Chapter 12
Shifting Practices and Frames: Literacy, Learning and Computer Games

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Abstract Digital culture and the online world have profound implications for contemporary notions of literacy, learning, and curriculum. The increasing integration of digital culture and technologies into young people's lives reflects the energy and excitement offered by online worlds. Online forms of text and communication are shaping students' experience of the world, including expectations and experiences about learning and literacy. While print literacies remain important, for schools to prepare students to participate in critical and agential ways in the contemporary and future world, they need also to teach them to be fully literate in digital and multimodal literacies, and at ease and in control in the online world. Computer games and other forms of digital games teach and exemplify multimodal forms of literacy. Schools can capitalise on their potential and work with them productively. Doing so, however, entails recognising the messy complexity of schooling and the practicalities of classroom lives. This chapter reports on a 3-year project in five schools concerned with literacy and computer games, and discusses the important role of teachers as on-the-ground leaders in pioneering new conceptions of literacy and curriculum change, and the importance of school structures and support to enable such change to happen.

Keywords Digital games • Teachers • Literacy • Pedagogy • Curriculum • Change

12.1 Introduction

There is increased interest in many parts of the world in the potential of digital games to enhance learning in the twenty-first century, building bridges between schools and students' out-of-school leisure lives, and utilising the qualities and

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affordances of digital games and technology (Gee 2007; Klopfer et al. 2009; Perrotta et al. 2013; Shaffer et al. 2008). The terms "digital games," "videogames," and "computer games" (and in some instances just "games") are used interchangeably in this chapter. "Digital games" in current literature is used to refer to a wide variety of games played on electronic devices of various kinds – computer games, videogames, Wii and console games, and games played on mobile devices such as iPads, dual screen devices, and smart phones. Such games, argue Shaffer et al. "give a glimpse into how we might create new and more powerful ways to learn in schools, communities, and workplaces" and "create new social and cultural worlds – worlds that help us learn by integrating thinking, social interaction, and technology, all in service of doing things we care about." They ask, "How can we use the power of videogames as a constructive force in schools, homes, and workplaces?" (2008, p. 105).

In this chapter, we report on an Australian Research Council project, *Literacy in the Digital World of the Twenty-First Century: Learning from Computer Games*.[1] The project had a particular focus, as the title suggests, on teachers and students working with digital games to support traditional (print-based) literacies and contemporary multimodal forms. The project's work was centred in five schools, with teachers and members of the research team working together to explore options and possibilities, developing and teaching curriculum units and observing and analysing classroom pedagogy and student work. While not formally concerned with leadership, the study depended heavily on the insights and experience that practising teachers brought to bear, as they thought through curriculum and pedagogic practicalities, and explored possibilities in the real-world context of "messy practice" and "messy change" (Thomson et al. 2006, p. 471). Working at the classroom level, with an eye to student learning, pedagogical preferences, curriculum and assessment requirements and their own and the school's technological capacities, the teachers provided grounded and practical ways forward, pushing at the boundaries of traditional subject areas: literacy and English curriculum, and the related areas of Drama, Media Studies, and ICT. The study explored how teachers might use games in the area of literacy learning, in both new and traditional forms, and the implications for curriculum, pedagogy, and curriculum change of doing so; as well as games themselves and students' experience with games in and out of school. In this chapter we focus on aspects of the project which are of particular interest to school leadership, and on the role of teachers as curriculum leaders in their field.

The chapter begins with an overview of why research in this area is important, and the key issues and questions raised. This is followed by a brief account of what the project entailed. From there, it turns more directly to questions of leadership and the roles of schools, systems, and teachers in leading change. In this instance, teach-

[1] Beavis, C., Bradford, C., O'Mara, J., and Walsh, C.: *Literacy in the Digital World of the Twenty First Century: Learning from Computer Games*. Australian Research Council 2007–2009. Industry Partners: The Australian Centre for the Moving Image, The Victorian Association for the Teaching of English, The Department of Education and Early Childhood Development, Victoria. Research Fellow: Thomas Apperley, Research Assistant: Amanda Gutierrez.

ers acted to lead change in curriculum and pedagogy at the micro level, in their own classroom practice and through their preparedness to try new approaches, resources, and technologies. At the same time, through their reflections, their role in the project and the documentation of their practice through the project book *Digital games: Literacy in action* (Beavis et al. 2012), they contributed to broader conversations about teaching with and about multimodal literacies in the professional community; about how pedagogy and curriculum are conceived; and the real-world implications, constraint, and possibilities of digital games and digital literacies.

12.2 Literacy, Learning and Computer Games: What's at Stake and Why Does It Matter?

Digital culture and the online world have profound implications for contemporary notions of literacy, learning, and curriculum. The increasing integration of digital culture and technologies into young people's lives reflects the energy and excitement offered by online worlds. Participation online creates a heady mix of new and old ways of playing, socialising, exploring, and making meaning. From computer games through to social networking, fan-fictions, chat sites, and the vast world of Web 2.0, online forms of text and communication are shaping students' experience of the world, including their expectations and experiences about learning and literacy.

Both the capacities of digital technologies to transform learning, as exemplified in computer games, and the social practices entailed in and around game play, have much to offer schools if school leaders understand their potential and capitalise on this potential to work with them productively in schools. There are two areas of particular relevance to contemporary education: first, the ways in which communication and meaning-making operate in digital contexts and their implications for curriculum, pedagogy, and assessment; and second, the capacities or affordances of games to support the development of complex conceptual understandings and "deep learning" in curriculum areas.

Perspectives from the field of games studies usefully inform ways of thinking about games as textual/literate forms (Apperley 2010). Earlier positions held by educators towards games were often characterised by hostility or mistrust: games and game play were seen as actively antithetical to learning. Reports on young people playing games tended to present games players as isolated, antisocial, or addicted (or at best, engaged in a lengthy waste of time), while games themselves were often viewed as trivial or unremittingly violent.

More recently, discourses around games have changed: interest has turned to what might be learnt from young people's engagement with games, and how schools might utilise what games have to offer to support teaching and learning. However, interest in this field, and the inclination or capacity to explore the possibilities of digital games, is not evenly distributed across the community. Some school com-

munities may feel hostility and mistrust if games are introduced to the curriculum without due consultation and explanation. The leadership team clearly has an important role in ensuring that such consultation and explanation with the parents and the school community takes place.

Research exploring the significance of computer games and students' engagement with them for education includes attention to young people's out-of-school play, to the kinds of literacies entailed in computer game play, and the use of commercial and educationally focused games in school to support teaching, learning, and curriculum. These areas are discussed in detail below.

12.3 Learning from Out-Of-School Play

There are many reasons why schools and systems might benefit from learning more about students' engagement with digital culture such as digital, video, or computer games and about games themselves – what they have to offer, why they might matter, and how those in education might best use their capacities. A significant body of research considers young people and technologies in the out-of-school world. This research has implications for education, particularly with respect to young people's literacy. The experience, skills, knowledge, and satisfaction entailed in such online activities as making and creating, chatting, posting, interpreting and responding, or collaborative or competitive game play, arguably shape students' dispositions and orientations towards the kinds of teaching and learning expectations and practices that they encounter in school (Carrington 2007; Davies and Merchant 2009; Gee 2007; Shaffer et al. 2008). Research in this area explores such questions as:

- how young people engage with digital technologies in their leisure time;
- what these technologies and the digital cultures they generate are like;
- what these technologies make possible;
- how young people use digital technologies;
- what they gain in doing so; and
- what understandings and expectations digital cultures and technologies create – about learning, knowledge, and communication, and about themselves, others, and the world.

Studies in this field observe the ways in which young people learn, socialise, try things out, and explore, and how they manage the easy flow between on- and off-line, "real" and "virtual" spaces, practices, and "friends," and the kinds of skills and practices they develop as they engage. Insights taken from research of this kind, with direct relevance to formal education in schools, include attention to key features of successful learning; the kinds of skills and practices fostered by online sites and cultures – in this instance videogames; orientations and dispositions towards learning developed through online engagement and play; the interweaving of online interaction with issues of identity, sociality, relationships, representation, and the

self; what young people learn and how they learn, in locations and activities such as these; and what characterises learning of this kind.

In some instances this research also compares the ways in which students "perform" in, and out of, school contexts. A common feature of such studies in many instances is the contrast between the complex understandings and capacities students can manage in the digital world compared to the more two-dimensional print-based literacies they usually use in school. These studies also typically draw attention to the ways in which technologies tend to be used in school, which are often more limited than the ways in which students engage with them out of school (Centre for Educational Research and Innovation [CERI] and Directorate for Education, Organisation for Economic Co-operation and Development [OECD] 2009; Ministerial Council on Education, Employment, Training and Youth Affairs [MCEETYA] 2007).

12.4 Digital Literacies and Game-Play

A related area of some significance is what might be learnt from digital games about new forms of literacy. Computer games can be seen as examples of new forms of communication. Characteristic foci within this research include attention to the ways in which meanings are created as the games are played, the ways in which information is presented and interpreted or understood, and the mix of elements which combine to create the way readers or players make sense of what they see (Beavis 2015; Marsh 2010; Steinkuehler 2007).

Researching games and game play provides insights into new ways of making meaning, and new forms of "reading," interpretation, representation, production or creation, and "writing." With respect to reading, for example, young players are simultaneously gathering and synthesising information from multiple sources as they play games. This information is in a number of forms, and players need to process the information as they go in order to play effectively. For example, players read information from various sources in each part of the game. They may focus on their avatar (the character that represents them, or whom they play) or on other characters represented on the screen. Depending on the game, there is likely to be a good deal of information about the avatars available. Players read this information and combine it with information about other aspects of the game. This information might include information such as:

- maps that show the location of the players' avatar or team members in the landscape, and that of potential enemies;
- the range of equipment, weapons, spells, or clothing available to them at any moment; bars and symbols indicating the amount of gold or other forms of wealth that "they" possess;
- symbols similarly indicating their "health" status or the number of lives that might remain to them;

- clues as to which items are active or interactive, indicated through highlighting of various kinds;
- background noise including sound effects, music, and chat from non-player characters;
- written speech and directions from characters they encounter; and
- ongoing abbreviated written chat between the players.

Reading in games involves attending to many elements simultaneously. As they play computer games, at any given moment players attend to some areas above others, foregrounding the specific areas of focus and backgrounding other symbol sets and semiotic systems according to dominant need. Elements and information that most immediately occupy players' attention at any time are informed by the presence of background information that is also part of the game, so that reading entails a subtle interplay between focal and subsidiary awareness (Polaayi 1958), which enables players to make meaning of what they see. Gee (2007) draws attention to the ways in which players call upon and synthesise diverse patterns and elements, integrating multiple sets of information or symbol systems into a whole. He names this the "semiotic principle," where "learning about and coming to appreciate interrelations within and across multiple sign systems (images, words, actions, symbols, artifacts, etc.) as a complex system is core to the learning experience" (p. 42). What differentiates the kinds of reading players engage in here from the "reading" of print text includes the blurring or conflation of reading with writing, and of interpretation with production, as players make the game happen as they play. A parallel set of processes and understandings, skills, and practices accompanies the creation of online content in digital form, analogous to writing, just as the processes described above are analogous to reading, but significantly different also.

Other important distinctions exist between forms like computer games and other forms of media where multiple sign systems work together, as in, for example, film or television. These include the role of context and the machine, and the interplay between the player, the software, and the technology – the machine upon which it is played and the game. Gamic action is determined by the dialogic interaction between them (Galloway 2006). For the machine, action takes a mechanical form in relation to the game logarithm, and the "involuntary" contribution made to the game by elements. For the player, actions include the physical actions they take as they operate the game, and the choices they make in determining their response to what the game presents. Consequences of their actions and choices contribute to the form the game takes, and/or the unfolding of the game. Interpreting and responding to the demands of the game in progress, they are engaged in executing an ongoing series of decisions and rapid manual operations to create the action of the game. There is also interaction with other people. Players may also be speaking to other players, physically beside them or online. Players call on knowledge they have of related games and narratives, to marshal relevant frames of reference for what they might expect to find in this instance, and the conventions in play. This information comes together as they make decisions about what to do next in the game. In a context where schools and systems internationally are calling for students to be critically

literate in both print and multimodal forms of literacy, digital games provide powerful insights into the nature of these literacies and the literacy practices that surround them, and the ways games operate and develop as multiliteracies "in the wild" (Beavis 2013).

12.5 The Use of Games in the Classroom: Games-Based Learning, Using Games to Teach

A further major area of interest concerns the potential of digital games to support learning, both learning processes and metaknowledge about learning, and about specific subjects and curriculum disciplinary areas. A great deal of rhetoric, interest, money, and research is being invested in the development of "serious games" or "games to teach" in many parts of the world. Research also explores the uses of commercially developed games to support learning in curriculum areas (McFarlane et al. 2002; Short 2012; Squire 2004). The affordances and possibilities of digital games to do this, in a variety of formal and informal settings, are increasingly being recognised. Games have been described as "learning machines," in that they need to ensure that players know how to play, are challenged and engaged, and are able to draw upon previous knowledge and information presented to them through the game to become increasingly expert at increasingly demanding levels (Gee 2007). The processes and structures of computer games are ideally designed to increase players' capacity to become expert in both the concepts and the subject matter of the areas with which games deal (Gee 2007).

12.6 Games in School: Teaching, Learning, and Curriculum Leadership

While there is considerable published research addressing school-wide leadership and the introduction of ICT (Chang 2012; Davies 2010; Moyle 2006; Ng and Ho 2012; Weng and Tang 2014) and on leading schools in the digital age (Cowie et al. 2011; Lee and Gaffney 2008; Williams 2008) on the one hand, and a growing number of studies of games-based learning and the use of digital games in schools on the other (Perrotta et al. 2013; Sandford et al. 2006; Young et al. 2012), there are as yet few published studies that bring the two fields together.[2]

School leadership plays an important role in supporting innovations, but as yet there is not a strong set of research findings around the ways in which leadership

[2]A notable exception is the Quest to Learn School in New York, funded by the MacArthur Foundation and designed and developed under the leadership of Katie Salen, built around the principles and possibilities of games and emphasising links between parents, school and the community (Salen et al. 2011).

teams can effectively work with teachers to introduce digital games into the curriculum. However, as has been shown to be the case with the introduction of ICTs into schools more generally, successful approaches begin with a strong focus on the pedagogies rather than the technologies (Moyle 2006). In the case of computer games, these games, and players' engagement with them, provide ideal models of how curriculum and induction into specific subject disciplines should operate. With the right games, much can be achieved. However, centrally worth noting is that even with the best games, it is not the games per se, but a combination of what the games make possible and what happens around the game that makes the difference in effective learning (Egenfeldt-Nielsen 2006; Francis 2006; Gee 2007; Perrotta et al. 2013). Good pedagogy, careful framing, and the opportunity for reflection and discussion are crucial.

While not all games are well suited to learning in curriculum areas, there is a wide array of commercial and non-commercial games (free-to-download games and games designed for educational purposes) that can enhance learning and engagement where teachers are able to create links between games, learning, and curriculum areas and/or use games to promote collaborative problem-solving orientations and behaviours (Klopfer et al. 2009; Sandford et al. 2006). For games that can be used well, the pedagogical approach and positioning in the curriculum are most important. For successful pedagogical change, leadership teams should focus on people – students – and how they can use technology tools to learn (Manchester 2009), in this case what, as Gee (2007) puts it, videogames can teach us.

The research on which this chapter reports took this approach to leadership, focusing on teacher professional learning and curriculum development, enabling a supportive approach to the development of new curriculum on a site-by-site basis to incorporate digital games into the learning program. Teachers worked closely with members of the research team to design and teach curriculum units and activities to connect digital games, student learning, and literacy, consistent with curriculum and assessment requirements and the policies and practices of the school, the Catholic Education sector and the state education department – the Victorian Department of Education and Training (DET; now the Department of Education and Early Childhood Development [DEECD]).

12.7 The Project

The project, *Literacy in the Digital World of the Twenty First Century: Learning from Computer Games*, set out to explore ways of strengthening students' new and traditional forms of literacy, through the use of computer games. It was funded by the Australian Research Council, DEECD (Victoria), the Australian Centre for the Moving Image, and the Victorian Association for the Teaching of English. The project was based at Deakin University and in five Victorian schools: two urban secondary state colleges, two Catholic secondary boys' colleges – one urban and one regional – and one coeducational Independent Melbourne School. Participating

schools were recruited through the Victorian Association for the Teaching of English.

The project had three foci:

- computer games (also referred to as video or digital games to reflect the growth and diversity of game forms and platforms over the period of the study) as cultural artefacts, new forms of narrative, and as multimodal contemporary textual forms;
- young people's knowledge of, and engagement with, the world of digital games and what might be learnt from that knowledge and engagement to support the learning of new and traditional literacies in school; and
- teachers and curriculum change: the challenges and opportunities teachers faced in reconceptualising English to encompass digital games, to support the learning of new and traditional literacies.

Over the course of the project, analysis of the nature of games as text and action was undertaken (Apperley and Beavis 2013) together with explorations of the ways in which games worked as narrative forms, and the reading practices and subject positions entailed. Students were interviewed about their out-of-school game-playing practices and preferences, and the place of games in their everyday lives. Students were taken to the Australian Centre for the Moving Image and filmed as they played games individually and in pairs, and their game play was captured and analysed. Professional learning days were held twice a year for participating teachers at the Australian Centre for the Moving Image and at the offices of the Victorian Association for the Teaching of English. Teachers undertook school-based research projects into the teaching of games within Literacy and English, Information and Communication Technology (ICT), Media, and Drama. Taking the form of curriculum units, school-based projects were planned in collaboration with members of the research team. Together with teachers, members of the research team observed the units in practice, interviewed students and teachers, and collected teacher and student artefacts.

12.7.1 Supporting Curriculum Redesign to Realise the Potential of Digital Games: Implications for Curriculum Leadership

While the project was not focused on school or systems leadership per se, the role played by both school principals, in welcoming the research team into their schools and supporting teachers as they sought to innovate, and the systems-level educational jurisdictions – the Catholic Education sector and the Victorian Department of Education and Training – were fundamental. Both provided leadership in envisioning and making possible research of this kind, with DET/DEECD in addition providing funding and in-kind support, including the active participation in the project

of the Senior Policy Officer in the Educational Policy and Research Division. While the "nitty gritty" of leadership remained at school level – in this instance, effectively at classroom level – the modeling and endorsement of research in this field provided at school leadership and systems level played an important role in enabling the research to proceed.

The role of the teachers was crucial. Historically, games have come into the school through the enthusiasm, vision, and expertise of individual teachers as games players (e.g., Francis 2006; Squire 2004) or where teachers in specific schools were interested as a group to explore games-based learning possibilities (McFarlane et al. 2002). In the case of this project, participating teachers were less expert, but were prepared to "have a go" with more modest experience, resources, and aims. The teachers came to the project in various ways. In one instance, involvement came through seeing the project advertised, with a call for expressions of interest; in another, a teacher already working with games in the classroom saw this as a way to extend that work. Others not initially aware of the project, but approached by a senior teacher to join, saw it as a way to "bridge the gap" between in- and out-of-school worlds, as reported in O'Mara and Gutierrez (2010).

A central feature was the way in which teachers themselves shaped the classroom work and curriculum units, in response to the theoretical framework offered by the project, and in tune with their own school and classroom contexts and student needs:

> The research was designed so that the teachers were working as co-researchers with the chief investigators, research fellow and research assistant. Eisner argues passionately that if research is to actually work to influence educational practice, the construction of the research process itself needs to work closely with schools and teachers so that it becomes more than educational commando raids to get data out (Eisner 2005, p. 92). Using a combination of reflective practice (Schön 1983) and an action-research approach (Kemmis, McTaggart, and Deakin University. School of Education. Open Campus Program. 1988), teachers developed and researched their own projects that introduced computer games into their classroom repertoire and enabled them to report on their practice to the wider teaching community. (O'Mara and Gutierrez 2010, p. 43)

Teachers in the study sought to combine new and existing forms of literacy, student interest, and the affordances of digital games to create active and engaging pedagogy and curriculum. In some schools, they acted collectively as part of a larger team, while in others they acted alone, but with the support of subject- and year-level coordinators. Through their classroom explorations of literacy and computer games in subject areas, teachers contributed to the pressing and ongoing debate about the ways in which literacy and curriculum areas might be reconfigured in the digital age.

12.7.2 Implications

The outcomes of the research strongly point to the need for literacy curriculum redesign, which in turn requires whole-school support and support from the school leadership particularly. Thomson and Blackmore (2006) offer three emergent

principles for successful school redesign, which have parallel implications for supporting the narrower focus of curriculum redesign: developing a strong warrant for redesign, attending to infrastructure, and building organic relations between school and community.

12.7.3 The Warrant for Curriculum Redesign

The warrant the project suggested for curriculum redesign to incorporate digital games – whether commercially popular games or games developed specifically for educational purposes – includes the opportunity for schools and teachers to build bridges between schools and students' out-of-school worlds. Games call on forms of literacy and engagement familiar to students from the world of games, including multimodal and interactive forms of text and literacy, and particular orientations towards learning, participation, and engagement. They provide a context in which students might develop expertise in multimodal and digital forms of text and literacy, as users and makers, and wider understanding through critical reflection. Curriculum incorporating the use, study, and/or making of games has the capacity to call on the affordances of the collaborative games world, including the qualities of games as both text and action, and the network of paratexts and communities that can develop around games to support existing classroom practices. These in turn might be used to extend knowledge, learning approaches, and expectations in ways consistent with digital forms of text and literacy and the online world.

12.7.4 Infrastructure Requirements

Infrastructural requirements for curriculum redesign include the provision of equipment, support, and time (Thomson and Blackmore 2006). In the project, infrastructure provided by school leadership and systems contributed significantly to the success of games work developed individually in the classroom, to participating teachers' conceptions of literacy and their expanding vision of pedagogical and curriculum possibilities offered by games, and to the conduct and outcomes of the project more generally. Participation in the research, and the exploration of games within curriculum, worked best when there was both individual commitment and school-level support. This included preparedness to support teacher release for them to participate in all aspects of the project. Innovation and change at school level is more likely to be undertaken and sustained when teachers have like-minded colleagues, either at their own school or elsewhere. The availability of technological resources and technical support is also important, as is the development of individual teachers' technological knowledge and expertise. While the provision of teacher planning time is generally the most expensive aspect of curriculum redesign, it is often the most important. It takes time for teachers to experiment, trial, and reflect

on new approaches, and for new approaches to shift thinking and become bedded down in practice. Time is required within the spaces of the school year to explore, design, teach, observe, and reflect on the effects and value of curriculum change such as that entailed in introducing games to the curriculum. The passage of time is also required for new practices and approaches to become established and refined.

12.7.5 Relationships Between School and Community

It is important that the school leadership communicate changes to curriculum and organisation and approaches to pedagogy where these intimately concern the community of the school. In research studies such as *Literacy in the Digital World of the Twenty-First Century: Learning from Computer Games*, the provision of information takes place formally through university-based ethical procedures which require plain language explanations to be provided to the parents of students most immediately concerned, and consent forms to be signed. At a more general level, newsletters and parent information evenings play an important role. In one school, a film was made showing students' and teachers' study of computer games in English across a 10-week term, and parents of the whole year level were invited to an evening screening. Opportunities such as these are crucial if parents and the community are to become supportive and informed.

12.7.6 Challenges

Involvement in the project also challenged teachers' existing practice, their conceptions of the subject English and of literacy, and their knowledge, attitudes, and understandings in relation to games. Teachers who stayed with the project felt their practice had changed, and that both the range of resources and conceptions of text available to them had been enriched through their participation and research. However, others found it harder to get involved or stay involved. Collaboration and support both within the school, and with the research team, were central to successful innovation and reform (O'Mara and Gutierrez 2010).

Games do not sit easily within traditional school subject boundaries, so leadership must be able to communicate the learning outcomes and potential effectively to the community to avoid misunderstandings and anxiety. The focus of this project was on games and literacy, and the ways in which games might be incorporated into English curriculum particularly. This meant that for some teachers, games strained to stay within traditional subject boundaries. Conceptions of production and response often implied the need for students to create their own games, sometimes crossing into other subject areas such as Information Technology or Drama.

12.8 Concluding Comments

Curriculum and pedagogical change to incorporate games into the classroom requires ongoing resources and support. There is a need for face-to-face and/or online professional learning support, and for relevant and updated resources to be available in a variety of modes, including online. The incorporation and study of games into English and literacy curricula provides an opportunity to teach and implement recommendations regarding digital English into curricula, reconceptualising pedagogy and curriculum to address multimodal forms of text and literacy. Curriculum leadership that recognises and responds to the changing nature of students' digital and literate lives can respond effectively to their students' learning needs and interests.

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