study tour as much as possible. They will be instrumental in advancing the development of virtual study tour prototypes. This project supports the Australian Universities Accord's focus on making education more inclusive and accessible for everyone. By creating these virtual study tour examples/snippets, we aim to broaden student participation in international learning experiences. Moreover, by transitioning to virtual study tours, we can substantially reduce our environmental impact associated with traditional tours while still offering students the educational benefits of international exposure. Our approach addresses UNSDGs 4 (Quality Education), 12 (responsible consumption and production patterns) and SDG 13 (climate change).

Project Description, Expected Outputs, Possible Stretch Goals

This internship builds on a traditional sustainability study tour to Norway undertaken by Curtin researchers in June 2023. It became clear that traditional study tours are not accessible to all students due to travel restrictions, financial constraints or other personal reasons. This realisation sparked the idea of creating virtual study tours that would allow a broader cohort of students to participate, whilst also reducing the travel footprint. This internship project focuses on producing visual examples/snippets that could be delivered as part of a virtual study tour.

Expected outputs: The successful intern will:

1. Conduct desk research to understand history and evolution of biodiversity on Curtin Bentley, leading to its current state.
2. Conduct desk research to create map pf biodiverse points of interest on campus
3. Develop an accompanying script/storyboard for short videos of each location identified.
4. Film/create content for each point of interest identified
5. Use this content, create three alternate formats: (i) one version in 2 D; (ii) two versions using VR tools: 180 dome, 180 cylinder
6. Showcase/present the visual examples/snippets to the research team in the HIVE
7. Conduct desk research to explore other tools that allow participants to “choose their own adventure” within a study tour, outlining each tour’s features, required skill levels, cost, potential advantages/disadvantages.

Stretch goals:

1. Create a prototype that facilitates a “choose your own adventure” experience.
2. Present the outcomes to academics from the Faculty of Business and Law. The student will gain experience in digital content creation, sustainability education, and VR technology, and develop project management and research skills. The student can build a portfolio of work to showcase to future employers. The student will contribute to a broader initiative to make sustainability education more accessible and inclusive and environmentally sustainable.

Links to background reading and any relevant recent work in the field

Bogusevschi, D., Muntean, C., & Muntean, G. M. (2020). Teaching and learning physics using 3D virtual learning environment: A case study of combined virtual reality and virtual laboratory in secondary school. Journal of Computers in Mathematics and Science Teaching, 39(1), 5-18. https://www.learntechlib.org/primary/p/210965/. Curtin's Hidden treasures map: https://s38508.pcdn.co/wp-content/uploads/sites/5/2024/07/hidden-treasure-map.pdf Dziubaniuk, O., Ivanova-Gongne, M., & Nyholm, M. (2023). Learning and teaching sustainable business in the digital era: a connectivism theory approach. International Journal of Educational Technology in Higher Education, 20(1), 20. https://doi.org/10.1186/s41239-023-00390-w leBrasseur, R. (2023). Virtual Site Visits: Student Perception and Preferences Towards Technology Enabled Experiential Learning. International Journal of Emerging Technologies in Learning, 18(2), pp. 115–140. https://doi.org/10.3991/ijet.v18i02.32013 Makransky, G., & Mayer, R. E. (2022). Benefits of taking a virtual field trip in immersive virtual reality: Evidence for the immersion principle in multimedia learning. Educational Psychology Review, 34(3), 1771-1798. https://doi.org/10.1007/s10648-022-09675-4 Molan, S., Weber, D., & Kor, M. (2022). Shaping children's knowledge and response to bushfire through use of an immersive virtual learning environment. Journal of Educational Computing Research, 60(6), 1399-1435. https://doi.org/10.1177/07356331211054569 Scavarelli, A., Arya, A., & Teather, R. J. (2021). Virtual reality and augmented reality in social learning spaces: a literature review. Virtual Reality, 25(1), 257-277. https://doi.org/10.1007/s10055-020-00444-8 Virtual Tours: 10 Examples of How to Visit Colleges or Universities remotely https://www.thinglink.com/blog/virtual-campus-tours/ Wu, B., Yu, X., & Gu, X. (2020). Effectiveness of immersive virtual reality using head-mounted displays on learning performance: A meta-analysis. British Journal of Educational Technology, 51(6), 1991-2005. https://doi.org/10.1111/bjet.13023https://bera- Yudintseva, A. (2024). An exploration of low-and high-immersive virtual reality modalities for willingness to communicate in English as a second language. Computers & Education: X Reality, 5, 100076. https://doi.org/10.1016/j.cexr.2024.100076

What type of visualisation will the student develop or produce?

The successful intern will create a 2D map of biodiverse points of interest at Curtin and subsequently, three visual examples/snippets (2 min each),

utilising different formats/platforms available through the HIVE (2D, 180 degree dome, 180 degree cylinder). The aim is to showcase and evaluate how visual technologies can be utilised to create immersive virtual experiences that can mimic a traditional study tour as much as possible and that can be built into a virtual study tour.

How will the visualisation contribute to your research outcomes?
The research team will use the map and visual snippets to explore stakeholder perceptions of virtual study tours and gather insights into how each format can be best utilized. These visualisations are critical to the research outcomes. To develop an immersive virtual study tour, various visualisation tools will be tested and presented in focus groups with students and staff to evaluate learning value and feasibility. Themes of immersion, connectivism, and transformative learning will be explored

If the project is successful, where would you consider publishing the results?
The project outcomes relate to learning and teaching and we would aim to present these at a relevant learning and teaching conference such as the WA Learning and Teaching Forum. A suitable target journal would be the International Journal of Educational Technology in Higher Education (Scimago Q1 Education, IF=8.6).

Draft Project Timeline:

Week 1
Project plan meeting with supervisors and Hive support staff. Confirm three visualisation tools/technologies to be used.

Week 2
Desk research to understand history and evolution of biodiversity on Curtin campus, leading to where it is now.

Week 3
Create map of biodiverse points of interest on campus. Develop an accompanying script/storyboard for short videos of each location identified.

Week 4
Film/create content for each point of interest identified.

Week 5
Using the film content, create three alternate formats for the visual examples/snippets (2 mins each).

Week 6
Using the film content, create three alternate formats for the visual examples/snippets (2 mins each).

Week 7
Using the film content, create three alternate formats for the visual examples/snippets (2 mins each).

Week 8
Desk research: Explore other tools that allow participants to “choose their own adventure” within a study tour, outlining each tour’s features, required skill levels, cost, potential advantages/disadvantages.

Week 9
Write report and prepare presentation

Week 10
Showcase/present the visual examples/snippets to the research team in the HIVE

Student Experience and Supervision:

How often will you meet with the student over the 10-week period?

The student will meet weekly with the project team. A member of the project team will be available for any interim queries.

Your work desk location and the location of student desk

The student will be allocated a desk and computer in a shared office space on level 5 of building 402. The research team are all located on levels 4 and 5 of 402.

Student Attributes:

Please indicate any preference for student's academic discipline or field of study

Student attributes: Ability to produce a map Script writing and/or storyboarding skills Filming/photography skills Storytelling skills Field: N/A

What competencies are required to start this project

Intermediate - 2D image and/or video software (e.g. Adobe Suite, Sony Vegas)

Do you have any other student attributes you think are important to the project?

Interest in sustainability and/or biodiversity would be useful.