

Authentic game-based learning and teachers' dilemmas in reconstructing professional practice

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Teachers who attempt pedagogical innovation with authentic digital games face significant challenges because such games instantiate open systems of learner activity, inviting inquiry learning rather than knowledge acquisition. However, school environments are normatively sanctioned cultural spaces where direct instruction and high stakes tests are *de riguer*. In this paper, we draw on the conceptual frame of dilemmatic spaces to illuminate the dilemmas teachers encounter when attempting to reconstruct professional practice in the classroom. We worked with nine teachers who enacted the Statecraft X social studies curriculum. Drawing on coded interview data, our findings suggest that teachers are forced to wrestle with tensions engendered by misalignments that emerge from the innovation's tacit requirement for change and the system's inherent gravitation toward maintaining the *status quo*. A school culture that cultivates innovative practice based on greater teacher agency is needed for authentic game-based learning to find traction in the classroom.

Keywords: dialogue; game-based learning; professional practice; teacher dilemmas

Introduction

Interest in the use of digital games for learning has risen steadily spurred by the writings of Prensky (2001) and Gee (2007) among others. The 2012 edition of the New Media Consortium's *Horizon Report* (Johnson, Adams, and Cummins 2012) forecasted a time-to-adoption horizon of two to three years for the take-up of game-based learning in education. However, evidence of widespread adoption is still lacking.

The objective of this paper is to examine some impediments to greater take-up of game-based learning in the classroom. A deeper understanding of challenges should help education leaders identify measures that can enhance take-up. Given this goal, our examination centres on teacher dilemmas that arise with the use of authentic games—games possessing the complexity of player challenges and comparable in look and feel to commercial off-the-shelf games—designed specifically for educational ends. Through our research, we identify and give voice to teacher dilemmas that arose in the course of a project that helped teachers appropriate game-based learning in the classroom. Given that institutional workplaces are normatively sanctioned cultural spaces, teachers’ professional conduct in the multi-layered and intertwined reality of classrooms, schools, and educational systems entails moral commitments that arise from taking positions and making value-laden choices, (Kelchtermans 2013). Progressive teachers who embrace pedagogical innovation often run into barriers because innovation inherently requires change but stable and entrenched systems gravitate to preserving the *status quo*.

Despite Dewey’s ([1900] 1990) injunction that learning in school be made deeply relevant to the life of the child, school learning tends to remain disconnected from the personal lives and interests of children (Engeström 1991), maintained by bureaucratic forces and power structures that yield to the lure of technical efficiency in executing the social mandate of schooling. In such a climate, educational innovation, which necessarily entails teachers reconstructing their practices, becomes a serious challenge. The present globalised era requires learners to develop the disposition of critical interrogation and the habit of thinking for themselves so that they can deal with accelerating change, instability, and multiplicity. Students

must also foster the capacity to wrestle with meaning (as a verb) and learning within a 21st century context of innovation and creative production (Araya and Peters 2010). To meet this need, educational change predicated on the remaking of pedagogies is essential (Luke 2006). Redesigned pedagogies require teachers to refashion their ways of Being in the classroom because lived practice is irreducible to adherence to a set of rules extracted from descriptions of expert behaviour (Bourdieu 1990). A capacity for performance (Bell 2008, Schechner 2003), manifested as the real-time coordination and integration of knowledge and skills raised to the level of enactive capacity, is required. A higher-order goal of our research project is thus to reconstruct possibilities related to schooling for a better educational and social future.

In what follows, we first critically examine the literatures of game-based learning and teacher dilemmas. Second, we describe the educational game we used in the context of the social studies curriculum that employed the game. Third, we articulate our research methodology and approach to data analysis. Fourth, we present the findings from our research. Finally, we discuss these findings in the context of the current literature-base and offer our conclusions and challenges for policy makers and educational stakeholders.

Examining research in game-based learning

Evidence for the efficacy of game-based learning is reported as scant (O'Neil, Wainess, and Baker 2005) and mixed (Iacovides et al. 2012). De Freitas (2006) reports scepticism about the efficacy of games as a learning tool. A meta-review of literature by Young et al. (2012) suggests that evidence of learning effects was found for games on language learning, history, and physical education, but not for games in science and mathematics. A separate meta-review by Connolly et al.

(2012) suggests that computer games are impactful primarily for knowledge acquisition and enhancing motivational outcomes. Given the disparity of claims, a more sophisticated understanding of research in the field may be helpful.

Several issues require elucidation. The first issue concerns the purpose of the educational game being used. Prensky (2001, 145) defines game-based learning as the combination of ‘computer video games with a wide variety of educational content’ to achieve outcomes no worse than traditional (content-centric) instruction. Educators and researchers who view games primarily as vehicles for content learning hold the layperson’s view that the purpose of schooling is to acquire knowledge. In this light, learning is understood to be quantitative in nature and hence assessable in terms of countable output. Thus, they speak positively of having accomplished ‘more learning’ when using games (de Freitas 2006). In contrast, Gee’s (2007) literacy oriented formulation foregrounds the development of learner identity that is accomplished through active learning, mastering semiotics, and engaging in situated meaning making through role taking in immersive game environments. This latter orientation emphasises literacy as a lived practice and the development of enactive capacities associated with enacted roles; for example, the role of a chemist or citizen. From this perspective, learning takes place in the first person, not the third person. Learners ‘learn to be’ (some kind of person); they do not merely ‘learn about’ (some subject content propositionally) (Thomas and Brown 2007). The outcome of learning is a capacity for performance in the real world. It is not merely a capacity for producing representational inscriptions of a predetermined type in a canonical form on high stakes tests. Games-to-teach follow the tradition of multimedia computer-aided instruction and instructional machines *from* which

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students learn, but games-to-learn position the authentic games as tools *with* which students learn within a broader social context (Chee in press).

The second issue concerns game type and complexity. Bate, MacNish, and Males (2014) draw attention to the fact that, at one extreme, a game might be constituted by simple drill and practice questions triggered by the roll of a simulated dice, while, at the other extreme, a game might be characterised by multiple participants engaging with a range of sophisticated media-rich immersive activities involving complex and intelligent feedback over an extended duration. There is no reason to expect the two games to have equal efficacy with respect to learning. Game type and complexity are necessarily a function of educational purpose. Games are not created equal. Serious confusions and errors arise from over-generalising across game instances that are more dissimilar than alike, other than sharing a common abstract category: namely, ‘game’.

The third issue concerns unenlightened pedagogy. Authentic digital games support meaning making in highly situated contexts. They entail first-person experiential learning and embed spaces for deep reasoning and inquiry. Students need to identify, frame, and solve problems involving complex activities that, by design, simulate realistic situations requiring decision-making and follow-up actions that have pertinent in-game consequences. Such games neither contain nor focus upon deriving ‘right answers.’ There are only better or worse game play outcomes relative to user-determined goals. An informed pedagogy must support and facilitate meaning making, not merely the production of approved ‘right answers.’ Unfortunately, much of game-based learning research is taken up with enhancing student motivation for learning content. There is little need for pedagogical innovation if knowledge acquisition is the goal.

The fourth issue concerns the widespread practice of ascribing causal attribution of learning effects solely to technology. Selwyn (2011), however, argues the importance of paying attention to the network of social relations that surrounds and envelopes the use of digital technologies in schools. Games do not ‘work’ or ‘not work’ in the classroom in and of themselves. They possess no causal agency. The efficacy of games for learning depends largely upon teachers’ capacity to leverage the game effectively as a learning tool and on students’ willingness to engage in game play and other pedagogical activities—such as dialogic interactions for meaning making—so that game use in the curriculum can be rendered effective. In short, teachers and students need to work to make pedagogically-informed game-based learning curricula work (Chee 2013).

In sum, authentic games invite teachers to engage with classroom pedagogy differently. Learning to enact a new pedagogy can, however, be a challenging experience.

Teacher dilemmas

Teachers frequently face dilemmas in their professional work. Dilemmas arise due to ambiguity concerning the roles of schools in a changing society (Ben-Peretz and Kremer-Hayon 1990). Teachers wrestle with dilemmas throughout their professional learning journey. Student teachers’ dilemmas tend to focus on instructional decisions and student performance (Talanquer, Tomanek, and Novodvorsky 2007) while senior teachers wrestle with issues of professional identity and dealing with gaps between ideology and reality (Ben-Peretz and Kremer-Hayon 1990).

Berlak and Berlak (1982) classify teacher dilemmas into three types: those relating to control, to curriculum, and to social norms. Dilemmas emerge from a

clash between a teacher's personal and subjective values and a non-congruent classroom reality. They entail messy situations that grant no simple 'right' answer. Typically involving moral choices, they are frequently dealt with by means of satisficing or left unaddressed altogether given the absence of a ready solution (Cuban 1992).

Dilemmas constitute an inescapable part of educational practice and research. They are unavoidable given the relativism of knowledge and different notions of what constitutes 'truth' for teachers, for their pupils, and for those who set and examine the curriculum. Because there are no inherently 'right' answers, dilemmas always leave 'a residue of guilt' or a 'remainder of regret' whatever the course of action eventually taken. Denicolo (1996, 63) suggests that such tensions can be productive for professional learning if they trigger deep reflection that leads ultimately to emancipation: the process 'could not be transformative without being challenging, nor could [teachers] own the direction without it being arduous.' Teachers often make sense of such professional learning through the construction of personal narratives (Mehrotra, Chee, and Ong 2014).

Honig (1996, 258) holds that dilemmas pose the question of difference and the ineradicability of conflict in settings such as that of professional practice. Difference 'is what identity perpetually seeks (and fails) to expunge, fix, or hold in place.' She proposes the construct of a *dilemmatic space* as the conceptual space within which moral subjects are positioned on multiple, conflictual axes of identity, such that the subject's agency is constituted and enabled by dilemmatic choices and negotiations. From her perspective, socialised human beings, as moral beings, inhabit dilemmatic spaces as a matter of course. From this, there is no escape.

A dilemmatic space establishes a relation between human subjects and their identities (Fransson and Grannäs 2013). With respect to professional life, dilemmatic spaces contribute to forming and constituting teachers' professional identities in relation to students, head teachers, parents, and policy-makers. Chronaki and Matos (2014) argue that teacher change and identity development can be teased out through the varied discourses of teachers enacting change. Teachers' identities and pedagogical beliefs are central to how they enact change (Ertmer 2005, Goos 2005). Enacted change occurs within the constraints of the realm of the possible, which Valsiner (1997) refers to as the Zone of Free Movement.

Research context: the game and curriculum

Our research takes place in the context of the Statecraft X social studies curriculum, designed for 15-year-old students. The curriculum is based on a performance pedagogy operationalised through play and dialogue (Chee 2011). The *Statecraft X*TM mobile game is played on Apple iPhones®. It addresses the topic 'principles of governance,' one of four key topics in the social studies curriculum for Secondary 3 students. An important component of game-based learning is that students learn through role taking. Thus, at the commencement of the game, each student is assigned the role of a town governor in the medieval kingdom of Velar, with total responsibility for the functioning of the assigned town and the happiness of its citizens. Figure 1 shows an overview of a player's town. The four circular buttons on the right execute actions related to housing, resource production, health care, and defense. The indicator panes on the top of the game interface show the current population of the town and its resources. Players, as governors, belong to one of four races: trolls, dwarfs, elves, and humans. Players also belong to one of four factions—Dragon, Phoenix, Griffin, and Pegasus—where a faction represents

an ideological grouping akin to a political party affiliation in the real world. Thus, each player has a race and belongs to a faction.

Insert Figure 1 about here

As a governor, each player must attend to the basic needs of the town's citizens, ensuring that there is adequate water, food, housing, and health care. In order for these benefits to be available, citizens need to be employed and put to work at the different facilities related to water and food production, the building of houses, and the provision of medical services. In short, a viable economy must be set up. The economy's viability is entirely dependent on the specific choices and actions taken by governors. These include the number of citizens employed at each facility, the amount of wages paid, and the number of units of output to be produced. As the game progresses, new layers of complexity are overlaid. Players, as governors, need to engage in trade when they find that they need wood and ore to build factories, but their town produces either wood or ore but not both. They have to keep citizens happy and maintain inter-racial harmony. They also have to establish their town's defenses to repel bandit attacks initially and counter a foreign invasion at the climax of the game. The students thus learn governance by governing, and they continuously make value-laden choices in game play. Their actions lead directly to in-game consequences. Depending on whether and to what extent they cooperate with other factions to defend the kingdom or fight for each faction's local interests at the expense of preserving the nation's sovereignty, students learn in a visceral way what it means to govern a nation. They do not merely learn *about* governance.

To enact the curriculum, each student is loaned an iPhone® with a supporting data plan paid for from project funds. Students play the game in their own time, outside of curriculum time. Being a mobile game, students can play the game anywhere, including in school, at home, while on the road, and at any other location with wireless network connectivity. The 24/7 nature of the game helps impress on them the reality that governments do not have the luxury of ‘off days.’ Significant disruptive in-game events, such as the onset of epidemics, often take place after school hours and during weekends. With a typical class comprising 40 students, we divide game play into two independent game sessions of 20 players each. That is, we run two separate instances of the game during each cycle of the curriculum. Students in each game session are divided into four factions with five students in each. Teachers do not participate in game play. Instead, they monitor it through a Web-based tool.

In class, teachers engage students in dialogue to help them make sense of and draw meaning from the events and processes of game play. Our dialogic pedagogy is based on Bakhtin’s (1981) notion of dialogue. It is rooted in notions of voice, answerability, and expansive learning conversations. It seeks to cultivate a multi-perspectival understanding of the complexities and value-ladenness of government choices, decisions, and actions. Unlike Socratic questioning which seeks to converge onto a ‘preferred’ answer, dialogue is expansive and helps students to understand, and possibly contest, the bases of ‘preferred answers.’ This mode of learning affords genuine social inquiry and the interrogation of ‘truths,’ myths, and values.

Two teachers facilitate student dialogue, with one teacher assigned to each group of 20 students. Given the nature of dialogic pedagogy, teachers need to elicit

student articulations and build upon them in a coherent fashion to distil key ideas at the end of each classroom session. To do this effectively, teachers need to think on their feet because they cannot know in advance what ideas and issues students will give voice to in class. In general, teachers find this challenging because formal pre-service teacher preparation does not equip them for this (Loughran, Brown, and Doecke 2001). As Wells (2010) attests, the challenges of enacting dialogue in the classroom bring to light deeper systemic issues—such as epistemological, institutional, and community factors—that often create predicaments for teachers. Notwithstanding, with professional development support, as detailed in the next section, we have obtained demonstrable student learning improvements with several of our collaborating teachers. Examples of such student gains are documented in Chee, Gwee, and Tan (2011) and Chee, Mehrotra, and Liu (2012).

Research methodology

We adopted the methodology of a collective case study (Stake 2006). Our data draw upon nine individual case studies, representing the nine teachers with whom we collaborated. Our research work in schools took place between January 2012 and February 2013.

Participants

Nine government secondary school teachers participated in our study. They taught social studies to 15-year-old students in either the Express or Normal (Academic) stream. Table 1 summarises the profiles of the teachers and their teaching contexts. Two teachers, indicated as mid-career switch teachers, came into the teaching profession as a second career.

Insert Table 1 about here

The nine teachers came from five schools. The principals of Dover and Norwich schools (all school names are pseudonyms) were demonstrably supportive of their teachers' experimentation with the game-based learning curriculum. Support in Dover was manifested by the presence of the Humanities Head during the lessons and ongoing interest in the research expressed by the school's Vice-Principal. In Norwich, support was derived primarily through the school principal's positional authority and endorsement of the project in his school. The principals of Cumbria and Xavier schools endorsed their teachers' participation in the project, but there was little evidence of further personal interest. Teachers in Plymouth had support from the Social Studies Head only. The teachers were informed about the broad goals of the research, and they signed a consent form prior to participation.

Materials

The teachers were introduced to the *Statecraft X*TM game as part of the initial professional development workshop they attended. This workshop required them to play the game as a student would for five consecutive days: a compressed duration compared with students who play the game for approximately 16 days. Teachers were given special access to the game's web-based Teacher Administration Tool so that they could monitor how the student factions were faring in the game. They also used this tool to share the Economic Wealth and the Citizen Happiness graphs generated from the game play statistics with their students. Teachers were familiar

with these graphs and knew how to interpret them in relation to emerging patterns of game play.

Procedure

Each research intervention cycle lasted three consecutive weeks, with six social studies lessons in total. Lesson duration varied between schools, with a range of 45 to 60 minutes. Teachers were interviewed prior to commencement of the research. Post-lesson dialogues were held after each of sessions 2 through 6. A set of structured interview questions was used to guide initial post-lesson conversations. These questions receded into the background as teachers increased ownership over the content and direction of the conversations. The post-lesson dialogues were organised to create a space for teachers to reflect on how they conducted their just-concluded lessons. They were also intended as cogenerative dialogues (Tobin 2006) wherein teachers and researchers could construct a common understanding of difficulties encountered and propose how the difficulties might be collectively addressed. All dialogue sessions were audio recorded. Each session lasted from 30 to 60 minutes. These recordings constitute our research data.

Data analysis

We transcribed our corpus of teacher interviews that comprised approximately 40 hours of conversations with teachers. The transcripts were systematically organised and labeled to facilitate ready identification with respect to teacher and interview session. Two coders carefully transcribed the interviews and crosschecked between themselves to resolve ambiguities.

The coding process was marked by three distinct phases. In the first phase, we sought to distil, categorise, and organise ideational units in a bottom-up fashion

with a view to identifying coherent conceptual motifs in teachers' talk. The primary aim during this phase was to obtain a feel for the data and to construct an initial scheme of first-level categories and sub-codes. In the second phase, our coding began to accommodate elements of the appropriation model of innovation uptake that framed our research (Chee and Mehrotra 2012). In the third phase, as transcripts from additional teachers were incrementally considered, differences between teachers became increasingly apparent, and this led to the addition of a further major category, that of teacher identity. The entire coding process was marked by incremental refinement, wherein sub-codes were added, moved, and regrouped until a stable and parsimonious set of codes was achieved. The coding scheme became final in version 8. We used NVivo version 9 to support the data management and coding process.

Findings

In this section, we present our findings of dilemmas that teachers experienced in appropriating the educational innovation of game-based learning. The cited instances are necessarily selective. They were chosen so as to effectively illuminate how teachers are caught in a vortex that pulls in opposing directions due to tensions between an old professional practice and a new one.

Schoolteachers perform their work in the context of institutionalised practices established by the educational system that employs them. These systems are inherently social, with appointed agents representing the 'face' of the system and perpetuating its practices. *De facto* cultural norms are an inescapable part of professional life. Teachers inhabit the dilemmatic spaces that such norms produce. Innovation implies doing things differently. Being different from what is normative inherently invites pushback. In such situations, teachers constantly face the

question: ‘How do I respond to this situation or event?’ Based on our data, we identify and illustrate four distinct circumstances, relating to the educational system in which the innovation was adopted, which gave rise to teacher dilemmas.

Resistance to/discomfort with a new mode of teaching and learning

Teachers who do things differently from what students are accustomed to invariably invite a reaction. Teacher E, referring to her class of 43 students, said:

But these other one third, they are more traditional in their learning. Like for example if I tried to get . . . like for example normal group work, and I ask them to learn things on their own and try to translate it into essay with arguments and perspective, these are the students that will say ‘I don't want to do this, why don't you just give me the answer?’ kind . . . yeah, that was where I'm coming from.

Teacher E shared that a third of her students were ‘traditional learners’ of social studies: a phenomenon mirrored across the schools, but more strongly evident in Plymouth. Her students, as stakeholders in a stable educational environment, had become habituated to reading the textbook with the aim of memorising content for subject tests. Consequently, they were resistant to the mode of inquiry learning and dialogic reasoning introduced by the game-based curriculum. The new mode of learning required a different kind of intellectual ‘hard work’ they were unaccustomed to. In addition, they needed to invest time and effort playing the game with their peers. The whole process appeared to them circuitous and unnecessary given their tacit epistemological belief that the purpose of going to school is to ‘acquire knowledge.’ Hence, they preferred to aim for the bottom line they perceived as important: *the answer*. Should a teacher push back against such deeply held beliefs? Might that be a losing battle?

Teacher B shared the reaction of a student designated as an overseas ‘scholar’ in her school. When informed that ‘we will not go back to the textbook, we will just move on to the next [topic in] the syllabus,’ the student was ‘very, very concerned’ because ‘y’know results come first more than game.’ As an authentic digital game, *Statecraft X™* does not ‘teach’ the four doctrinal principles of governance contained in the social studies textbook in the form of propositional statements. Rather, these otherwise inert ideas are given form and ‘brought to life’ in and through students’ thoughtful game play. Through inquiry, students are invited to construct their own principles of governance and compare them with the normative ones. In the hands of a skillful teacher, students learn much more than inert principles that garner the ‘results’ in standard tests that the particular student was so concerned about. Students learn those principles because the game was designed to support the distillation of the four doctrinal principles but, more than that, they learn *why* the principles make good sense within a system of democratic government. (Playing the game in a manner directly opposed to a principle—for example, the principle ‘anticipate change and stay relevant’—leads directly to adverse consequences in the game.) In light of the scholar’s comment, Teacher B felt the need to make it clear to her students, at the closing session of the curriculum, how game-based learning had contributed to their learning: ‘we need to make it explicit to them’ so ‘they don’t think they are being shortchanged.’

Referring to her students, Teacher A said:

I think they had their misgivings, they had their doubts, they weren't sure where it was all going. But then um as the dialogic sessions got better, um I think they feel more confident about this curriculum. They feel more sure about the curriculum like it's not going nowhere and it's not just a trial and error thing, because I think the kids can be quite skeptical sometimes. They can take that very skeptical perspective like ‘oh it's another initiative from

dunno where and then we are just the guinea pigs’ – some of them told me ‘are we the guinea pigs?’

Unlike students in Cumbria, Plymouth, and Xavier, those in Dover and Norwich schools were exceptionally bright and had the capacity to manifest the skepticism illustrated here. A teacher must work extra hard to garner the buy-in of students who remain skeptical despite a teacher’s best efforts to explain the rationale of the curriculum prior to its commencement. This challenge is a concrete manifestation of a chicken-and-egg conundrum because evidence of students’ effective learning can be derived only *after* successful completion of the curriculum innovation, not before. Yet, students, quite reasonably, wish to have the evidence in advance.

Quite remarkably, there appears to be an undercurrent of resistance amongst teachers themselves, broadly speaking, to the adoption of game-based learning in social studies. Teacher C indicated that a likely reaction from some of her colleagues would be, ‘some of them are like “okay just teach the kids what they need to do. That’s it. That’s done.” Yeah. Maybe not that [referring to the game-based curriculum] . . . that will get a lot of resistance actually.’ As a responsible education professional, how should a teacher respond to such peer sentiment: brush it aside or blush in awkward embarrassment?

The examples cited in this section illustrate how change is often unwelcome in systems that have attained a stable state of equilibrium. Change can cause discomfort. It can be perceived as a threat to long-standing practices associated with an established ‘way of life.’ Teachers who undertake innovation must forge ahead on the strength of personal conviction.

Teachers' perception of system requirements and normative expectations

Teachers often feel they have little freedom to do anything other than the education system's bidding. Teacher D reported:

. . . sometimes stakeholders in school will have different ideas – they want to finish the objectives and syllabus, they want to finish this particular part, they have this pen and paper exercise that you must do. And to be honest um, some departments are actually very rigid about such stuff.

Department Heads in school usually establish the prescribed content and assessments that teachers must assign their students, together with when these items must be completed. A standardised across-level schedule is followed to enable the administration of common tests.

In Teacher H's school:

I think they have never restricted the way we want to teach at all in this school. We are given full liberty like to teach in any manner we want and AS LONG AS we stick to . . . as long as students are able to answer the questions according to the topics uh . . . according to syllabus. So as long as we meet that target, we are free to teach in whatever ways that we want. [Words in uppercase denote speech emphasis.]

The instances above illustrate teachers' restricted agency and limited space for innovation. Accomplishing the agenda of the formal curriculum, based on its associated modes of assessment in terms of 'answering questions according to the topics' is of paramount importance in the dominant school culture. There is no room for negotiation on this matter.

Teacher A further reminisced:

Umm I think my belief would be that if we truly believe in something, we have to push very hard for it, very hard. We have to. So um, . . . I think we can

always propose and we can always try out. But I think the end point would be . . . will it lead to good results. So I think if you try out something and it does lead to good results, then they call it ‘is it quantifiable?’

Teacher A’s school appeared to have a more accommodating professional culture compared with that of Teacher H. Notwithstanding, teachers there still had to ‘push very hard for it’ if they wanted to do things differently. Unfortunately, even when good student results are produced, the question posed to teachers is: ‘Is it quantifiable?’ The teacher’s sense of pain is palpable. How should a teacher respond? Is ‘good citizenship education,’ a key aim of the social studies curriculum, quantifiable? These tensions, reflecting a deep bias in favour of reductive, numerical ‘evidence,’ exemplify the dilemmatic space that teachers inhabit.

Pressure to ensure students score high marks on standard tests

When asked how she was feeling about her classroom teaching near the end of a curriculum intervention, Teacher E responded:

Worried, because in the end of the day, I'm a teacher (and) I need to produce the results. As in not like produce results, but I need to have results. So I'm worried in a sense that I don't know how they will fare in the next test.

We can empathise with Teacher E’s acute sense of worry. Not only was she aware of her need to ‘produce results’ (high marks by her students on the next test), but she also felt the desperate need to actually *have* them in hand. We may also detect a sense of fear: the fear of being judged a non-performing teacher by her superiors. This situation placed Teacher E in a real dilemma. Pedagogical innovation always introduces perturbation to a teacher’s habituated routines, and a non-trivial amount of time and practice are needed for new teaching routines to become habituated. Given that Teacher E only enacted the game-based curriculum once, the

development of her new professional skillset was still a work-in-progress. However, she felt as if ‘judgment day’—‘the next test’—was just around the corner because she feared being seen in a poor light if her students did not score well on the upcoming test.

Teacher D coped with the pressure he faced in an altogether different way. He said, ‘ . . . how others view my performance, to be honest right, I don't care. [Slight laugh.] Because I know uh that at the end of the day I answer to my students.’ Teacher A, in similar fashion, felt that ‘I've also learned that sometimes you can't be too worried about what people think. At that point in time you just do what you feel is important, what is right, if it worked out well, great. If it didn't work out well, then just reflect what went wrong. That's it.’

These excerpts elucidate the very real pressure teachers face to ensure that the target learning outcomes, indicated by high marks on standard tests, are achieved. Teachers respond to and cope with this demand in uniquely individual ways. Teacher A had the support of her school Department Head. This Department Head went out of her way to personally observe both her teachers’ lessons. Hence, she was fully aware how the lessons were proceeding and what pedagogical issues her teachers had to grapple with. Teacher A thus had the benefit of a safe department environment within which to work. Regrettably, Teacher E did not have the same privilege. The much weaker support offered to Teacher E, coupled with the fact that she only had one opportunity to enact the curriculum, significantly impacted the degree of success she experienced.

Weak alignment between mandated and innovation-based forms of assessment

There is a common saying that ‘content is king.’ Teachers with whom we worked seemed to have this idea deeply etched into their consciousness. Teacher H said:

I would say that this package will only cover the concept of governance in the broad sense, but not so much the textbook and expected answer sense. Because in the textbook there are expected content that they are supposed to know like ERP, COE, and the other, other systems that ensure that Singapore has a smooth traffic for so-called, but of course, this is not covered in Statecraft, so these are still relevant questions that will be coming out in the exams and we still have to teach them and it comes under governance.

The formal social studies curriculum, a nation-wide curriculum, mandates that students know content related to implemented government policy, such as electronic road pricing (ERP) and certificates of entitlement (COE) that are used to control road usage and the car population. While requiring students to know about these aspects of government policy is reasonable, a difficulty arises when this information is assessed as inert content that takes the form of predetermined ‘expected answers.’ As previously indicated, game-based learning provides natural support for pursuing inquiry. Because of this, assessment in the Statecraft X curriculum was based on a student essay that focused on governance in relation to citizenship, not on factual content. The essay was graded using a rubric directed toward student voice, agency, critical reasoning, and active citizenship. This alignment between the form of assessment and the goals of the curriculum are essential on entirely logical grounds. Unfortunately, outcomes of the curriculum carry little weight if an educational system that does not validate them. Given that teachers are not in a position to vary the nationally mandated forms of assessment, they are caught in an inherent conflict between old and new forms of assessment. As Teacher G shared:

After Statecraft lesson . . . Okay because it's about governance right so I have to revisit the textbook again because textbook also have different components of governance – what it means to be a good governor. Okay so I have to revisit that content again. . . . Now is why I need to spend time on the content is because the content is a must.

By design, Statecraft X's dialogic pedagogy does not preclude teachers from bringing in ideas found in the social studies textbook and building connections between textbook content and experience of game play. It actually actively encourages teachers to develop these relations through its dialogic stance. However, given the limited contact time schools allocate for teachers to address the topic 'principles of governance,' it frequently happens that teachers trade off curriculum time to drill students on content in the manner demanded by the standard mode of assessment. After all, this is how teachers customarily spend available classroom time. Teachers thus face a grave dilemma. The game-based curriculum 'forces' them (together with their educational leaders such as the Department Head) to reflect on what their priorities are. If they wish to adopt the game-based curriculum, they must then look for practical ways to strike a balance between two learning goals that are not perfectly aligned. Taken as a whole, it is all too easy for teachers to view themselves as choosing to do unnecessary 'extra work' if they elect to enact the Statecraft X curriculum. Understandably, teachers do not respond positively to this prospect.

Furthermore, the standardised social studies assessment comprises two types of questions: structured essay questions (SEQ) and source based questions (SBQ). SEQs are content centric. In Teacher C's words, 'it's a content thing for the SEQ.' It also requires that answers be presented using a predetermined 'conventional structure.' In this regard, Teacher B said, 'after this whole thing right this whole project, definitely as teacher we need to teach them the conventional structure that will come out for "O" level next year.' Regrettably, this form of exam-oriented student prepping amounts to 'extra work' once again.

The greater assessment challenge, however, relates to the SBQ. Teacher A explained:

If I throw them a source-based question, and I say ‘do it now,’ they will fail. They WILL fail. Because . . . It's not just about content; it's about the answering technique. So they don't have that and that would yeah, that is 50 percent of the paper.

The ‘answering technique’ referred to by Teacher A concerns the standard curriculum’s requirement that students be taught to critically appraise data sources in terms of their reliability and seeing beyond the ‘face value’ of information. They must be able to make comparisons, inferences, and cross-references between provided sources. Teachers feel the need to hone students in ‘answering technique’ so that they will score high marks when they sit the test. As Teacher A said, ‘in preparation for the common test, but probably they need some practice – extra practice.’ Practice and extra practice requires extra time, but time is a luxury that teachers do not have.

Teachers are thus caught in a double bind because their professional performance is evaluated on the basis of how well their students score on standard tests. The ‘proven’ method of achieving high student test scores is to teach to the test. This approach represents the ‘safe option’ that keeps students, parents, and school leaders ‘happy.’ However, teachers recognise that to do so is simply to play ‘the schooling game.’ Those with a more acute professional sense of ethics feel a desire, indeed a compulsion, to serve their students better. Unfortunately, the system tends to ‘bite back’ against non-normative practice. Consequently, teachers who ought to be rewarded for going the extra mile in professional service may end up being penalised instead. This situation represents a painful dilemma for teachers. Inadequate system flexibility limits the possibilities for innovation.

Discussion

Our findings indicate that the reality of inhabiting a dilemmatic space is significantly sharpened when teachers embark on curriculum innovation that requires them to reconstruct practice. Treading a fine line between an old teaching practice and a new one still in the process of construction, teachers inhabit a no-man's-land that is a contested site betwixt and between practices.

Undergirding the different manifestations of teachers' dilemmas are core issues concerning entrenched social practices related to education and the framework of assumptions that sustain them. Biesta (2010) raises the question of what constitutes good education in an age so taken up with measurement. Citing de Vries (1990), he points out that the technical role of educational research has become so dominant that its cultural role has been marginalised. In its technical role, research produces means, strategies, and techniques to achieve *given* ends, such as those established by government policy makers. Such research is positioned as an instrument to provide secure evidence of 'what works.' This perspective, however, assumes an objective, fixed world—akin to the world of physics constructed by science—where causal efficacy and, hence, reliable reproducibility can be established. The cultural role of research, in contrast, furnishes different ways of understanding and imagining social reality. It therefore continually invites reconsideration of established ends and examines means and ends in strict conjugate relation to each other (Dewey [1938] 1991). The latter perspective supports the reconstruction of ends in light of ongoing changes in a fluid and dynamic world. It does not attempt to formulate behavioural rules or iron clad prescriptions because 'no conclusion of scientific research can be converted into an immediate rule of educational art' (Dewey [1929] 2008). Consequently, one teacher's success with a

curriculum innovation cannot guarantee the success of the curriculum in the hands of another teacher. Seen in this light, resistance to and discomfort with a new mode of teaching and learning are natural reactions to change, and they should be expected rather than repressed. These phenomena attest to the significance of our curriculum's change in classroom practice and the causal agency of teachers and students to influence the change process. Efforts to reconstruct practice can be rendered successful and effective only through sensitive human management of the change process (Evans 2001) and a deep respect for teacher identity as the cornerstone in shifting practice (Chee, Mehrotra, and Ong 2014).

The imperative to quantify change, as expressed by Teacher A, arises directly from a technocentric view of effecting change. However, learning improvements related to human development and identity progression, while evaluable, hardly lend themselves to objective measurement. For instance, is 'being a good citizen' an inherently quantifiable claim? The propensity for quantification merely evidences the penchant for reducing human performances of, for example, citizenship to representational inscriptions *about* citizenship, which can be objectively scored by multiple choice tests and like forms of assessment. Such measurement, however, pursues practical convenience at the expense of vital relevance. The pressure on teachers to produce high-scoring students on standard tests and the weak alignment between old and new forms of assessment are likewise spin-offs from a technocentric mindset to educational practice. Forms of assessment must first be updated and aligned to relevant goals. Teachers then need to be given the time and space to enhance their professional capacity to achieve the desired outcomes of the pedagogical innovation. It is, after all, practice that makes practice (Britzman 2003).

Fransson and Grannäs's conceptual frame of dilemmatic spaces provides a useful theoretical lens through which teachers' experiences may be interpreted. Teachers who embark on innovation find themselves in a situation where preexisting relations with institutional authority, practices, values, and ways of knowing are perturbed and potentially challenged. Such disequilibrium creates ripple effects that take effort to address, without ever attaining a full resolution. Teachers who choose innovation have to grapple with the dilemmas described.

We stress that what is at stake is not a simple matter of equipping teachers with technological, pedagogical, and content knowledge to teach with games, as some have intimated. Neither is it an issue of dealing with a tension between teaching students content knowledge versus process skills as others have suggested. Both these discourses seriously domesticate the critical issues at hand. The dilemmas teachers so keenly experience are overt manifestations of ongoing contests that revolve around individual values and competing visions of ideal society and, hence, how public education should be organised, what students should learn, and how they should be taught. As Wells (2010) suggests, governments are inclined to pursue a top-down bureaucratic approach to decision making at the expense of the participation of stakeholders most directly involved in educational practice. Giving primacy to technical efficiency and mass production as means to a reductive, quantifiable end, they lean upon their authority to attain compliance from other stakeholders. However, such expediency is achieved at the cost of discounting ethical and moral dimensions central to human identity development, Being-through-doing, and learning constituted as purposeful personal transformation (Stetsenko 2007). Ultimately, valuational differences underlie the collision between opportunities for enhanced pedagogy and the culture of schooling. Given that a

common social studies curriculum is implemented across Singapore schools, preexisting system requirements and mandated forms of assessment impinge on teachers' Zone of Free Movement (Valsiner 1997), constraining the realm of their possible actions. Consequently, change, to the extent it occurs, is slow due to political relations and the pressures on teachers and school leaders to understand and interpret change (Bate, MacNish, and Males 2014).

Authentic game-based curricula offer the potential to reform and strengthen education for the 21st century by developing students' capacity for critical interrogation, thinking for oneself, and creative imagination. Digital games, as simulated open systems, align well with the tenets of postmodern curricula that require students to grapple with multiplicity, instability, and relativity inherent in complex real-world systems (Doll 1993). Through this effort, they come to understand the socially constructed, tentative, and never final nature of all 'human knowledge,' including 'scientific knowledge.' Teachers also benefit. We observe that many teachers tacitly adhere to an objectivist ontology, believing that there is a 'universally true' account of 'how things really are,' while publicly professing to be constructivists from an epistemological standpoint. They then expect students to construct an understanding that is 'true' or 'correct.' However, such an expectation is misdirected because it arises from an inconsistent set of beliefs: one cannot be an ontological objectivist and an epistemological constructivist concurrently. Working with authentic games creates the opportunity for teachers to confront this contradiction and to approach issues and controversies, including those in social studies, in relative terms, situating classroom inquiry in relation to human purposes and values, rather than insisting on a single 'right answer.'

Through dialogic pedagogy, ideas are exchanged between students in the classroom. But these ideas are lived rather than abstract, and they are imbued with personal values and judgments. In keeping with the Bakhtinian position on dialogue, Sullivan (2012) highlights the difference between the Russian *pravda*, signifying ‘truth as lived,’ and *istina*, signifying ‘truth as abstract.’ Dialogic pedagogy does not endorse conversations that are merely abstract and academic but rather conversations that are visceral and ‘close to the heart.’ Dialogue, as Bakhtin argued, is ontological and needs to be a way of life in the 21st century classroom and in society at large.

Conclusion

In this paper, we drew on the conceptual frame of dilemmatic spaces to interrogate the challenges teachers face when adopting authentic game-based learning in formal curriculum. Given the nature of schools as normatively sanctioned cultural spaces, teachers are forced to confront tensions engendered by misalignments that emerge from an innovation’s tacit requirement for change and the inherent tendency of education systems to gravitate toward preserving the *status quo*. Our data showed evidence of (1) resistance to and discomfort with a new mode of teaching and learning, on the part of students as well as teachers, (2) constraints perceived by teachers that arise from system requirements and normative expectations in relation to their professional role, (3) pressure that teachers experience to ensure students score high marks on standard assessments, and (4) tensions that arise from weak alignment between mandated and innovation-based forms of assessment. Caught in the crosscurrents of a more progressive vision of education and one that values the predictability and safety of the *status quo*, teachers find themselves in a double bind.

Game-based learning, as advanced in the Statecraft X curriculum, offers social studies teachers an effective approach to inquiry learning grounded in game play and sense making dialogue. For such learning to find traction in 21st century classrooms, policy makers and education stakeholders must revisit the values, purposes, and assumptions that have underpinned school systems since the industrial age and confront the educational challenge of preparing today's youth for an unpredictable future. Reimagining and reconstructing educational systems, curricula, and modes of assessment necessarily entail taking calculated risk. This course of action may not be inherently appealing, but failure to act in a timely fashion will likely prove more costly in the long term. Stetsenko (2007, 746) asserts: 'Unless all stakeholders are in control of the process and the tools required for implementing it, including teachers and students, no meaningful change is possible.' The stakes are high. It would be unfortunate if present values embraced in the practice of schooling continue to impede the reconstruction of teachers' professional practice and prevent attainment of a better educational and social future.

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Table 1

Schoolteacher profiles and teaching contexts

Teacher	Gender	No. of years teaching experience	No. of curriculum enactments	Students	School (pseudonyms)	Level of school leadership support
A	F	> 3	2	Express	Dover	Very supportive
B	F	< 3 [†]	2	Express	Dover	As above
C	F	< 3	2	Express	Norwich	Supportive
D	M	< 3 [†]	2	Express	Norwich	As above
E	F	< 3	1	Express	Cumbria	Neutral
F	F	> 3	1	Express	Cumbria	As above
G	F	< 3	1	Express	Plymouth	Weak
H	M	< 3	1	Express	Plymouth	As above
I	M	< 3	2	Express & Normal (Academic)	Xavier	Neutral

[†] Mid-career switch teacher



Figure 1. The *Statecraft X* game interface showing the town map.