

THE TALKING PROJECTION: TEACHING THAT IS NOT FLAT

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Introduction

Nearly two years ago online teaching became a necessity, the only point of student-teacher synchronous engagement. Teaching through Microsoft TEAMS, Zoom, Slack, or any other platform for the teacher meant appealing to student learners, through their own computer. Online teaching for the educator necessitated the hasty adaption of personal computing equipment to the formalised surroundings of a conferencing platform that initially was itself a hasty adaption to run a flipped synchronous class. To varying degrees this hasty adaption meant that the teacher and the class would all interact on a shared platform led and observed on multiple screens in a variety of uncontrolled and unmonitored locations. Online learning on personal computing equipment in a variety of locations may have been the case for the majority, but not all educational establishments and not all individuals were either lucky enough or indeed institutionally organised in such a way. With remote teaching a necessity, but in-class learning still expected, any synchronous class delivery necessitated further adaption. Thus, this paper will explore such an adaption, this will be divided into theoretical and practical and will aim to conclude on a practical outcome. First, we will draw upon current pedagogies, such as the Zone of Proximal Development (ZPD), Universal Design for Learning (UDL) and Substitution, Augmentation, Modification, Redefinition (SAMR). Second, we will consider how the blending of current pedagogies will result in the application of the novel Single Screen Framework (SSF).

The problems with online synchronous teaching and the need for SSF

Teaching online on any platform runs the risk that the educator prioritises reading as an instructional from a pre-prepared script over learner engagement and unintentionally discourages motivation. Indeed, a combination of text/note based reading by the educator with the purpose of instruction runs a risk, exacerbated on computer, of confusing and disincentivising students¹. For the learner, teaching that appears didactic or prescriptive may originate from a well-meaning educator, but a certain ignorance concerning the altered interpretive dynamic produced over an online learning environment (OLE) increases the chance of negative unexpected outcomes². In fact, because of such an altered interpretive dynamic, a novel framework directing a methodological approach stands to impact and possibly produce positive pedagogical prospects.

Limitations of technology and the reactions placed upon the individual by external factors, such as the pandemic and international travel restrictions are a combination that, for me, resulted in teaching

University students who were in a classroom but as the international teacher I was to appear as a projection on a projector screen (see fig.1). Lecturing on the University of Southampton Winchester School of Art collaboration with Dalian Polytechnic University (DPU) it would have been easy to read off pre-prepared power point slides and conduct lectures/lessons in a prescriptive way. It would have been easy to continue with the three key assumptions which have since been challenged: that the learners will be motivated; the class will be attended using a stable platform; and that there will be no interruption to the internet through a bad connection. However, to keep with these assumptions and to teach in such a prescriptive way, would likely not allow learners to meet the goals of their University course.

Ultimately, due to circumstances, such as the aforementioned limitation of technology, prompting the reliance on three assumed matters as well as matters surrounding the reliance on software. An issue was created by the available hardware: a projector and projector screen, hardware that could not be changed but had to be used. Use of the hardware and software frequently resulted in classes that had limited engagement in which the projection of a power point slide (see. fig 1) could not be seen with any great clarity. Indeed, it was this limitation of hardware, that could not be circumvented, and the reliance on software, effecting the distanced/class-based style delivery that the issue of ‘flatness’ the literal as well as figurative ‘flat’ lesson delivery was to demand augmentation of pedagogy. Thus, in order to motivate and encourage active learning this situation necessitated the development and application of a novel Single Screen Framework (SSF).



Figure 1: Projected to the class at DPU. Taken with kind permission in 2021.

Theories behind SSF

In the development of Single Screen Framework (SSF) as a guide of functional principles designed to meet the needs of class-based learners and a remote educator, we would first have to consider the aspects of class practicality and long-term individual motivation. With class practicality and long-term motivation to be considered, we can divide this into three resourceful and practical criteria: Function of technology, Utility of design and Narrative of time spent in the class.

A question that, as an educator I never thought that I would ask was: Can the students see me or any materials on the projector screen? Between two to three feet is the natural sitting position of the learner who attends a class on a personal device, such as a laptop, however as we can see in figures 1 & 2 was not the case and in fact the students sat at over 2 meters from the projector screen. Thus, in order to minimize assumptions on student/learner accessibility a framework would be needed that considered function, utility and narrative in order to circumvent any potential limiting factor to accessibility and engagement.

On interrogating the need for student/learner engagement through accessible materials, research was undertaken in order to find a grounded framework from current pedagogy that would provide a source

of motivation. Indeed, a desire behind SSF would be to encourage individuals, who are not used to undertaking self-directed research, being recent college graduates, to conduct research in their own time and to actually offer materials/information as shared in-class engagement.

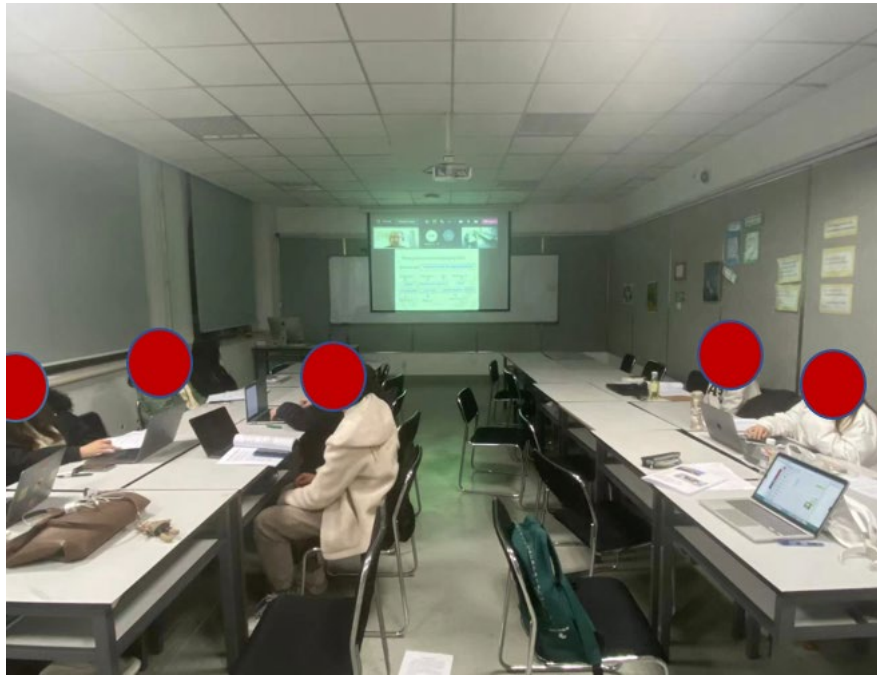


Figure 2: Taken from the back of the classroom. The University arrangement of the desks mean that the students are at a minimum of 2 meters from the projection.

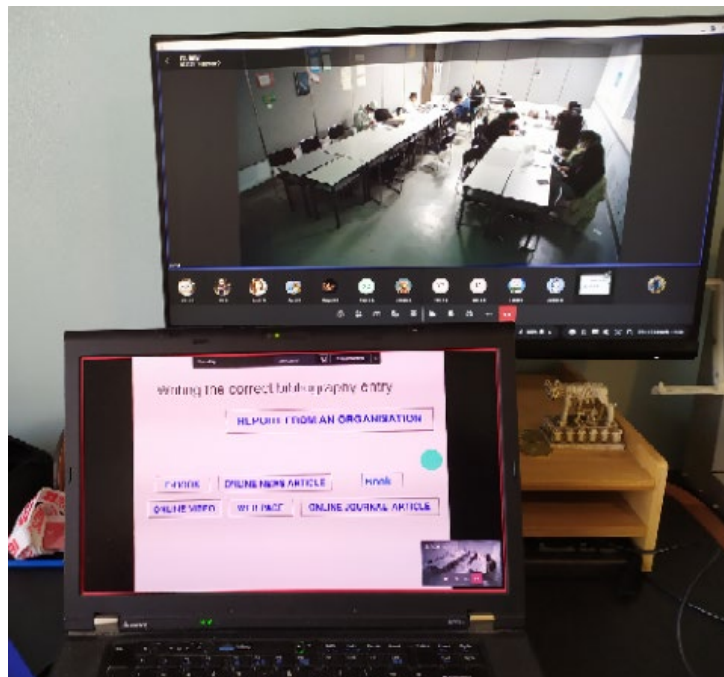


Figure 3: The set-up. It is important to remember that the students may not be able to see the projector screen.

Aiming to encourage in-class engagement and independent learner motivation, but aware of technical limitations as well as current social practices, it was decided that any theory or framework adopted should aid and promote social cohesion but also reduce the reliance on a power point presentation in order to increase student engagement through activities that may on first glance be seen as non-didactic. Given the needs of the distanced and somewhat novel circumstances of the in-class set-up three theories were decided upon. The three theories chosen were to be adapted to into the Single Screen Framework (SSF), these were: the Zone of Proximal Development, Universal Design for Learning, and Substitution, Augmentation, Modification, Redefinition. Each theory presented directly applicable pedagogies with which to approach the class, from the social, taking from sociology, to the technological and that based on the superficial motivating student engagement with prepared class materials such as power point slides and handouts.

The Zone of Proximal Development (ZPD) is a social cultural theory developed by Lev Vygotsky in 1978³. As a socio/cultural theory, this suggests that learners learn based on interaction with the educator but importantly that they learn and are motivated by other students. This goes on to suggest that stronger learners, perhaps those more comfortable with the material learned, will assist the unsure⁴. Thus, through the scaffolding of materials within the class a dialogue focused on problem-solving and mutual assistance could be fostered. In practice ZPD was encouraged in every lesson, however to individuals who were not used to discussion or collaboration with others in offering or asking for assistance, this proved to be something that was only to be successful over the long-term.

Universal Design for Learning (UDL) is a framework developed in 2005 by the Centre for Applied Special Technology, in which it offers concrete guidelines in the production of materials designed to elicit interest⁵. The UDL guidelines are divided into 3 sections: engagement, representation, and action & expression, this framework is partly focused on the presentation and the relationship of design to increasing sustained learning and motivation⁶. Indeed, in practicality such an alteration of the presentational style of the superficial in the use of power point slides and in the design of handouts did almost immediately increase learner uptake of materials. Whereas handout retention and note-taking had previously been minimal, a slight superficial alteration which did result in a change in learner behavior between classes.

The model Substitution, Augmentation, Modification, Redefinition (SAMR) was proposed and developed by Puentedura in 2006⁷. This model focuses on the understanding and use of digital and other technologies to interpret and thereby reframe certain class-based tasks⁸. With the use of this model the learner receives via the use of technology a certain recontextualization and functional improvement that acts to scaffold a task or set of tasks⁹. Indeed, given the adoption of information communication technologies (ICT) that allowed for teacher-learner augmentation, even as a synchronous in-class activity, this had the ability to appeal to learners on an individual and more personal basis.

An adaption and synthesis of ZPD, UDL and SAMR, into the Single Screen Framework resulted in a pedagogical framework designed to ensure the teaching to groups of students who have limited access to ICT but where ICT was necessary for the effective running of the class.

Single Screen Framework

To return to function, utility and narrative we may think of the three guiding theories, whereby the function will be the focused use of technology to complement the utility of class design and the narrative flow of the class session. However, given the imbedded focus of SSF on limited ICT capabilities we must therefore think of selection and interoperability of class materials and ICT networks. Indeed, a mock-up of SSF may be seen as in the figure below (see fig. 4) in which no single networked system is depended solely upon and in-built backchannels allow for the potential of scaffolded learning of groups or targeted students. What is indeed necessary here is selection of various attractive communication technologies that exploit the networks and motivate individual learners to ignore the deficiencies presented by the teacher/educator being remote.

Single Screen Framework (SSF)

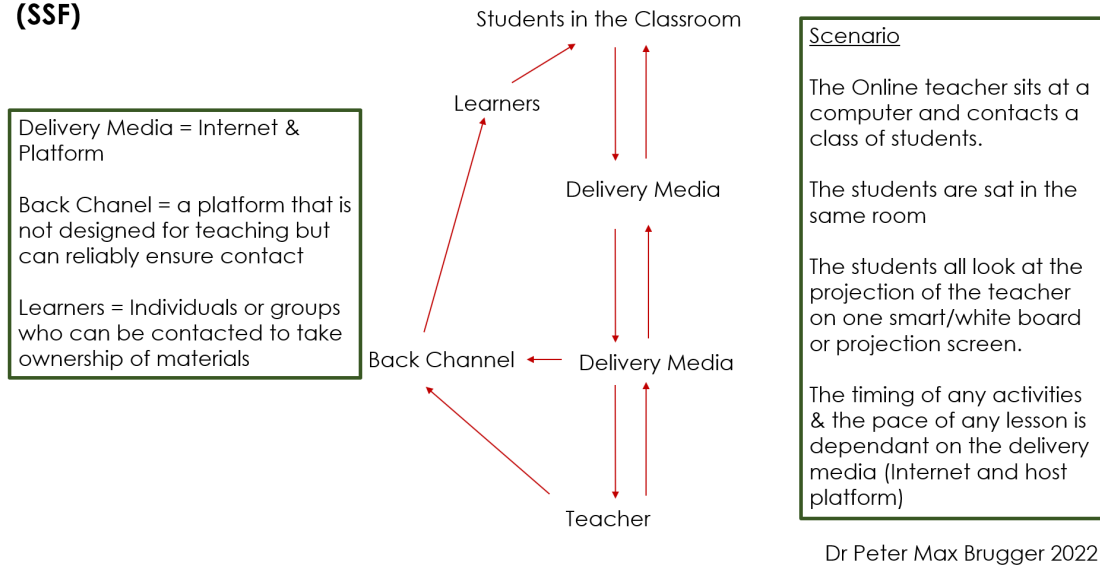


Figure 4: Single Screen Framework. The presentation of a scenario and a diagram indicating the relationship of communication networks.

In improvement of communication with the individual learner and in the maintenance of their concentration it was imperative that accessibility and interactivity be ensured in order to increase receptivity. Indeed, for accessibility, with reference to UDL, three items of software were augmented to suit class requirements: A mouse highlighter resulting in a coloured halo around the mouse pointer, the near exclusive use of Century Gothic Text, and moving animations. For interactivity in-line with ZPD the social media platform ‘WeChat’ was adopted; and concerning SAMR the highly flexible teacher materials and activities website called ‘Word Wall’ was used. Selection therefore of targeted digital tools has an importance in bringing together separate technologies that were adopted for learner utility.

Accessibility in SSF

Accessibility in SSF focused on whether the learner could see and indeed read from the projector screen. To meet SSF three augmented practices were used:

A mouse highlighter granted a coloured translucent halo around the pointer and served to focus the occasionally wandering attention of certain students. The mouse highlighter was found and later installed via a tutorial on YouTube¹⁰. The effect on in-lesson interactivity was to indicate to the individual what was to be achieved but also by functioning as to highlight items this allowed the student, who may need to read the material again with an anchor to ground and reassure themselves.

The Century Gothic font type, whilst a personal favorite, happens also to be one of the most readable typefaces. Studies on readability such as research conducted in 2013¹¹ & 2017¹² both researched and compared the ease and speed of readability looking at typeface recognition, accuracy, font size and colour combinations: all of which highly relevant given the distanced and sometimes imperceptible nature of the final distanced projection (see fig 2). Research conducted in 2013¹³ compared the word recognition rate of 10 typefaces including ‘Times new Roman’, ‘Arial’, ‘Century Gothic’, ultimately suggesting greater ease of readability of ‘Arial’ and ‘Century Gothic’ typefaces. This same research later went on to deliver a caveat, that irrespective of typeface chosen word recognition and text readability for all participants whether they were dyslexic or not was negatively impacted when it was italicised¹⁴, and thus all italicised materials were altered to be underlined or made bold. Ultimately, it

was in using the 'Century Gothic' typeface that seemed to increase learner access and utilization of materials provided, and after a changeover to use 'Century Gothic' rather than 'Calibri' there was noticeable retention of handouts.

Moving Animations, whilst used sparingly but with a targeted use on a power point slides served a purpose to the mouse highlighter in which they could and often did draw focus. The effect was not simply to draw focus however, but to show importance and prompt student in problem-solving. Thus, the strategic use of animations to would/may draw student attention to a probable answer and reinforce their own autonomy and potential for attainment. The use of animations in a power point for this purpose were not to be used all the time but were strategically used to prompt and by degrees encourage individual students in order to show them that they can find/research the answer.

Student/Learner accessibility was increased by the adoption of three augmented practices. The changes that these practices represented were not major alterations to previous lesson delivery, but as part of SSF did prompt accessibility encouraging engagement.

Interactivity in SSF

Interactivity in SSF was used to motivate and create a dialogue between the educator and learner. To meet SSF two external software applications were customised and used:

The social media platform of 'WeChat' was an invaluable backchannel in contacting individual learners during synchronous sessions¹⁵. In a variety of scenarios, such as when groupwork was set or individuals were called upon to present preprepared work, a network of collaboration through scaffolding was encouraged by direct contact with students who were known to be able to assist others in achieving class work. Contact with individual students in such a way as to prompt a mutually collaborative atmosphere was time-dependent, and indeed individuals became used to this targeted contact over time and towards the end of my time with them this assistive behavior had become automatic.

The teaching materials website 'Word Wall' is a free website that provides customisable templates that can easily be adapted for any class¹⁶. Indeed, sharing the class screen I was able to invite a student to come up to the class computer (see fig. 1) and to take control of the session on Microsoft Teams and to spin a wheel (see fig. 5). The majority of students, who had not experienced this before were rather reticent at first to come up to the classroom computer and to take control of the class session in order to spin the wheel. Taking-Control of the sessions, in 'Word Wall' resulted in two mouse pointers in which the student could interact but I as the educator would retain overall control and could override or interact if the individual was struggling. However, after the initial spin of the wheel (see fig. 5) students were very keen to do this and would often, as I found, be much more likely to put in the effort to answer the question. A progression of this was witnessed on certain occasions as the individual would go so far as to ask other members in the class. In increasing interactivity activities/games such as this were invaluable, and in a way similar to a 2020 study on the effects of Kahoot on teacher training and computer engineering students¹⁷ introducing a certain degree of gamification for a class-based activity that had a clear aim focused the individual. However, the effect was not solely on the individual but and on other students in the classroom, as this was seen to focus them as on a few occasions other classmates would offer unprompted answers.

The adoption of 'WeChat' and 'WordWall' proved invaluable in encouraging students to interact and become active participants in class as well as in activities. Both software applications did create very quick and easy rooms for dialogue between the educator and the learner.

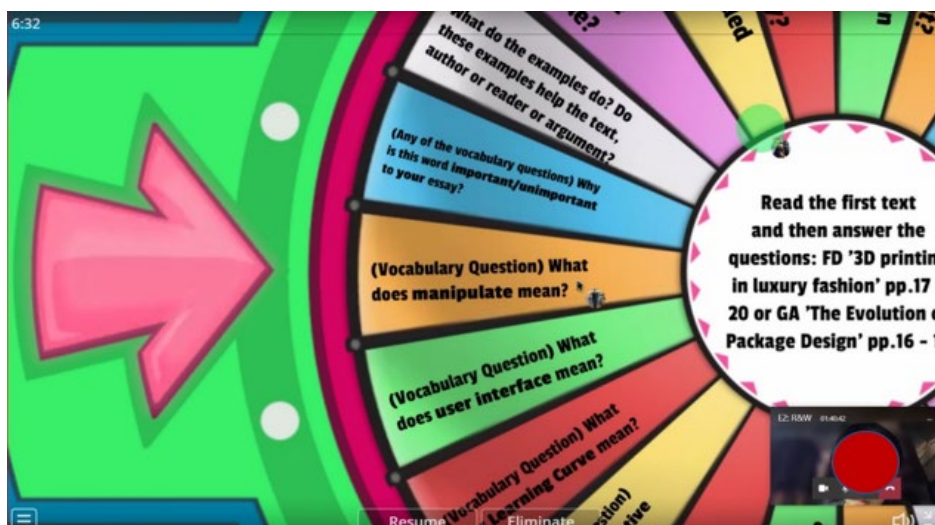


Figure 5: A student takes control of the class computer in order to spin the wheel and answer a vocabulary question. See the two mouse pointers. Template for the wheel provided by word wall (Word Wall 2022).

SINGLE SCREEN FRAMEWORK

In conclusion, Single Screen Framework is an adaption of three pedagogical theories, the Zone of Proximal Development, Universal Design for Learning, and Substitution, Augmentation, Modification, Redefinition. With an eye on limiting the potential of prescriptive remote teaching, focus is placed upon a student-centred approach that in the consideration of function, utility and narrative aims to include the student in scaffolded learning. Motivation can be encouraged in the long-term by the addition of a backchannel in which scaffolding can take place and indeed actions, such as those outlined by ZPD reinforced, encouraged and expanded. The current framework is tailored to meet the needs of the learners studying on the University of Southampton Winchester School of Art collaboration with Dalian Polytechnic University (DPU). However, SSF is a flexible framework that aims to guide the approach to distanced lessons that when presented with students who have different requirements for accessibility and interactivity this has the potential to meet their needs.

NOTES

- ¹ Florence Martin and Doris Bollinger, "Engagement Matters: Student Perceptions on the Importance of Engagement Strategies in the Online Learning Environment," *Online Learning Journal* 22, no. 1 (2018): 205-222
- ² Florence Martin and Doris Bollinger, "Engagement Matters: Student Perceptions on the Importance of Engagement Strategies in the Online Learning Environment," *Online Learning Journal* 22, no. 1 (2018): 205-222
- ³ Lev Semenovich Vygotsky and Cole Michael. *Mind in society: Development of higher psychological processes.* (Harvard: Harvard University Press, 1978)
- ⁴ Lev Semenovich Vygotsky and Cole Michael. *Mind in society: Development of higher psychological processes.* (Harvard: Harvard University Press, 1978)
- ⁵ "The UDL guidelines," CAST, accessed 13th April 2022, https://udlguidelines.cast.org/?utm_source=castsite&lutm_medium=web&utm_campaign=none&utm_content=aboutudl
- ⁶ "The UDL guidelines," CAST, accessed 13th April 2022, http://www.hippasus.com/rrpweblog/archives/2012/08/14/SAMR_SixExemplars.pdf
- ⁷ Ruben R., Puentedura. "The SAMR model: Six exemplars." (2012): 1-52.
- ⁸ Ruben R., Puentedura. "The SAMR model: Six exemplars." (2012): 1-52.
- ⁹ Erica R., Hamilton and Joshua M. Rosenberg and Mete Akcaoglu. *"The substitution augmentation modification redefinition (SAMR) model: A critical review and suggestions for its use."* *TechTrends* 60, no. 5 (2016): 433-441.
- ¹⁰ Kevin Stratvert. "How to Highlight Mouse Pointer Windows 10 YouTube." 6th August 2020. Tutorial, 18.03. <https://www.youtube.com/watch?v=kWsqTnVT7to&t=1s>
- ¹¹ Luz Rello and Ricardo Baeza-Yates. "Good fonts for dyslexia." *Proceedings of the 15th international ACM SIGACCESS conference on computers and accessibility*, pp. 1-8. 2013.
- ¹² Luz Rello and Ricardo Baeza-Yates. "How to present more readable text for people with dyslexia." *Universal Access in the Information Society* 16, no. 1 (2017): 29-49.
- ¹³ Luz Rello and Ricardo Baeza-Yates. "Good fonts for dyslexia." *Proceedings of the 15th international ACM SIGACCESS conference on computers and accessibility*, pp. 1-8. 2013.
- ¹⁴ Luz Rello and Ricardo Baeza-Yates. "How to present more readable text for people with dyslexia." *Universal Access in the Information Society* 16, no. 1 (2017): 29-49.
- ¹⁵ Joseph Arthur Davies and Laura Jane Davies and Brandon Conlon and Jamie Emerson and Hannah Hainsworth, and Hugh Gregory McDonough. "Responding to COVID-19 in EAP contexts: A comparison of courses at four Sino-foreign universities." *International Journal of TESOL Studies* 2, no. 2 (2020): 32-51.
- ¹⁶ "Word Wall: Create better lessons quicker." Word Wall
- ¹⁷ María Luisa Pertegal-Felices and Antonio Jimeno-Morenilla and José Luis Sánchez-Romero and Higinio Mora-Mora. "Comparison of the effects of the Kahoot tool on teacher training and computer engineering students for sustainable education." *Sustainability* 12, no. 11 (2020): 4778.

Bibliography

- Bajracharya, Jiwak Raj. "Technology Integration Models and Frameworks in Teaching and Training." *Journal of Training and Development* 6, no. 01 (2021): 3-11.
- Cast. "The UDL Guidelines." Accessed 13th April 2022. https://udlguidelines.cast.org/?utm_source=castsite&lutm_medium=web&utm_campaign=none&utm_content=aboutudl
- Davies, Joseph Arthur, Laura Jane Davies, Brandon Conlon, Jamie Emerson, Hannah Hainsworth, and Hugh Gregory McDonough. "Responding to COVID-19 in EAP contexts: A comparison of courses at four Sino-foreign universities." *International Journal of TESOL Studies* 2, no. 2 (2020): 32-51.
- Hamilton, Erica R., Joshua M. Rosenberg, and Mete Akcaoglu. "The substitution augmentation modification redefinition (SAMR) model: A critical review and suggestions for its use." *TechTrends* 60, no. 5 (2016): 433-441.
- Longobardi, Claudio, Michele Settanni, Shanyan Lin, and Matteo Angelo Fabris. "Student-teacher relationship quality and prosocial behaviour: The mediating role of academic achievement and a positive attitude towards school." *British Journal of Educational Psychology* 91, no. 2 (2021): 547-562.
- Lubega, J. T., and Muyinda Paul. "Adoption of the SAMR model to assess ICT pedagogical adoption: A case of Makerere University." (2014).
- Martin, Florence, and Doris U. Bolliger. "Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment." *Online Learning* 22, no. 1 (2018): 205-222.
- Onyango, George, and Rhoda Gitonga. "Exploring how technology complements constructivism using a lesson plan." In *2017 IST-Africa Week Conference (IST-Africa)*, pp. 1-11. IEEE, 2017.
- Pertegal-Felices, María Luisa, Antonio Jimeno-Morenilla, José Luis Sánchez-Romero, and Higinio Mora-Mora. "Comparison of the effects of the Kahoot tool on teacher training and computer engineering students for sustainable education." *Sustainability* 12, no. 11 (2020): 4778.
- Puentedura, R. "The SAMR model: Six exemplars." Retrieved August 14 (2012): 2012. http://www.hippasus.com/rrpweblog/archives/2012/08/14/SAMR_SixExemplars.pdf.
- Rello, Luz, and Ricardo Baeza-Yates. "Good fonts for dyslexia." In *Proceedings of the 15th international ACM SIGACCESS conference on computers and accessibility*, pp. 1-8. 2013.
- Rello, Luz, Martin Pielot, and Mari-Carmen Marcos. "Make it big! The effect of font size and line spacing on online readability." In *Proceedings of the 2016 CHI conference on Human Factors in Computing Systems*, pp. 3637-3648. 2016.
- Rello, Luz, and Ricardo Baeza-Yates. "How to present more readable text for people with dyslexia." *Universal Access in the Information Society* 16, no. 1 (2017): 29-49.
- Stratvert, Kevin. "How to Highlight Mouse Pointer Windows 10." YouTube. 6th August 2020. Tutorial, 18.03. <https://www.youtube.com/watch?v=kWsqNvT7to&t=1s>
- Vygotsky, Lev Semenovich, and Michael Cole. *Mind in society: Development of higher psychological processes*. Harvard university press, 1978. https://www.google.co.uk/books/edition/Mind_in_Society/RxjjUefze_oC?hl=en&gbpv=1
- Walker, R. A. "Sociocultural issues in motivation." *Social and emotional aspects of learning* (2010): 712-717.
- Word Wall. "Word Wall: Create better lessons quicker." Accessed 13th April 2022. <https://wordwall.net/>