

## Speculative Design Principles for Emergent Global Citizenship in Foundational Schooling

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### ABSTRACT

The complexity of 21st-century global challenges necessitates innovative approaches to global citizenship education. This study develops speculative design principles for emergent global citizenship in foundational schooling through futures research methodologies. Drawing from speculative design theory and emergent citizenship frameworks, the research employs participatory scenario-building and critical literature analysis of international case studies. Three core principles emerge: radical anticipation, relational ethics, and transformative imagination. These principles challenge conventional citizenship education by emphasizing future-oriented thinking, ethical interdependence, and creative possibility. The study contributes to educational futures discourse by providing a framework that transcends instrumental approaches to global citizenship, instead fostering capacities for navigating uncertainty and complexity. Implementation recommendations include curriculum prototyping, teacher professional development in futures literacy, and policy reforms supporting experimental pedagogies. This research demonstrates how speculative design can reorient foundational education toward more critical, adaptive, and ethically engaged forms of global citizenship.

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## 1. INTRODUCTION

The global challenges of the 21st century—ranging from climate crises and mass migration to technological disruptions—have created unprecedented complexity in human life organization (OECD, 2022). According to the World Economic Forum (2023) report, approximately 65% of children entering primary school today will work in job types that do not yet exist, demanding adaptation and anticipation capacities that far exceed conventional educational frameworks (Facer, 2019). This condition requires new approaches to global citizenship education capable of responding to uncertainty and rapid change (Sterling, 2021). Conventional foundational education systems often remain trapped in nationalist paradigms and static approaches to citizenship, thus being inadequate to prepare learners for increasingly interconnected global realities (Biesta, 2020; Pashby et al., 2020).

Conventional approaches to global citizenship education tend to be limited to instrumental perspectives and declarative knowledge about global issues (Andreotti, 2011; Davies et al., 2018). These limitations trigger the need to explore alternative approaches that are more reflective, critical, and future-oriented (Osberg, 2018; Facer, 2019). The concept of "speculative design" (Dunne & Raby, 2013; Coulton & Lindley, 2019) offers a thinking framework that uses imagination and speculation to explore possible futures,

while "emergent global citizenship" (Biesta, 2020; Osberg, 2018) refers to understanding citizenship as a dynamic process that continuously evolves through complex interactions in global contexts. However, the integration of these two concepts in foundational education remains largely unexplored, creating a significant research gap (Ross, 2021; Jackson, 2022).

In the Indonesian context, citizenship education remains dominated by nationalist approaches that are less responsive to global dynamics (Zamjani, 2021). A study by the Ministry of Education and Culture (2022) shows that 78% of teachers experience difficulties integrating global issues in citizenship learning. Meanwhile, international research reveals that conventional global citizenship education approaches tend to neglect dimensions of uncertainty and complexity (Biesta, 2020; Andreotti, 2011). UNESCO (2023) affirms the need for paradigm transformation from past-oriented education toward anticipatory and reflective approaches.

This research aims to develop speculative design principles for emergent global citizenship in foundational schooling. The research questions focus on: (1) How can speculative design principles be developed to support emergent global citizenship? (2) How can these principles be implemented in foundational education contexts? The methodology combines futures studies literature analysis with participatory design involving educational stakeholders (Bradbury, 2015; Vaughan, 2017). This approach ensures that the resulting principles are not only theoretically sound but also practical and contextual.

The speculative design principles produced in this research are expected to make significant contributions to educational futures discourse (Ross, 2021; Selwyn, 2020). By integrating speculative approaches in citizenship education, foundational education can transform from mere knowledge transmission toward developing critical and imaginative capacities necessary for shaping more just and sustainable shared futures (Giroux, 2020; Biesta, 2020). This research also potentially bridges the gap between critical education theory and pedagogical practice in global citizenship education contexts (Andreotti, 2011; Pashby et al., 2020).

## **2. METHODS**

### **2.1. Research Design**

This research employs a futures studies approach that integrates causal layered analysis (Inayatullah, 2013) with scenario planning methodologies (Miller, 2018). The study adopts a hybrid research design that combines elements from research through design and participatory action research frameworks (Bradbury, 2015; Tanenbaum, 2020). This integrated approach enables the exploration of diverse future possibilities for global citizenship education while simultaneously identifying strategic leverage points for transformative educational change (Vaughan, 2017; Candy & Kornet, 2019). The design ensures that the development of speculative design principles incorporates perspectives from multiple stakeholders throughout the research process.

### **2.2. Data Sources and Participants**

Primary data sources comprise three main categories: speculative design literature, contemporary global citizenship frameworks, and innovative international case studies. The research employs purposive sampling (Patton, 2015) to recruit participants for the co-design process, including 15 primary school teachers, 5 curriculum specialists, and 10 global education practitioners. These participants provide diverse perspectives and practical insights essential for developing contextually relevant design principles. Additional data sources include global education policy documents and scholarly

publications on citizenship education futures, which undergo critical discourse analysis to identify dominant paradigms in global citizenship discourse (Facer, 2019; Selwyn, 2020).

### 2.3. Data Analysis

Data analysis employs multiple complementary methods to ensure comprehensive understanding and theoretical robustness. Thematic analysis (Braun & Clarke, 2019) identifies recurring patterns and relationships between key concepts across different data sources. Futures wheel analysis (Vaughan, 2017) facilitates the exploration of potential consequences and implications of emerging trends in global citizenship education. The analytical process proceeds iteratively through stages of open coding, thematic grouping, and validation through expert discussions (Creswell & Poth, 2018). Critical discourse analysis examines the underlying assumptions and power dynamics within global citizenship education policies and practices.

### 2.4. Research Procedure

The research unfolds through four sequential yet interconnected phases conducted over a six-month period. The initial phase involves systematic mapping of the current global citizenship education landscape through comprehensive literature review. The second phase employs backcasting and foresight methods (Miller, 2018) to develop alternative future scenarios for citizenship education. The third phase facilitates co-design workshops and focus group discussions with participants to generate and refine design principles. The final phase incorporates critical reflection through Delphi method with expert panels (Inayatullah, 2013) to validate and enhance the emerging principles. Throughout these phases, data triangulation occurs through participatory observation, in-depth interviews, and document analysis, ensuring methodological rigor and theoretical saturation. The speculative design process integrates scenario building (Candy & Kornet, 2019) with participatory design approaches (Tanenbaum, 2020) to create a collaborative and iterative research environment.

## 3. RESULT AND DISCUSSION

### 3.1. Methodological Implementation and Validation

The research employed a comprehensive futures studies approach that integrated causal layered analysis (Inayatullah, 2013) with participatory scenario planning (Miller, 2018) to develop and validate the speculative design principles. The six-month research process engaged 30 participants through iterative workshops and focus group discussions, ensuring that the emerging principles were grounded in both theoretical sophistication and practical wisdom. The triangulation of data sources—including participatory observation, in-depth interviews, and document analysis—provided robust validation for the findings (Bradbury, 2015).

The application of causal layered analysis revealed multiple dimensions of the current challenges in global citizenship education. At the litany level, the research identified superficial trends toward standardized global citizenship curricula. At the systemic level, analysis uncovered structural constraints within national education systems. The worldview layer exposed competing paradigms of citizenship education, while the myth/metaphor layer revealed deep narratives shaping citizenship conceptions (Inayatullah, 2013). This layered understanding informed the development of principles that address not only surface-level practices but also fundamental assumptions about citizenship and education.

Table 1: Research Methodology and Participant Engagement

Research Phase	Primary Methods	Participant Groups	Key Outcomes
Landscape Analysis	Causal layered analysis, Systematic literature review	Curriculum experts, Global practitioners	Identification of systemic constraints and transformative potentials
Scenario Development	Backcasting, Foresight methods, Futures wheel analysis	Teachers, Curriculum experts	Alternative future scenarios for citizenship education
Co-design	Participatory workshops, Focus group discussions	All stakeholder groups	Emergence and refinement of design principles
Validation	Delphi method, Triangulation	Expert panels, Practitioners	Theoretical and practical validation of principles

### 3.2. Speculative Design Principles for Emergent Global Citizenship

Through the participatory research process, three core principles emerged that reconceptualize global citizenship education for foundational schooling. These principles represent a significant departure from conventional approaches by emphasizing process over content, emergence over transmission, and possibility over prescription.

#### 1. Radical Anticipation Principle

The radical anticipation principle developed directly from futures literacy workshops and scenario planning exercises with teachers (Miller, 2018). This principle emphasizes developing capacities to navigate uncertainty and anticipate multiple possible futures. As one teacher participant noted: "Our students need to be comfortable with not knowing, while developing tools to face whatever futures emerge." The principle integrates insights from anticipatory governance theory (Miller, 2018) while addressing the practical challenges of implementing futures thinking in primary classrooms.

Implementation strategies include simple scenario planning, futures wheel analysis, and foresight exercises adapted to students' cognitive development levels (Vaughan, 2017). These approaches enable students to consider long-term consequences of collective actions while developing resilience in facing uncertainty (Osberg, 2018). The principle challenges the predominant focus on past and present in citizenship education, instead positioning the future as a space of possibility and responsibility.

#### 2. Relational Ethics Principle

Relational ethics emerged from thematic analysis of cross-cultural dialogues and positionality reflections during focus group discussions (Braun & Clarke, 2019). This principle focuses on recognizing global interdependence and the ethical responsibilities that emerge from complex relational networks (Biesta, 2020). Curriculum experts emphasized that "ethical reasoning must evolve beyond national

boundaries to address transnational challenges," while global practitioners shared concrete experiences of implementing collaborative projects across cultures.

The principle expands ethics of care discourse (Noddings, 2013) to the global realm by emphasizing mutual vulnerability and collective responsibility (Zembylas, 2021). Implementation includes developing transcultural dialogue, global collaborative projects, and critical reflection about positionality in global systems (Andreotti, 2011). These approaches help students understand their position within global networks while developing empathy toward different perspectives (Jackson, 2022).

### 3. Transformative Imagination Principle

Transformative imagination resulted from design fiction activities and speculative prototyping sessions with all stakeholder groups (Coulton & Lindley, 2019). This principle develops the ability to imagine alternatives to existing socio-political orders and actively participate in their transformation (Giroux, 2020). As one curriculum expert reflected: "We need to move from teaching about citizenship to practicing citizenship through imaginative engagement."

The principle connects speculative design discourse (Dunne & Raby, 2013) with transformative pedagogy (Freire, 1970), emphasizing agency in social change. Implementation includes using design fiction, speculative prototyping, and critical design methods that allow students to explore and critique various future visions (Tanenbaum, 2020). These approaches enable students to not only adapt to the future but also actively shape it (Selwyn, 2020).

Table 2: Speculative Design Principles Framework

Design Principle	Theoretical Foundations	Learning Implementation	Expected Outcomes
Radical Anticipation	Anticipatory governance (Miller, 2018), Critical futures studies (Inayatullah, 2013)	Scenario planning, Futures wheel analysis, Foresight exercises	Futures literacy, Adaptive resilience, Foresight capability
Relational Ethics	Ethics of care (Noddings, 2013), Relational ethics (Biesta, 2020)	Transcultural dialogue, Global collaborative projects, Positional reflection	Cosmopolitan empathy, Ethical reasoning, Intercultural competence
Transformative Imagination	Critical pedagogy (Giroux, 2020), Design activism (Dunne & Raby, 2013)	Design fiction, Speculative prototyping, Critical design methods	Citizenship agency, Creative courage, Transformative capacity

### 3.3. Theoretical Integration and Advancement

The research demonstrates significant theoretical advancement by integrating speculative design approaches with critical education traditions. While traditional critical education focuses on deconstructing existing injustice structures (Freire, 1970), speculative design adds a prospective dimension by exploring transformation possibilities toward more just conditions (Ross, 2021). The integration of these approaches creates synergy between critical awareness and social imagination necessary for meaningful citizenship in the 21st century (Biesta, 2020).

The radical anticipation principle expands futures literacy discourse in education (Facer, 2019) by acknowledging the fundamentally uncertain and undetermined nature of the future (Osberg, 2018). Unlike predictive approaches that attempt to forecast the future, radical anticipation develops students' capacities to think in multiple timeframes and consider unexpected consequences of human actions (Vaughan, 2017). This represents a significant departure from conventional citizenship education's emphasis on historical and contemporary issues.

Relational ethics advances global citizenship education discourse by emphasizing affective and relational dimensions often overlooked in cognitively-focused approaches (Pashby et al., 2020). The principle recognizes that citizenship is not merely legal status or identity, but relational practice that continuously evolves through engagement with others (Jackson, 2022). This perspective requires recognition of shared vulnerability and collective responsibility transcending national boundaries (Andreotti, 2011).

Transformative imagination bridges speculative design with critical pedagogy by emphasizing agency in social transformation (Giroux, 2020). The principle acknowledges that social change requires the ability to imagine alternatives to the status quo and develop capacity to realize them (Selwyn, 2020). This represents an important advancement beyond critical approaches that emphasize critique without providing constructive alternatives.

### **3.4. Implementation Challenges and Contextual Considerations**

The research identified significant implementation challenges through the participatory design process. In the Indonesian context, these include teachers' limited familiarity with futures methodologies, pressure to achieve conventional academic targets, and structural constraints within the education system (Ministry of Education and Culture, 2022). However, the co-design sessions generated practical strategies for addressing these challenges, including gradual implementation approaches and the development of professional learning communities.

The study reveals that implementing these principles requires fundamental shifts in pedagogical approaches and assessment practices. Teachers need to transition from knowledge transmitters to facilitators of social imagination (Jackson, 2022), while assessment needs to evolve from measuring standard achievement toward documenting capacity development for world-making (Facer, 2019). These changes have significant implications for teacher professional development and curriculum design (Selwyn, 2020).

The research also highlights the importance of contextual adaptation. While the principles maintain theoretical coherence, their implementation requires careful consideration of local educational contexts, cultural norms, and institutional constraints (Zamjani, 2021). The participatory nature of the research ensured that the principles incorporate this necessary flexibility while maintaining their transformative potential.

### 3.5. Methodological Reflections and Contributions

The integrated methodology employed in this research offers significant contributions to educational design research. The combination of futures studies methods with participatory action research enabled both deep theoretical exploration and practical principle development (Bradbury, 2015). The extended engagement with stakeholders over six months allowed for iterative refinement of concepts while building capacity among participants.

The research demonstrates how speculative approaches can be grounded in empirical data and stakeholder engagement, addressing common criticisms of speculative design as being too abstract for educational applications (Dunne & Raby, 2013). The methodological approach provides a model for how educational innovation can balance visionary thinking with practical implementability.

However, the methodology also faced limitations. The research period, while substantial, limited opportunities to observe long-term implementation effects. Additionally, the participatory nature meant that principles were developed in specific contexts with particular stakeholder groups, which may affect their transferability to other educational settings.

### 3.6. Concluding Synthesis: Toward Emergent Global Citizenship

The three speculative design principles represent a comprehensive framework for reimagining global citizenship education in foundational schooling. They offer a transformative approach that prepares students for uncertain futures while fostering their agency in shaping more equitable and sustainable societies. The principles should be understood not as rigid prescriptions but as living frameworks that require contextual adaptation and continuous refinement through practice.

The research contributes to educational futures discourse by providing concrete pathways for reorienting citizenship education from knowledge transmission toward capacity building for emergent global challenges (UNESCO, 2023). By integrating speculative approaches with critical pedagogy and participatory design, the study demonstrates how education can prepare children not just for the world as it is, but for the world as it could be (Biesta, 2020).

The principles and the methodological approach developed through this research offer valuable resources for educators, policymakers, and researchers interested in transforming citizenship education for the 21st century. They represent an important step toward educational approaches that honor the complexity of global challenges while nurturing the creative and ethical capacities needed to address them.

## 4. CONCLUSION

Based on the research findings, comprehensive implementation should begin with developing age-appropriate curriculum resources that integrate speculative design methods into existing subjects, alongside creating robust professional development programs that build teachers' capacities in futures literacy and speculative pedagogy. Educational institutions should simultaneously establish vibrant communities of practice where educators can continuously share experiences and refine implementation strategies through collaborative reflection, while also revising curriculum frameworks to incorporate futures thinking and ethical reasoning competencies at the policy level.

To ensure sustainable integration, strategic allocation of resources for teacher development in speculative design methodologies and pilot programs for innovative assessment approaches are essential. Further research should include longitudinal studies

examining the implementation impact of these principles, alongside investigations into their adaptation across diverse cultural contexts and the development of appropriate assessment frameworks for process-oriented citizenship education. Strengthening partnerships between teacher education institutions, schools, and educational communities will create the necessary ecosystems for ongoing innovation in global citizenship education.

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