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Disruptive play or platform colonialism? The contradictory dynamics of Google expeditions and educational virtual reality.

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DISRUPTIVE PLAY OR PLATFORM COLONIALISM? THE CONTRADICTORY DYNAMICS OF GOOGLE EXPEDITIONS AND EDUCATIONAL VIRTUAL REALITY

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Abstract: *This paper provides an exploratory case study Google Expeditions (GE), a virtual reality (VR) toolkit designed for the classroom, and it's roll-out in the UK through the "pioneer program". Drawing from existing research on Google, platform studies, and interdisciplinary work on the digital landscape, this paper examines the conflicting tensions around the logic of Google for Education (GFE) and the tangled user experiences of GE within a higher education context. Findings are drawn from participant observation of a one day GE trial; participant observation of 396 people's mostly first time experience with GE; a post-trial survey with those predominantly first-time users (N = 100); and participant observation of invite-only GFE events organized by Apps Events on GFE's behalf. In addition to providing a detailed insight into the roll-out of a rising educational Google product, findings suggest GE engages contradictory dynamics. On one hand, users experience exciting, disruptive play, and on the other, the pioneer program extends Google's platform empire, colonizing educational space and those within it.*

Keywords: Google for Education (GFE); Google Expeditions (GE); platformization; disruptive play; virtual reality (VR); platform colonialism.

Introduction

Launched in 2015, Google Expeditions (GE) is a virtual reality toolkit designed for the classroom, intended to maximize playful, experiential learning which boosts memory and engages learners (Shrom 2016). The GE toolkit includes up to 50 Google Cardboard viewers or head mounted displays (HMD, see figure 1) with accompanying smart phones, a teacher's tablet and over 1000 virtual expeditions (in 2019, 500 in 2017 at the time this research was conducted).

Figure 1: Google Expeditions (GE) head mounted displays (HMDs) and smart phones.

Each expedition is made from 360 panoramas and 3D photoscapes. The teacher's tablet maps each HMD, represented by a small circle that follows each student's gaze, indicating to teachers what students are looking and where they are in the VR expedition. These features allow the teacher to lead the expedition experience, pause the tour when appropriate, ask students to note certain features or specific questions at specific times and virtual locations. The expeditions cover a wide range of high quality educational content, presented to potential users in this way:

> Imagine visiting the bottom of the sea, Buckingham Palace or even the surface of Mars all in an afternoon. With Google Expeditions, teachers can take their classes on immersive virtual journeys to bring their lessons to life (Greeting message, Pioneer program home page, https://edu.google.com/intl/en_uk/pioneer-program/ 2017).

Virtual expeditions include a wide range of experiences, spanning tours of natural wonders like volcanoes around the world, the great barrier reefs, or Machu Picchu, as well as highly inaccessible regions like the nuclear aftermath in Chernobyl or the Googleplex in California. Expeditions also include career insights providing inside perspectives and the locations of people working as a television presenter or as a scientist, and on and on (2017).

The Expeditions 'pioneer program', is a free global Google for Education (GFE) initiative aiming to bring GE to millions of 'select' schools and universities. First introduced in 2015-2016 in the United States of America, the pioneer program came to the UK in 2016-2017, visiting select schools and universities, as well as to any community centres, after school groups and youth groups with enough participants – which although not officially advertised was around 400+ students. In May 2018, GE introduced an augmented reality functionality, demonstrating the rapid pace of technological change as well as in Google's product priorities (Google for Education 2018).

Through participant observation of one institution's experience of GE, this paper examines the 'pioneer program' and the almost entirely first-time user experiences of 396 students and staff, surveying 100 of these participants about their experiences. Although unanticipated in the original research design, I also report on participant observation in many invite-only G Suite for Education promotional events, a surprising follow-up part of the GE experience. In addition, I attended public talks by Google leaders – all of which provided unique insights into GE, GFE and Google's interest in the educational market. Based on this data, this paper offers an original account of GE, its roll-out across the UK, and reflects on the broader implications of GE and GFE on the educational landscape.

From a user perspective, the findings paint a contradictory picture marked by excitability and also reluctance, where many students report less enthusiasm than educators. The pioneer program and its roll-out strategy also point to a complex process, equally characterized by two perspectives: platform colonialism and educational enrichment. In terms of platform colonialism, GE is one small part of a highly sophisticated marketing strategy which extends Google's platform into the educational market by embedding free Google products in classrooms, establishing path dependency, and seducing new vulnerable users (children and educators) into a lifetime of brand loyalty. In terms of enrichment, GE is an innovative non-profit educational technology, one that appears to be publicly-oriented, provides much needed support for teachers, students, and educational institutions. These twin tensions between Google's aggressive take-over of the educational technology market in today's classrooms, and genuine educational enrichment drive the findings and analysis presented here. These tensions pose a serious and deeply entangled problematic around the role GE and of the work of GFE, both of which are important factors for understanding Google's

role in the future of educational technology.

In order to pick apart this problematic, this paper provides an original account of GE, its context, and current state of play. Following this, the paper brings together scholarship on Google in part to contextualize the case more broadly, and to connect existing explanations about the logic of GE's free provision to educational institutions. In addition to multi-sided markets, current theories on platformization, data colonialism, and surveillance capitalism position Google not only within the broader data eco-system and as one of the big four global tech players. From here, I explain the mixed method approach and key findings, arguing that several distinct stories emerge from the data, including tensions around the user experience – between excitable and reluctant use, and between the power of disruptive play for educational enrichment and Google's power to colonize educational space and those within it. The GE 'roadshow' demonstrates one of Google's small empire building tactics in education. These tensions are brought together in the conclusion to reflect Google's role in education today, as well as reflecting on key implications for tomorrow's educators, students, and wider educational futures.

A brief background: Virtual Reality (VR) & Google Expeditions (GE)

VR is an exciting technology, one that is often considered innovative and future-oriented. Jones defines VR 'as a technological construct meant to convey via the senses and/or the imagination a sensation of reality' (2005; c.f. Rheingold 1993, 1991). VR is understood as providing an immersive experience, whereas augmented reality is about adding in digital features to users' experience (e.g. Pokémon Go or Snapchat filters). Although virtual reality is not new, it is returning to the public eye and many claim we are entering VR's 'third' or even fourth 'wave' (Heim, 1993, 2015; Scoble and Israel, 2016). This wave follows widespread hype and recent investment by global platforms like Facebook, Google, Sony Interactive Entertainment, Samsung, HTC and StarVR Corp – a global wave demonstrated, in part, by establishing the Global Virtual Reality Association in 2016 (GVRA, https://www.gvra.com/). Like many innovations, VR technologies appear to follow a boom and bust cycle, spiralling from hyped-up innovation to obsolescence and from almost mainstream penetration to relative oblivion (Peters, 2009; Carey and Elton 2010). In the case of VR, this cycle has many peaks beginning in the early 1900s (e.g. the stereoscope), the 1960s (e.g. the Sword of Damocles and military investment), the mid 1990s (e.g. the rise of 3D and the launch of consumer VR headsets) and more recently, in the 2010s.

GE, as many VR and edtech initiatives before it, aims to bring the excitement of new innovative technologies into education. Yet, VR is only a small part of GE and aside from some historical context, the scholarship on VR does little to help explain GE or its implications. As such, the focus of this paper is not on VR per se, but on the experience of GE as one product in GFE's strategy to enter schools, enrich education, simultaneously extending its platform empire and colonization strategy – a strategy with historical precedents especially in the high growth stakes of the educational technology market (Buckingham 2007; Selwyn 2017).

Organizationally, GE sits within several departments, including Google VR and GFE. GE builds upon Google Cardboard, developed in 2014 by two Google engineers, David Coz and Damien Henry, who were working at the Google Cultural Institute in Paris – an important detail given GE's reliance on high quality content (Metz, 2015; Lardinois, 2014). Google Cardboard is an affordable head mounted display (HMD) made out of cardboard and

because it costs only a few dollars or pounds, it is widely understood as carrying VR into the mainstream market for 'everyone' (https://vr.google.com/). Launched at the 2014 annual Google I/O conference, Cardboard was a 'surprise hit', immediately showing up Facebook's expensive purchase of Oculus Rift and showcasing accessible cutting-edge technology (Lardinois, 2017). The New York Times launched NYTVR in 2015, an app featuring original VR documentaries, and partnered with Google to send over 1.3 million free Cardboard viewers to US subscribers on at least two different occasions (Dalton, 2016; Rao, 2016; Robertson, 2016; Wohlsen, 2015). A number which Clay Bavor, Google's VP of Google Cardboard and VR, claims has increased to over 10 million HMD viewers in March 2017 (on Twitter; Lunden, 2017).

The Cardboard model is openly available to anyone who wants to make or produce their own version of Google's Cardboard HMD, so the 10 million figure only refers to *branded* products rather than the whole cardboard market. GFE, GE's parent department, shares a similar trajectory in the education market, boasting over 70 million users as of January 24 and up from 8 million in 2010, growth which is at least partially attributed to GE and the pioneer program (Landinois 2017; Weintraub 2010). Google VR, building on Google Cardboard's success, has developed many other VR products, including Daydream, Jump (a VR camera), a VR ready smartphone (Pixel), VR for creators (Tilt Brush) and a set of tools for VR developers (https://vr.google.com).

Originating in 2006, GFE is a non-profit arm of Google (parented by the Alphabet Company), and is responsible for developing a wide range of educational apps, products and services. GFE aims to provide 'solutions built for teachers and students' (Garrett, 2017). GFE came to life with its primary product, Google Apps for Education, which were made 'free' for those in the education sector in 2009. These apps were relaunched as G Suite for Education in 2016 (Lardinois 2012), and include: 11 core services (e.g. Classroom, Gmail, Drive, Calendar, Vault, Docs, Sheets, Forms, Hangouts etc.), core devices like Chromebook, productivity tools, and cloud services – all designed specifically for the classroom (GFE 2017; Gough, 2006; Fox, 2015; Chang, 2016; Rochelle, 2016). GE, is only one of many products offered in G Suite, all intended to provide global educational value.

Ben Schrom, one of Google Expeditions' product managers, claims GE enables large scale experiential and accessible spatially oriented learning for the masses (Schrom et al., 2016). Schrom compares the expensive technology of the school bus with the cheap educational costs of Cardboard VR:

> *Even the classic technology of the big yellow bus that takes us on field trips, again, provides amazing moments but it's really expensive and it's super limited by time and space. VR gives us new found powers to scale and make experiential, dynamic and engaging learning a much much more regular occurrence. The economics of VR for schools looks really different when a single device can be your science lab, can be your programmable robot, can give you access to museums, and can be your school bus (Schrom et al., 2016, my transcription).*

This brief overview points to GE as an increasingly accessible technology and publicly oriented initiative developed to support teachers and students, intended to maximize educational benefits. However, it also points to the nesting of Google products (e.g. GE and Google Cardboard) in other product bundles (e.g. G Suite for Education) within overlapping departments (e.g. Google VR and GFE) all seductively pitched to educators as saving money, supporting learning and fixing a broken system – as discussed further in the findings section below.

Understanding Google: Business logics, data extraction and platform colonialism

Most of the literature on Google focuses on search (e.g. Beltrán-Alfonso et al., 2017; Hillis, Petit and Jarrett, 2013; Trevisan et al., 2016). Mapping and Google Earth (e.g. Farman, 2010; Lee 2010; Gordon 2007; Plantin 2014) or on Google as a capitalist business enterprise (e.g. Girard, 2009; Fuchs, 2012; Jin 2013; Duff 2016). Recent scholarship examines Google's role as a platform and digital intermediary (Plantin et al., 2016; Srnicek 2016; Gillespie, 2010, 2017a; Bermejo, 2009), as related to algorithmic and civic power (Gillespie, 2017b; Moore 2016), or as a multi-sided market (Van Couvering, 2017; Mansell, 2015; Luchetta 2013). In terms of education, more critical accounts focus on the power of 'big tech', data, and surveillance – often referring to Google as one example among many rather than providing details (Williamson 2017; Van Dijck et al. 2018) Yet, despite the rise in more critical approaches to Google, those that have looked at Google Apps for Education tend to do so in highly optimistic and uncritical terms. Existing studies examine usability (Brown and Hocutt, 2015; Găbureanu and Botnariuc 2016), effectiveness, and learning benefits (Istrate and Găbureanu, 2015; Cahill, 2012; Railean 2012; Bruggeman 2014).

Based on an analysis of Google's power to 'organize the world's information', Hillis, Petit and Jarrett argue that Google has a kind of 'consecrated status' – meaning it is both sanctioned 'by law, custom or usage' and is '[rendered] hallowed, sacred or divine' (2013, p. 6). Part of Google's rise to power includes the use of ordinary users' 'monetizable [personal] information' in exchange for search and access to products and information (Hillis et al., 2013; Sandoval, 2014). Christian Fuchs takes up this point, framing Google as both good and bad for internet culture, embodying good and evil 'like the figure of Satan and good like the figure of God' (2013, p. 147) – echoing Hillis et al.'s idea of 'consecrated status' (2013). Further, Fuchs comments on the ubiquity of Google and its ideology, what Fuchs' terms 'googology' emphasizing the freedom of workers to 'play labour' all of their time in and towards the company (2014, pp. 132, 133; c.f. Scholz, 2013). This seems highly relevant, especially given Google employee's self-referential use of the word 'Googleyness' to define the ideal characteristics of Google employees (see figure 2 below).
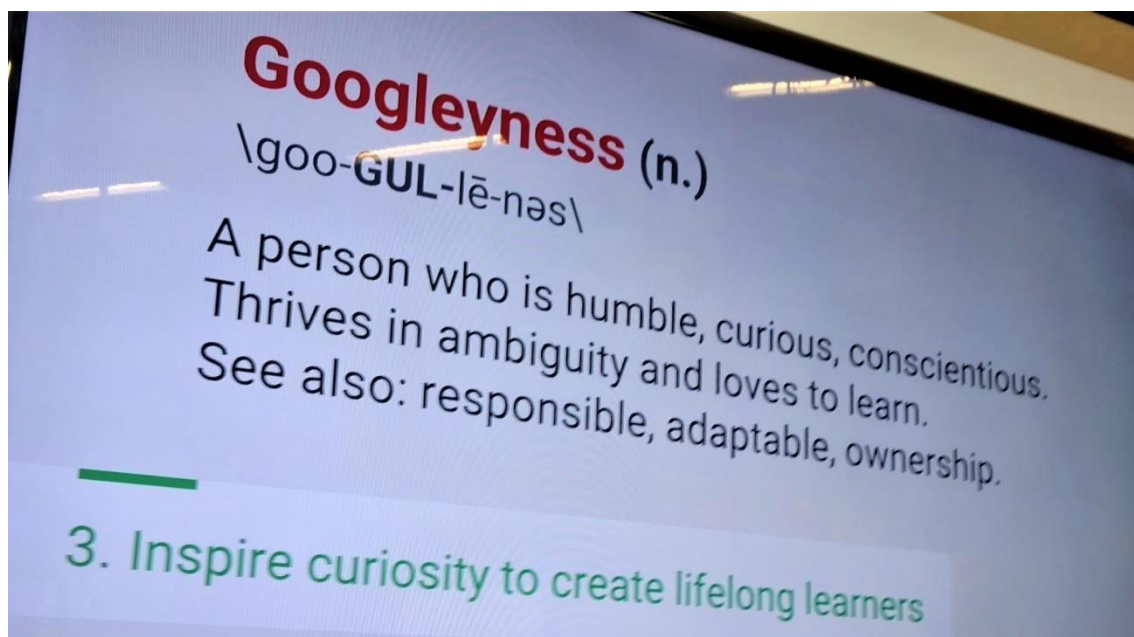

Figure 2: Google for Education's definition of 'Googleyness' (n.), from an AppsEvent workshop on G Suite for Education (2017).

This kind of soft power constructs ideal employee behaviour through both play labour *and* as a particular kind of personal characteristic identified as 'Googleyness'. Employees carry these logics to users, embedding free 'play' within Google Expeditions (c.f. Player-Koro, Bergviken Rensfeldt, and Selwyn 2017). Marisol Sandoval offers a critical perspective of the implications of play labour, highlighting Google's pervasive user surveillance, ubiquitous personalized advertising and ruthless capitalization of users as products for advertisers (2014). In terms of the GE, Google claims to keep user data 'secure', free from advertisements, and claims 'schools own their data' (Google Privacy & Security Centre). Despite these claims, Google faces on-going lawsuits (Davis 2018) and the Electronic Frontier Foundation has twice launched a 'Spying on Students' campaign, drawing attention to Google's extraction and collection of student data, ineffective privacy controls and lack of data transparency (Gebhart 2017; EFF 2015).

The extraction and use of student data opens up questions about Google's economic motivation for its free provision of GE and G Suite Apps for Education across the education sector. Many internet-based and social media companies employ a similar business model, what some economists refer to as a 'multi' or 'two-sided market', where:

> *the platform may – and often does – structure prices so that one side of the market operates at a loss while the other side generates all the profit of the platform' (Van Couvering, 2017, p. 1813; c.f. Mansell, 2015; Luchetta, 2013).*

Google can offer search or Gmail or G Suite Apps for Education including GE for free in exchange for monetizable data. While Google claim they do not extract or use student data *for advertisers* (quite different from claims that data is not mined or not collected for profit), GFE also acts as both the face of Google's corporate social responsibility and as a 'loss leader', in part because the same products are licenced for profit to business clients through Google Enterprise (Moore, 2016). Here Google can emphasize its work for the 'social good' through education, and apparent profit losses in education products are compensated by profits made in Google's many other holdings (Moore, 2016).

Beyond the Google universe, it is important to remember that Google operates within a data ecosystem, one that overlaps with GFE's for-profit logics. Through an analysis of Google's public-facing policy documents Lindh and Nolin (2016) argue that Google intentionally conceals this multi-sided market and their business logics:

> *the rhetorical aim of Google customer-oriented policy documents is to disguise the business model and to persuade the reader to understand Google as a free public service, divorced from marketplace contexts and concerns. We found it quite remarkable that the commercial aspects of Google's relationship to customers were so absent in the documents we reviewed (2016: 7).*

There are a number of competing theories explaining the broader 'marketplace contexts' referred to above, including: data colonialism (Couldry and Mejias 2018); surveillance capitalism (Zuboff 2019); platform society and platformization (Van Dijck et al 2018; Helmond 2015, see also programmable pedagogies Williamson 2016, and platform capitalism Srnicek 2016).

Between these theories, we can see a struggle to conceptualize the interstices weaving the material infrastructures of platforms with social, economic and cultural realities. Platformization, an important concept explaining the expansion of social media, refers not only to the extension of web-sites across the web, but also the reshaping of 'external web data' to become 'platform ready' (Helmond 2015). Van Dijck et al (2019) build on this

argument, suggesting that platform society 'emphasizes the inextricable relation between online platforms and societal structures' (2019: 2). Alongside health and financial data, educational data is amongst the most valuable, and Google and Facebook are crucial gatekeepers in the normalization of data extraction, mining and collection within and across educational systems (Van Dijck 2019: 118-119). Couldry and Mejias take this argument further, identifying the exploitative nature of platforms and 'big tech' as 'data colonialism' – an ideological system driving 'the predatory extractive practices of historical colonialism with the abstract quantification methods of computing' (2018). Similarly, Zuboff argues that we are in 'a new economic order that claims human experience as free raw material for hidden commercial practices of extraction, prediction, and sales' (2019).

I argue, that although each of these theories are unique, distinct concepts and the particulars of their respective vernaculars, they are more similar in essence than they are different. In addition to proximity and critical focus on platform power, these works can be situated as parts of a collective attempt to capture coercive economic and social dynamics of big tech and their impact on the social infrastructures of everyday life – all important aspects of the broader marketplace contexts. For this paper, GFE illustrates Google's platform colonialism – the combined structures and practices of data colonialism, surveillance capitalism and platformization – via the roll-out of a nested GFE product line designed to achieve market and cultural dominance in and through the classroom.

Mixed Methods: Participant observation and survey

At the time this project was being developed, virtually no critical and publicly available research existed on GFE or GE – both were new as of 2006 and 2016 respectively. Prior research either examined Google products in instrumental ways or referred to any educational products as undifferentiated from Google. As a result, a mixed method approach (see Schoonenboom and Johnson 2017) driven primarily by participatory methods and a quantitative survey seemed the best way to capture the complexities of GE as an emerging technology and set of practices. Mixed methods provide a deeper empirical rigour, allowing for both triangulation and 'heightened knowledge' of the research object (Schoonenboom and Johnson 2017). The primary method, participant observation, provides an 'orientation to inquiry' (Reason and Bradbury 2008 as cited in Bergold and Thomas 2012). This orientation aids exploratory research, allowing for a bottom up approach to identify emerging and tacit processes, interactions with and around technology, and for exploring both anticipated and unanticipated forms of engagement (Hewson et al., 2016; Flick 2018; Snee et al., 2015; DeWalt and DeWalt, 2011).

Based on these methodological principles, the research design included 3 stages (see figure 3 below), the last of which only emerged after completing the first two stages. The sample began with participants in a small university in an urban centre, populated by an international student body, and largely involving primarily undergraduate students (ages 18-24), staff (ages 30+) and some post-graduates (approximately aged 23-35)

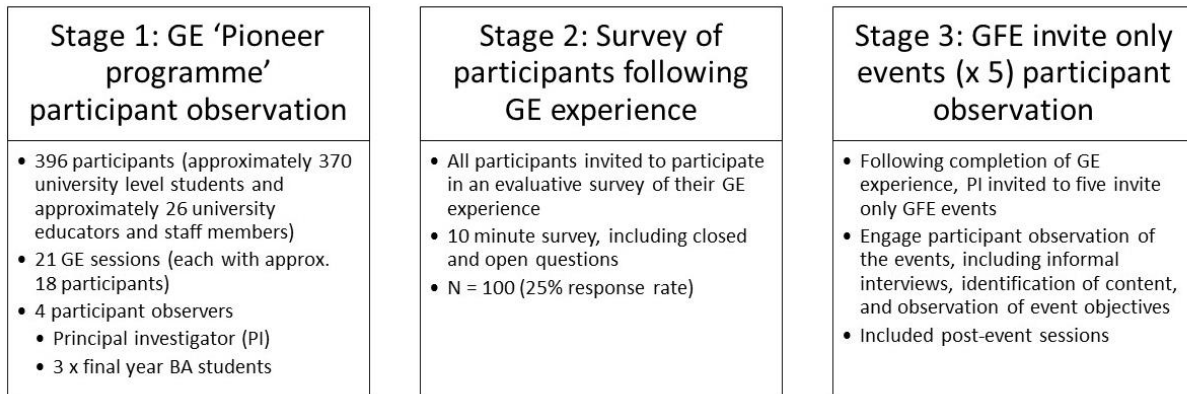| Stage 1: GE 'Pioneer programme' participant observation	Stage 2: Survey of participants following GE experience	Stage 3: GFE invite only events (x 5) participant observation

• 396 participants (approximately 370 university level students and approximately 26 university educators and staff members)
• 21 GE sessions (each with approx. 18 participants)
• 4 participant observers
  • Principal investigator (PI)
  • 3 x final year BA students
	• All participants invited to participate in an evaluative survey of their GE experience
	• 10 minute survey, including closed and open questions
	• N = 100 (25% response rate)
		• Following completion of GE experience, PI invited to five invite only GFE events
		• Engage participant observation of the events, including informal interviews, identification of content, and observation of event objectives
		• Included post-event sessions

Figure 3: Research design depicting research stages

In the first stage, the PI was responsible for setting up 21 'teaching' sessions of approximately 18 participants per session, as instructed by the GE coordinator. Following this scheduling, 3 GE field assistants came for the day to provide technical and instructional support for the session participants. The PI and 3 student observers sat within sessions, recording notes in a field note log, taking pictures, and conducting informal interviews with other participants. Each student observer was briefed on participant observation and field log notes prior to the GE sessions, and then interviewed about their experience and their field logs. These interviews allowed for a better understanding of participant observers whole impressions of the event and to follow up on any particular details recorded in the field log.

In stage 2, all participants were invited to complete a survey including 36 closed questions and 4 open questions, all asking participants to reflect on their GE experience for entry into a pool to win a £50 incentive. Of the 396 participants, 25.2% (N = 100) completed the survey, with a much higher response rate for staff (86%) than for students (19%.) Although the participant group was primarily composed of undergraduate students, survey respondents also included staff and postgraduate students.

Following completion of the survey, the PI began to receive multiple invites to select events hosted by Google for Education (GFE). Although stage 3 began as a response to unanticipated events following the first 2 stages, this stage provided data revealing deep insights into the GE's motivations, practice, and operating logics, far beyond the data collected in the first two stages. The PI observed 5 events, noting a wide range of co-participants including educators, educational tech teams, international participants, educational decision makers, heads of schools, and many others – all joining for insights on Google's freemium services. All of this data was incorporated and thematically analysed in order to identify the most important findings across qualitative data (participant observation notes) and quantitative data (survey results).

These data-gathering techniques and thematic analysis lead to meaningful findings, yet they are also limited. The first two stages focus on one case taking place in one higher education institution, and the limited experiences of those members with GE. Most of these users were new to VR and most had never experienced Google Cardboard. This means that it is difficult to assess the learning potential of GE as participants' reactions are likely to be as much the result of a novel experience as they are the result of engaging GE. This research cannot provide evaluative insight on the educational impact or potential of VR, instead, it aims to further understanding of GE – as a Google project and as an educational endeavour – rather than as an appraisal of GE's or of VR's educational value. Stage 3 provided key insights into

the 'broader market contexts' as well as Google's strategy for entering classrooms and the edtech market. Yet, the findings are based on a relatively small sample, are not generalizable or representative and do not claim to be.

Findings: The pioneer program, dynamics of contradictory use, disruptive play, and building platform empires

> 'The Expeditions Pioneer Program is just one of the ways Google is helping teachers engage students' (Pioneer program message, 2017).

Beginning with Google's reliance on volunteers and their promotional labour to run the pioneer program, one of the first findings is that Google's pioneer program reflects a strategy shaped by Google's 'consecrated status' and its aims to further develop this status. In terms of use, the findings are contradictory. Despite repeated excited expressions noted by all observers throughout the day, detailed participant observation notes reveal that this enthusiasm is uneven, and is marked by a notable split between excitable and reluctant patterns of use. Survey results indicate that this split is considerable, where 65% experienced a 'wow-moment' and 35% did not (or were not sure). In addition, participants observers noted a higher level of enthusiasm amongst staff, a point that also seems to apply across all 21 sessions observed in this research, as well as in other schools (e.g. interview with Patrick, GE lead at a primary school). The invited events reveal that the GE pioneer program is less of an educational enrichment strategy and more of a promotional marketing tour (even internally referred to as the 'roadshow') for Google for Education, G Suite Apps for Education and cloud services. Taken together, GE extends Google's platform universe, enrols committed users through freemium services, and demonstrates one of its strategies for building up its platform empire.

The pioneer program: Enrolling users

Steered by Jennifer Holland and Ben Schrom, GE product managers, the pioneer program was brought to 11 countries and over a million US students in 2015/2016 (Bonasio, 2016; Martz, 2016). Between its roll-out in September 2016, and its completion in the summer of 2017, the pioneer program had reached over a million UK students (Chahara, 2017; Grace, 2017).

The application process to become a pioneer was time-consuming and required applicants to invest considerable free labour – all repeatedly framed by the 'possibility of selection' and 'limited eligibility' to participate in a Google initiative. Beginning with the completion of an online application (September 2015), selected applicants were notified that they *could* be eligible (September 2016) – only if they submitted a completed Google Sheets form indicating they had signed up 400-600 people for 20-26 different 30 minute GE sessions. Some of the required information for this stage of application included names of participants, areas of study, and emails of participating staff (September 2016). Successful applicants were then notified of possible dates for the pioneer program to visit. Informal interviews with other GE participants from other institutions confirm that this is a common application process, likely designed for use in schools rather than higher education. Thus, while this research reports on only one instance of the pioneer program, many other likely similar instances were co-occurring across schools, educational institutions, and youth-related organizations from 2015-2017. Certainly, the application process *enrolled* users into the G Suite Apps for Education product universe, requiring investment of time and information.

The GE Experience: Contradictory user dynamics

One of the most immediate observations is the intense excitement associated with Google – apparent from the application process to the eagerness to participate in the GE and subsequent events – a reaction explained by Hillis et al's as a response to 'Google's consecrated status'. For participants, GE provided an amazing opportunity to do something with Google *and* was an exciting technology with unknown potential. Both staff and students visibly demonstrated enthusiasm, curiousity and expressed glee about being able to participate. Participants also appeared to demonstrate a genuine excitement about GE. All of the observers noted high levels of user enthusiasm, recording many positive expressions such as 'that's so cool', 'amazing' and 'wow' being expressed throughout all 21 GE sessions. One survey respondent commented:

> *I really enjoyed the immersive nature. The change of energy was exciting (that I wasn't sitting down watching a big screen) and I could move and explore independently.*

Indeed, 65% of survey respondents said they experienced a 'wow-moment' during their experience, which respondents described as the moment when they saw the 'phenomenal mountains' or 'seeing the Syrian refugee camp as if I was a part of it'. Other survey respondents noted that the unique perspective GE enabled a sensation of 'being there'. For example, one survey respondent claimed their wow moment came with 'seeing the wonders of the world from the vantage point you couldn't get if you were actually there'. Another described the sensation of 'feeling the space, being inside a never seen before space' while another mentioned the 'feeling of height' – all comments which illustrate that the sensory element had an impact of a number of users.

In terms of education, only 2 survey respondents referenced education in their wow-moment. For example, one said:

> *it came alive for me when the lectures and the content became one. Having a visual aid as well as an expert in that area really made it come alive and sparked much discussion.*

This enthusiasm appears to also apply to Google as a company, and not just the GE experience. When asked about their views of Google as a company in an open question in the survey, many respondents described it as an 'amazing' and 'innovative' company, further supporting the idea of Google's almost divine status (Hillis, Petit and Jarrett, 2013). The majority of survey respondents were also active users of Google products, most frequently using YouTube (93%), Maps (88%), Search (87%) and Chrome (84%). In terms of VR, 60.6% (N = 60) claimed they had never used VR prior to their experience with GE. The majority of survey respondents did say the GE experience was good or excellent (75%), yet a quarter of them said their overall perception of GE was poor or satisfactory (25%), as shown in figure 2 below. Similarly, 21% (N= 21) said they did not have a 'wow-moment, 11% were not sure, and 3% selected 'other'. Thus not all respondents were caught up in the excitement, as some of the 34% who did not have a wow-moment described their experience as 'okay' or 'slightly boring'.
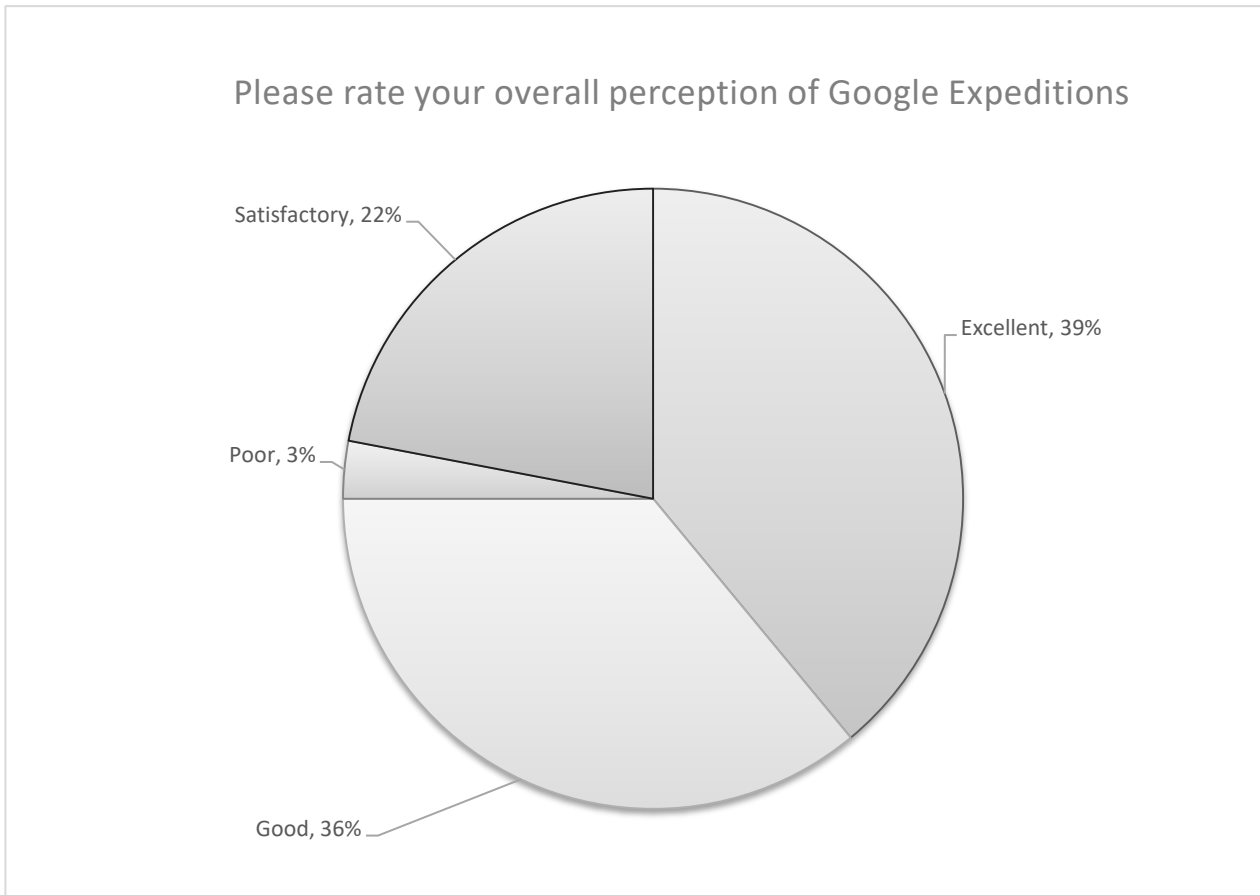
Please rate your overall perception of Google Expeditions

Satisfactory, 22%

Excellent, 39%

Poor, 3%

Good, 36%

Figure 2: Survey responses to the question 'please rate your overall perception of Google

Expeditions'

Figure 2 is important, because it seems that although only a slight majority, the 39% of respondents rating their experience as excellent – and as reflected in participant observers – this was not representative. In contrast, to the educational optimism and technological excitement of GE, just over a third of survey respondents (39%) expressed confusion and disinterest in GE, correlating with all of the participant observers' log entries noting participants who appeared visibly disengaged.

These survey results are supported through the participant observation, which noted two groups of participants – excitable and reluctant users. All observers noted that every group session was different. Each session explored different expeditions, some looking at 3-5 different expeditions and some looking at more. Every session was led by different staff members, some changing part way through, and some sessions involved students as expedition leaders. Some sessions were marked by distracted students and others by intensity and playfulness. Within this context, more reluctant users shared 3 primary motivations, namely resistance, discomfort or distraction, discussed below in turn.

Beginning with resistance as a motivation, there were three sessions with individuals who appeared withdrawn. Respondents sat at their tables, holding the Cardboard viewers on their laps or on the table in front of them and sitting quietly as if waiting for the experience to end. When approached, these respondents each spoke of particular issues. One student explained that she 'did not see the point' or the purpose of GE for her work or areas of interest. For this student, GE specifically and VR more generally, made no sense in relation

to her learning goals and discipline. The discussion was particularly striking as it was quite clear that it was not the technology that was confusing for her, but rather its purpose in a learning environment. Similarly, one staff member refused to lead the session she had signed up for, explaining that VR was unrelated to her subject area and that she didn't know (or want to know) 'how to use the toolkit' and did not want to risk using it in front of her students.

In another session exploring underwater excursions, two students expressed discomfort and some awkwardness, made visible through body language and silence. These students sat facing the Expeditions leader with their HMDs beside them. When asked how they were doing by the PI, both students described visual impairments which made it impossible to use the viewer, highlighting the visual primacy of GE and the importance of visual ability for engaging VR content. These students expressed discomfort and appeared excluded from the experience. The GE experience was not inclusive and did not account for visual impairments or disabilities. In addition, many participants with ordinary visual capabilities also struggled with the viewers and the 360 content, complaining of eye strain, nausea and headaches (e.g. rubbing of eyes and temples, verbal expressions etc.). Indeed, 53% of the survey respondents claimed there were limitations to GE, 20% of whom directly mentioned visual issues, such as not being able to wear glasses and/or getting headaches, nausea or dizziness. In this sense, discomfort, usability and visual ability were issues for over half of the respondents.

In terms of distraction, a point Neil Selwyn has documented in numerous studies (e.g. 2015, 2017), there were many instances where users appeared disengaged from the GE content. For example, one participant observer noted that one session was filled with students who 'talked the entire time, mostly to each other and concentrated most on taking pictures of the tool kit' (Observer 3, on the Underwater Excursions session). One expedition leader commented that 'it is difficult to teach students when they are excited about using a new technology. They talk and can't listen'. Another respondent said 'there is a fine line between learning well and getting distracted'. According to the survey, this issue impacted 1 in 6 respondents, as 14% expressed concerns about GE being 'distracting'. At times, these concerns accompanied positive opportunities, like allowing students to 'actively visualize what they are learning about' (survey respondent). For some, the technology may be distracting because it was interesting and for others, because it was not interesting. Regardless of whether users found the experience engaging or positive, many identified 'distraction' as both a risk and a benefit.

The final observation about the GE experience comes from the participant observers, who noted that successful engagement had more to do with the personal characteristics and teaching techniques of 'teachers' than of the GE toolkit. This points to the difficulty of properly assessing GE in terms of experiential or spatial learning and meaningful engagement. The observers described the *lecturer's engagement* – made visible through knowledge, tone, attitude and connection with students – as far more important than the technology. For example, observer 2 described one staff member as 'standing up instead of sitting down and making jokes in a dynamic tone' which meant that 'the class was much more attentive to the speaker than in the previous session' (Observer 2, on Roman Ruins session). Observer 3 made a similar observation about what she thought was the most engaged session *because the lecturer was engaged* – with students and with the content noting that the staff member's attitude:

> *made a big difference in student engagement – students were fascinated as well as being highly responsive and taking part in a very active discussion (Observer 3, on the 'Life of Matriarchs' session).*

Survey respondents also emphasized that the lecturer's engagement was directly related to any educational benefit. For example, in response to an open question on VR's educational value, survey respondents stated that 'it really depends upon the skill of the lecturer' and another said 'it is down to the teacher'. Based on these observations, the technology is secondary to the staff members, their knowledge, their competence and most importantly their connection with students. This observation leads to an important question about *why* GE was exciting for so many. Taken together, these findings – the organizational labour required to participate in GE, excitable and reluctant users, and the importance of engaged teachers – indicate that what I call 'disruptive play' is a crucial factor shaping users' experiences.

The 30 minute GE sessions were highly disruptive organizationally, educationally, technologically, and socially. In terms of organization, the GE experience took staff and students outside of their classrooms disrupting not only classroom routines, but also the ordinary flow of educational content to the content provided by GE. In terms of education, both staff and students became learners – studying a new technology and an innovative educational practice. Technologically, participants were exploring a new Google product, interacting with GE field assistants, 360 content, and the GE toolkit – all unfamiliar. Socially, participants were part of a bigger high-energy event. All of these were disruptive experiences. I argue that part of GE's excitement had less to do with the technology and more about this disruption.

Engaged educators demonstrate a capacity for managing these disruptions through an openness to the unfamiliar and a playful attitude to disruption. In response to the open survey question asking for any other comments, one staff member said 'I really enjoyed the opportunity and it was good to see colleagues at play'. This comment highlights the unusual nature of the GE events. The opportunity for staff and students to *play* was exceptional and offered huge experiential value. Thus, GE use reveals different patterns of engagement, both excitable and reluctant, pointing to the importance of engaged educators and their capacity to manage disruption and engage the technology and situation in a playful manner with better outcomes for themselves and for students.

However, in support of the application process, participant observation of GFE's follow up activities illustrate that GE is not only just one freemium service, but its roll-out is also a sophisticated empire building tactic, as explained below.

Platform empires: The GE 'roadshow'

In the days and months following the end of the GE experience with the pioneer program, GFE began sending invitations to additional events related to Google and G Suite Apps for Education. Based on participation in 5 of these events, each followed a similar format. First, guests were invited to network with other educators, including staff from 'Google schools' (institutions partnering with Google and exclusively using Google products like Chromebooks and G Suite Apps for Education), as well as other pioneer program participants. Event attendees came from all across the UK and sometimes, from other countries. Following the networking session, participants were invited to a large group session led by Google and Apps Events staff, where they were introduced to Google's

successful innovations like Google X's stratospheric internet project Loon (https://x.company/projects/loon/), cloud services, and an inside view on working at Google. Participants borrowed a Chromebook to use in guided workshops focusing on G Suite products such as Classroom, Expeditions, and e-Portfolios. Following these product demonstrations and pitches, guests were offered prosecco and gourmet snacks, to be taken with Google staff, AppsEvents teams and other participants, before being sent off home with a Google goody bag packed with branded stationary, stickers, and Google products like Google Cardboard.

It became immediately apparent that the purpose of these events was not to engage educators about their GE experience, but to feature GE as *one of many* GFE products available to educators for free. Some of these events did not even feature GE or its educational value, instead promoting Google's expertise in innovation and many other educational benefits.

Notably, these events were organized by AppsEvents, an independent company partnered with Google and responsible for providing G Suite training and certification across the globe. AppsEvents staff, like Expeditions staff, were not officially Google employees, instead they were outsourced on freelance contracts. Despite this relative precarity, both AppsEvents and Expeditions staff were on hand to speak to guests and answer any questions about Google products or training, with great optimism and genuine enthusiasm for GFE and its products (c.f. Watanabe and Crockett, 2016). For example, AppsEvents' define their primary goal as providing 'amazing Google PD [professional development] for Educators, to give them the tools and the inspiration to take their work to the next level' (AppsEvents 2017). It is notable that Google staff and partners maintain a high level enthusiasm at every point of interaction with educators and learners, consistently promoting GFE's public facing educational values. This enthusiasm is perhaps best demonstrated by Jen Holland, one of GE's product managers, when she explained that they offer free products to educators because Google 'believes education is important' and that they 'love teachers and students' (AppsEvent talk, 2016).

Lindh and Nolin (2016) refer to this positive framing as deliberate subterfuge, actively obscuring Google's business model by presenting altruistic motivations around the value of education and technological solutionism. Indeed, the celebratory rhetoric of GE – whether bundled into G Suite Apps for Education or as its own standalone product– presents 'Google as a free public service, divorced from marketplace contexts and concerns' (Lindh and Nolin 2016, 7). It was only during participant observation at these events that additional evidence of this deliberate disguising of Google's business model came to light. First, internally, Google staff and partners widely refer to the pioneer program as 'the roadshow', which is a cross between celebrity performance and a touring set of promotional activities intended to sell products and secure buyers for G Suite Apps for Education products. The 'roadshow' reference was not intended for public use, yet it lays bare the sophisticated marketing techniques used on participants from the very first moment of application.

The pioneer program and the roll-out of GE is extremely sophisticated. In addition to the value of disruptive play, many educators face increasingly extreme work conditions and are not only vulnerable to Google's seductive and appealing overtures, they are also in need of help. For example, one interview respondent states:

> *I do have to say, even if there is an angle from any company trying to get into the youth market and trying to embed it in classrooms as well to get teachers to be reliant on these different things, I have to say that if it helps learning, I have no problems with it whatsoever. As an experience it [GE]*

was phenomenal and it was all free. Considering the changes with money in education at the minute as well, the restrictions we have, the ability to go on expensive trips, this was a completely different way of doing things. It helped teachers, which is I guess the most important thing (Patrick, primary school teacher and GE lead, interview 2017).

Patrick, like many other educators, is aware of the ways in which Google may have 'an angle' for providing GE for free, yet given diminishing resource and the impact of austerity on education, Patrick – like many others – literally cannot afford to be critical. The reality is this educator is willing to make this trade-off because the free 'phenomenal experience' is worth it 'if it helps teachers'.

Conclusion

In summary, this paper examines the meaning and experience of GE for users and for its broader social and economic implications. The findings are both simple and complex.

They are simple because the GE experience as reported here demonstrate clear benefits – tremendous excitement and enthusiasm, educational enrichment, and many instances of engagement with new technologies – and playful approaches to learning. The findings are also complex because these dynamics are also contradictory. Just over a third of respondents (N = 35%) were more reluctant, less excitable and less moved by Google's powerful status (c.f. Selwyn, 2015, 2017; Buckingham, 2007). In terms of use, there are conflicting tensions about how GE works differently for some users. Yet, the dynamics of use also tell us a story about technological utopias. In this case, GE promoted by Google, reported by press and reiterated by the majority of respondents in this case (65%) as exciting and innovative quickly becomes the dominant narrative.

Looking closely at the GE experience reveals the importance of non-technological factors – like *human connection*, *knowledge* and *competence* in teaching and learning – as illustrated by disruptive play. Disrupting classroom routines and learning flows appears to be beneficial for those who are able to manage change, experiment with new tools and roles (e.g. students as teachers and/or teachers as learners), and encourage these approaches in learners and others around them. Disruptive play show that the technologies are secondary to the educators' skill sets and attitudes, particularly in managing the GE experience as one to aid rather than replace engagement with learners. In many ways, this marks the power of 'disruptive play', especially effective for educators by implicitly breaking routines and forcing a kind of educational play with teaching strategies and techniques. This is important, and rests somewhat uneasily alongside the excitable use and seemingly high levels of engagement experienced by the majority of respondents.

Google's innovation rhetoric is also about creating particular kinds of subjects beginning with the internalization of Google's platform values (e.g. 'Googleyness'). The GE roadshow is also about enrolling ordinary people to voluntarily extend the Google universe, for free. The 70 million GFE and GE users are also *working* for Google in exchange for the promise of educational and personal enrichment. This is the heart of GFE's expansion strategy, one that resonates with those outlined in existing literature addressing Google's soft power, platform and surveillance capitalism, and data colonialism (Srnicek 2016; Zuboff 209, Couldry and Mejias 2018; Sandoval, 2014; Fuchs, 2014; Hillis et al., 2013). Thus, GE is an amazing example of Google's power to make, push and define the terms of educational engagement and to stake claims on educational futures.

Google may or may not be instrumental in radically changing tomorrow's classrooms, but GE shows how Google is extending its product universe further and deeper into public institutions, while embedding younger audiences into early brand loyalty, path dependencies, as well as into Google as a social infrastructure. The educational landscape is facing brutal austerity, leaving gaps for tech giants like Google to fill, shape and colonize. In this sense, GFE's support of learners and educators comes at a time where play and excitement are desperately required.

So these findings are complex, because although we can see obvious between educational enrichment through additional resources, cost-savings, support for teachers *and* learners, and all the benefits of disruptive play, we can also see Google's aggressive platform colonialism. The GE roadshow is a seductive marketing tour for Google, thinly disguised as an altruistic educational initiative because Google 'loves teachers and students' (Holland 2016). The invite-only events were an important although externally invisible part of the GE roadshow, and it is here that educators were wined and dined not only with the promise of free Google products and services, but also with the promise of care and educational enrichment. In these ways, the roadshow is a brilliant way to encourage playful engagements while also extending the platform's scale, scope and reach. It is only through participant observation of the pioneer program – before, during and after – that the extent of GE as one tactic of Google's platform colonialism has become apparent.

In closing, this project documents one institution's experience with the pioneer program, finding real tensions between educational enrichment and platform colonialism. While this is a valuable contribution to education and technology studies, many more questions need to be asked, including the question of what is really at stake in this balance between enrichment and colonialism? What are Google extracting from schools, where does it go, and how are they making profit – economic or strategic – from this work? And most importantly, what are the real implications of extending Google's role into young people's lives and into public infrastructures and social institutions?

Acknowledgements

Biography

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