Reflections on 21st century skill development using interactive posters and virtual reality presentations

Andrew Warrick[1] and Heather Woodward[2]

Abstract. In this preliminary research study, Japanese university students created two dimensional (2D) interactive posters and 360° Virtual Reality (VR) presentations using Thinglink software. Students can use Thinglink software to annotate images with photos, videos, and descriptions. Researchers explore the extent to which students believed that creating and presenting their VR and interactive poster presentations improved their 21st century skills of critical thinking, communication, collaboration, and creativity. They thought that creating them helped to develop their communication and creativity skills, and to a lesser extent, their collaboration and critical thinking skills. Researchers consider other avenues and recommend improvements for task design to help students develop collaboration and critical thinking skills.

Keywords: CALL, 21st century skills, Thinglink, presentation, virtual reality.

1. Introduction

As the economic prosperity of countries relies increasingly on technological innovations and globalization, developing students' 21st century skills becomes essential for future success in the workforce. The National Education Association (2015) outlines four 21st century skills to help students navigate the challenges of today's globalized world. These 21st century skills comprise critical thinking, communication, collaboration, and creativity (4Cs). Budhai and Taddei (2015) recommend that teachers foster the 4C's development by utilizing technology. As such, there is a need to further investigate the extent to which students believe that the technology utilized develops the 4Cs. Project-Based Language Learning

1. Rikkyo University, Tokyo, Japan; andrewwarrick@rikkyo.ac.jp; https://orcid.org/0000-0001-6399-2519
2. Rikkyo University, Tokyo, Japan; heather.woodward@rikkyo.ac.jp; https://orcid.org/0000-0002-2840-9305

How to cite this article: Warrick, A., & Woodward, H. (2021). Reflections on 21st century skill development using interactive posters and virtual reality presentations. In N. Zoghlami, C. Brudermann, C. Sarré, M. Grosbois, L. Bradley, & S. Thouësny (Eds), *CALL and professionalisation: short papers from EUROCALL 2021* (pp. 290-295). Research-publishing.net. https://doi.org/10.14705/rpnet.2021.54.1348

© 2021 Andrew Warrick and Heather Woodward (CC BY)

(PBLL) can be used to develop the 4Cs, with Farouck (2016) noting that PBLL creates an environment for students to learn the skills of collaboration, negotiation, doing research with technology, and creating presentations – essential skills for business success. PBLL entails use of projects (i.e. a series of tasks planned to achieve a specific aim) to learn language. For example, one project consists of planning and presenting interactive posters and VR presentations using Thinglink software.

Teachers have utilized VR technology mainly to improve students' vocabulary and presentation quality (Papin & Kaplan-Rokowski, 2020; Xie, Chen, & Ryder, 2019); however, Hu-Au and Lee (2017) write that employing VR technology tasks can help foster student creativity, and students become eager to share their own content with others. Additionally, Lin, Wang, Kuo, and Luo (2017) find that students can improve their communication and cooperation among peers as they work together to complete VR tasks. Therefore, our research question is to what extent do students believe that VR and interactive poster software in a presentation course can contribute to the development of their 21st century skills?

2. Method

2.1. Participants

Ninety first-year Japanese students at Rikkyo University, a private university in Tokyo, were enrolled in a mandatory English presentation course for 14 weeks. They had TOEIC scores between 280 and 680 with at least six years of formal English education in junior and senior high school.

2.2. Thinglink

Thinglink is a subscription-based software that allows users to upload 2D or 360° photos, annotate them, and add voice recordings, photos, videos, notes, or pictures to those annotations (Thinglink, 2020). Students can create 2D posters or link a series of 360° photos to create VR tours. Posters and presentations are interactive insofar as audience members can click on the annotations while they watch and listen to the presentations. We selected Thinglink because VR software can nurture creativity (Hu-Au & Lee, 2017) and improve communication and collaboration (Lin et al., 2017). We therefore thought it suitable for enhancing students' 21st century skills.

2.3. Procedures

Researchers assigned two Thinglink individual presentation tasks. For each task, students used Thinglink to create 3D tours or interactive posters. Participants presented online using Zoom, an online conferencing application. Afterwards, they completed a survey.

2.4. Survey and analysis

At the end of the course, we administered a 20-item survey with a seven-point Likert scale. Survey questions were posed in English and Japanese, and asked students how they felt Thinglink helped to develop their creativity, collaboration, communication, and critical thinking. Descriptive statistics were used to analyze these results. Researchers also made observations from students' presentations, then discussed their observations to confirm any similar experiences.

3. Results

Table 1 below shows the number of students and percentage of students who answered to what extent the projects helped to develop their creativity, collaboration, critical thinking, and communication skills. For example, one student (1.1%) strongly disagreed that the projects helped creativity whereas 22 students (24.4%) strongly agreed.

Table 1. Students' perceptions of Thinglink fostering 21st century skills

	Creativity	Collaboration	Critical Thinking	Communication
Strongly Disagree	1 (1.1%)	10 (11.1%)	2 (2.2%)	1 (1.1%)
Disagree	5 (5.6)	14 (15.5)	12 (13.3)	7 (7.8)
Slightly Disagree	2 (2.2)	7 (7.8)	7 (7.8)	6 (6.7)
Neutral	7 (7.8)	17 (18.9)	21 (23.3)	16 (17.8)
Slightly Agree	21 (23.3)	17 (18.9)	23 (25.6)	27 (30)
Agree	32 (35.6)	15 (16.7)	12 (13.3)	23 (25.6)
Strongly Agree	22 (24.4)	10 (11.1)	12 (13.3)	10 (11.1)

When asked if using Thinglink to create interactive posters and VR presentations developed their creativity, 83.3% of participants slightly agreed, agreed, or strongly agreed, and 66.7% believed the projects developed their communication skills,

while 52.2% participants believed that the projects helped develop their critical thinking skills, and 46.7% believed it developed collaboration skills.

4. Discussion

Researchers noticed differences when students used Thinglink software compared to traditional software such as PowerPoint. During their presentations, participants needed to direct audience members, such as lead them on a tour of a city in VR, so they took on the communicative role of not just presenting information but guiding their audience as they interacted with their VR presentations and posters. Students might believe that their communication skills were developing because they were using different communicative functions such as directing audience members to turn to the left or right to view a particular scene; 2D presentations also have photos that presenters can point to and explain, while the 3D presenters did not have a pointer. As 360° VR allows users to 'move' from one place to another, it can provide a more authentic experience than 2D photos which might be better for encouraging more realistic language use (Xie et al., 2019).

Regarding creativity, participants had almost unlimited choices for creating their VR presentations and posters using Thinglink. They could tell whichever story they wished, present any place, and add any types of multimedia. We believe that the degree of freedom afforded by projects fostered their creativity, and perhaps as Wen (2020) found, the students were motivated to explore the full extent of what was possible knowing their work would be shared with peers.

For collaboration, projects were individual assignments; yet, 46.7% of students reported that the projects helped foster collaboration. Some participants might have sought help from their classmates. Wen (2020) found that learning new technology promotes this type of cooperation as students rely on each other for assistance. If cooperative elements had been designed into projects, such as group work projects, more participants might have experienced increased collaboration as other studies such as Reinders and Bonner (2018) and Lin et al. (2017) have shown. However, results cast doubt on the reliability of students' perceptions as researchers anticipated a lower percentage of agreement.

Creating a VR tour might have been less conducive to improving critical thinking than, for example, presenting the advantages and disadvantages of solar energy. We believe students who agreed that Thinglink helped develop their critical thinking skills might have thought that the process of learning a new software or technology

requires critical thinking skills, or that some students reflected carefully on the Thinglink task itself in creating their presentations, but more research must be conducted to confirm this rationale.

5. Conclusion

As technological innovations and globalization help to further economic prosperity, one of the most important tasks for teachers is fostering the development of students' 21st century skills. More research into how effective VR and interactive poster technology is for improving the 4Cs is needed, as we only considered students' impressions of the software in furthering these skills. After our preliminary research, we consider ways to adapt VR and interactive poster tasks in the future to help students develop these skills. We realize that technology alone might fail to build these skills, so teachers should consider task design to achieve desired results.

References

Budhai, S. S., & Taddei, L. M. L. (2015). *Teaching the 4CS with technology: how do I use 21st century tools to teach 21st century skills?* ASCD.

Farouck, I. (2016). A project-based language learning model for improving the willingness to communicate of EFL students. *Proceedings of IMCIC - ICSIT* (pp. 145-150). https://www.iiis.org/CDs2016/CD2016Spring/papers/EB193TO.pdf

Hu-Au, E., & Lee, J. (2017). Virtual reality in education: a tool for learning in the experience age. *International Journal of Innovation in Education, 4*(4), 215-226. https://doi.org/10.1504/IJIIE.2017.10012691

Lin, M. T. Y., Wang, J. S., Kuo, H. M., & Luo, Y. (2017). A study on the effect of virtual reality 3d exploratory education on students' creativity and leadership. *EURASIA Journal of Mathematics, Science and Technology Education, 13*(7), 3151-3161. https://doi.org/10.12973/eurasia.2017.00709a

National Education Association. (2015). Preparing 21st century students for a global society: an educator's guide to the "Four Cs". https://www.academia.edu/36311252/Preparing_21st_Century_Students_for_a_Global_Society_An_Educators_Guide_to_the_Four_Cs_Great_Public_Schools_for_Every_Student

Papin, K., & Kaplan-Rokowski, R. (2020). An exploratory analysis of the impact of learners' first language on vocabulary recall using immersive technologies. In K. M. Frederiksen, S. Larsen, L. Bradley & S. Thouësny (Eds), *CALL for widening participation: short papers from EUROCALL 2020* (pp. 266-271). Research-publishing.net. https://doi.org/10.14705/rpnet.2020.48.1199

Reinders, H., & Bonner, E. (2018). Augmented and virtual reality in the language classroom: practical ideas. *Teaching English with Technology, 18*(3), 33-53.

Thinglink. (2020). *Create unique experiences with interactive images, videos & 360° media*. https://www.thinglink.com/

Wen, Y. (2020). Augmented reality enhanced cognitive engagement: designing classroom-based collaborative learning activities for young language learners. *Educational Technology Research and Development, 69*(2), 843-860. https://doi.org/10.1007/s11423-020-09893-z

Xie, Y., Chen, Y., & Ryder, L. H. (2019). Effects of using mobile-based virtual reality on Chinese l2 students' oral proficiency. *Computer Assisted Language Learning, 34*(3), 225-245. https://doi.org/10.1080/09588221.2019.1604551

Published by Research-publishing.net, a not-for-profit association
Contact: info@research-publishing.net

© 2021 by Editors (collective work)
© 2021 by Authors (individual work)

CALL and professionalisation: short papers from EUROCALL 2021
Edited by Naouel Zoghlami, Cédric Brudermann, Cedric Sarré, Muriel Grosbois, Linda Bradley, and Sylvie Thouësny

Publication date: 2021/12/13

Rights: the whole volume is published under the Attribution-NonCommercial-NoDerivatives International (CC BY-NC-ND) licence; **individual articles may have a different licence**. Under the CC BY-NC-ND licence, the volume is freely available online (https://doi.org/10.14705/rpnet.2021.54.9782490057979) for anybody to read, download, copy, and redistribute provided that the author(s), editorial team, and publisher are properly cited. Commercial use and derivative works are, however, not permitted.

Disclaimer: Research-publishing.net does not take any responsibility for the content of the pages written by the authors of this book. The authors have recognised that the work described was not published before, or that it was not under consideration for publication elsewhere. While the information in this book is believed to be true and accurate on the date of its going to press, neither the editorial team nor the publisher can accept any legal responsibility for any errors or omissions. The publisher makes no warranty, expressed or implied, with respect to the material contained herein. While Research-publishing.net is committed to publishing works of integrity, the words are the authors' alone.

Trademark notice: product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

Copyrighted material: every effort has been made by the editorial team to trace copyright holders and to obtain their permission for the use of copyrighted material in this book. In the event of errors or omissions, please notify the publisher of any corrections that will need to be incorporated in future editions of this book.

Typeset by Research-publishing.net

Cover Theme by © 2021 DIRCOM CNAM; Graphiste : Thomas Veniant
Cover Photo by © 2021 Léo Andres, Sorbonne Université
Cover Photo by © 2021 Sandrine Villain, Le Cnam
Cover Layout by © 2021 Raphaël Savina (raphael@savina.net)

Fonts used are licensed under a SIL Open Font License

ISBN13: 978-2-490057-97-9 (PDF, colour)

British Library Cataloguing-in-Publication Data.
A cataloguing record for this book is available from the British Library.

Legal deposit, France: Bibliothèque Nationale de France - Dépôt légal: décembre 2021.