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Views of ECE experts and teaching interns on curriculum greening and its alignment with the Philippine professional standards for teachers

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Abstract

Extension: In the Philippines, teacher preparation programs often include environmental education, also known as "curriculum greening," to prepare early childhood educators to deliver engaging lessons. This study determined the views of Early Childhood Education experts and teaching interns regarding (a) curriculum greening and (b) how curriculum greening aligns with, and adds value to, the indicators of the Philippine Professional Standards for Teachers (PPST) in the context of ECE. It employed a quantitative descriptive design to examine ECE experts' and teaching interns' perceptions of curriculum greening and its alignment with PPST, conducted at a state university in Cebu City, and analyzed using weighted means. The results showed general agreement (overall WM = 4.32, Agree), especially regarding encouraging environmentally conscious values (WM = 4.63), problem-solving skills (WM = 4.71), and sustainable activities (WM = 4.63). However, the integration of curriculum greening into PPST domains was rated as Moderately Evident (ME), with Learning Environment (WM = 3.46) ranked highest and Diversity of Learners (WM = 3.11) ranked lowest. Overall, the study concludes that curriculum greening is widely recognized as vital by both ECE experts and interns, yet its integration with PPST competencies remains moderate.

Keywords: Curriculum greening program, Early childhood education, Philippine professional standards for teachers, Sustainable education, Teaching interns, Environmental education.

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Contents

Contribution of this paper to the literature

This study contributes to the existing literature by providing an original examination of curriculum greening in relation to the Philippine Professional Standards for Teachers (PPST) in Early Childhood Education. It generates empirical evidence from ECE experts and teaching interns on the alignment of sustainability competencies with PPST domains.

1. Introduction

Integrating sustainable practices into formal education has become an urgent societal concern to counter environmental degradation and intensifying climate change. In the Philippines, teacher preparation programs often include environmental education, also known as "curriculum greening," to equip early childhood educators to deliver engaging lessons. Research shows that even after environmental education (EE) was introduced into teacher preparation programs, aspiring educators continue to face challenges with clarity of implementation, resource availability, and application of knowledge and skills (Corpuz, San Andres, & Lagasca, 2022; Sustainable Development Goals, 2020; Tsui, 2020; United Nations, 2020).

Parallel to the call for curricular greening is the established PPST framework, which defines teacher quality and guides both in-service and preservice students in the country. Within Early Childhood Education (ECE), aligning greening initiatives with the PPST is critical: It ensures that sustainability-related values, content knowledge, and pedagogical strategies are woven into what ECE professionals should know, do, and value in order to foster holistic development in young learners (Fernandez, 2023).

However, little is known about how Early Childhood Education experts and teaching interns perceive the incorporation of curriculum greening within the PPST-aligned competencies. Do they view greening as complementary or supplementary to existing domains? How do they value greening content relative to key PPST indicators, such as designing inclusive learning environments, planning responsive curricula, and engaging in professional growth, and what insights do these perceptions offer for both policy and practice? These questions underscore the need for a nuanced examination of ECE stakeholders' views on integrating environmental and sustainability content into the standards governing teacher quality in the Philippines.

Despite the growing importance and guidance of PPST, empirical research still struggles to capture how curriculum greening is meaningfully operationalized within PPST-aligned competencies in ECE, particularly from the perspectives of both experts and teaching interns. Existing studies largely focus on policy integration and theoretical alignment, yet they seldom examine how these translate into actual teaching practices, decision-making, and value formation among future educators. This lack of context-specific and stakeholder-driven insights limits the development of responsive teacher education programs that effectively integrate sustainability into established professional standards, underscoring the need for research.

Therefore, this paper mainly aimed to investigate the views of ECE experts and teaching interns regarding (a) curriculum greening and (b) how curriculum greening aligns with, and adds value to, the indicators of the PPST in the context of ECE. Three main areas are examined explicitly in this study: (1) the general opinions of ECE experts and interns regarding the curriculum-greening program; (2) how they believe that greening corresponds with particular PPST indicators; and (3) how they evaluate the "value content" of curriculum greening in relation to those PPST indicators. The study seeks to contribute to sustainable education in teacher preparation and the continuous improvement of ECE curricula in the Philippines by utilizing this triangulation of viewpoints.

2. Methodology

2.1. Research Design

The study used a quantitative descriptive research design to examine the perceptions of Early Childhood Education (ECE) experts and teaching interns about the alignment of curriculum greening to the PPST. This research design is appropriate, as it utilized numerical data to describe perceptions through a survey questionnaire.

2.2. Research Environment

The study was conducted at a state university, specifically in the College of Teacher Education, where 30 ECE experts serve as professors. Within that state university was an Integrated Laboratory School where the teaching interns were stationed and assigned teaching roles. This environment was deemed appropriate as it was a school setting where ECE was set.

2.3. Research Respondents

The study involved two groups of participants. The first group comprised 30 Early Childhood Education (ECE) experts and active practitioners from the College of Teacher Education. The second group was composed of 30 ECE teaching interns assigned to an Integrated Laboratory School as part of their curriculum. They were purposively chosen for their relevant experience related to the study's aim. The sample size was small because the study focused only on the views of a state university that offered Early Childhood Education, which is not available in most schools in the Visayas region of the Philippines.

2.4. Research Instrument

The study employed a researcher-developed questionnaire derived from the indicators of the Philippine Professional Standards for Teachers (PPST). Prior to administration, the instrument underwent expert validation to establish its clarity, relevance, and content validity. The instrument was pilot-tested by ECE teachers and teaching interns who were not included in the actual conduct of the study. The instrument also yielded a coefficient of 0.87 using Cronbach's alpha. A four-point Likert scale was used to measure participants' perceptions of curriculum greening and its alignment with PPST value-content indicators.

2.5. Data Analysis

A weighted mean was used to analyze quantitative data on respondents' perceptions of curriculum greening and its integration with PPST indicators. The numerical results were interpreted using a set of predetermined descriptors that reflected the degree of perceived alignment.

3. Results and Discussion

3.1. Views of Early Childhood Education Experts and Teaching Interns on Curriculum Greening Program

Curriculum greening is a method of ensuring that students are equipped to address the hurdles of the 21st century across society, the environment, and the economy. Teachers, as key stakeholders in students' growth and development, play a crucial role in curriculum design. Child guidance and discipline, cultural variation, appropriate teaching and learning methods, fostering independence, and many other factors are required to ensure sustainable education. Table 1 presents the views of ECE experts and teaching interns on the Curriculum Greening Program.

Table 1. Views of ECE experts and teaching interns on the Curriculum Greening Program.

Curriculum greening…			**Weighted mean**	**Views Extent**
1. Is a redirection of education to a more sustainable future.			4.42	A
2. Is only about spreading what sustainable development is.			3.46	N
3. Is mainly for students and young people			3.79	N
4. Is teaching all about nature and its surroundings.			3.96	N
5. Calls for reorienting existing education to one that includes knowledge, skills, issues, perspectives, and values.			4.38	A
6. Connects the cultural, social, economic, and environmental dimensions.			4.50	A
7. Looks at environmental damage as repairable			3.88	N
8. Encourages learners to follow sustainable practices.			4.63	A
9. Guides students to search for root causes of problems before solving them			4.58	A
10. Considers informal, non-formal, and formal interactions to learn about sustainable development.			4.33	A
11. Encourages learners to visualize their sustainable personal goals based on different scenarios.			4.54	A
12. Develops decision-making, problem-solving, and creative thinking skills as they respond to sustainability.			4.71	A
13. Fosters learners' environmentally responsible mindset, skills, and attitudes.			4.63	A
14. Incorporates global, national, and local dimensions in the study of sustainable issues.			4.33	A
15. Integrates sustainable topics on regional, national, and international agreements to foster sustainable collaborations.			4.42	A
16. Promotes relations and interdependencies by providing contextualized learning tasks anchored on sustainable development goals.			4.38	A
17. Encourages values like equality, democracy, and social justice			4.33	A
18. Guides the learners to be actively involved in the activities of their community.			4.25	A
19. Assists the learners to become actively engaged in the schools' ESD-based activities.			4.42	A
20. Integrates in the lesson the current cultural, economic, and geographical issues about sustainability.			4.38	A
Total Mean			4.32	A
1.0-1.9 – Strongly Disagree (SD)	2.0-2.9 Disagree (D)	3.0-3.9 Neutral (N)	4.0-4.9 Agree (A)	5.0 Strongly Agree (SA)

The Department of Education implemented sustainability initiatives, such as the School Inside a Garden Program (SIGA) and Disaster Risk Reduction Management (DRRM), to promote environmental awareness, disaster preparedness, and responsible resource management in schools. The school's sustainable practices also encouraged educational institutions to address environmental issues and strengthen community involvement (Goldman, Ayalon, Baum, & Weiss, 2018; Sustainable Development Goals, 2020). Moreover, policies such as Executive Order 27 and the Enhanced Basic Education Act of 2013 emphasized human rights education, critical thinking, creativity, and responsible citizenship to develop empowered and socially responsible learners (Ashwini & Aithal, 2024; Fischer et al., 2022). Higher education institutions help in the development of sustainable goals through analytical and imaginative learning experiences (Nkrumah & Sinha, 2020).

Table 2 indicates the views of ECE experts and teaching interns on the curriculum greening program. Among twenty (20) views about curriculum greening, the highest weighted mean was 4.71 (A) for View #12: develops decision-making, creative thinking, and problem-solving skills as they respond to sustainability, this being the highest mean under agreed and the lowest mean 3.46 (N) for View #2; is solely about teaching information about sustainable development. Majority of the participants agreed respectively on the following sixteen (16) views according to the weighted mean each got: View #12: develops decision-making, creative thinking, and problem-solving skills as they respond to sustainability; Views #8 & #13- encourages learners to follow sustainable practices and fosters learners' environmentally responsible mindset, skills, and attitudes; View #4- encourages students to search for sources of issues before carrying out solutions, View #11- encourages reinventing education to include values, perspectives, issues, skills, and knowledge; View #6- connects the environmental, social, environmental, economic, and cultural, dimensions (Baró, Calderón-Argelich, Langemeyer, & Connolly, 2019; Baró, Camacho, Pérez Del Pulgar, Triguero-Mas, & Anguelovski, 2021).

Views #1, #15, and #19 emphasized ESD and sustainable collaborations (UNESCO, 2013); views #5, #16, and #20 highlighted the integration of sustainability issues and SDGs in learning (Berchin, de Aguiar Dutra, & Guerra, 2021); Views #10, #14, and #17 promoted formal and informal learning and values such as equality, democracy, and social justice (UNESCO, 2013); while Views #4, #7, #3, and #2, which received neutral ratings, focused on

environmental awareness and the development of problem-solving skills and decision-making skills related to sustainability (Ashwini & Aithal, 2024; Nkrumah & Sinha, 2020).

Based on the results, a teacher has a significant influence on greening the ESD curriculum, as education promotes and integrates sustainable development across different educational levels. Not only will a teacher place high regard on curriculum greening as a means to sustainable education, but they should also ascertain the components that comprise it. Moreover, his ability to seamlessly integrate sustainable initiatives into existing programs serves as an impetus for sustainability. While global and domestic organizations have acknowledged the significance of education in creating communities grounded in educational principles, this work is still ongoing, resulting in environmental management, curriculum greening, a legally binding curriculum, and a scholastic curriculum.

Furthermore, Alicamen (2023) stated that to raise teachers' awareness, training for early childhood instructors in specialized pedagogy for adopting ESD within the existing curriculum is required, as is cooperation from school officials. Aithal and Rao (2016) also stated that schools can become advocates of sustainability by taking technological advancements and learner readiness into account, and that the opportunities, challenges, and repercussions of adopting green practices are integral to the long-term viability of education. Given the multiple issues that necessitate extensive, systematic, and holistic planning, it was emphasized that the separate countries' current financial, cultural, social, and political contexts can pose significant obstacles to the implementation of ESD.

In this regard, survey participants stated that the most challenging aspect of implementing ESD is ensuring that ESD programs and activities are appropriate to the local environment. When narrowing the problem of ESD implementation at the school level, gaining school support for incorporating ESD programs into the curriculum and co-curricular activities is always a challenge. The challenge is to foster a spirit in educational institutions that readily and enthusiastically supports ESD implementation, as evidenced by educators' interest and efforts to promote integration and whole-school engagement in ESD programs, with teacher training as a critical component. Developing an environmentally friendly curriculum is also influenced by the expectations placed on institutions by educational bodies. It is significantly easier to excite and inspire kids when teachers are well-trained and enthusiastic. Teachers can frequently use the surroundings to teach specific concepts in their subject. If they have determined that this is desirable, they will progressively develop methods to promote ESD in their classes (Browning & Rigolon, 2019).

Some teachers mentioned the challenge of developing a sustainability curriculum in their open-ended responses. They cited a slow pace of action of sustainability themes in the school programs, as well as a rigorous syllabus that focuses solely on summative and public tests. As a result, less focus would be placed on instilling values, strengthening favorable views, and promoting control and morality, among other things. Nonetheless, practical practice is a constant difficulty. Furthermore, institutions are crowded places, and instructors are under increasing workplace strain. Additional obstacles may arise from these factors, such as gaps in awareness, comprehension, desire, and understanding of how to grow more sustainably. The approach necessitates a shift from empowering individuals to empowering groups, creating time, overcoming budget constraints, tying infrastructure changes to mental changes, and involving the entire community. Regarding this topic, open-ended survey respondents indicated that unawareness of sustainable practices would be a barrier to adopting them in their homes and classrooms (Lavado-Anguera, Velasco-Quintana, & Terrón-López, 2024; Marpa, 2020).

Knowing the stories of many ESD courses taught by educators is important; however, incorporating ESD topics into an already overburdened curriculum may harm teaching quality by increasing teachers' teaching loads. It is also a challenge for educational institutions to create favorable learning conditions that effectively support the adoption of ESD instructional and learning methods. In principle, it would only be practicable if ECE specialists and Teaching Fellows could articulate the challenges of curricular greening in relation to PPST standards.

3.2. Assessment of PPST Domains as Foundations for Curriculum Greening

According to the PPST, new educators must meet the requirements acknowledged for admission to the field of education; possess an excellent grasp of the subjects/areas within which their bodies were educated as far as subject matter expertise and pedagogy; have the required expertise, abilities, and principles that encourage the teaching-learning process; handle educational initiatives and have methods that encourage instruction according to the educational requirements of the pupils they teach.

Providing training for early childhood teachers on specific pedagogy for applying ESD within the existing curriculum, along with support from school officials, is necessary to enhance teachers' understanding (Alicamen, 2023; Mesuwini, Ganya, & Mlotshwa, 2026; Miller, Kumar, Pearce, & Baldock, 2022). One of the radical curriculum theories proposed by Coskun and Aslan (2021) is that learning can reorganize and reroute the community, and that it is feasible to raise individuals who can comprehend the issues facing society, offer solutions, and critically examine them. This may support the conclusion that a field experience and pupil-teaching sequence receiving special designation and recognition for cooperating with field placement sites to provide high-quality experiential opportunities that put theory into practice.

The overall means of 4.32 (Reaction) and 4.24 (Learning) fall within the Very High range, indicating strong endorsement of the project's relevance, quality, and instructional effectiveness. This outcome aligns with previous studies that highlight a high level of engagement and enjoyment, which manifest as a desirable coaching experience (Quinton, Tidmarsh, Parry, & Cumming, 2022). Similarly, coaching initiatives have been found to increase satisfaction, awareness, and confidence in applying what is learned (Zhao et al., 2023). In addition, satisfaction and learning gains can encourage contextual adaptation (Paull, Whitsed, & Girardi, 2016). Therefore, learning required engagement.

Table 2. Views of the ECE experts and teaching interns on the indicators of PPST in relation to curriculum greening.

Domain	Indicators	Weighted Mean	Extent of Perception
1. Content Knowledge and Pedagogy	1.1 Demonstrate content knowledge and its application within and/or across curriculum teaching areas.	3.38	ME
	1.2 Demonstrate an understanding of research-based knowledge and principles of teaching and learning.	3.17	ME
	1.3 Show skills in the positive use of ICT to facilitate the teaching and learning process.	3.13	ME
	1.4 Demonstrate knowledge of teaching strategies that promote literacy and numeracy skills.	3.25	ME
	1.5 Apply teaching strategies that develop critical and creative thinking, and/or other higher-order thinking skills.	3.58	ME
	1.6 Use Mother Tongue, Filipino, and English to facilitate teaching and learning.	3.25	ME
	1.7 Demonstrate an understanding of the range of verbal and non-verbal classroom communication strategies.	3.33	ME
	Total Mean	3.30	ME
2. Learning Environment	2.1 Demonstrate knowledge of policies, guidelines, and procedures that provide safe and secure learning environments.	3.38	ME
	2.2 Demonstrate understanding of learning environments that promote fairness, respect, and care to encourage learning.	3.42	ME
	2.3 Demonstrate knowledge of managing classroom structure that engages learners, individually or in groups.	3.54	ME
	2.4 Demonstrate understanding of supportive learning environments that nurture and inspire learner participation.	3.71	ME
	2.5 Demonstrate knowledge of learning environments that motivate learners to work productively by assuming responsibility for their own learning.	3.42	ME
	2.6 Demonstrate knowledge of positive and nonviolent discipline in the management of learner behavior.	3.29	ME
	Total Mean	3.46	ME
3. Diversity of Learners	3.1 Demonstrate knowledge and understanding of differentiated teaching to suit the learners' gender, needs, strengths, interests, and experiences.	3.25	ME
	3.2 Implement teaching strategies that are responsive to the learners' linguistic, cultural, socioeconomic, and religious backgrounds.	3.13	ME
	3.3 Use strategies responsive to learners with disabilities, giftedness and talents.	3.29	ME
	3.4 Demonstrate understanding of the special educational needs of learners in difficult circumstances.	2.83	OE
	3.5 Show skills in the selection, development, and use of a variety of teaching and learning resources.	3.04	ME
	Total Mean	3.11	ME
4. Curriculum and Planning	4.1 Prepare developmentally sequenced teaching and learning processes to meet curriculum requirements.	3.29	ME
	4.2 Identify learning outcomes that are aligned with learning competencies.	3.38	ME
	4.3 Demonstrate knowledge in the implementation of relevant and responsive learning programs.	3.29	ME
	4.4 Seek advice concerning strategies that can enrich teaching practice.	3.13	ME
	4.5 Show skills in the selection, development, and use of a variety of teaching and learning resources.	3.08	ME
	Total Mean	3.23	ME
5. Assessment and Reporting	5.1 Demonstrate knowledge of the design, selection, organization, and use of diagnostic, formative, and summative assessment strategies.	3.33	ME
	5.2 Demonstrate knowledge of monitoring and evaluation of learner progress and achievement using learner attainment data.	3.29	ME
	5.3 Demonstrate awareness of existing laws and regulations that apply to the teaching profession.	3.25	ME
	5.4 Demonstrate familiarity with a range of strategies for communicating learner needs, progress, and achievement.	3.42	ME
	5.5 Demonstrate an understanding of the role of assessment data as feedback in teaching and learning practices and programs.	3.25	ME
	Total Mean	3.31	ME
6. Community Engagement and Professional Linkages	6.1 Demonstrate an understanding of responsive learning environments	3.29	ME
	6.2 Seek advice concerning strategies that build relationships with parents/guardians and the wider community.	3.33	ME
	6.3 Demonstrate awareness of existing laws and regulations that apply to the teaching profession.	3.21	ME
	6.4 Demonstrate knowledge and understanding of school policies and procedures to foster harmonious relationships with the wider school community.	3.50	ME
	Total Mean	3.33	ME

Domain	Indicators	Weighted Mean	Extent of Perception
7. Personal Growth and Professional Development	7.1 Articulate a personal philosophy of teaching that is learner-centered.	3.50	ME
	7.2 Demonstrate behaviors that uphold the dignity of teaching as a profession	3.42	ME
	7.3 Seek opportunities to establish professional links with colleagues.	3.42	ME
	7.4 Demonstrate an understanding of how professional reflection and learning can be used to improve practice.	3.42	ME
	7.5 Demonstrate motivation to realize professional development goals.	3.33	ME
	Total Mean	3.42	ME
1.0-1.9 Not Evident (NE)	2.0 – 2.9 Often Evident (OE)	3.0–3.9 Moderately Evident (ME)	4.0 Highly Evident (HE)

Based on Table 2, the level of perception of ECE experts and teaching interns regarding the indicators of PPST in relation to curriculum greening is moderately evident (ME) in all seven (7) domains. Feedback from participants who provided average or fair responses indicated that teachers believed the seven (7) domains, specified with their respective indicators, needed consistency and clarity. Isakova and Pchelnikov (2019) provide support for curriculum redirection towards sustainability in their study, concluding that the escalation of global environmental issues has demonstrated to the entire global community the current need to re-evaluate all aspects of learning about the environment. Participants' perceptions of curriculum greening aligned with the PPST were moderately evident, with the highest mean in Domain 2 (3.71) and the lowest in Domain 3 (2.83) (Uralovich et al., 2023).

Ginsburg and Audley (2020) found that curriculum implementers are not applying their learning in day-to-day practice. Some of them ignored the importance of daily practice and habit formation. This is evidenced by William Reid's Theory on Curriculum Redirection, which holds that actual action ought to be identified more by particular and tangible knowledge rather than broad or general information, arguing that the curriculum is an accomplishment that anybody associated with education ought to and must pursue, explaining how individuals choose what to impart and acquire (Reid, 2013).

In support of the result are the participants' responses. A participant (P1) in this study stated that he was not oriented to the concept of curriculum greening in ESD. Another participant (P5) stated that she was unsure what curriculum greening entails but surmised that, given its name, it must involve incorporating sustainability into the curriculum. Still another participant (P8) honestly stated that he is not familiar with the ESD curriculum greening and has not heard about it. These findings suggest that, at an average or fair level of understanding of the indicators in the PPST, teachers' understanding of curriculum greening will affect and influence their attitudes and mindset towards ESD integration or embedding in the curriculum and other curriculum greening programs (Van Dijk-Wesselius, van den Berg, Maas, & Hovinga, 2020; Žalėnienė & Pereira, 2021). Moreover, the data gathered revealed another relevant attribute of value content that could intensify the embodiment of curriculum greening. Table 3 outlines the value content of curriculum greening relative to the PPST indicators.

Table 3. Views of the Early Childhood Education Experts and Teaching Interns on Curriculum Greening-Value Content relative to the Indicators of PPST.

Domain	Indicators	Weighted Mean	Extent of Perception
Value Content	1. Demonstrate motivation to learn through investigation with intentional teaching on the ESD greening.	3.46	ME
	2. Demonstrate willingness to guide the learners effectively on the use of their learning for their personal, physical, social, cognitive, moral, emotional, and psychological development.	3.46	ME
	3. Seek opportunities to nurture learners' appreciation of nature and develop an interest in plants to gain a greening consciousness.	3.42	ME
	4. Demonstrate consistency in creating the school green, the green growth strategies, how to adopt a clean and green school, and the green school initiative work	3.50	ME
	5. Demonstrate knowledge of greening the curriculum, the challenges in the 21st century, such as global warming, climate change, and unsustainable lifestyle.	3.33	ME
	Total Mean	3.43	ME
1.0-1.9 Not Evident (NE)	2.0 – 2.9 Often Evident (OE)	3.0–3.9 Moderately Evident (ME)	4.0-4.9 Highly Evident (HE)

The results indicate that all five value-related indicators had a mean of 3.43, corresponding to a moderately evident description. The overall mean score indicated that ECE experts and teaching interns found the content on curriculum greening to be moderately integrated into the beginning teachers' indicators. The usefulness of greening initiatives in the school environment (Giezen & Pellerey, 2021). Findings are supported by Stevenson, Peterson, Bondell, Mertig, and Moore (2020) that such policies could be successful in addressing green space inequities. Moreover, the study revealed that ECE experts and teaching interns need to demonstrate knowledge of curriculum greening, such as climate change and unsustainable lifestyles (mean = 3.33). This finding implies that concepts related to curriculum greening initiatives should be integrated into early childhood education learning activities.

4. Conclusion

The study concludes that curricular greening is a crucial step toward achieving sustainability in education. Although both ECE professionals and teaching interns acknowledge its importance, it remains insufficiently integrated into teacher education standards and practices. To realize the revolutionary potential of curriculum

greening inside the classroom, it is essential to align it more closely with professional teaching standards. Teacher education institutions help in integrating sustainability principles into curriculum design, professional development, and pedagogy, thereby empowering future educators. By doing this, they can help young pupils develop attitudes and behaviors focused on sustainability, positioning them to actively participate in building a sustainable future.

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