

Robot for Mayor: Creative Pedagogies with Social Robots in Secondary Education for Youth Civic Agency

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Abstract

This paper presents new ways to imagine and carry out creative pedagogies that use robots to teach socio-technical topics. The paper presents key theoretical and methodological ideas that informed a project co-designed in partnership with teachers and learners from Manurewa High School. This project portrays a speculative story of an affable humanoid robot who shares its goal of running for Mayor of the city of Auckland in Aotearoa New Zealand and asks children for advice on how to prepare for this future role. The findings from this case study are organised around three main themes: suspending disbelief, powerful questions, and breaking the fourth wall. A discussion around learning using digital technologies more creatively and more critically closes the paper. The appropriateness of robots for creative and dialogic learning calls for the participation of learners and teachers in playful co-creation activities that transgress the conventional roles and scripts in the classroom and the curriculum.

Keywords

Creative Technologies, Creativity, Human-Robot Interaction, Generative Themes

1. Introduction

Including the voices of youth in decision-making can lead to increased agency (Ballard et al., 2021), and to the self-determination of the community (Berryman et al., 2017). Youth civic agency is defined as an “ability to participate in civic

spaces as active and informed citizens” (Blevins et al., 2016: p. 372). The main practices to teach civic agency in secondary education tend to rely on conventional pedagogies, which can be more adequate to learn *about* citizenship than *how* to identify and exercise civic agency (Campbell et al., 2012: p. 135).

Teaching civic agency matters because participation continues to weaken; voter turnout across Aotearoa New Zealand continues to decrease (Whitfield, 2021). The lowest voter turnout is by the youngest group: 18 to 24 year olds (Foster & Taylor, 2019). The research presented here is part of ongoing efforts to work with local schools to identify new and effective ways to drive interest and participation in civics using design-based and participatory approaches (DiSalvo et al., 2017).

A thirty-year plan for Auckland to become “the world’s most liveable city” was formulated around the “Mayor’s Vision” (Auckland Council, 2012: p. 15). The Plan’s targets denoted a particular view of liveability, at the expense of voices from youth of ethnic minorities who hold other priorities and views of *liveabilities*, and who deserve to imagine their own futures for themselves and their communities (McArthur & Robin, 2019). We prepared a project as a creative and critical response to the Auckland Plan: the *Robot for Mayor 2030* to identify, apply, and assess “serious games” strategies for children to perceive and challenge the underlying ideologies, assumptions and values embedded in future planning. The project sought to support children and youth to elicit ideas, values, and aspirations for the future of their city.

A social media campaign was launched by the research team capturing the attention of a group of teachers from Manurewa High School, who requested our support to their efforts to strengthen learners’ awareness and involvement in citizenship education. A shared ethos around dialogic pedagogies for emancipation (Freire, 2000) cemented this partnership and helped the team define the goal to create creative and participatory learning experiences (DiSalvo et al., 2017). From its conception, the project ethos placed learners and teachers as co-researchers (Fløtten et al., 2021) to examine the question: *How may social robots help drive the interest and participation of youth in civics?* (Figure 1)

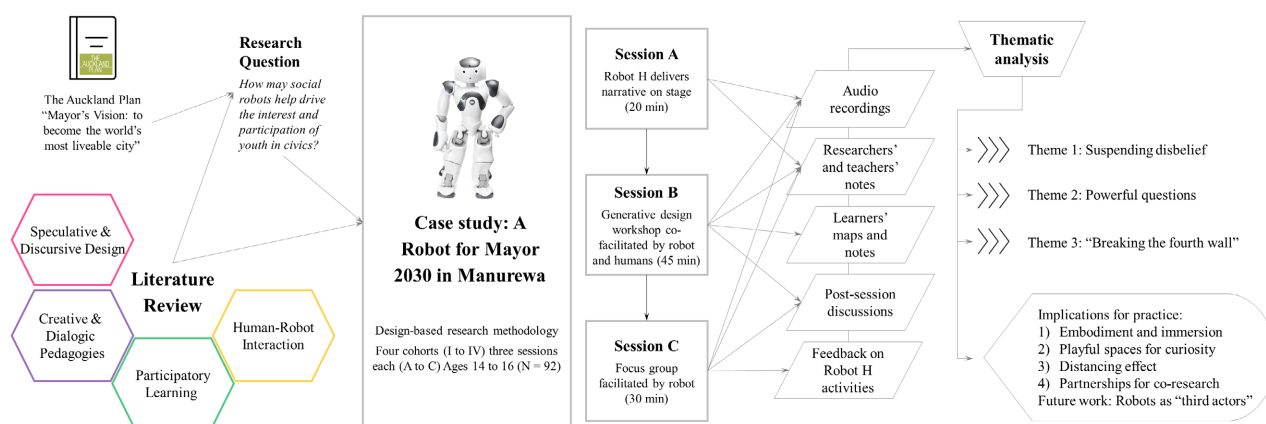


Figure 1. Roadmap of the research journey.

2. Literature Review

Four areas informed this interdisciplinary project: speculative and discursive design; dialogic pedagogies; participatory learning; and human-robot interaction precedents in education.

2.1. Design for Speculation and Discourse

Speculative design envisions “how things could be” to spark conversations and open up new perspectives (Dunne & Raby, 2013). In critical design, design fiction, discursive design, and adversarial design, professional designers generate speculative scenarios that require a “thorough and expert use of design skill [and a] sophisticated attention to the aesthetic characteristics of possible future conditions” (DiSalvo, 2009: p. 55). Whilst our work shares with these areas an orientation to creatively interrogate possible futures, it expands from an individual artist’s vision to a breadth of worldviews by many co-creators (Banathy, 2013), i.e., teachers and learners. An intention of this work is to identify ways to strengthen the capacities of diverse people to speculate about their future as active agents rather than in response to what designers create. Speculation here is thus reformulated away from designers (DiSalvo et al., 2011: p. 194) and is oriented towards valuing contestation and pluralism. A related type of speculative practice that deals with themes of citizenship and civics is *Electoral Guerrilla* theatre, a satirical means to usurp the highly mediated civics rituals and draw attention to issues or agendas of public interest (Bogad, 2016: p. 5).

2.2. Dialogic Learning

Learning can be conceived as a dialogic relationship of collective discovery and construction of knowledge, rather than a “banking” transaction where experts deposit knowledge in others (Freire, 2000). This turn is recognised in this project to position creativity as a cornerstone of future-oriented dialogic education. A goal for our team is also to put into practice ways to experience learning that are compatible with the Pacific concept of *Ako* which stands for both to learn and to teach (depending on the context) and is better understood as “reciprocal learning” (Morrison & Vaiolleti, 2011).

According to Hipkins (2012), research in secondary education needs to shift towards futures-building, rather than future-proofing. In *futures education*, learners engage with questions that personalise the curriculum, and create dialogic relationships that cultivate diversity over uniformity. Digital technologies in this space “can connect students to real-world issues and authentic knowledge-building activities, and extend their learning opportunities” (Hipkins, 2012: p. 4). Another feature of futures education is to resist the tendency to focus on a narrow range of subjects and student outcomes and to instead work on the connections between key competencies and the daily experiences of learners (Hipkins, 2012).

Conversations can support deliberation spaces where learners share views about complex topics and build collective learning (Jenlink & Carr, 1996).

Transformational conversations allow individuals to identify assumptions, interrogate opinions, and evolve ideas. Through suspension of judgment and openness to agonistic exchanges (Wenman, 2003), learners can become aware of diversity and how divergent views conflict and complement each other to hold paradox rather than reach consensus (Banathy, 2013). Our work seeks to promote conversations that promote learning by disrupting “the traditional uses and users of technologies” (Jenlink & Carr, 1996: p. 34). A pedagogy of conversation has potential for authentic engagement points (Jenlink, 2004) valuable to tackle complex topics like civics and futures education.

2.3. Participatory Design for Learning

Authentic partnerships can amplify student engagement in their learning as well as to engage teachers in their own learning and in the counselling and leadership of learners. Roles of design in shaping participatory action have been assessed in the literature (Manzini & Coad, 2015; Margolin & Margolin, 2002; Simonsen & Robertson, 2012). *Designerly* approaches to participation tend to focus on solutions, i.e., products, technologies, and services. Other orientations seek to open access or build capacity in artistic, technology, and problem-solving skills (DiSalvo et al., 2011; Lukens & DiSalvo, 2011), but only occasionally has design been used as a means to foster and support collective imaginative abilities (Light et al., 2009).

Some technology designers can adopt tokenistic participatory practices such as having children share “great, crazy, creative” ideas and yet they still consider that in order “to come up with new, exciting, great ways to encourage learning of specific topics, it’s more difficult to use [a participatory] approach” since they still believe that it is experts who hold “the knowledge of what to do with these new technologies” (Rogers et al., 2017: p. 229). Under such approaches, people are invited to “come in at different points, to comment on, or use our technology probes in various ways, to make suggestions that we haven’t thought of, that’s great.” (Rogers et al., 2017: p. 229) Our work rejects this paternalistic stance by centring children and teachers as genuine co-creators and not merely useful test users. Supporting *future-fluency* in learners is the main goal of this work. Therefore, its evaluation includes learners’ engagement and the extent to which their views are more diverse and original than the responses they would normally elicit through conventional teaching approaches.

2.4. Human-Robot Interaction for Learning

Robots have been used in schools mainly to teach STEM topics (Benitti, 2012; Ezeamuzie & Leung, 2021; Konijn & Hoorn, 2020; Kucuk & Sisman, 2017; Papadopoulos et al., 2020; Velentza et al., 2021) and language (Deublein et al., 2018). Recent work has started to show potential for robots as facilitators in social and humanities topics (Kaipainen et al., 2022). To date, only a few have investigated the potential roles for robots in storytelling (Conti et al., 2020) and in teacher-robot and learner-robot interactions (Ceha et al., 2021). Research shows

that more advanced and nuanced experiences are needed to deploy social robots in the teaching-learning experience (Velentza et al., 2020; Velentza et al., 2021; Xia & LeTendre, 2021).

Across the literature, studies allude to the *future potential* of using social robots across school levels, yet the most ambitious use scenarios remain unrealised (Cheng et al., 2018; Smakman et al., 2021). From our prior experiences using robots in research and teaching, they can personify an alluring animacy that gives them *charisma* with adults and children (Ames, 2019; Conti et al., 2020; O'Gieblyn, 2021). The character that we initially developed, and its storyline, took these qualities as a starting point to seek excitement and transgress mainstream approaches to teaching civics (Hooks, 2014). Pilot studies with five groups of teenagers provided feedback to improve the story and confirmed its adequacy to instigate interest and curiosity in citizenship and future visioning.

Human-Robot Interaction (HRI) studies of relevance include using social robots to interview children (Wood et al., 2016) and studies of robot expressiveness (Flannery & Bers, 2013). Research on the development of autonomous agents and storytelling also helps to understand and design interactive experiences using robots (Mateas & Sengers, 1998). The use of an android in this project aligns with “radical” (Greenfield, 2017) and convivial uses of technology (Illich, 2021) by seeking “the most ample and free access to the tools of the community” to support their own agendas (Illich, 2021). Lastly, we seek to employ robots in ways that apply game-based learning for children to learn *to become* rather than to know *about* subject content propositionally (Chee, 2015).

3. Case Study: A Robot for Mayor in Manurewa

Manurewa High School is a large multicultural school in Aotearoa New Zealand with over two thousand students representing fifty nationalities. Its vision is Piki Atu Ki Te Rangi guided by the values of Respect, Excellence, Whanaungatanga and Akoranga¹. Manurewa High School is classified in the lowest decile by the Ministry of Education, a system that impacts on “how schools are viewed, on enrolment patterns, on staffing of schools and on how students view their educational opportunities” (Vester, 2018). One third of students are Māori, one third Samoan, and the rest includes Pasifika, Asian, and European. Such diversity is valued in this project for the rich interplay of worldviews and experiences as the team prioritises cultural and social sensitivity in tackling future and civics education.

One of the principles in The New Zealand Curriculum is a “future focus [that] encourages students to recognise that they have a stake in the future and a role and responsibility to help shape it.”² Social studies competencies in secondary schools include: “Understand how the ways in which leadership of groups is acquired and exercised have consequences for communities and societies; Under-

¹Manurewa High School website: <https://www.manurewa.school.nz/about>.

²Future focus principle in The New Zealand Curriculum: <https://nzcurriculum.tki.org.nz/Principles/Future-focus-principle>.

stand how formal and informal groups make decisions that impact on communities.” (Level 4), and “Understand how policy changes are influenced by and impact on the rights, roles, and responsibilities of individuals and communities.” (Level 8). These topics have traditionally been taught through standard lectures, textbooks, and essays (Campbell et al., 2012).

The Manurewa teachers shared their goal to increase learner participation, facilitate critical debate, and stimulate creative thinking about the future of Auckland and their diverse communities. The team identified shared values to ground this project on creative participation, civic agency, and the use of technology for future-oriented learning. This project had a good fit with the school focus on learners’ Hauora (wellbeing). The project seeks to enable all participants, researchers, and partners to develop Akoranga (learning) as each brings their unique contribution and have opportunities to experience learning in new contexts. The resulting design brief for this project was: *To invite the Robot for Mayor 2030 to share its story and ask Manurewa learners for advice on how to prepare for the role of mayor in the future.*

To enhance the interest and participation of children in future civics became the central purpose of the project not just to instrumentally increase voter turnout or to meet the learning outcomes in the curriculum. By future civics we refer to how children today perceive their future lives in society and the future of their communities.

Study Design

A design-based methodology was adopted for this project based on its alignment with the research question and design brief (Findeli et al., 2008; Gaver, 2012; Grocott & Sosa, 2018; Sosa & Grocott, 2020). In design research the priority is on the interplay between research and design activities to generate an artefact, in this case of an intangible nature: the interaction between android and children. Mindful that conventional methods can lead to issues of validity and research fatigue, a creative disposition to research methodology was embraced early on (Kara, 2015: p. 3). Methods such as interviews, surveys, experiments, design workshops, and focus groups were applied. The team also tested design techniques including personas, journey maps, and experience prototyping to craft a narrative that creates appeal while highlighting themes and predicaments of civics and politics without resorting to farce or parody. A number of robot personalities were explored and tested in community events, workshops, showcases, and research seminars where the robot pitched elements of the story to audiences and their reactions were observed and analysed by the teachers and researchers.

The resulting narrative converged on an inquisitive and affable robot that asks seemingly simple questions in a playful tone to learn from the children how to become a good robot mayor. Systematic testing showed that this character had a strong appeal with children, and it offered a conducive platform to address what they otherwise perceived as dull topics, i.e., elections and public policy. Tensions

were observed in early versions including critiques to human politicians for being “robotic”, gender issues, and the fine line between a satiric and a persuasive story that enables conversations that stay on topic. In the early enactments, the appeal and attention often faded rapidly, which led to creating strategies to maintain attention to the robot’s speech using short interlocutions supported by body poses, animations, and subtle details such as expressive eye blinking and head orientation. The robot was used as the main feature of a design-based inquiry.

The initial interactions with the robot confirmed the efficacy of the story to stretch the disbelief about a robot who is not ready yet, but plans to run for office in the future, and in order to bridge this gap seeks the ideas of young people to learn how to become a good official to help manage a large and complex city. The idea of the robot seeking to learn from young people first-hand about their views of the future allowed us to insert in the narrative a series of seemingly naïve questions. Initially nameless and gender neutral, audiences often asked what the robot’s name and gender was. The name “Robot H” was chosen in allusion to *help*, *human*, and *hope*, and the decision was made to keep ethnicity, age, and gender undefined. In multiple occasions the robot showed technical flaws or lapses (delays, poorly timed and clumsy motions, unclear inflections, failed voice detection), yet these were beneficial rather than detrimental to the narrative of an unprepared robot.

Three session types were prepared by the team. In Session A, the robot presents the backstory and articulates its vision to become the Mayor of Auckland in 2030. Appendix shows the algorithm for the opening of Session A including the utterances and gestures crafted by the research team with the purpose to establish the bases of the story and the inquisitive but amicable tone of the conversation. Session A continues with the robot establishing ground rules of inclusiveness and divergent reasoning with no right or wrong answers. It then asks a series of open questions to the children with the intent to start the conversation including “What is the role of a mayor?”, “How do people share their ideas and opinions with the mayor?”, and “What could I do differently if I’m elected?”.

Primed by these questions, the children take turns to participate and the robot nods and asks for more ideas and responses from the group. The robot in Session A introduces the narrative and aims to foster the suspension of disbelief and stimulate divergent thinking in children. With a duration of 20 minutes, Session A shown in **Figure 2** is audio recorded and ends with the robot inviting children to continue the conversations with their peers and at home in preparation for a second visit the following week, when they are invited to a design workshop to share and expand their ideas further to assist the robot in its political aspirations. The human facilitator sets up the robot and maintains a secondary role in Session A, only occasionally encouraging children to take turns.

In Session B, the robot returns to the classroom a few days later to facilitate a generative design workshop (Sanders & Stappers, 2012) that combines elements



Figure 2. Session A: presentation and group sharing.

of mapping, brainstorming, collage, and storytelling. The goal of the activity is to collectively design their own vision for the future of their city. For this session, small teams sit around tables where they have access to a large-format worksheet, flash cards, small card cut-outs, sticky notes, and colour markers as shown in **Figure 3(a)**. The worksheet consists of a template with concentric circles and the cut-outs are printed with an assortment of images including people of different ages, ethnicities, and occupations. Other cards have images of public transport, houses, nature, entertainment, etc. Robot H invites learners to share their ideas and to actively listen to their teammates and to the researcher as they build together their future vision of themselves, their community, and the city in the year 2030. Robot H stands up on a table where all children can hear the instructions and see the visual support materials displayed. Robot H asks children to stick the card(s) at the centre of the worksheet and to write down or draw their ideas noting that there are no right or wrong ideas and that the group must include all ideas and build upon each other rather than try to build consensus.

As learners start to ideate, Robot H intervenes to invite children to think about the people who will be involved in shaping the future they imagine and to use the small cut-outs and cards to illustrate their ideas. Robot H also asks teams to consider what would need to change between now and 2030 in order for those situations to happen, including how a mayor could contribute. Lastly, the robot invites learners to think about the impacts and effects of those future situations in their daily lives. With a duration of 45 minutes, Session B-which is audio recorded and all worksheets labelled and photographed-concludes with teams sharing their ideas. Two human facilitators adopt a more active role in Session B handing out the materials, answering questions, and generally encouraging children to participate in their groups. Session B ends with the robot thanking the children and inviting them to a final session the following week.

To prepare for Session C, the research team collects and analyses the more salient ideas and unique views generated by the children in Session B. These are presented by the robot in Session C, who asks the children to elaborate, clarify, and expand on these themes and ideas of the future. This session draws from

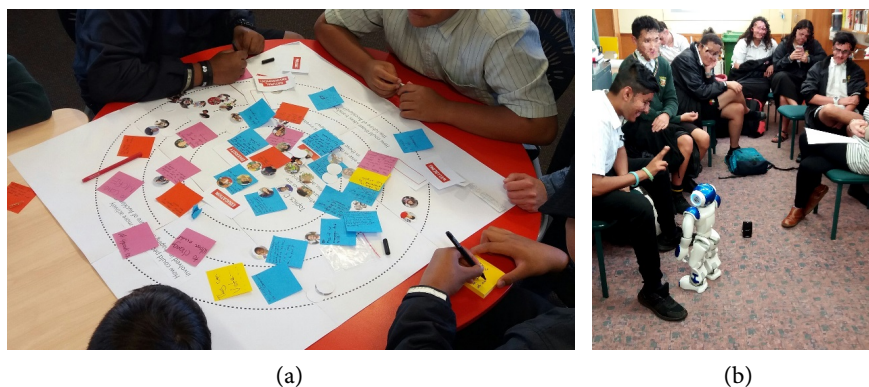


Figure 3. (a) Session B generative workshop and (b) Session C debriefing focus group.

focus group techniques asking children to elaborate or respond to these stimuli. Due to the more open-ended nature of this conversation, the robot's role in Session C is to announce the purpose of the session, listing the main topics for discussion, and in the final part of the session thanking everyone for their participation and further advice. The core facilitation in Session C is done by the research facilitators, who encourage children to think about and elaborate on the topics selected. With a duration of 20 to 30 minutes, Session C as shown in **Figure 3(b)** is audio recorded and closes by asking learners for their ideas about the possible use of robots for other learning situations.

Reflexive analysis was conducted of audio recordings, researchers' and teachers' notes, post-session discussions by the research team, and labelled photographs of the notes and maps created by the learners. An iterative reflexive thematic analysis was carried out by the team, three of whom were present in all sessions. Familiarisation with the data was followed by initial inductive and deductive coding to form candidate themes that were tested with and revised by the teachers (Braun et al., 2019). Thematic maps were generated and used to orient team discussions. Four cohorts between ages 14 to 16 ($N = 92$) participated in the sessions for which approval was given by the university ethics board. Cohort selection was based primarily on maximising age groups and by timetabling restrictions. Consent and assent forms were signed by the legal guardians and the children, after a two-week period from when they were invited to participate. Sessions took place at the school's library and the classrooms in periods available between timetabled classes.

4. Findings

The findings presented here emerged from data collected from four cohorts (I to IV) in three sessions each (A to C). From the outset, the teachers noted that the children found the narrative compelling and noted an increase in engagement and participation. They also highlighted how the story and the robot helped children pause, think, articulate their ideas, and listen to others.

The excitement around the robot may seem paradoxical since it simply articulated scripted speech routines such as that in Appendix. It used pre-defined

body animations and reacted in generic ways to what the children said, rather than perform voice recognition or Machine Learning tools. Admittedly, responses in Session A tended to be simple and conventional, such as “Mayors make decisions, they make Auckland better...”. Nonetheless, the team was surprised by the excitement and enthusiasm in Sessions B and C. Prompted by the narrative, children gave their attention and participated beyond what the teachers expected. At times, ideas drifted toward the mischievous or dystopian, yet most learners contributed thoughtful and meaningful responses that teachers saw reflected genuine interest, rich cogitation, and spurred lively deliberation.

The data were organised, analysed, and interpreted in collaboration with the teachers in three related, but distinct themes considered of high relevance for civic agency. **Figure 4** shows these themes including overlapping ideas and a fourth column (left) with key feedback on the activity.

4.1. Theme 1: Suspending Disbelief and Abductive Reasoning

The first set includes contributions that denote children’s engagement with the narrative and suspension of disbelief. This effect is captured in expressions such as “A robot mayor would make New Zealand look good” (session Ic), “Robot H

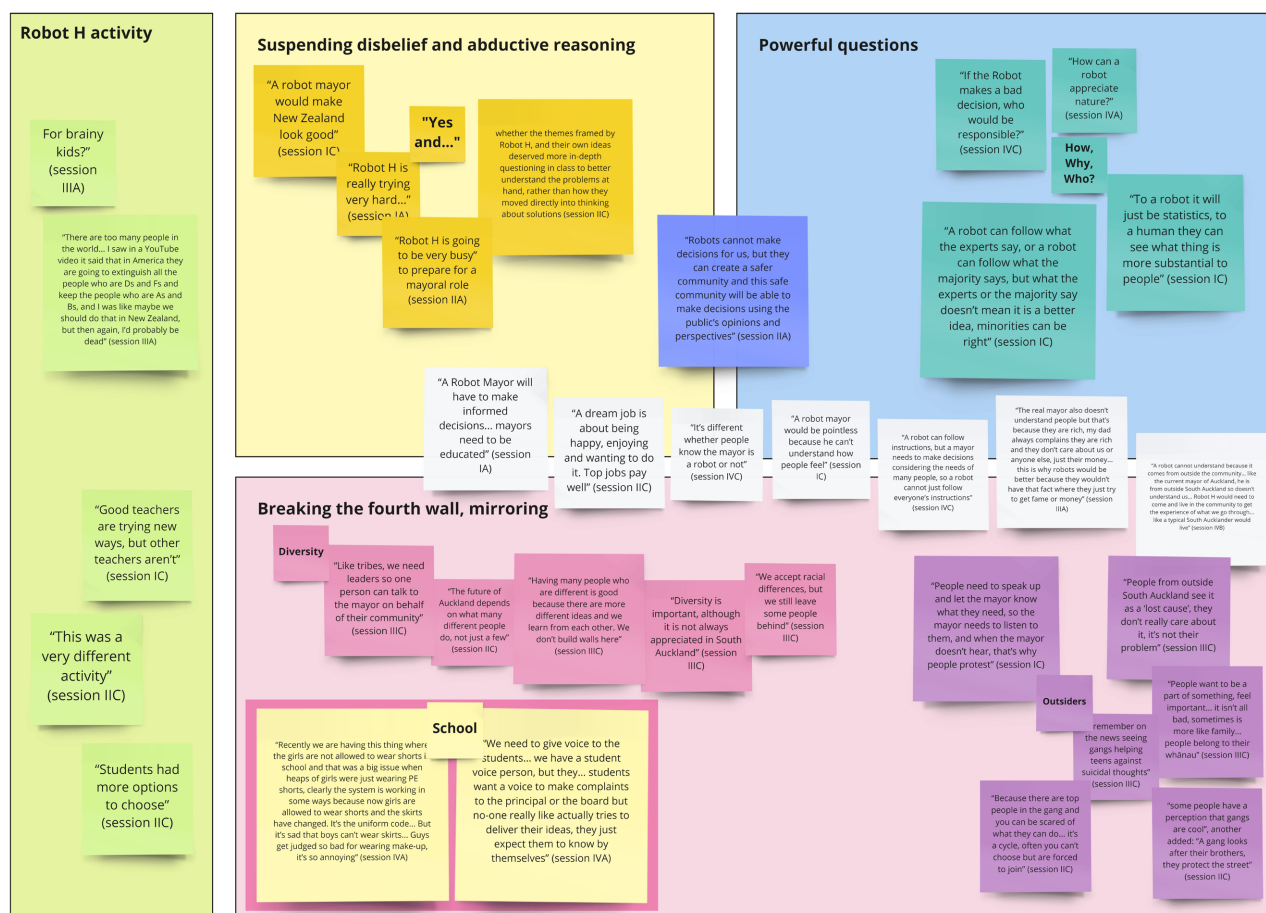


Figure 4. Three main themes emerging from the sessions: Suspending disbelief; Powerful questions; Breaking the fourth wall. A fourth space includes ideas on the Robot for Mayor activity.

is really trying very hard...” (session I_A) and “Robot H is going to be very busy” to prepare for a mayoral role (session II_A). These ideas seem to explore the implications and imaginatively build upon the narrative, however “unimaginable” or far-fetched it may appear at first. With such ideas, the children showed a (temporary) acceptance and a disposition to elaborate the possibilities and consequences of a robot mayor. Suspending disbelief was critical in this project and it was iteratively crafted and tested through prototyping, as it attracted children’s attention and provided the pathways to orient action.

Some children sharply pondered whether the scenarios posed by Robot H, and their own ideas stemming from those scenarios deserved more in-depth questioning in class. They suggested this as a way to better understand the complex issues at hand, rather than immediately move into solutioning mode (session II_C). These observations are evidence of how Robot H sparked the interest of children to reframe issues and problems related to civics and citizenship, including some of them being able to go beyond a narrow technocratic focus that could have limited these conversations only to what a robot can do to “solve” or address complex civics issues.

Abductive reasoning, also called the logic of creativity, is frequent in this type of responses expressed in ideas of the type “yes, and...” (Anderson, 1986). A child, for example, imagined possible roles for the robot to support and enable better collective decision making: “Robots cannot make decisions for us, but they can create a safer community and this safe community will be able to make decisions using the public’s opinions and perspectives” (session II_A).

Other ideas about the future effects of a robot politician shifted the focus to the humans being governed by robots. This is illustrated by a child noting how the citizens’ behaviour would depend on whether they are aware that the mayor is a robot: “It’s different whether people know the mayor is a robot or not” (session IV_C).

4.2. Theme 2: Powerful Questions

A second theme encapsulates perceived challenges, contradictions, and paradoxes in the robot’s narrative. These ideas often emerged while children explained the current system to the robot, for example, on the topic of the role and responsibilities of current human mayors, a child asked: “If the Robot makes a bad decision, who would be responsible?” (session IV_C). This type of questions surprised the teachers, who noted that these would normally be absent in lessons on civic agency.

Ideas and questions about emotions came up across cohorts; one child opined that “A robot mayor would be pointless because he [sic] can’t understand how people feel” (session I_C). Since Robot H avoided being explicit about its own gender while interacting with the children, it was notable that they primarily chose male pronouns. Along the importance of emotions in leadership, a child stated: “He can’t feel or have emotions, so he would not understand”. Such remarks almost invariably prompted group discussions around the role of emo-

tions and empathy in the decision-making by human politicians. For example, a child pointed that “To a robot it will just be statistics, to a human they can see what thing is more substantial to people” (session I_C). This type of perceived or imagined limitations of androids led children to recognise and appreciate leadership abilities. For example, in response to someone indicating that a robot mayor could help by planting trees in the city, one child asked: “How can a robot appreciate nature?” (session IV_A).

In discussions about collective decision making, some children referred to the challenges and paradoxes of attending to different voices. Comparing robots and humans, a child said: “A robot can follow instructions, but a mayor needs to make decisions considering the needs of many people, so a robot cannot just follow everyone’s instructions” (session IV_C). These statements denote an awareness by these children of critical judgement and negotiation in positions of public authority. In a closing session, a child observed: “A robot can follow what the experts say, or a robot can follow what the majority says, but what the experts or the majority say doesn’t mean it is a better idea, minorities can be right” (session I_C).

4.3. Theme 3: “Breaking the Fourth Wall”

The third theme aligns well with the Brechtian metaphor of “breaking the fourth wall” (Shanahan, 2018). If the first theme is about suspending disbelief, here children were able to *return* to their present reality armed with new ideas sparked by their interactions with Robot H and each other. This is best illustrated by how some children translated the robot-human “otherness” to talk about decisions made by those outside/inside their community: “A robot cannot understand because it comes from outside the community... like the current mayor of Auckland, he is from outside South Auckland so doesn’t understand us... Robot H would need to come and live in the community to get the experience of what we go through... like a typical South Aucklander would live” (session IV_B). A young girl addressed the notion of *caring* by comparing how a robot and a human mayor make decisions: “The real mayor also doesn’t understand people but that’s because they are rich, my dad always complains they are rich and they don’t care about us or anyone else, just their money... this is why robots would be better because they wouldn’t have that fact where they just try to get fame or money” (session III_A).

Children also translated views on authority, rules, and collective decision making from a future mayoral role into their present context at school: “We need to give voice to the students... we have a student voice person, but... students want a voice to make complaints to the principal or the board but no-one really like actually tries to deliver their ideas, they just expect them to know by themselves” (session IV_A). This child further elaborated: “Recently we are having this thing where the girls are not allowed to wear shorts in school and that was a big issue when heaps of girls were just wearing PE shorts, clearly the system is working in some ways because now girls are allowed to wear shorts and the

skirts have changed. It's the uniform code... But it's sad that boys can't wear skirts... Guys get judged so bad for wearing make-up, it's so annoying" (session IV_A).

Other sensitive topics were also raised as children explained societal dynamics to the robot. Some noted that perceptions of South Auckland are shaped by stereotypes from biased media coverage. Many felt that the focus on gangs and street fights gives a limited view of their everyday reality. One child put it this way: "People from outside South Auckland see it as a 'lost cause', they don't really care about it, it's not their problem" (session III_C). The topic of gangs sparked heated dialogues at times, sparking a variety of perceptions about their role in the community. A boy expressed in relation to gang membership: "People want to be a part of something, feel important... it isn't all bad, sometimes is more like family... people belong to their *whānau*" (community) (session III_C). A girl added: "I remember on the news seeing gangs helping teens against suicidal thoughts" (session III_C). Explaining to the robot why youngsters join gangs, one child explained: "Because there are top people in the gang and you can be scared of what they can do... it's a cycle, often you can't choose but are forced to join" (session II_C). In response to someone saying that "some people have a perception that gangs are cool", another added: "A gang looks after their brothers, they protect the street" (session II_C).

Diversity and multiculturalism became prominent conversation topics. One child expressed that "Diversity is important, although it is not always appreciated in South Auckland" (session III_C). Another explained to the robot the concept of exclusion as: "We accept racial differences, but we still leave some people behind" (session III_C). A controversy around representation and leadership styles emerged in a cohort when addressing how diverse opinions and priorities shape decision-making. One set of opinions was that "The future of Auckland depends on what many different people do, *not just a few*" (session II_C), while other children differed saying that "Like tribes, we need leaders so *one person* can talk to the mayor *on behalf* of their community" (session III_C).

Addressing the ethnic diversity in South Auckland, a child said: "Having many people who are different is good because there are more different ideas and we learn from each other. We don't build walls here" (session III_C). This last comment alluded to the border wall featured in the presidential campaign of the USA the year prior (2016) and is of significance here because the session facilitator is originally from Mexico. At least to some extent, her position of genuine unfamiliarity with life in Aotearoa allowed her to pose questions that would have appeared as disingenuous if made by a local interlocutor.

Children made other connections to education and work. Advising the robot to prepare for the role, one child said: "A Robot Mayor will have to make informed decisions... mayors need to be educated" (session I_A). Many interpretations on education and leadership emerged, i.e., from education as a way to access jobs, a way to find one's life purpose, a way to meet parents' expectations, and a way to contribute to the community. In one session, children talked about

jobs this way: “A dream job is about being happy, enjoying and wanting to do it”, while other children had more utilitarian definitions, i.e., “Top jobs pay well” (session II_C).

4.4. Feedback on Robot H Activities

Children commented on their experiences in these activities and their wider schooling journey. In one cohort, children asked in the opening session whether the robot was meant “for brainy kids?” (session III_A) and they expressed their surprise to learn that their class was included in the study. This was possibly due to the perception that advanced learning technologies are available only to an elite such as those specialising in STEM areas (Margolis et al., 2017). A child from this group of “at risk” learners said: “There are too many people in the world... I saw in a YouTube video it said that in America they are going to extinguish all the people who are Ds and Fs and keep the people who are As and Bs, and I was like maybe we should do that in New Zealand, but then again, I’d probably be dead” (session III_A). Expressions like this suggest how children value their presence in this type of learning experiences to examine the “unthinkable” which stretches here from the robot becoming a mayor to their own inclusion in high-tech types of school initiatives (Carlone et al., 2015).

Expanding on ideas of *who* uses learning technologies, one child commented that “Good teachers are trying new ways, but other teachers aren’t” (session I_C). On their experience with the robot, some reflected that “This was a very different activity” (session II_C) and further wished that “Students had more options to choose” (session II_C) including classes that use digital technologies in many other subjects. In sum, the Manurewa sessions provided findings in response to the design brief and in alignment with some of the key competencies for social studies in the NZ Curriculum mentioned before. The three main themes presented here are not mutually exclusive, some statements as shown in Figure 4 have traces of all three. The research team settled on these because of their applicability to orient learning experiences and activities with children. Table 1 presents indicative questions to tackle youth civic agency along these three themes.

5. Discussion

A recommendation for child well-being by UNICEF (Brazier, 2017) is to “consult children [because] they see things from a different viewpoint”. The case of Robot for Mayor 2030 informs efforts to engage youth in future-looking learning by demonstrating innovative pedagogies to encourage them to develop civic agency. This project examined the question: *How may social robots help drive the interest and participation of youth in civics?* The findings from Manurewa High School respond to this question by suggesting four main drivers for interest and participation:

- 1) Promoting suspension of disbelief and abductive reasoning, i.e., “yes, and...”. This can be achieved by people creatively developing activities and narrative devices and iteratively refining the elements that work best in their

Table 1. Indicative questions to tackle youth civic agency organised by the themes emerging in this case study.

Suspend disbelief	Ask powerful questions	Break the fourth wall
Who would make a surprising Mayor?	What makes a good Mayor or leader?	How may those ideas apply to me/us?
How could the system of governance be different?	What is required to understand what people need and want?	What else is linked to, relevant, or similar to that?
How else could we organise ourselves?	How can majorities and minorities make joint decisions?	Who is the right or the likely person to do this?
How does it feel to lead (and be led)?	What experiences prepare for leadership and authority?	Why can't we (or they) do that?
What may be the consequences of...?	Why may someone choose to run for office?	How are these situations similar or different?
What other scenarios are possible?	How can diverse people reach agreements?	What can we do today to influence the future?
How else can decisions be made and by whom, when?	How could we anticipate the consequences of a collective decision?	How may the ordinary (familiar) become extraordinary (unfamiliar)?
What if the unthinkable was possible, even became inevitable?		What else have we taken for granted so far?
Why is one individual at the top of government?		

context. The physical presence of robots can help promote embodied learning experiences harder to achieve with other media including screen based. And yet, recognising the high cost of commercial robots, embodiment and immersion effects that lead to generative suspension of disbelief can be pursued using more accessible means like low-fidelity models and open-source DIY assemblages (Gibbons & Snake-Beings, 2018).

2) Advancing and sustaining spaces where curiosity is cultivated. This can be achieved via activities where diverse participation is fostered and informed by the values of the group, school, or organisation. Agonistic pluralism in this project was promoted by valuing every voice and emphasising relationality and connection over correct answers, “winning” debates, or silencing some voices through consensus. Our project highlighted excitement as a key pedagogic principle (Hooks, 2014) and demonstrated how enjoyment and humour can “coexist with and even stimulate serious intellectual and/or academic engagement” (Shanahan, 2018) in learning civic agency in secondary education.

3) Pursuing a type of alienation or distancing effect (“breaking the fourth wall”) that helps learners to become “spect-actors” able to see the familiar with new eyes (Brecht, 2014). Brechtian narrative devices enable the interruption of the sense of illusion in storytelling and can achieve a *Verfremdungseffekt* or V-effect, i.e., making the familiar unfamiliar (Brecht, 2014; Shanahan, 2018). This can lead participants to critically and creatively reimagine conventional situations that tend to go unexamined.

4) Working collaboratively in partnerships between teachers, children, re-

searchers, and designers of creative technologies (Connor & Sosa, 2018). These types of collaboration can be challenging to organise, as the conventional STEM teachers may not be interested in using robots other than to teach coding, and civics teachers may feel intimidated or alienated by the idea of using robots to teach social studies and humanities topics.

These drivers for youth participation converged in the Robot for Mayor 2030 project, where work in partnership led to the narrative of a naïve and charismatic robot with noble intentions and ambitious dreams that worked well with its own admission of its current limitations -physical as well as emotional to grasp the complexities of human behaviour. This led to children imagining, questioning, and reflecting upon possible futures as well as their present reality. The conversations with Robot H enabled children to relax the constraints and open the space of future possibilities, allowing them to articulate new ideas and possibilities. Humanoid robots seem particularly adept at delivering generative narratives in this space since they can play their role and simultaneously remind people that they are “only a robot after all” as a manoeuvre to trigger new ways of looking at things (i.e., “I *know* x, but I don’t *really* understand it, please tell me, how does it *feel* to you?”). This is a type of “reverse-Turing test” (Epstein et al., 2008) interaction that can lead to key discoveries of what subtle aspects of the human experience means.

The Manurewa sessions also point towards an alternative pedagogy using robots: to reposition teachers as “third actors” in the classroom (Else, 1945). In ancient Greek drama, the invention of the second actor as an “answerer” created possibilities that did not exist with a single actor and the chorus on stage. With the second actor, “tragedy was really born, because debate, action, conflict between two characters could now be represented” (Else, 1945). The addition of a third stage character two and a half millennia ago further expanded the narrative infrastructure with roles that allow the protagonist to interact with an on-stage listener for greater narrative depth (Else, 1945). With a robot facilitating conversations with children, teachers can adopt a reflective position to observe and notice the possibilities in these interactions. Teachers may thus more easily identify opportunities to expand on key ideas that emerge in the conversations, ask learners to comment on the interaction, or transfer some of the ideas onto more realistic contexts exploring implications of immediate relevance. Robots as third actors can change the teaching script, enabling new ways of “indirect teaching” (Biesta, 2015).

6. Conclusion

The Robot for Mayor 2030 project presented here originated from the convergence of different factors including teachers who were open to try new approaches to teach civics, a project that sought to creatively respond to a government 30-year plan for a city where diverse voices were marginalised, and a synergistic collaboration between teachers, learners, and researchers using creative

research approaches (Kara, 2015). The study sought to identify the drivers to spur interest and participation in youth civics demonstrating new uses of technology for learning and revealing fresh ideas for teaching and learning to explore without the use of high-tech devices.

The design process behind Robot H and the study presented here was heavily influenced by the people and the context in Manurewa where it emerged. The narrative was shaped by the feedback and opinions of teachers, learners and the public, and the research plan and protocols were developed in close collaboration with teachers. We believe that this particularity helps rather than hinders the universal applicability of the findings inasmuch as they address issues shared by learners in other contexts. The themes that emerged from this study are general enough to inform and inspire teachers and researchers to adapt and develop them in their own work.

Most robots in high schools are found in technology labs where they are used to teach how to code. Therefore, only the learners who are already interested in technology and engineering will have access to robots, while most miss out. Robot H showed ways to more creatively use humanoid robots to learn subjects like Social Studies and the Humanities, which could assist to spark interest in technology in a wider range of learners for increased inclusivity (Margolis et al., 2017). From a research perspective, the interdisciplinary nature of this project has caused delays and difficulties in getting research outputs accepted by reviewers from academic journals in fields like design, technology, and education.

On the other hand, Robot H also showed the serious limitations of the Nao platform. The team was disappointed by its constraints in speech recognition, monotonous voice synthesis, and clunky movements. In developing Robot H, we felt misled by the deceiving videos and inflated claims made not only by the company Aldebaran and vendors but also in many carefully edited videos made by roboticists in academia. The hype around social robots has only been matched by the commercial failure of companies behind robots like Nao, Pepper, Anki, and Jibo, to name the most prominent. The charisma of this technology (Ames, 2019) comes with a hefty cost and the risk of rapid obsolescence. A key lesson of this project was to realise the value of social robots as research tools to explore new pedagogical possibilities that can then be implemented in ways that do not introduce extra burdens for teachers and a technological dependency for schools.

Future research in this area includes bringing these studies out of the classroom and into informal learning spaces to support student-driven topics and projects. We are also interested in applying the findings of this project using other technologies such as interactive video, videogames, VR/XR, and 3D printing for learners to create and build their own characters and sci-fi narratives for learning (Gibbons & Kupferman, 2019).

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Ames, M. G. (2019). *The Charisma Machine: The Life, Death, and Legacy of One Laptop per Child*. The MIT Press. <https://doi.org/10.7551/mitpress/10868.001.0001>
- Anderson, D. R. (1986). The Evolution of Peirce's Concept of Abduction. *Transactions of the Charles S. Peirce Society*, 22, 145-164.
- Auckland Council (2012). *The Auckland Plan*. <http://theplan.theaucklandplan.govt.nz/>
- Ballard, P. J., Anderson, G., Moore, D. P., & Daniel, S. S. (2021). Youth Experiences in *Authoring Action: The Impact of an Arts-Based Youth Program on Youth Development*. *Journal of Adolescent Research*, 38, 178-210. <https://doi.org/10.1177/07435584211006787>
- Banathy, B. H. (2013). *Designing Social Systems in a Changing World*. Springer Science & Business Media.
- Benitti, F. B. V. (2012). Exploring the Educational Potential of Robotics in Schools: A Systematic Review. *Computers & Education*, 58, 978-988. <https://doi.org/10.1016/j.compedu.2011.10.006>
- Berryman, M., Eley, E., & Copeland, D. (2017). Listening and Learning from Rangatahi Maori: The Voices of Maori Youth. *Critical Questions in Education*, 8, 476-494.
- Biesta, G. J. J. (2015). *Beautiful Risk of Education*. Routledge. <https://doi.org/10.4324/9781315635866>
- Blevins, B., LeCompte, K., & Wells, S. (2016). Innovations in Civic Education: Developing Civic Agency through Action Civics. *Theory & Research in Social Education*, 44, 344-384. <https://doi.org/10.1080/00933104.2016.1203853>
- Bogad, L. M. (2016). *Electoral Guerrilla Theatre: Radical Ridicule and Social Movements* (2nd ed.). Routledge. <https://doi.org/10.4324/9781315645360>
- Braun, V., Clarke, V., Hayfield, N., & Terry, G. (2019). Thematic Analysis. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* (pp. 843-860). Springer. https://doi.org/10.1007/978-981-10-5251-4_103
- Brazier, C. (2017). *Building the Future: Children and the Sustainable Development Goals in Rich Countries*. Innocenti Report Card 14, UNICEF.
- Brecht, B. (2014). *Brecht on Theatre: The Development of an Aesthetic*. Bloomsbury Publishing.
- Campbell, D. E., Levinson, M., & Hess, F. M. (2012). *Making Civics Count: Citizenship Education for a New Generation*. Harvard Education Press.
- Carlone, H. B., Huffling, L. D., Tomasek, T., Hegedus, T. A., Matthews, C. E., Allen, M. H., & Ash, M. C. (2015). 'Unthinkable' Selves: Identity Boundary Work in a Summer Field Ecology Enrichment Program for Diverse Youth. *International Journal of Science Education*, 37, 1524-1546. <https://doi.org/10.1080/09500693.2015.1033776>
- Ceha, J., Law, E., Kulić, D., Oudeyer, P.-Y., & Roy, D. (2021). Identifying Functions and Behaviours of Social Robots for in-Class Learning Activities: Teachers' Perspective. *International Journal of Social Robotics*, 14, 747-761. <https://doi.org/10.1007/s12369-021-00820-7>

- Chee, Y. S. (2015). *Games-to-Teach or Games-to-Learn: Unlocking the Power of Digital Game-Based Learning through Performance*. Springer.
<https://doi.org/10.1007/978-981-287-518-1>
- Cheng, Y.-W., Sun, P.-C., & Chen, N.-S. (2018). The Essential Applications of Educational Robot: Requirement Analysis from the Perspectives of Experts, Researchers and Instructors. *Computers & Education*, 126, 399-416.
<https://doi.org/10.1016/j.compedu.2018.07.020>
- Connor, A. M., & Sosa, R. (2018). The A-Z of Creative Technologies. *EAI Endorsed Transactions on Creative Technologies*, 18, e3.
<https://doi.org/10.4108/eai.10-4-2018.154460>
- Conti, D., Cirasa, C., Di Nuovo, S., & Di Nuovo, A. (2020). "Robot, Tell Me a Tale!": A Social Robot as Tool for Teachers in Kindergarten. *Interaction Studies*, 21, 220-242.
<https://doi.org/10.1075/is.18024.con>
- Deublein, A., Pfeifer, A., Merbach, K., Bruckner, K., Mengelkamp, C., & Lugin, B. (2018). Scaffolding of Motivation in Learning Using a Social Robot. *Computers & Education*, 125, 182-190. <https://doi.org/10.1016/j.compedu.2018.06.015>
- DiSalvo, B., Yip, J., Bonsignore, E., & DiSalvo, C. (2017). *Participatory Design for Learning: Perspectives from Practice and Research*. Routledge.
<https://doi.org/10.4324/9781315630830>
- DiSalvo, C. (2009). Design and the Construction of Publics. *Design Issues*, 25, 48-63.
<https://doi.org/10.1162/desi.2009.25.1.48>
- DiSalvo, C., Lodato, T., Fries, L., Schechter, B., & Barnwell, T. (2011). The Collective Articulation of Issues as Design Practice. *CoDesign*, 7, 185-197.
<https://doi.org/10.1080/15710882.2011.630475>
- Dunne, A., & Raby, F. (2013). *Speculative Everything: Design, Fiction, and Social Dreaming*. The MIT Press.
- Else, G. F. (1945). The Case of the Third Actor. *Transactions and Proceedings of the American Philological Association*, 76, 1-10. <https://doi.org/10.2307/283321>
- Epstein, R., Roberts, G., & Beber, G. (2008). *Parsing the Turing Test: Philosophical and Methodological Issues in the Quest for the Thinking Computer*. Springer.
<https://doi.org/10.1007/978-1-4020-6710-5>
- Ezeamuzie, N. O., & Leung, J. S. C. (2021). Computational Thinking through an Empirical Lens: A Systematic Review of Literature. *Journal of Educational Computing Research*, 60, 481-511. <https://doi.org/10.1177/07356331211033158>
- Findeli, A., Brouillet, D., Martin, S., Moineau, C., & Tarrago, R. (2008). Research through Design and Transdisciplinarity: A Tentative Contribution to the Methodology of Design Research. In Swiss Design Network (Ed.), *Focused—Current Design Research Projects and Methods* (pp. 67-94). Swiss Design Network.
- Flannery, L. P., & Bers, M. U. (2013). Let's Dance the "Robot Hokey-Pokey!". *Journal of Research on Technology in Education*, 46, 81-101.
<https://doi.org/10.1080/15391523.2013.10782614>
- Fløtten, K. J., Guerreiro, A. I. F., Simonelli, I., Solevåg, A. L., & Aujoulat, I. (2021). Adolescent and Young Adult Patients as Co-Researchers: A Scoping Review. *Health Expectations*, 24, 1044-1055. <https://doi.org/10.1111/hex.13266>
- Foster, J., & Taylor, D. (2019). Voter Turnout Decline in New Zealand: A Critical Review of the Literature and Suggestions for Future Research. *New Zealand Sociology*, 34, 1-26.
- Freire, P. (2000). *Pedagogy of the Oppressed*. Continuum.

- Gaver, W. (2012). What Should We Expect from Research through Design? In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 937-946). The Association for Computing Machinery. <https://doi.org/10.1145/2207676.2208538>
- Gibbons, A., & Kupferman, D. W. (2019). Flow My Tears, the Teacher Said: Science Fiction as Method. In S. Farquhar, & E. Fitzpatrick, (Eds.), *Innovations in Narrative and Metaphor* (pp. 167-181). Springer. https://doi.org/10.1007/978-981-13-6114-2_11
- Gibbons, A., & Snake-Beings, E. (2018). DiY (Do-It-Yourself) Pedagogy: A Future-Less Orientation to Education. *Open Review of Educational Research*, 5, 28-42. <https://doi.org/10.1080/23265507.2018.1457453>
- Greenfield, A. (2017). *Radical Technologies: The Design of Everyday Life*. Verso Books.
- Grocott, L., & Sosa, R. (2018). The Contribution of Design in Interdisciplinary Collaborations: A Framework for Amplifying Project-Grounded Research. In J. Oliver (Ed.), *Associations: Creative Practice and Research*. Melbourne University Press. <https://www.mup.com.au/books/9780522869996-associations>
- Hipkins, R. (2012). *Taking a Future-Focus: A Personal Response to Review of TLRI School-Sector Projects, 2003-2012*. NZCER. <http://www.tlri.org.nz/sites/default/files/pages/Taking%20a%20future%20focus%20%20Rose%20Hipkins%20.pdf>
- Hooks, B. (2014). *Teaching to Transgress*. Routledge. <https://doi.org/10.4324/9780203700280>
- Illich, I. (2021). *Tools for Conviviality*. Marion Boyars.
- Jenlink, P. M. (2004). Discourse Ethics in the Design of Educational Systems: Considerations for Design Praxis. *Systems Research and Behavioral Science*, 21, 237-249. <https://doi.org/10.1002/sres.624>
- Jenlink, P., & Carr, A. A. (1996). Conversation as a Medium for Change in Education. *Educational Technology*, 36, 31-38.
- Kaipainen, K., Jarske, S., Varsaluoma, J., & Väänänen, K. (2022). Adolescents' Perceptions of the Role of Social Robots in Civic Participation: An Exploratory Study. In *2022 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. IEEE. <https://doi.org/10.1109/HRI53351.2022.9889636>
- Kara, H. (2015). *Creative Research Methods in the Social Sciences: A Practical Guide*. Policy Press. <https://doi.org/10.2307/j.ctt1t88xn4>
- Konijn, E. A., & Hoorn, J. F. (2020). Robot Tutor and Pupils' Educational Ability: Teaching the Times Tables. *Computers & Education*, 157, Article ID: 103970. <https://doi.org/10.1016/j.compedu.2020.103970>
- Kucuk, S., & Sisman, B. (2017). Behavioral Patterns of Elementary Students and Teachers in One-to-One Robotics Instruction. *Computers & Education*, 111, 31-43. <https://doi.org/10.1016/j.compedu.2017.04.002>
- Light, A., Simpson, G., Weaver, L., & Healey, P. G. T. (2009). Geezers, Turbines, Fantasy Personas: Making the Everyday into the Future. In *Proceedings of the Seventh ACM Conference on Creativity and Cognition* (pp. 39-48). The Association for Computing Machinery. <https://doi.org/10.1145/1640233.1640243>
- Lukens, J., & DiSalvo, C. (2011). Speculative Design and Technological Fluency. *International Journal of Learning and Media*, 3, 23-40. https://doi.org/10.1162/IJLM_a_00080
- Manzini, E., & Coad, R. (2015). *Design, When Everybody Designs: An Introduction to Design for Social Innovation*. MIT Press. <https://doi.org/10.7551/mitpress/9873.001.0001>
- Margolin, V., & Margolin, S. (2002). A "Social Model" of Design: Issues of Practice and

- Research. *Design Issues*, 18, 24-30. <https://doi.org/10.1162/074793602320827406>
- Margolis, J., Estrella, J., Hole, J. J., & Nao, K. (2017). *Stuck in the Shallow End: Education, Race, and Computing*. MIT Press.
- Mateas, M., & Sengers, P. (1998). *Narrative Intelligence*. John Benjamins Publishing.
- McArthur, J., & Robin, E. (2019). Victims of Their Own (Definition of) Success: Urban Discourse and Expert Knowledge Production in the Liveable City. *Urban Studies*, 56, 1711-1728. <https://doi.org/10.1177/0042098018804759>
- Morrison, S. L., & Vaoleti, T. M. (2011). AKO—A Traditional Learning Concept for Maori and Pacific Youth. *Bildung und Erziehung*, 64, 395-408. <https://doi.org/10.7788/bue.2011.64.4.395>
- O’Gieblyn, M. (2021). *God, Human, Animal, Machine: Technology, Metaphor, and the Search for Meaning*. Knopf Doubleday Publishing Group. <https://books.google.co.nz/books?id=PxQLEAAQBAJ>
- Papadopoulos, I., Lazzarino, R., Miah, S., Weaver, T., Thomas, B., & Koulouglioti, C. (2020). A Systematic Review of the Literature Regarding Socially Assistive Robots in Pre-Tertiary Education. *Computers & Education*, 155, Article ID: 103924. <https://doi.org/10.1016/j.compedu.2020.103924>
- Rogers, Y., Frauenberger, C., & Quintana, C. (2017). Conversation: Tensions and Possibilities between Learning and Participatory Design. In B. DiSalvo, J. Yip, E. Bonsignore, & C. DiSalvo (Eds.), *Participatory Design for Learning: Perspectives from Practice and Research* (pp. 225-234). Routledge. <https://doi.org/10.4324/9781315630830-22>
- Sanders, E. B. N., & Stappers, P. J. (2012). *Convivial Toolbox: Generative Research for the Front End of Design*. BIS Publishers.
- Shanahan, A. M. (2018). Pirated Pedagogy: Repurposing Brecht’s Performance Techniques for Revolutions in Teaching. In A. Flotsos & G. S. Medford (Eds.), *New Directions in Teaching Theatre Arts* (pp. 193-208). Springer International Publishing. https://doi.org/10.1007/978-3-319-89767-7_12
- Simonsen, J., & Robertson, T. (2012). *Routledge International Handbook of Participatory Design*. Routledge. <https://doi.org/10.4324/9780203108543>
- Smakman, M., Vogt, P., & Konijn, E. A. (2021). Moral Considerations on Social Robots in Education: A Multi-Stakeholder Perspective. *Computers & Education*, 174, Article ID: 104317. <https://doi.org/10.1016/j.compedu.2021.104317>
- Sosa, R., & Grocott, L. (2020). The Creative Translation of Design Methods into Social Research Contexts. In H. Kara & S. Khoo (Eds.), *Researching in the Age of COVID-19 Vol 3: Volume III: Creativity and Ethics* (Vol. 3, pp. 9-19). Policy Press. <https://doi.org/10.2307/j.ctv18dvt3x.6>
- Velentza, A.-M., Fachantidis, N., & Lefkos, I. (2021). Learn with Surprise from a Robot Professor. *Computers & Education*, 173, Article ID: 104272. <https://doi.org/10.1016/j.compedu.2021.104272>
- Velentza, A.-M., Plasa, S., & Fachantidis, N. (2020). Future Teachers Choose Ideal Characteristics for Robot Peer-Tutor in Real Class Environment. In A. Reis, J. Barroso, J. B. Lopes, T. Mikropoulos, & C.-W. Fan (Eds.), *Technology and Innovation in Learning, Teaching and Education. TECH-EDU 2020. Communications in Computer and Information Science* (Vol. 1384, pp. 476-491). Springer. https://doi.org/10.1007/978-3-030-73988-1_39
- Vester, A. (2018). *Removing the Decile Label: An Inquiry on the Causes, Impacts and Possible Mitigation of the Stigmatisation That Accompanies Resourcing for Disadvantage*. E. A. Limited.

- Wenman, M. (2003). 'Agonistic Pluralism' and Three Archetypal Forms of Politics. *Contemporary Political Theory*, 2, 165-186. <https://doi.org/10.1057/palgrave.cpt.9300091>
- Whitfield, K. D. M. (2021). *Local Government and Youth Voter Turnout: Obstacles and Solutions for Aotearoa New Zealand*. Ph.D. Thesis, University of Otago.
- Wood, L. J., Lehmann, H., Dautenhahn, K., Robins, B., Rainer, A., & Syrdal, D. S. (2016). Robot-Mediated Interviews with Children: What Do Potential Users Think? *Interaction Studies*, 17, 438-460. <https://doi.org/10.1075/is.17.3.07woo>
- Xia, Y., & LeTendre, G. (2021). Robots for Future Classrooms: A Cross-Cultural Validation Study of "Negative Attitudes toward Robots Scale" in the US Context. *International Journal of Social Robotics*, 13, 703-714. <https://doi.org/10.1007/s12369-020-00669-2>

Appendix

Table A1. Excerpt of the code for the opening of Session A in Manurewa.

```

^start(Stand/Gestures/Hey_4) Kia Ora, Hello everyone! \pau=200\
^start(Stand/Gestures/Me_5)\pau=500\ As you know, my name is H \pau=700\ Robot
H! ^wait(Stand/Gestures/Me_5)
^start(Stand/Gestures/Give_1) Thank you for inviting me to your school!
^wait(Stand/Gestures/Give_1)
^start(Stand/Gestures/Enthusiastic_1) I'm a simple robot who wants to connect better
with humans! ^wait(Stand/Gestures/Enthusiastic_1)
^start(Stand/Waiting/Think_2) So, \pau=300\ I got a brilliant idea!
^wait(Stand/Waiting/Think_2)
^start(Stand/Gestures/YouKnowWhat_1) What if a robot \pau=150\ became the Mayor
of Auckland in 2030? ^wait(Stand/Gestures/YouKnowWhat_1)
^start(Stand/Gestures/Enthusiastic_5)
^start(Stand/Gestures/YouKnowWhat_1) Seriously, I'm not joking ^wait
(Stand/Gestures/YouKnowWhat_1)
^start(Stand/Gestures/Explain_2) What if a robot really became the Mayor of Auckland
in 2030? ^wait(Stand/Gestures/Explain_2)
^start(Stand/Emotions/Neutral/Embarrassed_1) I know!, I'm small \pau=100\ and
honestly sometimes clumsy ^wait(Stand/Emotions/Neutral/Embarrassed_1)
^start(Stand/Gestures/No_3) There are many things \pau=50\ I cannot do yet!
^wait(Stand/Gestures/No_3)
^start(Stand/Emotions/Positive/Proud_2) But, I'm learning!
^wait(Stand/Emotions/Positive/Proud_2)
^start(Stand/Gestures/Explain_3) Humans can help me to improve my skills,
^wait(Stand/Gestures/Explain_3) \pau=300\ especially young people
^start(Stand/Gestures/You_4) like you!

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