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SNAPSHOTS OF CRITICAL PARTICIPATORY ACTION RESEARCH BASED ON UNDERGRADUATE RESEARCH EXPERIENCES PROJECTS

Economic, Social, Cultural and Political Sustainability

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Introduction

World Meteorological Organization (WMO) (2021) determined that the Earth's average temperature was approximately 1.2°C in 2020, exceeding the pre-industrial level. In the COP 28 Climate Conference (COP 28), climate change was on the agenda and global initiatives were encouraged to deal with it, aiming to retain the 1.5°C climate goal around some critical issues (e.g., the right to live clean, healthy and sustainable environment, children's right and women empowerment) (United Nations, 2023). After becoming a party to the Kyoto Protocol in 2009, Türkiye ratified the 2030 Agenda related to Sustainable Development Goals (SDGs) simultaneously with 192 countries. The Turkish government also approved and enforced the 2016 Paris Climate Agreement in 2021. Accordingly, the Turkish Ministry of Environment and Urbanisation was renamed the Ministry of Environment, Urbanisation and Climate Change, with two new organisations dedicated to climate change – the Directorate of Climate Change and the Climate Council. The Ministry of Environment and Urbanisation initially declared the 2011–2023 Türkiye's National Climate Change Adaptation Strategy and Action Plan. The analysis of adaptation strategies implies that the plan covered only one strategy oriented to 'organizing training, awareness-raising, and informative activities to develop the capacity to combat and adapt to climate change' (Ministry of Environment & Urbanisation, 2012, p. 140). However, the strategy did not clarify what educational strategies and practices are needed to perform the training and activities.

To meet this need, the Ministry of National Education (MoNE) proclaimed a climate change action plan for education in 2022. In this action plan, school managers, teachers, staff and students were provided professional training on climate change. The training and the purview of the action plan mainly focused on environmental

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and economic sustainability, and the zero-waste implementations in the plan mainly targeted 5–6-year-old children. In addition, the MoNE currently plans to update the content of professional development training for pre-service teachers in light of SDGs, environment, and climate change. For example, the 2013 Early Childhood Curriculum has recently been revised. Among significant changes, the curriculum has been extended with two new objectives and nine indicators targeting the sustainability of the social and emotional development and values (MoNE, 2024). Another key alteration in the curriculum may be the addition of outdoor playtime, an outdoor learning activity, to support children's awareness about the environment and sustainability of culture. Although the new curriculum has undergone significant updates related to sustainability, it does not provide explanations regarding sustainability (MoNE, 2024).

Following COP 28, the 2024–2030 Climate Change Adaptation Strategy and Action Plan has recently been introduced. The vision of this plan is to prepare citizens and the public and private sectors in Türkiye for the impacts of climate change and to ensure their adaptation to climate change for an economically-, socially- and ecologically-resilient, more sustainable and greener Türkiye. Moreover, within the strategies and principles of the action plan, the section on 'awareness raising and education' emphasises constructing training, capacity building programmes and development of consciousness-raising campaigns to raise awareness of decision-makers, public employees, private sector and citizens about the hazards of climate change and the impact of decisions on the other sectors/fields (p. 10). Furthermore, the *Climate Change and Adaptation Measures* section underlines to enhance societal and organisational awareness and capacity on biodiversity, nature conservation, nature-based solutions, and ecosystem and their contribution to adaptation to climate change, governmental organisations (e.g., the MoNE, Scientific and Technological Research Council of Türkiye (TUBITAK) and Higher Education Council (HEC) to diversity the training, media affairs and projects oriented to climate change and expand the in-service training organisations (Ministry of Environment, Urbanisation and Climate Change, 2024). Besides, unlike the previous action plan, this plan highlights the importance of constructed actions (e.g., waste management) that are interrelated to many sectors (e.g., education, engineering, law and health). Therefore, it is proposed that the objectives of the curriculum should be revised in terms of SDGs from early childhood to post-graduate level, professional development programmes should be designed for educators at different educational levels and the number of higher education programmes on climate change should be increased (Ministry of Environment, Urbanisation and Climate Change, 2024).

In addition, Türkiye's Twelfth Development Plan (2024–2028) targets practical implementations of the SDG with a participatory approach involving both national and local governments. This plan aims to increase the schooling rate for 3–5 years from 52.2% to 60% in 2028 by providing and sustaining the quality of early childhood education based on local needs. Students' sustainability awareness will be

raised with the help of a green transition to learning environments with a transdisciplinary approach to struggling with climate change impacts. Regarding higher education, universities will be supported in transforming their campuses into sustainable and climate-friendly ones. For this aim, pilot universities will implement climate-related projects (e.g., zero-waste, clean energy, alternative energy resources) based on their resources and needs (Presidency of Strategy and Budget, 2024).

Study Place

Given the standpoint of the pioneering role of higher education in designing sustainable futures (Davis & Davis, 2021), the university where this research was carried out has implemented some changes to adapt to the mentioned strategies and development plans. For example, the Environmental Problems Research and Application Center has been established, and this centre has organised several seminars in collaboration with the MoNE and the Ministry of Environment, Urbanisation and Climate Change. The Environment and Energy Management System Commission, affiliated with the University's Quality Management Coordination Unit, has been expanded according to the HEC's Quality Standards. This commission consists of the Environment and Zero-Waste and Energy sub-commission, consisting of members mainly from the faculties of engineering and architecture. The members have recently visited external stakeholders (bottled water factories and local governmental organisations) to elicit information about their implementations related to the environment and zero waste.

Moreover, zero-waste principles have been adopted to extend zero-waste implementations throughout the university. An action plan for zero waste has been developed based on the principles, and the Environment and Zero-Waste sub-commission has kicked off a pilot study at engineering and architecture faculty and offered seminars (e.g., a conference on International Day of Zero Waste) to students, academics and staff. Furthermore, the Environment Student Club has been established to enhance undergraduate students' active participation in environment-related activities. This club and the sub-commission have recently organised a 'Keep Clean the Environment' activity on World Environment Day. Moreover, other faculties, especially the Faculty of Education actualised practices targeting all pillars of sustainability via organising seminars, conferences, competitions and theatre.

Despite positive environment-related initiatives in Türkiye, Turkish people seem to continue living in extreme weather conditions due to the impacts of sustainability issues, such as climate change. Thus, based on SDGs and the four pillars of sustainability, we, the Turkish people, should take more effective and sustainable actions to combat the outcomes and reasons for climate change. Davis (2015) and UNESCO (2017) emphasise that individuals must robustly transform their thinking and act for sustainability. To adopt this transformation as outlined in the SDGs, citizens should be 'sustainability change-makers' and improve their knowledge, skills,

values and attitudes through Education for Sustainability (EfS) with the guidance of educators who are proactive and influential agents of change in education (Davis & Davis, 2021; Stafford-Smith et al., 2017; UNESCO, 2017, p. 7).

EfS and Teacher Education

Higher education also has a vital role in sustainability, SDGs and implementations via community-based research, and thus, EfS should be incorporated into components and processes of universities (Evans et al., 2017; Gayá & Brydon-Miller, 2017; Sterling, 2014). For Lee, Barker and Mouasher (2013), there are two approaches to promoting EfS integration. While change starts at the top (i.e., presidency, administration) and enlarges downwards in the top-down approach, it is derived from the bottom (i.e., students, faculty members) and expands to the top in the bottom-up or grassroots approach. Another approach by Brinkhurst et al. (2011) emphasises the role of academics and staff as change agents and calls for a middle instead of top-down or bottom-up approaches. In addition, for effective EfS integration, Scott et al. (2012) underline that turnaround leadership should be considered between top-down and bottom or middle-level changes based on the needs of universities/institutions.

Extracurricular initiatives in pre-service teacher education are mostly derived from academics' personal interests and devotion (Ferreira, Ryan & Tilbury, 2014; Stevenson et al., 2014). In other words, these initiatives mostly remain an *ad hoc* practice rather than being guided by top-level strategy, as Davis and Davis (2021) concluded in their study on anecdotal views about initial early childhood teacher education. In the other systematic review of how EfS is embedded in pre-service teacher education, Evans et al. (2017) propose four approaches: '(1) across whole curriculum areas, courses or institutions-systemic approach, (2) through dedicated core/compulsory subjects, (3) a component of a core/compulsory subject and (4) a dedicated elective subject' (p. 411). The review indicates that while the substantial body of research focuses on the subject-focused approach, the systemic approach remains less-studied. A previous study showed that while 'environmental education in early childhood' is offered as a compulsory course, 'sustainable development and education' is offered as an elective course in the undergraduate programme of early childhood education in Türkiye. As described by Evans et al. (2017), the undergraduate programme follows 2 and 4 approaches through these courses. As Alıcı and Alan (2022) and Alıcı and Sahin (2023) underlined, the compulsory course targets primarily environmental sustainability rather than all pillars of sustainability, and this course can be revised to include all these pillars in some universities, which, however, depends on the course instructors' interest and acknowledgement. Besides, the elective course is not conducted specified for early years.

Although the UNESCO Roadmap for Implementing a Global Action Program on EfS highlights that developing educators' capacities to raise their competencies

to target sustainability issues and deliver EfS more efficiently is one of the five critical actions (UNESCO, 2014), the Turkish Teacher Competencies and Turkish National Qualifications Framework for Higher Education have no explicitly targeted competencies and qualifications for EfS (Alıcı, 2020). Moreover, the relevant literature indicates a *significant research gap* on sustainability and teacher education, particularly early childhood pre-service teacher education and EfS, both in Türkiye and the world (Alıcı, 2020; Davis & Davis, 2020). Davis and Davis (2020) reached only five studies on pre-service early childhood education and EfS. Afterwards, a special issue on early childhood pre-service teacher education in EfS was edited by Evans et al. (2022). Five distinct papers from Sweden, Malta, Australia and Ecuador have different perspectives on this special issue. Moreover, in Türkiye, Sahin and Alıcı (2019) reviewed pre-service teacher's views on nature relatedness, Karaarslan Semiz and Temiz (2021) examined pre-service teachers' perceptions and teaching practices regarding nature-based activities, and Alıcı and Alan (2022) investigated pre-service teachers' practicum in terms of EfS activities in two different universities.

In light of the literature review and Evans et al.'s (2022) critical outcome from their duoethnographic research, the differences between the teacher education systems, contexts and teacher educators' perspectives about teaching and learning and research once more indicate the 'importance of *acting versus* waiting for *consensus*' (p. 8). In this research, I share pre-service teachers' critical participatory action research (CPAR) within undergraduate research experiences (UREs) projects targeting different SDGs in the context of Environmental Education in Early Childhood Course. Moreover, this research aims to explore pre-service teachers' experiences in CPAR-based UREs projects and to describe their understanding, pedagogical approaches and stances related to EfS after project implementations. The following research questions guide this study:

Research Questions

- What are pre-service early childhood education (ECE) teachers' experiences throughout the planning, designing and implementing CPAR-based UREs projects?
- How do pre-service ECE teachers' understanding, pedagogical approaches and stances related to EfS change after the implementation of their CPAR-based UREs projects?

Methodology

This section presents pre-service ECE teachers' CPAR-based UREs projects. CPAR-based URE projects refer to undergraduate pre-service teachers' research-based university-community partnerships and a means for the implementation of

SDGs via HEIs. Before presenting the projects, firstly, CPAR and CPAR-based UREs in EfS will be elucidated.

Critical Participatory Action Research

By 2030, SDGs aim to contribute to becoming a world 'free from hunger, injustice and absolute poverty' and to provide 'universal education, health and employment with inclusive economic growth, based on transparency, dignity and equality' while minding the Earth's limits (International Institute for Applied Systems Analysis, IIASA, 2023). To address all of these goals, promoting EfS, tangible and practicable transformative frameworks need to be constructed to support individuals' involvement and community engagement (Keahey, 2021; Trott, Weinberg & Sample McMeeking, 2018). In other words, EfS targeting SDGs tallies with the principles of PAR/ CPAR/action research (Rauch, Steiner & Kurz, 2022). Both advocate that theory and practice are interconnected and attach importance to individuals' active participation in learning processes and transformative roles as change agents to shape their own living environments (Radits et al., 2015). On the other hand, given that the origin of the term 'sustainable development' comes from the Brundtland Report, titled 'Our Common Future', which defines sustainable development as 'meeting the needs of the present generation without compromising the ability of future generations to meet their own needs' (WCED, 1987), it could be claimed that SDGs adopt understanding of just attaching importance to a sense of intergenerational equality but mostly ignore contemporary equality issues (Cachelin, Rose & Rumore, 2016). Therefore, SDGs, CPAR and critical theory bear some differences. Nevertheless, for this chapter, I prefer to use the term 'sustainability' instead of 'sustainable development' as it is analogous to CPAR. It is defined by Agyeman, Bullard and Evans (2002) as:

> Sustainability cannot be simply a 'green', or 'environmental' concern, important thought 'environmental' aspects of sustainability are. A truly sustainable society is one where wider questions of social needs and welfare, and economic opportunity are integrally related to environmental limits imposed by supporting ecosystems.
>
> *(p. 78)*

Even though action research is classified with distinct terms such as action research (AC), PAR and CPAR (Santos, 2013), all of them are derived from similar research paradigms and utilise overlapping scientific paths and processes (Altrichter et al., 2002). Yet, they are not free of considerable differences. For instance, while AC, PAR and CPAR require researchers and participants to make a collaborative inquiry to enhance participants' social and educational praxis in light of their comprehension during the research process (Kemmis & McTaggart, 1988), PAR or Southern AC highlights 'contemporary societal ills' with broad social involvement (Santos,

2013, p. 493) to promote social equality/democratic equality. On the other hand, although CPAR adopts the principal concepts in PAR (e.g., social process, participatory, practical and collaborative, emancipatory, critical, reflexive and bridging theory and practice; Kemmis & McTaggart, 2005; Sadik, 2019), it is suggested that, as a new approach, CPAR *engages in critical living practice* to promote EfS and living systems theory (Lange, 2009). Also, CPAR has emerged from education researchers' 'dissatisfactions with classroom action research, which does typically not take a broad view of the role of the relationship between education and social change' (Kemmis, McTaggart & Nixon, 2014, p. 12). However, CPAR aims to help participants/individuals collaborate to realise their individual and collective practices by pursuing rationality, sustainability and justice criteria (Kemmis, McTaggart & Nixon, 2014). To do so, the following spiral of self-reflective cycles is proposed:

- *plan a change,*
- *act and observe the process and consequences of the change,*
- *reflect on these processes and consequences, and then a new cycle begins*
- *re-plan,*
- *act and observe,*
- *reflect, and go on… (p. 18)*

CPAR and UREs in EfS

Despite their quite distinct characteristics (e.g., research context, design and duration), the integration of PAR/CPAR with UREs can compensate for the limitations of each approach by expanding participants' scope (undergraduates and community members), benefits and collaboration (Trott, Sample McMeeking & Weinberg, 2020). In other words, PAR/CPAR-based UREs could present opportunities for both undergraduate students and community members to gain research experiences (i.e., enhancing their research skills, autonomy and knowledge) and to become change agents through democratic participation (Kindon, Pain & Kesby, 2007; NASEM, 2017). In addition, while UREs are adopted in laboratory settings in natural sciences (NASEM, 2017), PAR/CPAR-based UREs could focus on real-world issues (e.g., climate change) emerging in the local environment (Trott, Sample McMeeking & Weinberg, 2020). UREs are derived from the positivist paradigm (Parsell, Ambler & Jacenyik-Trawoger, 2014); in contrast, PAR, especially CPAR, comes from critical theory. Thus, participants could become capable researchers carrying out critical and community involvement research through PAR/CPAR-based UREs (Trott, Sample McMeeking & Weinberg, 2020). Overall, this research presents pre-service teachers' experiences in designing and performing their CPAR-based UREs projects targeting various SDGs within the Environmental Education in Early Childhood Course, helping them develop their research skills and become change agents by collaborating institutions (e.g., universities, governmental organisations) and people (e.g., public employees, pre-service ECE students).

Compared to UREs, CPAR/PAR is emergent, place-based, more local and less structured; therefore, there is not just one format/structure to describe CPAR/PAR-based UREs (Trott, Sample McMeeking & Weinberg, 2020). For the present study, course-based authentic research was used as one of the URE models (Russell et al., 2015). In other words, CPAR through course-based UREs was utilised for this study to promote Scott et al.'s (2012) turnaround leadership, since while CPAR follows a bottom-up or grassroots approach, UREs pursue a top-down approach. To explicate CPAR through course-based UREs, the following section provides a summary of the research environment and participating undergraduate students' (pre-service teachers) characteristics.

The Study Environment

As mentioned in 'Study Place', this research was conducted at the newly established university characterised by considerable initiatives based on SDGs and Turkish governmental regulations and local needs. Moreover, the ECE curriculum was revised and updated with a new compulsory course – Environmental Education in Early Childhood – in 2018. According to the course description by HEC (2018), this course mainly targets environmental sustainability; yet, it was re-designed to promote all pillars of sustainability in the present study.

Environmental Education in Early Childhood Course

A 14-week compulsory course was delivered in the sixth semester (spring) of the undergraduate ECE programme. For this study, the 11-week theoretical and 9-week practical parts of the course were intertwined. Pre-service teachers created and implemented their individual and group projects throughout the practice part. The theoretical part aimed to help pre-service teachers gain awareness of sustainability and its pillars, EfS, fundamental concepts of EfS, the importance of EfS, SDGs, ECEfS, the pedagogies of ECEfS and how to construct and conduct effective activity plans/projects targeting EfS in early childhood. In other words, before designing and implementing their projects, they were knowledgeable about ECEfS. This part also included various pedagogies from lecturing, discussion, group work, a field trip and a guest speaker. Therefore, pre-service teachers had experiences with distinct teaching methods. In the theoretical part, pre-service teachers also had a chance to listen to previous years' projects from their senior peers. In the presentation phase, 'junior-senior interaction' was promoted, allowing pre-service teachers to adopt recommendations from their seniors in the planning and implementation phases and the most challenging/manageable parts of their projects. From time to time, participating students also asked their seniors for feedback.

In the practice part, individual and group projects were shaped based on CPAR through UREs. Before kicking off their projects, pre-service teachers were knowledgeable about CPAR and its self-reflective cycles. In the project presentation, they also understood how to construct reflective cycles and how to elicit answers

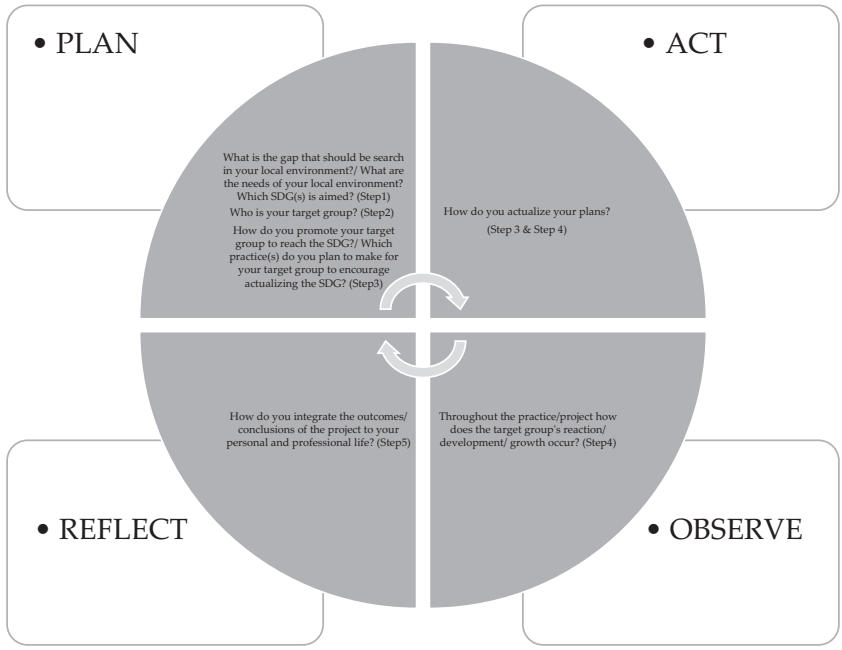

FIGURE 1.1 Cycles and steps of the CPAR-based UREs projects.

to questions at each cycle. The theoretical part also covered a discussion of what questions can shape each cycle. The steps illustrated in Figure 1.1 were duly followed by pre-service teachers. In the practice part, pre-service teachers performed at least three presentations about their projects and debriefed their classmates about the design sample selection and implementation phases of their projects. Based on peer feedback, they could make revisions to their projects, and if convenient, they would perform further presentations to receive more feedback.

In the last 2 weeks of the course, pre-service teachers shared their individual and group projects with their classmates. In the practice part, the steps of the mentioned cycle were followed by the lecturer/co-researcher. At the end of the session, the lecturer/co-researcher held an interview/focus group interview with students to uncover any alterations in their understanding and stances related to sustainability, EfS and pedagogies related to ECEfS.

In Step 1 during the *Plan* cycle, pre-service students sought the needs/gaps of the local environment through literature review, data collection and self-assessments (for individual projects) and determined and drafted which SDG(s) are related to identified needs and gaps. Then, they presented their reports to the class, including all aspects of Step 1, and received feedback from the lecturer/co-researcher and their classmates. In Step 2, pre-service teachers drafted and presented a report about their participants and received feedback. In step 3, they informed the class about the implementation phases of their projects; they drafted a report, presented it and received feedback, similar to Steps 1 and 2.

Pre-service teachers performed Steps 3 and 4 during the *Act* cycle. Step 4 entailed the implementation of their projects.

In Step 4 during the *Observe* cycle, pre-service teachers engaged in observations by collecting data on whether they attained their objectives or not while implementing their projects.

In Step 5 during the *Reflect* cycle, pre-service teachers drafted and presented a report covering all aspects of Steps 1, 2, 3 and 4, and received feedback. They then finalised their reports and submitted them as a course assignment.

Participants

Participants were all third-year undergraduate students and had previously attended various courses to promote and implement their individual and group projects, including 'research methods in education', 'community service', 'teaching approaches in early childhood', 'measurement and evaluation in education' and 'measurement and evaluation in ECE'.

Pre-service teachers implemented group and individual projects targeting various SDGs in this course. While they focused on the community's local needs for the planning phase of their group projects, their individual projects were derived mainly from their own needs. Eleven group projects and 25 individual projects were designed by a maximum of six pre-service teachers.

For this chapter, I only share one group project targeting SDG 12 (Responsible Consumption and Production) and encompassing economic and political sustainability and one individual project targeting SDG 5 (Gender Equality) and promoting social, cultural and political sustainability.

Waste/Stale (Leftover) Bread Project

Prior to proceeding to the details of project cycles, I should note that this project is dedicated to the significance of bread, as it is among the staple foods for Turkish people. In Türkiye, bread is preferred at all meals, including breakfast. Although 37 billion loaves of bread are produced in Türkiye per year, 2.1 billion of them, unfortunately are wasted (Türkiye İsrafı Önleme Vakfı [Turkish Foundation for Waste Prevention] Report, 2024). Similarly, we discovered that about 7% of food is wasted in student dining halls. Thus, this project targeted SDG 12.5, 'Substantially Reduce Waste Generation', and 12.c, 'Fossil Fuel Subsidies', and was conducted by six pre-service teachers (four females and two males).

Pre-Service Teachers' Experiences

Plan Cycle

Step 1: The group engaged in informal observations of their immediate environment, particularly in dormitories, and realised a waste/stale (leftover) situation.

FIGURE 1.2 The place where the bread was left.

They delved into the situation at dining halls and other dormitories and took photos of what they witnessed related to waste/stale food (See Figures 1.2 and 1.3).

Their overall observations suggested that students in dormitories claim much more bread during meals than they can consume and leave their leftover bread, even fresh loaves, in random places in dining halls. Loaves then become mouldy and are thrown into garbage containers by the staff. The group discussed this problem to discover what could be done to diminish students' bread consumption and prevent leftover bread from being discarded. Then, they decided to collect and share waste/stale(leftover) bread with the animals at the sanctuary. The group discovered that their solution was linked with SDG 12 and targets 12.5, 'Substantially Reduce Waste Generation', and 12.c, 'Fossil Fuel Subsidies'.

They presented their initial outcome and received feedback from their classmates and the lecturer/co-researcher. In his/her feedback, one of their classmates advised them to divert their focus not only on collecting and sharing leftover bread but also on reducing bread consumption more than needed. Then, the project group revised their project accordingly and proceeded to Step 2.

Step 2: The group identified their target group as university students, especially early childhood pre-service teachers living in dormitories. Based on their project outcomes, they intended to extend the impact with the involvement of local residents around the campus. Moreover, they attempted to collaborate with preschools to obtain support from children, parents and teachers for their project. This step was also presented in the class, and the project team received feedback from their classmates and the lecturer/co-researcher.

FIGURE 1.3 The place where the bread was left.

Act Cycle

Step 3: To diminish the bread consumption of the students at the dormitories, they decided to make students aware that bread waste is one of the highest food waste proportions. Firstly, they applied for the head of the dormitories to get the required permissions and support for their project. During the meeting with the head of the dormitories, they shared the documents explaining their project, such as its aim, target group and practices that could be implemented. After they got permission, they prepared posters, brochures, e-journals and conferences.

Even if they aimed to decrease the amount of bread waste, it has already occurred inescapably. As mentioned in Step 1, the group decided to share this waste with the sanctuary. They researched whether there was a sanctuary in the city or not. In light of their research, they reached a local government-run sanctuary. They applied to the sanctuary and local government for permission to conduct the project. Moreover, while researching local government facilities for bread waste, they realised the local government had put some bins to collect it. They asked for some bins for the dormitories.

They presented this step in the class and got feedback from their classmates and the lecturer/ co-researcher.

Observe Cycle

Step 4: The project was implemented in this step. In the end of Step 3, the group asked the local government for bins to collect leftover bread in dormitories. The local government delivered the necessary number of bins, and these bins were placed in the relevant spaces in dormitories. Upon relevant permission from heads of dormitories, the group organised a series of meetings with dormitory residents, especially with pre-service ECE teachers, to inform them about the project with posters and brochures. Participants were also informed about how to reach the project's social media page to keep updated about current news and activities within the project (e.g., project e-journal, announcements, sanctuary visits and calls for volunteers) (Figure 1.4).

To obtain more support from the community, the group members interviewed dining hall staff and janitors. They first informed the staff about the project and asked questions about their responsibilities and roles at the dormitories. Then, the team collected information on how many hours the staff work during their shifts and how much bread waste is collected per day. Although the group asked the staff whether they could help the project team collect bread waste, the staff unfortunately rejected this request.

The group also visited the city bakers to get their support for their project. As in the meetings with dormitory staff and janitors, the group initially informed the bakers about their project and elicited some information about bread production (e.g., the amount of bread produced per day and the number of loaves left per day).

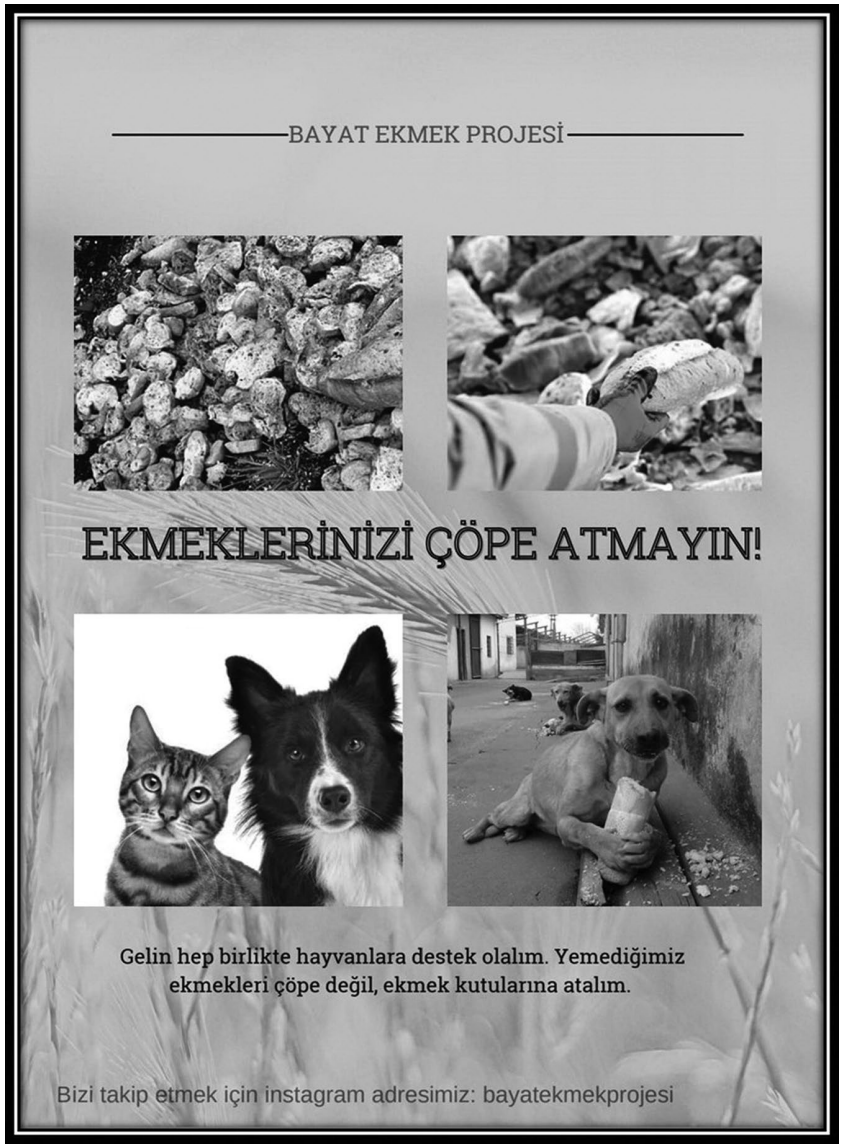

FIGURE 1.4 Poster.

Nevertheless, the bakers rejected the group's request to share leftover bread with animals, as they claimed that there was not much bread left per day. They also stated that they sell leftover bread the day after.

After student meetings, the group informed other students in dormitories that they could collect bread leftovers in the bins delivered by the local government. The majority of students supporting the project were third-year pre-service ECE students. The voluntary students then expressed satisfaction at being involved

in the project. Within 3 days, three large bins were full of bread leftovers. Once the group posted the date of the sanctuary visit on the project's Instagram page, they and volunteers visited the sanctuary to deliver bread leftovers collected (See Figure 1.5). It should be noted that the sanctuary staff scheduled a return visit to dormitories to collect bread leftovers (Figure 1.6).

FIGURE 1.5 Instagram page.

FIGURE 1.6 Sanctuary visit.

Reflect Cycle

Step 5: All the group members expressed that they were committed to seeing the project outcome, regardless of the obstacles they faced. Instead, they were self-encouraged/motivated to finalise the project and touch the lives of animals at the sanctuary.

The local government website also published details of the project) as well (https://www.kirsehir.bel.tr/haberler/kirsehir-belediyesi-nden-universite-ogrencilerinin-projesine-destek) and local news website (https://ankahaber.net/haber/detay/kirsehir_belediyesinden_universite_ogrencilerinin_projesine_destek_87950. The group members were proud of their project and its outcomes.

Pre-Service Teachers' Understanding, Pedagogical Approaches and Stances Related to EfS

In the end of the course, the group members were recruited for an interview. One of the group members stated:

> At the beginning of this course, I just thought that sustainability and environmental education are only related to recycling. However, this concept is related to all components of the environment and sustainability pillars. Not just focusing on recycling… much more than recycling…
>
> Through this project, I have become knowledgeable about sustainability, its pillars and SDGs, and I also have experience in how to conduct activities

> targeting sustainability with children in early childhood settings. For example, I will encourage children to be active agents in the learning process through a project approach, creative drama, field trips and outdoor learning activities…
>
> I am very proud to have implemented this project. We received positive reactions from not only university students but also staff at the sanctuary and the local government… All in all, I am so glad to have implemented this project.

It can confidently be claimed that participating pre-service ECE teachers' understanding of sustainability changed given the analysis of self-reflective cycles of CPAR-based UREs project and interviews. At the beginning of the course, the term 'environmental education' evoked the concept of recycling for them, and they had difficulty articulating their understanding of the terms 'sustainability' and 'EfS'. Nevertheless, they could explain sustainability with all its pillars after the course. Moreover, they had an opportunity to explore the SDGs and their targets in detail during the course. They also discovered what pedagogical approaches can be adopted to support EfS practices in the early years, as they had experienced distinct pedagogies. Prior to attaining graduate student status, they also delved into the CPAR steps and acquired how to revise and implement a project based on their experiences, participant reflections and peer/mentor feedback. In addition, they learned how to manage challenges, such as negotiations with the authorities and community members to obtain their support for their project. Ultimately, they had considerable experience in identifying local needs and collaborative community engagement, once their project was successfully implemented. Positive feedback from participants, the community and the local government engendered a positive stance towards EfS-oriented projects among the project members.

The Project on Societal Gender Equality

Melisa, one of the pre-service ECE teachers, designed this project individually. She also obtained support from her classmates in the implementation phase. In this section, this project is also summarised following the relevant cycles and steps similar to the Waste/Stale (Leftover) Bread Project.

Pre-Service Teachers' Experiences

Plan Cycle

Step 1: The news on media (printed, audio-visual and social media) related to violence against children and women led Melisa to dedicate her project to this issue. Firstly, Melisa researched the concepts of gender, societal equality and equality. She believed that the contexts of these concepts are too restricted, and many people, particularly university students, are unaware of them. Therefore, she focused on Goal 5 of the SDGs: Gender Equality and its targets to draw individuals' attention to this issue. These targets are Targets 5.1 'End Discrimination Against Women

and Girls', Target 5.2 'End All Violence Against and Exploitation of Women and Girls' and Target 5.3 'Eliminate Forced Marriages and Genital Mutilation'.

Step 2: For Melisa, the point of origin of gender equality is sunk into oblivion and banalised. Thus, she decided to work with undergraduate students enrolled in the Faculty of Education, especially pre-service ECE teachers – who are well-positioned to mentor future generations on matters pertaining to gender and equality, drawing upon their accumulated experiences and awareness of pertinent issues.

Act Cycle

Step 3: To raise pre-service teachers' awareness of social gender equality, Melisa decided to design banners on gender equality, phases of violence against women, discrimination against women (See Figure 1.6) and child brides (See Figure 1.7). She also drafted and scheduled a silent drama to attract pre-service teachers' attention to the banners. For this drama, Melisa got support from her classmates. Before performing the drama, she informed the Deputy Dean of the Faculty of Education about her project, got support for her project and obtained permission to perform indoor and outdoor dramas in the faculty.

Observe Cycle

Step 4: This step was the implementation phase of the project. Upon permission from the deputy dean, Melisa rallied together with five of her classmates (silent

FIGURE 1.7 Discrimination against women.

drama performers) for 1 hour and drafted the scenarios of the dramas. One of the drama performers held a placard on gender equality. The other one acted as a woman exposed to violence and held a banner on the phases of violence against women. One performed a child bride role and held a placard (Figure 1.7). Holding a banner (Figure 1.6), the last two acted as a woman subjected to discrimination and a man who was the agent of discrimination against the woman. As seen in Figures 1.8 and 1.9, Melisa undertook the make-up and costumes of the performers (Figure 1.10).

FIGURE 1.8 Child bride.

FIGURE 1.9 Outdoor silent drama.

FIGURE 1.10 Indoor silent drama.

Pre-service teachers' attention was drawn to gender equality through silent drama performances. During the dramas, it was challenging for the performers to remain still, refrain from laughter or speech and maintain their composure, given that the audience was present and observing their every movement. Some of the pre-service teachers even attempted to distract the performers, even if they knew they could not reply to them. Throughout the silent dramas, the audience was very

interested in what was happening and Melisa did commentary about the roles. Pre-service teachers shared this drama via social media to support Melisa's project, contributing to extending the impact of the performances.

Reflect Cycle

Step 5: At the inception of the project, Melisa was concerned about her ability to implement it, given the pervasive prejudices surrounding the issue and the potential for extreme reactions. However, she indicated that she received support not only from the faculty administration but also from her classmates and other pre-service teachers. Her project's news was published on at Faulty of Education web-site (https://ef.ahievran.edu.tr/arsiv-haberler/6666-fakultemizde-toplumsal-cinsiyet-esitligi-farkindalik-etkinligi-gerceklestirildi).

Pre-Service Teachers' Understanding, Pedagogical Approaches and Stances Related to EfS

During the interview, Melisa uttered her feelings and thoughts as indicated below:

> I am happy and proud of myself and my classmates since we were able to accomplish to draw the attention of pre-service students to gender equality. Although this issue is controversial and risky for a project, I could overcome challenges and successfully implement my project …
>
> Thanks to my experience in this project, I can dive into a project that explores the social and cultural aspects of sustainability. It will be great to contribute to a topic that is not as widely covered by my classmates, who are mostly focused on environmental and economic issues. Thus, I am also delighted to hold on to this project and get people's support by sharing my project on social media. Moreover, my project was disseminated via the Faculty of Education website and social media. Based on these outcomes, I will definitely carry out a project on gender equality with children.

Furthermore, during the focus group interview with the drama performers, they expressed satisfaction at being involved in the project and believed that they could contribute to raising awareness among pre-service teachers of gender equality issues.

For instance, Ela (who acted as a woman who is capable of doing jobs that men can do) aired:

> The banners, costumes, and makeup are absolutely stunning. People can easily understand what we do. People came up to us, read our banners, and asked Melisa questions. They even took our photos and shared them on social media to encourage us.

On the other hand, Onur (who acted as a man impeding Ela) highlighted one of the crucial issues in Turkish early childhood education:

> While I have a role impeding Ela, in fact, I was exposed to similar obstructions at the early childhood institution as a male pre-service student from the early childhood teachers when I went to the preschool for the practicum. One of my male classmates stated that they [the teachers at the practicum school] did not approve existence of male practitioners in the preschool. Therefore, I think all kinds of discrimination could be eliminated via this type of action [project].

Umay (who performed as a child bride) uttered:

> I am so excited and delighted to perform this role since my mom got married when she was 15. Luckily, people now attach more importance to the education of their daughters compared to 20 years ago, and schooling has increased…

In addition, the drama performers underlined that the early years would be crucial to initiate an attempt for education on gender equality and that such an endeavour cannot succeed without parental involvement and support. They also emphasised that they, as educators, can use different types of pedagogies (e.g., drama, project approach) and activities (e.g., field trips and games) and tools (e.g., videos, public service announcements). Moreover, one of the drama performers emphasised that governmental organisations should implement tangible measures for gender equality: 'In this city, the presence of female drivers on local buses may contribute to the transformation of gender stereotypes among young children…'

In light of the analysis of the reflective cycle, it became evident that the understanding of pre-service ECE teachers regarding sustainability underwent a transformation following Melisa's elucidation of her rationale for undertaking a project focusing on the social, cultural and political dimensions of sustainability, rather than the economic and environmental aspects. She also perceived a moral obligation to take action regarding this issue following her exposure to the news and related events, including instances of child brides subjected to abuse and discrimination. Although she had some concerns, particularly regarding the potential reactions of individuals to the project, she felt more at ease and self-assured about implementing the project after obtaining permission for silent drama from the faculty administration. Her experiences during the project ultimately shaped her perspective on the optimal methodology for designing a social equality project involving children. Furthermore, she assumed a considerable risk in planning and implementing a silent drama, as there had been no precedent for such an activity at the faculty, and she may have encountered difficulties recruiting sufficient volunteers to perform the drama.

In examining the perspectives of drama performers on the subject of gender equality, it becomes evident that they possessed a unique capacity to draw parallels

between their experiences and the broader social context. This is exemplified by their ability to make connections between the experiences of a female bus driver and her mother, who was a child bride and the broader issue of gender equality. Moreover, one of them was particularly concerned with the issue of gender discrimination, not only in relation to women but also to men. Given especially the case in the early years of childhood in Türkiye, there is still a perception that certain roles could be fulfilled exclusively by women or men. The performers also emphasised that change could start from early years with the support of parents, proficient early childhood educators and governmental policies. Thus, they opted to stage silent dramas to motivate pre-service ECE teachers to consider the possibility of taking action in the realm of social issues.

Conclusion

The results of CPAR-based URE projects demonstrated that pre-service teachers were driven and enthusiastic about undertaking these projects, as they were instrumental in their learning process and subsequent actions. Moreover, through these projects, particularly in collaboration with faculty administration, heads of dormitories and the local government, pre-service teachers had an opportunity to enhance their skills and responsibilities related to leadership roles in their own development and autonomy (Checkoway, 2001). Pre-service students also had experience of how to address local needs in the context of sustainability. In other words, they had a chance to rehearse for executing a project with kids in early childhood settings. Although these projects were designated with a bottom-up or grassroots approach, students collaborated with different stakeholders. These collaborations allowed the impacts of their project to go beyond the campus setting. Moreover, collaborative attempts could strengthen the cooperation of the university, the local government or other institutions, as highlighted in the Turkish 2024–2030 Climate Change Adaptation Strategy and Action Plan.

Pre-service students were able to learn how to interact with the local community and authorities during their projects. These projects also led their understanding of sustainability, its pillars and ECEfS to change. Prior to the study, the students lacked awareness of sustainability; however, in the end of the course, many demonstrated a deeper understanding, including of SDGs, the significance of early environmental education, and the importance of sustainability, overlapping with the findings of the study by Alıcı and Sahin (2023) with ECE teachers. Moreover, pre-service teachers indicated that all tenets of sustainability can be integrated into activities and daily plans in ECE, employing diverse pedagogical approaches such as drama and project-based learning to facilitate children's active engagement. Similarly, Alıcı and Alan (2022) indicated that pre-service teachers at the practicum preferred child-centred activities and pedagogies promoting children's active involvement.

In a nutshell, the students' course and project experiences have the potential to motivate them to make adaptations and changes in their daily and professional lives,

as they could come to recognise that sustainability is a value they wish to incorporate into life and education. In addition, I believe that the project outcomes will motivate them to take relevant, meaningful and authentic steps and actions in their professional lives. Davis et al. (2024) underlined that daily educational praxis in all early childhood education learning environments containing teacher education must be revisited to embrace transformational leadership and systems approaches. In this way, educators, researchers and practitioners to maintain their contributions to the transformation of mindsets for the realisation of local and global sustainability.

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