

# Creating Affinity Spaces through Instagram® to Enhance Students' Virtual Learning Exchanges in a Green Dentistry Project

**Anisa Vahed**

Durban University of Technology,  
Durban, South Africa

**Fábio Barbosa de Souza**

Federal University of Pernambuco  
Recife, Brazil

## **Abstract**

Infusing Instagram® into higher education teaching, learning and assessment practices proliferates the literature as an ally for students to have meaningful learning experiences. There is limited evidence, however, of its use in transforming dental education practices, specifically collaborative online learning of eco-dentistry practices. The purpose of this paper is to assess the Dental Technology (n=23) and Dentistry (n=10) students' opinions about and reflections on their experiences of using Instagram® in a Green Dentistry Collaborative Online International Learning (COIL) Virtual Exchange Project (VEP). An interpretive research paradigm and a descriptive case study research design within a qualitative framework were used. Students' open-ended responses to the challenges and benefits of using Instagram® and their reflective reports of their COIL VEP experiences were thematically analyzed. Three main themes emerged namely, familiarity with using Instagram®; educational benefits of using Instagram®; and lack of supportive infrastructure. Using Instagram® to create affinity spaces for students to experience meaningful learning in a COIL VEP can intensify their focus, amplify their attention, and exemplify the application of theoretical concepts to professional-based practice. These findings suggest that Instagram® used in COIL VEPs requires a rethink of the curriculum and delivery, particularly supporting the principles of preserving the confidentiality and privacy of patients online. There is limited evidence of globally distributed teams learning about eco-friendly dentistry through a COIL VEP. This nuanced internationalizing at home, pedagogical and assessment approach enables students to co-create and share disciplinary knowledge while improving their interpersonal and intercultural skills.

**Keywords:** Instagram®, Green dentistry, affinity space, virtual exchanges, collaborative learning, dental technology, COIL

## 1. Introduction

Infusing social media into teaching and learning practices enhances collaboration, co-creation, learning and interaction between educators and students (Abbott et al., 2013; Elumalai et al., 2020; Bozalek et al., 2013; Carpenter et al., 2020; Cumerlato et al., 2020; Folkvord et al., 2020; Machado et al., 2020; Salehudin et al., 2020; Souza et al., 2019). The Digital 2020 October Global Statshot Report (Kemp, 2020) further revealed that more than 450 million people have started using social media in the past twelve months as a result of the new habits that people have adopted during the global coronavirus disease 2019 (COVID-19) pandemic crisis. This equates to annual growth of more than twelve per cent. Reportedly, there has been a surge in the use of Instagram®, amongst other commonly used social networking sites (SNS) such as Facebook®, YouTube®, WhatsApp®, and Facebook Messenger.

Created in October 2010 and acquired by Facebook, Inc. in April 2012, Instagram®, an amalgamation of 'instant camera' and 'telegram', is a photo- and video-sharing SNS. Instagram® users can create visually enhanced messages using photographs and one-minute videos, and post stories to communicate with other users in ways that vary in privacy and formality (Alhabash & Ma, 2017; Davies et al., 2019; Wulandari, 2019). An attractive feature of Instagram® that has influenced its growing popularity, specifically in higher education, is mobile image upload and enabling users to browse other users' content and to add their content to a feed. This was acknowledged by Douglas et al. (2019) in their review of the role of Instagram® in anatomy education, specifically the use of visually-rich images to support understanding and interpretation of discipline-specific content. In doing so, the above authors critically pointed out the need for improved quality control over the content in terms of the sourcing and sharing of correct content aligned with the ethical and legal policies of posting sensitive content. Similar concerns related to the risks of breaching patient confidentiality were also conveyed by Yang et al. (2020). Consequently, several medical societies have, therefore "issued guidelines for the appropriate use of social media by medical professions and trainees" (Yang et al., 2020, p. 2128e).

From an online learning perspective, Instagram® facilitates the creation of what Gee (2003) coins as an affinity space, which in this study are groups of geographically dispersed students who virtually convene, participate, interact and share various kinds of knowledge. Gee and Hayes (2012) elaborated that members of an affinity space are collectively drawn together because of a shared interest or engagement in a common activity despite their age, ethnicity, socioeconomic status and educational level. Davies et al. (2019, p. 378) cautioned that SNS such as Instagram® is not a 'pedogeological panacea', however, when used alongside a wider curriculum design with clear learning objectives it can enable educators and students to access a diverse array of affinity spaces. For instance, and despite being geographically located distantly in the Hashtag Geography Project, Instagram® supported instant communication and feedback among students who worked in their professional field of practice in 'real-time' (Davies et al., 2019). Additionally, Instagram® harnessed students' creativity through the innovative use of digital photography and hashtags, which are words or phrases chosen to categorise a picture. In turn, educators were

able to “develop creative ways of supervising student learning – at a distance – while still in the field” (Davies et al., 2019, p. 373). The above authors, however, clarified that there is a risk of students posting photos as a replacement for a more robust analysis of the overall purpose of their project. This can be curbed through in-depth discussions that force students to reflect on the decision process behind the construction of their images.

Another attractive feature of Instagram® is vlogging or video blogging. Students can upload one-minute videos to communicate their messages to their audiences either publicly or privately on Instagram®. As demonstrated by Wulandari (2019), Instagram® vlogs boost students’ self-confidence as they review and improve their performance; motivation to acquire new knowledge; abilities to be more critical and to learn independently. She cautioned, however, that vlogging could be expensive because of the high data consumption, especially if there is weak internet connectivity. Regardless of this, and given the multiple positive attributes mentioned above, Instagram® was the selected SNS for students to co-create visually engaging content while innovatively presenting their research work on the Green Dentistry Virtual Exchange Project (VEP). Notably, and especially from a South African perspective, there is little evidence on how online affinity spaces created by Instagram® enhance students’ cognitive (knowledge) and social competencies.

### **1.1 Overview of the Green Dentistry COIL VEP**

The Green Dentistry Collaborative Online International Learning (COIL) VEP was developed to infuse interdisciplinary, intercultural and global dimensions into the content of the curriculum. An initiative of the State University of New York (SUNY), a leading international organisation focused on the emerging field of Globally Networked Learning, COIL is a teaching and learning methodology that provides opportunities for intercultural and transnational learning to students from globally diverse geo-locations. Through co-developed and co-taught modules COIL VEPs use technology-mediated tools to enable students to have meaningful and integrated learning experiences. Consequently, collaborative enquiry and construction of knowledge are promoted.

Initially, and although done at different times, each author completed a five-week COIL Orientation programme (<http://coil.suny.edu/page/partnering-orientation>). This training provided guidelines to develop the necessary skills to co-teach cross-cultural courses. Subsequently, the authors collaborated and established a partnership through an eight-week Academy for COIL Course Development (<http://coil.suny.edu/page/academy-coil-course-development>). They designed their online collaborative project titled Green Dentistry: Incorporating Sustainability and Conservation Concepts into Clinical and Laboratory Dental Practices. This links to the emerging concept of Eco-friendly dentistry, which is about reducing the “environmental impact of dental practices in moving toward an ecologically sustainable health care system” (Rathakrishnan & Priyadarhini, 2017, p. 59). Eco-

friendly dentistry is based on the model of the four R's – Rethink, Reduce, Re-use and Recycle in terms of managing and disposing of waste, pollution prevention, conservation of energy, water, and money and the use of high-tech dental innovations (Khanna & Dhaimade, 2019). This aligns with the DUTs strategic plan titled *ENVISION2030*, particularly green ecosystems which is “about environmental sustainability and our responsibility to the environment” (Durban University of Technology, 2020). Table 1 illustrates the curriculum structure and learning outcomes of the Green Dentistry COIL VEP.

**Table 1 - Description of activities, tasks and learning outcomes of the Green Dentistry COIL VEP timeline**

<b>WEEKS 1-4</b>	<p><b>Ice Breaker</b>  <b>Activity 1:</b> <i>Introductory Videos &amp; Cultural Identity</i></p> <ul style="list-style-type: none"> <li>▪ Create a ‘2-minute’ video.</li> <li>▪ Post your video on the Green Dentistry Facebook page.</li> <li>▪ Students to comment on each other’s videos.</li> <li>▪ Stereotyping and Effective Group Dynamics: Upload the top three Rules of Engagement in the Discussion Moodle Thread.</li> </ul>	<p><b>Task:</b></p> <ul style="list-style-type: none"> <li>❖ Describe your background (cultural/academic/Personal).</li> <li>❖ Share your interests.</li> <li>❖ Identify your field of study.</li> <li>❖ Share goals or future perspectives.</li> <li>❖ Tell us something in your ‘mother tongue.’</li> </ul>	<p><b>Specific Learning Outcome:</b>            Acquire a deeper understanding of diversity in terms of similarities and differences within the group, and develop an awareness of different perspectives and worldviews.</p>
<b>WEEKS 4-8</b>	<p><b>COIL VEP</b>  <b>Activity 2:</b> Case-Study: Investigate sustainability protocols that will reduce the environmental impact of clinical and laboratory-based dental practices by considering the four ‘Rs’ of <b>Reduce, Reuse, Recycle and Rethink</b> with regards to:</p> <ol style="list-style-type: none"> <li>1. Water and energy conservation.</li> <li>2. Use of non-toxic versus toxic products/materials.</li> <li>3. Eco-friendly infection control practices.</li> <li>4. Waste Management and reduction of pollution.</li> <li>5. Technology innovations and integrative practice.</li> <li>6. Ergonomics.</li> </ol>	<p><b>Task:</b> Team members communicated and collaborated to complete their sub-case considerations.</p>	<p><b>Specific Learning Outcome:</b> Apply effective communication and intercultural competency skills by completing a case study on eco-friendly clinical and laboratory-based dental practices.</p>
<b>WEEKS 8 &amp; 9</b>	<p><b>Reflection</b>  <b>Activity 3:</b> <i>Students’ Reflective Reports.</i></p>	<p><b>Task:</b> Using the Gibbs model, reflect on your overall experiences participating in this project.</p>	<p><b>Specific Learning Outcome:</b>            Reflect on individual experiences, discuss personal and academic impacts, and evaluate the success of the project.</p>

Given that 95% of the diverse student population were English second language speakers, facilitators provided students with pre-implementation training sessions both face-to-face (February 2020) and virtually (April and June 2020). The main reasons for this were to bolster students' confidence in English language communication, introduce them to the COIL concept, and show them how to responsibly use the various technology-mediated tools to complete the VEP while nurturing positive learning attitudes and enthusiasm for international collaboration. Macroscopically, the training sessions cultivated the notion of digital citizenship that is teaching students how to participate intelligently, productively, and ethically as responsible citizens in virtual spaces and communities (Scott, 2015).

To accommodate the semester differences between the Durban University of Technology (DUT) in Durban, South Africa, and the Federal University of Pernambuco (UFPE), in Brazil, especially during the challenging COVID-19 period, the Green Dentistry COIL VEP was implemented over nine weeks from 2 October to 27 November 2020. Another noteworthy point is that the COIL VEP was integrated into DUTs Dental Technology Theory, specifically prosthetics, subject (DTTH221) and UFPEs Sustainability in Dentistry international curricular component (IVE 0148). A two-hour synchronous meeting on 2 October 2020 kick-started the VEP. Subsequently, a one-month introductory icebreaker activity initiated the culture and diversity component of the COIL VEP (Table 1). The Green Dentistry case study research project was then launched.

Six mixed DUT (n=23) and UFPE (n=10) student teams were assigned to collaboratively investigate, develop and present a team-specific sub-case consideration that collectively would build the key elements of the overall case (Table 1). It must be noted that given the unequal number of students between DUT and UFPE, facilitators sought to ensure that 4 of the 6 teams consisted of 2 UFPE students and 3 - 4 DUT students, while the remaining two had 1 UFPE student and 4 DUT students. This provided the impetus to include icebreaker activities over four weeks to encourage team building necessary for successful collaboration between students. As illustrated in Figures 1 and 2, the final product of the sub-case consideration required each team to photo- and/or video-share their work on Instagram®. A point that deserves to be mentioned is that Greendentistry 2020 Instagram® account was initially exclusive to DUT and UFPE students and academic instructors as they were required to reciprocally peer assess each team's project. There is substantial evidence in the literature that assessment for learning encourages students to develop lifelong skills in assessing and providing feedback to others while enabling them to constructively comment on their work and improve upon it. Essentially, peer assessment enables students to identify their strengths and weaknesses, target areas for remedial action, and develop metacognitive and other professional and personal skills (Topping, 2009). Peer assessment also strategically supports McPherson, Smith-Lovin and Cook's (2001) concept of 'homophily', which is a tendency among users to gravitate towards interactions with like-minded individuals. The objective is to enhance students' collaboration, and in partnership with academic instructors facilitate the co-construction/co-creation of knowledge through the Instagram®

activities. This best practice was also recommended by Douglas et al. (2019). After the COIL VEP the Greendentistry 2020 Instagram® page was made public (<https://instagram.com/greendentistry2020?igshid=YmMyMTA2M2Y=>). Furthermore, students were encouraged to make notes or keep an online journal reflecting thoughts and feelings throughout their COIL journey to prepare for the final reflection task.

This paper aimed to assess students' opinions about and reflections on their experiences of using Instagram® in a Green Dentistry COIL VEP. The principal question leading this study is to what extent students' participation in online affinity spaces created by Instagram® enriches their knowledge and skills in a Green Dentistry COIL VEP.



Figure 1 - An Instagram® Snapshot of the various Green Dentistry 2020 sub-case projects.



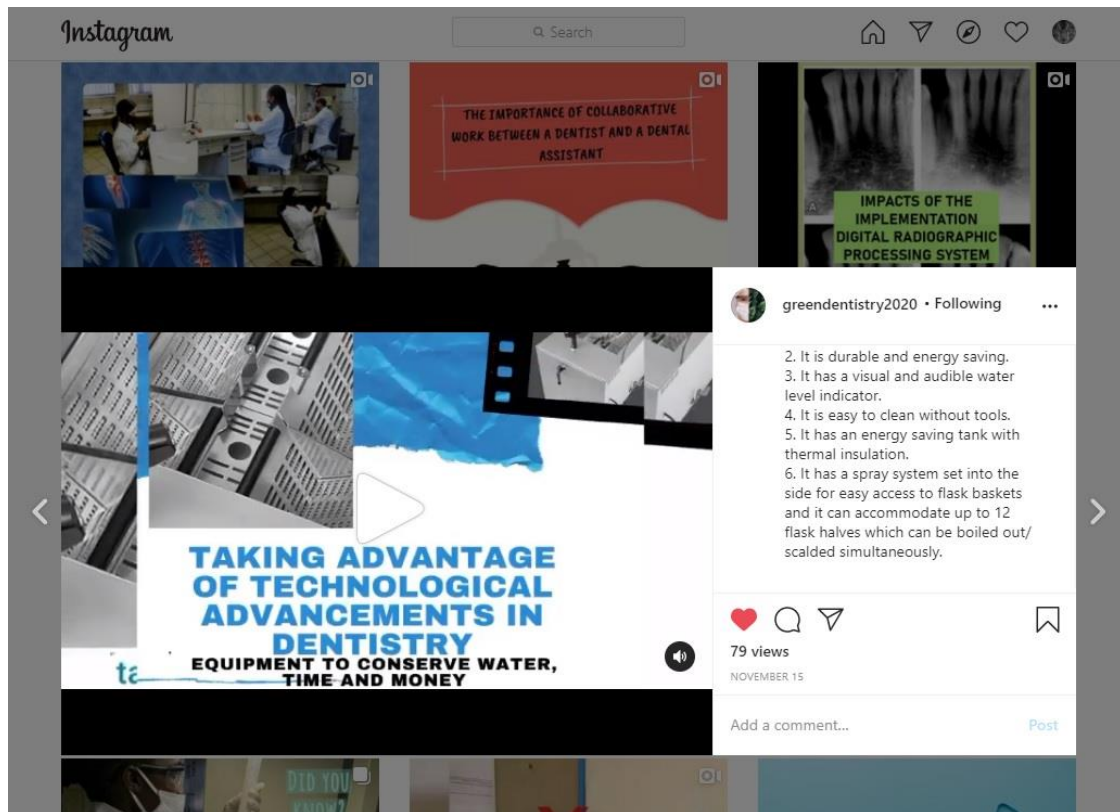


Figure 2 - An Instagram® image of a Green Dentistry 2020 COIL VEP.

## 2. Methodology

An interpretive research paradigm and a descriptive case study research design within a qualitative framework were used. A central tenet of a case study research approach is “the need to explore an event or phenomenon in depth and its natural context” (Crowe et al., 2011, p. 1). This project was reviewed and granted ethical clearance from DUTs Institutional Research Ethics Committee (REC 33/18) and UFPEs Dentistry School (IVE-148).

### Participants

The 2020 second-year Dental Technology (DUT) students (n=23) and fourth-year Dentistry (UFPE) students (n=10) participated in the study. Written consent was received from all participants.

### Data Collection Instruments and Analysis

Students’ open-ended responses to the challenges and benefits of using Instagram®, which were retrieved from an anonymised and descriptive questionnaire, and their reflective reports of their COIL VEP experiences were thematically analyzed. The principles of thematic analysis advocated by Punch (2014), specifically about two-level coding, were used to analyse data. The first level of coding entailed using descriptive low inference codes to summarise segments of the data. The second level of coding used higher-order inference ‘pattern’ or conceptual codes to pull the data together into a smaller number of more meaningful units. The authors initially coded individually and after a mutual debriefing (inter-coder reliability) they then integrated the codes into themes (O’Connor & Joffe, 2020).

### 3. Discussion of Findings

Three dominant themes emerged namely, familiarity with using Instagram®; educational benefits of using Instagram®; and lack of supportive infrastructure.

#### 3.1 Familiarity with using Instagram®

Using Instagram® in dental education has been documented in Brazil (Cumerlato et al., 2020; Machado et al., 2020; Souza et al., 2019) however, it is clear from the findings of this study that its use within South African higher education institutions is nascent. This is confirmed by the contrasting experiences of using Instagram® by the UFPE and DUT students. The majority of UFPE students (75%) declared that they "...already knew the application and how to handle the posts". The overwhelming majority of DUT students (85%), by contrast, conveyed that:

*To be honest, this year was my first time using Instagram and I must say it was a lovely experience.*

*Instagram® was tough for me because it was my first time using it...if it was not for COIL I would have probably never used Instagram.*

*My coil experience was a great learning curve for me. I learned how to do an Instagram post in my module 4.*

In fact, and to the best of the first author's knowledge, this is the first study that has focussed on the use of Instagram® in Dental Technology education in South Africa. This corroborates the unfamiliarity of using Instagram® within an educational context by the South African students who participated in this study.

#### 3.2 Educational Benefits of using Instagram®

In support of Abbott et al. (2013) assertion that Instagram® is finding a niche in educational settings, both the UFPE and DUT students were predominantly positive about the various educational benefits of using Instagram®. Overall, students were enthusiastic about the aesthetic features of Instagram®, which generated feelings of fun and enhanced intimacy and connectedness with their peers. This correlates with the findings by Carpenter et al. (2020), particularly that the visual element of Instagram® posts enables users to shape affinity spaces, and innovate how they use Instagram®. Moreover, and consistent with the characteristics of an affinity space, the visual content of Instagram® enriched students' cognitive (*understanding*) and collaborative problem-solving (*skills*) competencies relative to their respective sub-case project areas. In particular, the constructive peer review process of their postings enabled them to acquire and share an improved and joint understanding of green dentistry about their professional field of practice:

*Viewing all the posts made by each group was very interesting, educational and informative.*

*The activity of posting the images on the Instagram and commentary led us to have more criticality and attention in seeing and reading the content produced by our colleagues.*



*... all six groups were able to put together a post on Instagram regarding their given topics. These posts were all very informative, creative and educational; those who needed improvement were positively criticized and resubmitted. I believe that the goal of this collaboration which was to expose students to different cultural perspectives and develop intercultural and critical thinking skills was reached.*

*Our activity through Instagram was very good to help us develop our creativity and at the same time made us research a lot about a specific topic.*

*I was ecstatic by the end of the course where a large amount of "green" dentistry information was gathered and shared through our Instagram posts, which can be utilized by all in the dental industry around the world to become "green" and eco-friendly - as a dental technician going forward... learnt a great deal about green dentistry and what I as a dental technician can do to become eco-friendly and reduce the amount of pollution and waste my work produces.*

### **3.3 Lack of Supportive Infrastructure**

Unlike the UFPE students, the main challenges experienced by DUT students were the high cost of data consumption of using Instagram® and weak Wi-Fi connectivity. Some students noted that Instagram® "... requires a lot of data" and consumes a high "...amount of internet bundles ...". Others conveyed that they struggled "...producing work in due time as the network coverage resulted in the student residence not being connected enough for me to access my social media platforms." The aforementioned challenges mirrors the earlier concerns shared by Bozalek et al. (2013, p. 432), in that the lack of "...a supportive infrastructure environment could potentially limit the possible widespread adoption of the technologies into the mainstream of South African higher education." Moreover, the challenges identified in this study support the arguments by Elumalai et al. (2020) that sustainable technical support and infrastructure is vital to eLearning, especially fostering equitable student learning opportunities through collaborative and inquiry-orientated projects. Responding to the aforementioned challenges to influence academic's willingness and ability to adopt social media into their pedagogical practices requires a rethink of curriculum and delivery, and institutional resources to expand pockets of good practice. Essentially, the findings mentioned above support the earlier arguments promulgated by Scott (2015) that pedagogy and assessment need to radically transform in a digital age through international networks, which in this study was achieved through COIL.

### **4. Conclusion**

The salient features of this study showed that given the visually-rich nature of dental disciplines, Instagram® can potentially create affinity spaces to actively engage student learning in terms of intensifying their focus, amplifying their attention, and exemplifying the application of theoretical concepts to professional-based practice. The reported benefits of using Instagram® significantly contribute to the findings of prior research, that is, to infuse this modality in the undergraduate dental curriculum design and delivery. This will require dental educators and students to be informed about the social media policy of the university and the Council that regulate their

profession. In particular, how to avoid any breach of the policy and what the consequences are of not adhering to the principles of preserving the confidentiality and privacy of patients online. Bolstering the concept of affinity space created by Instagram® requires further studies to measure the extent to which this SNS influences the co-creation of learning amongst students including clinical and laboratory competency outcomes.

## 5. Limitations and Future Research

There are some limitations to this study. Although this study is based on a small sample population that was differently located geographically, it has the potential to improve diffusion on a wider scale given that the results demonstrate students' active engagement with Instagram®. In support of Bozalek et al. (2013, p. 421) assertion the "sharing and dissemination of experiences with peers would open up dialogue amongst practitioners in the institution; increase uptake by a wider community; lead to changes in policies and norms, and create a culture of innovative practices of teaching/learning" with Instagram® and other SNS. Another limitation of the study was that the results did not account for factors such as demographics (age and gender), socioeconomic and/or first-generation status. The aforementioned limitation, therefore, points to a longitudinal study involving both students and academics to provide a comprehensive analysis of the widespread implementation of SNS in teaching and learning practices, together with the extent to which it is transforming the curriculum and preparing students for professional practice. In part, this can provide the impetus to further develop academics and students' digital and visual literacy skills, which are critical to support the collaborative construction of knowledge in VEPs such as COIL. Inevitably, this could further address issues on the lack of supportive infrastructure, and other forms of support.

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