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Student Teachers' Understanding and Engagement with Education for Sustainable Development in England, Türkiye (Turkey) and Pakistan

Douglas Bourn, Qudsia Kalsoom, Nese Soysal & Burtay Ince
2023

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2023

Background to report

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Partner Universities

University College London

The university has a world-leading Faculty of Education and Society, the IOE, which includes initial training of teachers at early years, primary, secondary, and further education levels. Its mission is to support independent, free thinking education professionals. Its programmes have been rated outstanding by OFSTED across all subjects and phases. The IOE has been ranked number one for education worldwide every year since 2014. As part of University College London (UCL) since 2014, the IOE offers a wide range of courses, research and professional development programmes covering all aspects of education, psychology, and social science.

Gazi University

Gazi University is one of the biggest universities in Türkiye that embodies a great number of students (around 40.000 including graduate and undergraduate students). It also houses the oldest Faculty of Education which is one of the leading faculties in the field of education. The university endeavours to become one of the top universities in the country and is among the ten 'Research Universities' designated by the Higher Education Council. The Faculty of Education is considered as the foundation of the university, aiming to raise the best quality teachers. The faculty provides a various number of teaching programs for all K-12 levels including Educational Sciences, Special Education and Arts.

University of Dundee

University of Dundee (UoD) is a leading research university in Scotland, UK. UoD is committed to addressing global challenges in the fields of health, education, sustainability, and social justice through research and impact, education, engagement, and enterprise. Sustainability is the key focus of the UoD's strategy for 2022-2027. In line with the broader university's strategy, the Division of Education and Society (in the School of Humanities, Social Sciences and Law, UoD) is committed to interdisciplinary research that can improve the lives of individuals and communities locally and globally.

Beaconhouse National University

Beaconhouse National University (BNU) is a premier liberal arts university of Pakistan. It offers a range of programmes in different disciplines. School of Education at BNU offers programmes in the field of education. School of Education is the major training institution for the Beaconhouse schools in particular and educationists all over the country in general. School of Education is also committed towards knowledge production and exchange in the field of language education, teacher education and educational leadership. The faculty here is actively involved in researching local as well as global educational issues.

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Executive Summary

The concept of education for sustainable development (ESD) has emerged as one of the important educational themes in the past two decades. Advocates of ESD believe that ESD can lead to socio-economic and environmental justice. UNESCO (2019) declared ESD as a key enabler to achieve 17 Sustainable Development Goals. Teacher education has a pivotal role in developing prospective teachers' capacities to engage with education for sustainable development (ESD). Recognizing the key role of teacher education in promoting ESD in K-12 education, ESD has been made a part of Professional Standards for Teachers in some countries such as Scotland and Sweden. There is also an increasing interest among researchers (Bezels et al., 2020; Soysal and Ok, 2021) to investigate the impact of teacher education programmes on student teachers' (prospective teachers) conceptions of ESD. However, there is lack of research on the influence of teacher education programme on student teachers' conceptions of ESD and their future commitment for ESD. This timely, international research aimed at understanding student teachers' conceptions of ESD, emphasis on ESD in teacher education programmes as perceived by student teachers, the importance the student teachers perceive of sustainable development as part of their future teaching, and the ways they intend to engage with ESD in future.

Overall, 347 student teachers from four universities in three countries (England, Türkiye and Pakistan) participated in this mixed-methods study. The qualitative and the quantitative data indicated that the majority of the student teachers (STs) from all the participating universities view ESD as educational content related to the issues of sustainability such as citizenship, climate change, pollution, ethnicity, poverty, slave trading, colonialism, democracy, recycling, conservation of flora and fauna/water resources, biodiversity, water consumption, freedom, respect, and gender equality. Although all STs described ESD in terms of content, the description of content (with reference to three dimensions i.e., environment, economy, and society) varied considerably among the participants from the four universities. The student teachers from IOE, UCL's Faculty of Education and Society, highlighted environmental, social, and economic issues as a part of ESD content. On the other hand, STs from University X, Pakistan and the two Turkish universities mostly mentioned environmental issues as ESD content. The reason for the differences seems to be institutional context. IOE is incorporating more social aspects of sustainable development component into all aspects of its teaching and research in addition to environmental and economic aspects.

STs highlighted a range of skills and values that are expected to be developed for ESD. However, it is also important to note that, except from problem-solving skills, critical thinking skills and holistic thinking skills, other skills mentioned by the STs are not specific only to ESD-outcomes. For example, the development of the following skills is a focus of any educational programme in K-12 or higher education: i.e., critical thinking, decision making, literacy skills, summarising, literacy skills, analysis, creative thinking, working in groups, numeracy, presentation skills, comprehension skills, statistical analysis, interpreting evidence. Some STs talked about vocational skills and online entrepreneurship skills. This indicates that STs understanding of ESD-outcomes is partially aligned to the outcomes mentioned in ESD literature. It is also important to note that the most of STs do not view ESD as a way to transform students' worldviews. This indicates that STs understanding related to ESD-outcomes is not fully aligned to scholarly debates on ESD outcomes.

It is also important to note that although STs from the participating institutions did not mention any ESD strategies or processes while describing ESD, they highlighted a number of constructivist strategies which they intend to employ in the future. This indicates that they are aware of some ESD-processes such as processes of collaboration and dialogue and processes of active and participatory

learning (Tilbury, 2011). Their conceptions regarding ESD outcomes and ESD processes are less visible compared to their conceptions in terms of ESD content.

Both qualitative and quantitative data indicate that, although STs from all the participating institutions intend to include ESD in their future teaching, STs from University X, Pakistan feel less prepared to teach for ESD. The quantitative data indicated that the STs from the IOE and the two Turkish universities are equally committed to teach for ESD in the future. However, STs from Pakistan showed less commitment towards ESD in their future teaching. Quantitative data indicated that more than 70% STs from Türkiye claimed that SD and ESD were discussed in some of their courses. This percentage is considerably higher than the percentage (50%) from IOE respondents. From University X, Pakistan 59% and 50% STs mentioned that they had studied SD and ESD respectively as a part of their courses. These findings indicate that STs' future commitment towards ESD cannot be fully explained with reference to their study programmes. This finding requires further investigation.

The study shows that the university context, and educational experiences of the STs are the determinants of their ESD conceptions and their future engagement with ESD. Since ESD is offered as a standalone course in the Turkish universities, STs' ESD-conceptions, and their commitment to ESD was significantly more developed compared to that of STs in Pakistan. Although STs at IOE did not study ESD as a standalone course, they studied the different elements of ESD in other courses and had undertaken orientation on sustainability issues. They also showed high commitment to being ESD educators in the future.

The study shows that integration of ESD into the whole programme as a philosophy, or its inclusion as a topic in more than one course, provides more opportunities for students to come across the concepts of ESD - and this encourages more holistic ESD conceptualisation. Although integration of ESD as a standalone course provides more direct descriptions of basic ESD concepts, the conceptions of STs are not reinforced in different courses. This results in developing limited conceptualisations of ESD. University X, Pakistan follows the standardized curriculum of B.Ed. prepared by the Higher Education Commission of Pakistan (HEC). In that curriculum, ESD is not a focus in any of the courses. University X has started offering an elective course on ESD, but it is taken by few students. The lack of emphasis on ESD in the B.Ed. curriculum (developed by HEC) seems the major reason for relatively less developed ESD-conceptions among the STs at University X.

Another point shaping the development of ESD conceptualisation can be the pedagogies used in the integration of ESD into the programmes. As Bourn and Soysal (2021) indicate, not many ESD courses are promoted with transformative learning strategies. However, in England, transformative learning strategies are used more for the integration of ESD into the programmes.

The findings indicate that the institution's own commitment to sustainability and ESD is pivotal in developing student teachers' conceptions of ESD, and empowering them to act as ESD educators in their future teaching. STs who study in sustainability-committed institutions become more aware of the concepts of sustainable development and ESD. In addition to the institutional commitment towards sustainability, the overall ethos of the teacher education programme also shapes student teachers' ESD conceptions and their future engagement with ESD. Student teachers who experience an ESD-focused teacher education programme (ESD as the underpinning philosophy of the programme, ESD as a standalone course, or ESD integrated courses) demonstrate more holistic understanding of ESD and are more committed towards ESD in their future teaching. The finding that the student teachers' understanding of ESD specific outcomes, and transformative pedagogies, is relatively less developed indicates a need for introducing more ESD literature to the student teachers so that they become more aware of different aspects of ESD.

Based on the study findings, here are some recommendations for teacher education programmes and researchers in the area of ESD.

Recommendations

- Teacher education programmes should apply ESD as an overarching approach or philosophy for the whole programme to allow student teachers to learn about the ESD content in different courses/ modules and participate in ESD-processes and ESD-focused assessment.
- Teacher education programmes should offer standalone courses on ESD to help student teachers become aware of ESD elements i.e., ESD content, processes and outcomes and help them develop their capacity to teach for ESD in the future.
- Researchers may investigate how student teachers' experiences of different teaching approaches and processes impact their conceptions of ESD-processes and ESD-outcomes.
- Researchers may investigate the relationship between student teachers' ESD conceptions and their engagement with ESD in future.

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List of Acronyms

B.Ed.	Bachelor of Education
CoHE	Council of Higher Education
CLIL	Content and Language Integrated Lesson
DERC	Development Education Research Centre
EE	Environmental Education
ESD	Education for Sustainable Development
HEC	Higher Education Commission
ICT	Information and Communications Technology
IOE	Institute of Education
PGDE	Professional Graduate Diploma in Education
PGCE	Postgraduate Certificate in Education
QAA	Quality Assurance Agency
SD	Sustainable Development
SDGs	Sustainable Development Goals
STs	Student Teachers
TSL	Transformative Sustainability Learning
UCL	University College London
UN	United Nations
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
UXP	University X, Pakistan (Anonymized name of the university)
WCED	World Commission on Environment and Development
VLE	Virtual Learning Environment

1. Introduction

In the past two decades, the concept of Education for Sustainable Development (ESD) has become a central focus of international educational discourse. This can be witnessed from initiatives such as the UN Decade of Education for Sustainable Development (2005-2014), five-year (2014-2020) Global Action Programme and UNESCO's (2019) framework "ESD for 2030". The underlying assumption for "ESD for 2030" is that ESD is *"an integral element of the SDG [Sustainable Development Goals] on quality education and a key enabler of all the other Sustainable Development Goals"* (UNESCO, 2019).

Considering the key role of ESD in promoting socio-economic and ecological justice, many countries such as Germany, Japan, Sweden, UK, and South Korea have incorporated ESD into their education systems. In Germany, a National Platform and Partner Networks on all education areas were designed (Singer-Brodowski et al., 2020). Quality Assurance Agency (QAA, 2022) in the UK has recently made ESD a part of benchmark statements of different higher education courses. In Pakistan, although ESD has not been mainstreamed in school education or teacher education (Kalsoom et al., 2019), some universities such as University of Education and Lahore University of Management Sciences have included an elective course on ESD in their education programmes. In Türkiye, ESD is integrated into teacher education programmes as a standalone course in education faculties and as a topic in some courses (Bourn and Soysal, 2021). It is also integrated into K-12 curriculum and some policy documents (Ince et al, 2022).

Although ESD has entered global discourses on education, there is no consensus on what constitutes ESD. One of the reasons for this lack of consensus is the complexity of the concept of sustainable development (SD). The term SD first appeared in the report of the UN World Commission on Environment and Development (WCED) in 1987. The report, entitled 'Our Common Future', but commonly known as the 'Brundtland Report' after the name of the Chair, defined SD as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*. Since 1987, a range of different descriptions of the term SD have emerged. Despite variations in the overall interpretation of SD, society, environment, and economy are mentioned as the key elements in SD interpretations (Ciegis et al., 2009; Harris, 2000; UNESCO, 2005). UN Sustainable Development Goals also balance the three dimensions of SD (UN, 2015, para 2, 5, 18 & 55). Accordingly, ESD is viewed as a kind of education that addresses sustainable development issues related to all three dimensions of sustainability (Corney & Reid, 2007).

Initial teacher preparation programmes have been viewed as key drivers in advancing the agenda of ESD (Buckler & Creech, 2014; McKeown & associates, 2013; McKeown, 2014, 2002; Tilbury, 2011; UNESCO, 2005, 2014) because *"many educators form their views about what it means to be an educator during initial teacher education, this is a critical area for action"* (UNECE, 2013, p. 40). Nolet (2013) notes that initial teacher education has an impact on ESD teaching at school. Corney and Reid (2007) noted that teacher preparation programmes can influence student teachers' conceptions of ESD through a variety of ways such as discussions on sustainability issues in different university courses. Moreover, teacher educators can serve as role models as ESD educators (Kalsoom and Khanam, 2017) to develop student teachers' conceptions of ESD. Considering the key role of initial teacher preparation in ESD, it is important to investigate student teachers' (preservice teachers/prospective teachers) understanding or conceptions of SD and ESD. Firth and Winter (2007) and Evans et al. (2012) consider student teachers' understanding of sustainability as an important prerequisite to teach for ESD. Gugssa and Aasetre (2022) argue that the study of conceptions is important because teachers' conceptions determine their lesson planning and instructional

practices. Similarly, Cheung (2020) contend that teachers serve as models for their students and their conceptions will influence their students. Similarly, Laurie et al. (2016) insist that students' learning can be negatively impacted if teachers do not have good understanding of ESD. Ferguson et al. (2021) also believe that teachers' own understanding of sustainability can either enhance or limit its delivery in classroom. Teachers' thinking and classroom practice are linked; a teacher's thinking, and their understanding, influences their classroom instructional practice (Fischer & Hänze 2020; Pennington, 1995).

Study Rationale and Purpose

There are studies (Bezeljak et al., 2020; Olsson et al., 2016; Soysal and Ok, 2021; Summers et al.; 2004) that have investigated conceptions of SD, ESD and student teachers' willingness to implement ESD in their future teaching. However, to the best of our knowledge, no studies have examined the influence of teacher education programmes on student teachers' conceptions of ESD and their future commitment to ESD. Moreover, we are not aware of any international comparative studies on ESD conceptions and future commitment to ESD. This timely international research aims to understand student teachers'¹ conceptions of ESD, focus on ESD in teacher education programmes as perceived by student teachers, the importance the student teachers attach to SD as part of their future teaching, and the ways they intend to engage with ESD in the future.

Research Questions

1. How do student teachers in England, Türkiye, and Pakistan interpret the concept of ESD?
2. Are student teachers' conceptions of ESD holistic with reference to ESD-content, ESD-processes, and ESD-outcomes?
3. Do student teachers' conceptions of ESD-content equally cover three dimensions of sustainable development (i.e., society, environmental and economy)?
4. How do student teachers in the three countries (UK, Türkiye and Pakistan) plan to implement or engage with ESD in their classrooms?
5. How do student teachers in the three countries (UK, Türkiye and Pakistan) perceive the inclusion/ presence of ESD in their preservice teacher education programme/ courses?

Significance of the Study

This study adds to existing literature on student teachers' conceptions on ESD and their commitment for ESD. It also highlights the role of ESD in teacher education in developing student teachers' conceptions of ESD and their future commitment for ESD. The study included international sample from four universities in three countries. The study outcomes have implications for the teacher education programmes and the teacher educators. The study findings may be used to review and

¹ Student teachers in this report refer to the people who are enrolled in a teacher education programme.

revise the curricula of the teacher education programmes in the participating universities and other universities as well.

The Research Context

In England, there are different routes into teacher education such as school-based training, Professional Graduate Diploma in Education (PGDE), and university-led Postgraduate Certificate in Education (PGCE). IOE, UCL's Faculty of Education and Society, is arguably the world's leading educational institute² and has a proud record of engagement in initial training of teachers with its PGCE programmes. On PGCE programmes, student teachers train for a year at the university, during which they are placed in schools for a minimum of 24 weeks to be able to get classroom experience. UCL's Sustainability Strategy 2019-24 highlights that *"every student will have the opportunity to study and be involved in sustainability and increase its sustainability research with increased focus on the SDGs"* (UCL, n.d, p.11). In 2020, UCL has developed its Connected Curriculum framework and launched a sustainable curriculum toolkit and incentive scheme. A sustainability-focused induction module for all staff and students has also been revised. By 2024, it plans to embed sustainability into taught courses as part of their priority actions. IOE has also endeavoured to incorporate a strong social justice and sustainable development component into all aspects of its teaching and research. For Primary PGCE, there is an optional Virtual Learning Environment (VLE) space for climate change and sustainability that student teachers are encouraged to engage with, and an integrated curriculum inquiry focussed on sustainability that all student teachers are involved with.

IOE has hosted the Development Education Research Centre (DERC) since 2006 and has had a particularly strong research and publications record related to sustainability themes. It also has launched a new centre in 2022, the Centre for Climate Change and Sustainability Education, which aims to provide teachers with the expertise to teach about climate change and sustainable development. Student teachers will be able to access this as well.

Founded in 1926, Gazi University is one of the biggest universities in Türkiye. It embodies 12 faculties, one graduate school, four vocational schools and five institutes. It is one of the few 'Research Universities', as determined by the Turkish Council of Higher Education (CoHE). The Faculty of Education was the basic pillar of the university when it was first founded in 1926 and holds a special position within the history of education in Türkiye. In the Faculty, there are 8 different departments with 28 programmes with approximately 6500 students enrolled. The core curriculum for the education faculties in Türkiye is determined by CoHE. The Bologna Process³ also required universities to standardize their curriculum and provide easier access to mobilization. However, universities are given room to make changes in their departments' curriculum as well. The university endeavours to adopt SDGs at national and international levels. It participated in the 2020 Green Metric rating and was awarded the Green Metric certificate. As of October 2022, it became one of the ten pilot universities that signed the "Cooperation Protocol in the Field of Creating a Sustainable and Climate Friendly Campus" with CoHE. At Gazi University, ESD is provided as an elective course (under the code 'EBS121' and title 'Sustainable Development and Education') in their 4-year teacher

² Ranked number one for education worldwide every year since 2014 in the QS World University Rankings.

³ https://en.wikipedia.org/wiki/Bologna_Process

education programme. It does not appear that ESD forms an overarching theme among the curricula of teacher education programmes.

There is also another university at which student teachers participated in the study. It is in the west part of Türkiye and founded in 1992. Aiming to provide education at national and international levels, the Education Faculty includes 6 departments. The core curriculum of CoHE is followed in the faculty and as part of teacher education curriculum, ESD courses are designed in their 4-year teacher education programme.

The anonymised University X (UXP) is one of the largest public sector universities in Pakistan. It has nine campuses across the province of Punjab. It provides higher education at an affordable cost to the students in different cities of Punjab (the most-populated Pakistani province with an approximate population of 120 million). The university has been included in the Times Higher Education's list of universities contributing towards SDGs. The university specializes in the field of teacher education and offers teacher education programmes on all of its campuses. In Pakistan, there is a standardized curriculum for Bachelor of Education programmes (B.Ed.), which has been prepared by the Higher Education Commission of Pakistan and is implemented in all the universities and teacher education colleges that offer B.Ed. This standardized curriculum does not have any standalone course on ESD. Moreover, only 5 % of the content of the whole B.Ed. curriculum deals with sustainability (Kalsoom et al., 2019). Universities are allowed to offer some additional elective courses if they want. The UXP offers an elective course on ESD in its 4-year B.Ed. programme.

2. The Study Framework

The concepts of sustainable development (SD), education for sustainable development (ESD), and teachers' agency constitute the framework of the study. Before discussing these concepts, a brief description of the term 'conceptions' has been provided.

Conceptions

'Conceptions' are usually described as one's understanding of something or meanings attached to an experience. Sandberg (2000) views conceptions as *"people's ways of experiencing or making sense of their world"* (p.12). Pratt (1992) in his seminal work on 'conceptions of teaching' describe conceptions as *"specific meanings attached to phenomena which then mediate our response to situations involving those phenomena"* (p. 204). Hsieh and Tsai (2017) views conceptions as lenses which we use to view different phenomena. Gugssa and Aasetre (2022) define conceptions regarding environmental education as *"teachers' ways of comprehending (i.e., attaching meanings to) the constructs, environment and EE"*.

Studying conceptions is important as they significantly influence our interpretation of events, people, and phenomena (Pratt, 1992). Scholars (Eley 2006; Olafson & Schraw, 2006) found that teachers' conceptions influence their views and beliefs, and ultimately their instructional practices. Similarly, scholars from the field of environmental education have also noted that teachers' conceptions and beliefs about environment and environmental education influence their choice of environmental content which they teach in class (Ferguson et al., 2021; Quinn et al., 2016).

Sustainable Development (SD)

The term SD first appeared in the report of the UN World Commission on Environment and Development (WCED) in 1987. The report, entitled 'Our Common Future', but commonly known as the 'Brundtland Report' after the name of the Chair, identified interconnections between economic growth, social equity, and environmental problems, and proposed SD as a policy solution. The Brundtland Report defined SD as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*. Since 1987, a range of different descriptions of the term SD have emerged. Redclif (2005, p. 213) noticed that *"since the path-breaking deliberations of the Brundtland Commission, the expression 'sustainable development' has been used in a variety of ways, depending on whether it is employed in an academic context or that of planning, business, or environmental policy"*. Despite variations in the overall interpretation of SD, three dimensions of SD, i.e., society, environment and economy, are commonly referred to in most of the interpretations of SD (Ciegis et al., 2009; Harris, 2000; UNESCO, 2005). UN Sustainable Development Goals also balance the three dimensions of SD (UN, 2015, para 2, 5, 18 & 55).

Education for Sustainable Development (ESD)

Like SD, the concept of ESD does not have an agreed definition. A straightforward description of ESD is that it is a kind of education that addresses sustainable development issues related to three dimensions of sustainability which are environment, society, and economy (Corney & Reid, 2007).

However, educational focus on the three dimensions of sustainability has been described differently by different scholars. Here is an overview of how ESD has been conceptualized in literature on ESD.

ESD as a programme of Sustainable Development

ESD as a programme of SD is a means to address climate, environmental, economic, and social issues by making people aware of these issues and building their capacity as individuals and groups to take pro-sustainability actions. McKeown (2002) views ESD as a programme to “*guide and motivate people to seek sustainable livelihoods, participate in a democratic society, and live in a sustainable manner*” (McKeown, 2002, p.13). UNESCO (2005) explains the programme of ESD by stating that ESD aims at developing:

...an understanding of social institutions and their role in change and development, as well as the democratic and participatory systems which give opportunity for the expression of opinion... an awareness of the resources and fragility of the physical environment and the effects on it of human activity and decisions... a sensitivity to the limits and potential of economic growth and their impact on society and on the environment, with a commitment to assess personal and societal levels of consumption out of concern for the environment and for social justice. (p.5)

ESD as values framework

ESD literature indicates that ESD has been viewed as a values framework. For example, Dahl (2012) argues that sustainability is fundamentally an ethical challenge and can be addressed by promoting sustainability values through education. The sustainability values are: “*justice, moderation, solidarity and respect for the environment and its limits, contradict the dominant materialistic and self-centred values of the economic system and the consumer society*” (Dahl, 2012, p. 18).

The Bonn Declaration (UNESCO, 2009) states that “*ESD is based on values of justice, equity, tolerance, sufficiency, and responsibility. It promotes gender equality, social cohesion and poverty reduction and emphasises care, integrity, and honesty, as articulated in the Earth Charter*”.

Similarly, UNESCO (2005) also maintains that “*ESD is fundamentally about values, with respect at the centre: respect for others, including those of present and future generations, for difference and diversity, for the environment, for the resources of the planet we inhabit*”.

ESD as a Curricular and Pedagogical Process

Scholars such as Tedesco, Opertti, and Amadio (2011) view ESD as a set of different themes which need to be a part of curriculum. These themes overlap with UNESCO's (2005) strategic perspectives on society and environment. The sub-themes of ESD listed as “*values education, civic and citizenship education, health education, education for HIV and AIDS prevention, human rights education, ICT, gender equality, and environmental education*” (Tedesco et al., 2011 p.11). The same authors further highlighted that environmental education was the most referred theme in curriculum documents of more than fifty countries. Recently, QAA (2022) has included ESD as a key component in the benchmark statement of different courses in higher education. This also indicates that ESD is viewed as a curricular theme.

Scholars such as Kalsoom (2017), McKeown (2002) and Tilbury (2011) also view ESD in terms of curricular content and targets and pedagogical processes. Tilbury (2011) states that ESD involves “*processes of collaboration and dialogue; processes which engage the ‘whole system’; processes*

which innovate curriculum as well as teaching and learning experiences; processes of active and participatory learning" (p. 7). She further explains that ESD processes aim at helping the learners *"learn... to ask critical questions; to clarify one's own values; to envision more positive and sustainable futures; to think systemically; to respond through applied learning; and, to explore the dialectic between tradition and innovation"* (Tilbury, 2011, p. 8 & 13). Similarly, Kalsoom (2017) argues that *"ESD is a complex of content and pedagogy that makes students aware of sustainability issues i.e., poverty, environmental degradation, economic and social injustice; and helps them in learning attitudes and behaviours which are democratic, just, and environment friendly"* (p.10-11). The curricular aims or learning outcomes for ESD involve cognitive as well as affective learning. Affective learning regarding sustainability refers to change in one's attitude and behaviours. This could be learning *"feeling bad for environmental destruction, climate change, oppression, and socioeconomic injustice. It also involves a strong feeling of undertaking pro-sustainability actions at individual or collective levels"* (Kalsoom, 2019). Sipos et al.'s (2008) pedagogical framework 'transformative sustainability learning (TSL)' also includes affective learning along with cognitive learning. As Bourn and Soysal (2021) highlighted in their studies, to achieve affective learning outcomes, pedagogical processes should be carefully designed so that they can lead to transforming attitudes and behaviours.

ESD as a change in perspective

ESD has also been viewed as a vehicle to transform people's perspective. Scholars like Stevensen (2007) and Vare and Scott (2007) believe that the purpose of ESD should be building learners' capacity as critical beings who could question lifestyles, experts' opinions and contribute towards a sustainable living (Vare & Scott, 2007). Similarly, Sterling (2011) argues that ESD should lead to epistemic learning which empowers learners to look at things differently. The roots of this aim of ESD may be found in Schumacher's (1997), Orr's (1992) and Freire's (1970) ideas of education. Schumacher (1997) argued:

the volume of education has increased and continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it would have to be education of a different kind: an education that takes us into the depth of things.

David Orr (1992) labelled environmental problems as problems of education. He argues that there is in fact no correlation between educational achievement and pro-sustainability behaviours. Schumacher and Orr ask for a different education, an education that empowers people to ask critical questions about human activities and behaviours and to transform those which are not pro-environmental. Sterling (2011) argues that ESD learning resonates with Mezirow's concept of transformative learning and Freire's concept of critical consciousness. Both transformative learning and critical consciousness aim at transforming people's worldviews so that they can see things differently.

Prior Research on Student Teachers' Conceptions of ESD

Researchers have investigated STs' conceptions of ESD. For example, Evans et al., (2012) found in their study that STs held different conceptions of ESD such as education that is continuous; education about ecological systems and environmental systems; education that is active, hands-on, local, and relevant; and education for the future. They noted that many pre-service teachers described ESD as being education *about* the environment. They mostly described teaching for

sustainability as teaching about ecological systems and resource issues. Evans et al. (2012) further argued that some STs' conceptions were outside the context of the scholarly tradition and the reason was that they were unfamiliar with the concept of education for sustainability.

Bezeljak et al. (2020), in their study with 60 Slovenian and 60 Austrian biology STs, found that less than half of the STs from both countries had a good understanding of the environmental aspects of SD. However, they did not have an understanding of the interconnections between social, economic and environmental aspects of SD. Moreover, their view of ESD was also focused on environmental awareness. Bezeljak et al. (2020) also found that the STs from both countries knew about some pedagogical principles of ESD, such as active learning and transformative education.

Summers and Child (2007) noted that, although large number of STs (n=123) were generally aware of all the dimensions of SD, the aspects of citizenship and preservation of diversity were missing in their conceptions. Whereas Birdsall (2014) noted that STs and teachers' understanding of ESD were not holistic. Ferguson (2008) conducted a study with 263 STs at two teachers colleges in Jamaica to explore conceptions of SD. They found that STs' conceptions were largely focused on economic and environmental dimensions of SD. They mostly did not view SD with reference to the issues of social justice, equity, or political empowerment.

Recently Ferguson et. al. (2021) found, from their survey of 296 teachers, that teachers understood SD as an interlinked concept with three dimensions (society, economy, and environment). However, their perspectives were less associated with citizen participation. Hagevik et al. (2015) found, through their research in an elementary science methods course in a large university in the US (n=24), that conceptions of SD lacked an understanding of the interconnectedness between environment, economic, societal, energy, and technologies to political concerns. Moreover, students felt unprepared to teach about SD. A similar finding was also reported by Burmeister and Eilks (2013).

Andersson et al. (2013) found, in their experimental study, that the students who participated in a SD course wanted to teach for SD more keenly, as compared to the students who did not participate. A similar finding was reported by Kalsoom and Qureshi (2021). They also noted some difference in STs' engagement in ESD after participating in a sustainability focused intervention. They further noted that more engagement with ESD was possible by focusing on STs' capacity building as ESD educators.

3. Research Methods

The study employed a mixed method approach. The qualitative data through semi structured interviews and quantitative data through survey were collected and analysed separately and mixing of the data occurred at the interpretation stage (Leech & Onwuegbuzie, 2009).

Participants

Student teachers (STs) from IOE, University College London, UK; Gazi University, Türkiye; University X, Pakistan (UXP); and another university (anonymously called University A) from Türkiye constituted the study population. The participants' age was always more than 20 years.

The Study Sample

Dworkin (2012) argued that the number of interviews in qualitative phase should range from 5 to 50 to reach a point of saturation. In the current study, we satisfied the condition of including minimum number of participants (Dworkin, 2012) from each country. Semi-structured online interviews were held with the STs who had already participated in the online survey. On average, each interview lasted for 28 minutes. The composition of the STs from each university who participated in the online survey and interviews has been presented in Table 1.

Table 1: Composition of Sample from Different Universities

University	Number of Responses in Online Survey	Number of Interviews
UCL	92, mostly (86/92) from the student teachers on PGCE Secondary Programme.	5 with the STs on PGCE Secondary Programme
UXP	136, mostly from 4-year B.Ed. (Honours) programme	11
Gazi University and University A	119	7

The majority of the participating STs from University X were in the fourth year of their 4-year B.Ed. (Honours) Elementary programme and a few were from B.Ed. Secondary programme. The entry requirement for the 4-year B.Ed. (Honours) degree is 12 years of education. The participants from Türkiye were in their junior or senior years of B.Ed. from various programs (Biology Teaching, English Language Teaching, Turkish Language Teaching, Pre-School Teaching). The participants from UCL/IOE were on one-year PGCE programme. The entry requirement to the programme is a UK Bachelor's degree (16 years of education).

For the quantitative part, participation in the study was completely voluntary. Information about the survey was circulated to relevant students via the academic contacts in each of the universities. The

researchers took measures (such as conducting interviews in private location and using headphones instead of using computer speaker) to ensure privacy. Interviews were recorded with the participants' permission only. Two respondents preferred submitting a written response to the interview questions and they were allowed to do so.

Instrumentation

To answer the research questions, a questionnaire and interview protocol were developed (Appendix 1 and 2) in the light of the literature. The questionnaire contained two sections. Section 1 aimed at measuring student teachers' conceptions of ESD (as a set of three elements i.e., content, processes, and outcomes) while Section 2 aimed at measuring student teachers' commitment towards implementing ESD in future. The questionnaire's face validity was determined by seeking feedback from two colleagues at IOE. Revisions were made according to the colleagues' suggestions. Then, content validity of the questionnaire was determined as content validation is crucial in the development of a new questionnaire (Tsang et al., 2017). To determine if the questionnaire items were adequately measuring the construct which it was intended to measure, and whether the items were sufficient to measure the domain of interest (Johnston et al., 2014; Tsang et al., 2017), the questionnaire was shared with three experts from the field of ESD. The experts judged the questionnaire items on two bases: 1) if the items captured ESD conceptions and commitment for ESD; 2) if some items were also tapping other related constructs. The questionnaire was again modified in the light of this expert opinion. After determining the content validity, the questionnaire was pilot tested to measure Cronbach alpha (as a measure of reliability of the scale). Cronbach alpha value for the section 1 was found '0.875' and for the section 2 it was '0.936'. By conventional criteria, any value above 0.7 is considered reliable.

For the semi-structured interviews, interview protocol was developed in the light of the literature review. The interview protocol was pilot tested with two people before collecting qualitative data.

Data Interpretation

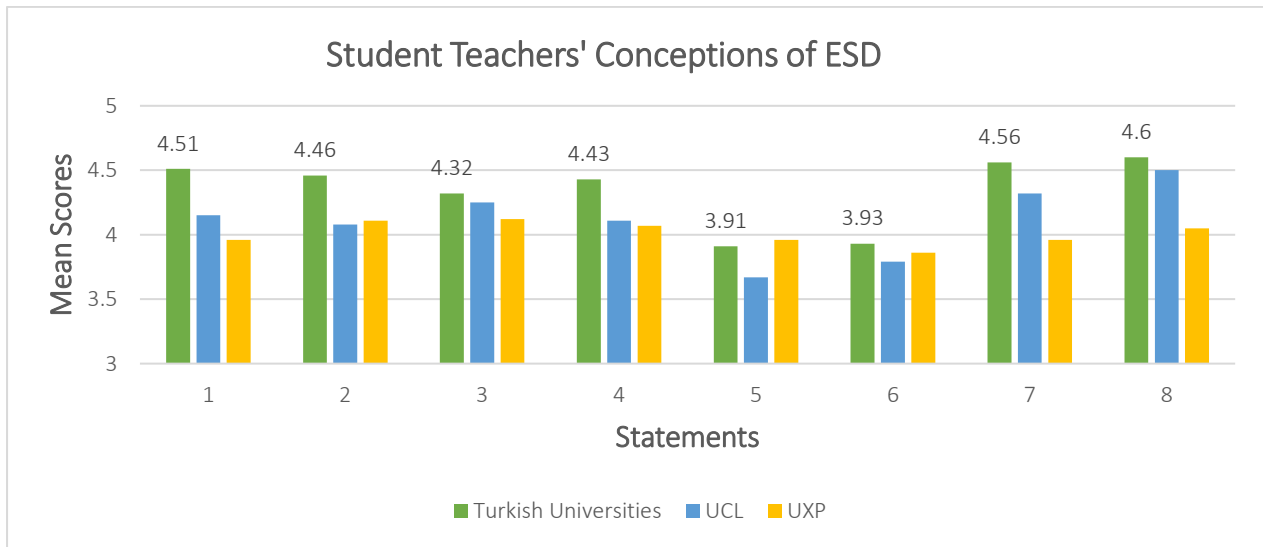
The quantitative data were analysed using mean scores and percentages. The mean scores on the questionnaire items have been interpreted based on Likert Scale indicating (1) Completely Disagree (2) Disagree (3) Not Sure (4) Agree (5) Completely Agree. To find if the mean scores on an item were statistically similar to the above-mentioned cut-off values, one sample t-test was run.

The qualitative data were initially analysed through *a priori coding*. However, new themes (that were not a part of a priori codes) were also included.

4. Quantitative Data Analysis

ESD Conceptions

Figure 1: Student Teachers' Conceptions of ESD



Statements 1-8:

1. A body of knowledge about social, economic, and environmental issues.
2. A set of processes (such as collaboration, dialogue, reflection) that can promote pro-sustainability attitudes and behaviours.
3. A kind of education that promotes the values of justice, open-mindedness and respect for diversity.
4. About building students' capacities to question things.
5. About employing learner-centred pedagogies.
6. About employing transformative pedagogies.
7. A goal for societal transformation.
8. A way of empowering people to take responsibility for present and future generations.

Mean scores in Figure 1 indicate STs' conceptions of ESD. STs' mean scores on items 1, 2, 3, 4, 7 and 8 are either above 4 or very close to 4. This represents an agreement with the statement based on the Likert Scale key ('5' = Strongly Agree, '1' = Strongly Disagree). The results demonstrate that STs from all participating universities understand that ESD is about social, economic, and environmental issues; is a set of processes that can promote pro-sustainability attitudes and behaviours; promotes values of justice, open mindedness, and respect for diversity; aims at social transformation; is about building students' capacities to ask critical questions to take responsibility for present and future.

Country-wide mean scores on different items indicates that STs from Türkiye and UCL mostly conceptualise ESD (Türkiye M=4.6, UCL M=4.5) as *'a way of empowering people to take responsibility*

for present and future generations'; and a 'goal for societal transformation' (Türkiye M=4.56, UCL M=4.32). On the other hand, STs from UXP largely view ESD as a means to 'promote the values of justice, open mindedness and respect for diversity' (M=4.12) and 'a set of processes (collaboration, dialogue) that can promote pro-sustainability attitudes and behaviours' (M=4.11). On the other hand, for the STs in the three countries, the conceptualisation of ESD in terms of 'employing learner centred pedagogies' is relatively lower (Türkiye M= 3.91; UCL M= 3.67; UXP M= 3.96). The conceptions of STs about constructivist and transformative pedagogies as ESD pedagogies also seem lesser developed (Türkiye M= 3.91; UCL M= 3.79; UXP M= 3.86).

Engagement with ESD

Figure 2: Student Teachers' Future Engagement/ Commitment to Teach Sustainability Content

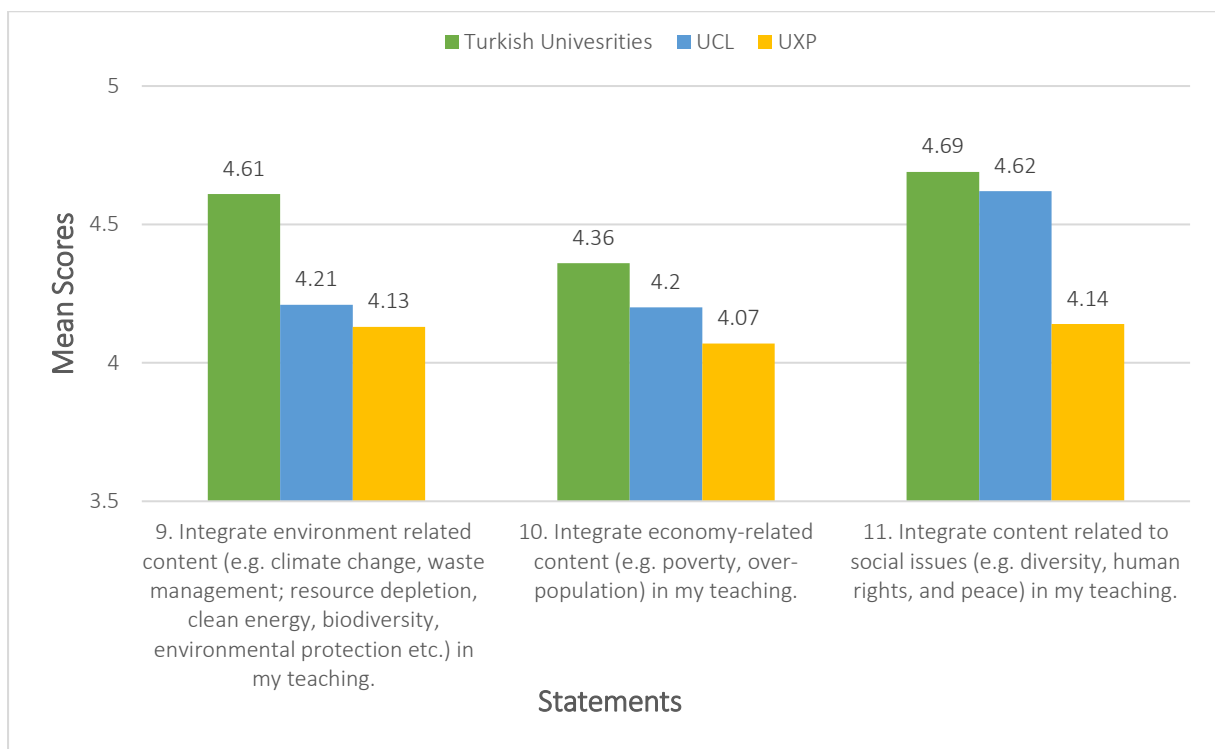
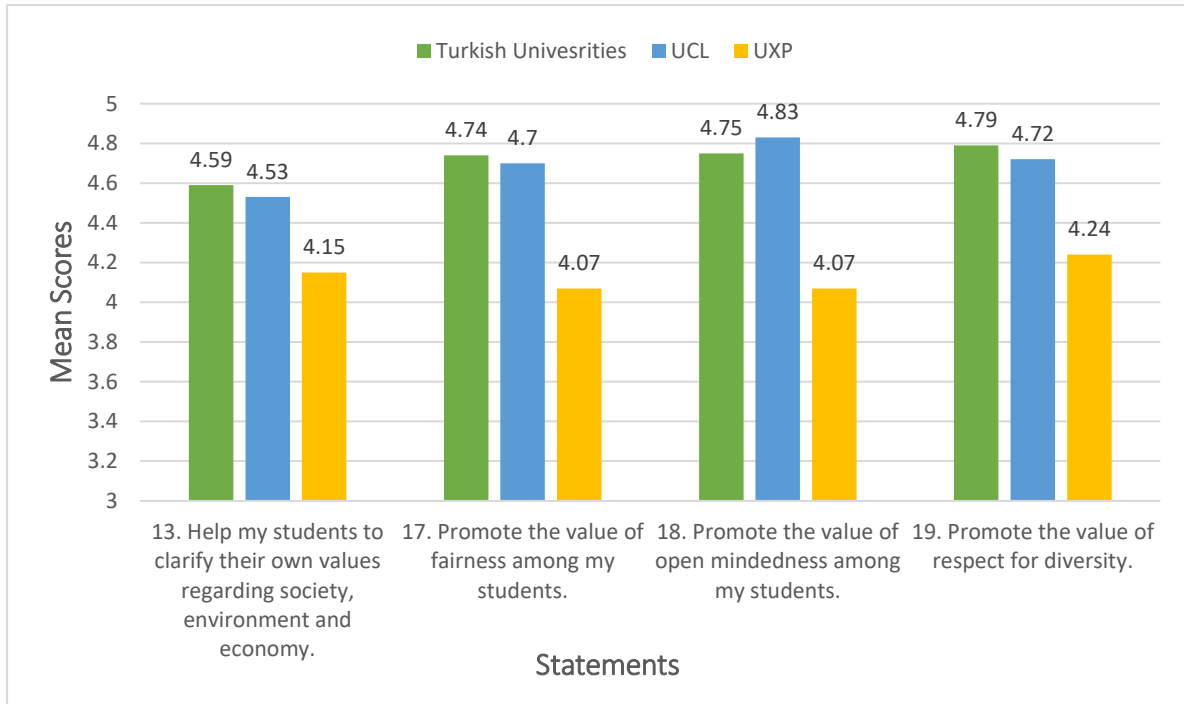


Figure 2 indicates that, although there are slight differences among the level of agreement among STs from the three countries, overall mean scores (all above '4') indicate that STs from all participating institutions agree to include social, environmental, and economic content in their future teaching. The data analysis further indicates that STs intend to integrate social dimension of SD more (Türkiye M= 4.69; UCL M= 4.62; UXP M= 4.14) as compared to integrating environment-related (Türkiye M= 4.61; UCL M= 4.21; UXP M= 4.13) or economy-related content (Türkiye M= 4.36; UCL M= 4.2; UXP M= 4.07).

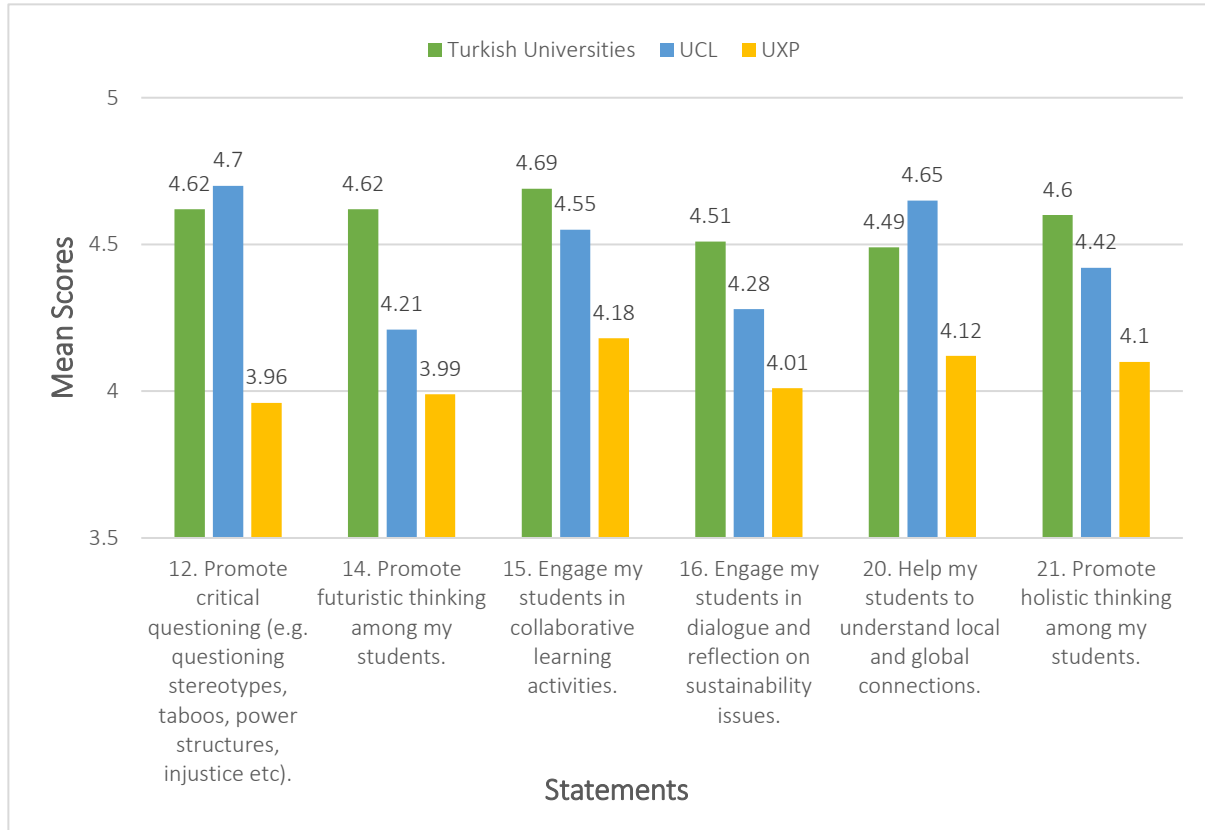
STs from Türkiye seem more committed or engaged towards integrating social and environmental issues in their future teaching, as compared to economic dimensions. The mean scores on all three dimensions of STs at UXP are very similar, and lower than that of STs in other participating universities. This indicates that the STs at UXP are relatively less committed to integrating different sustainability issues into their teaching.

Figure 3: Student Teachers' Commitment to Teach for Sustainability Values



Mean scores (all above '4') in Figure 3 indicate that STs in the three countries agree to promote ESD values in future. However, STs in Turkish universities and UCL seem highly committed (mean scores above 4.5) to promoting sustainability values in the future, as compared to STs at UXP. It is also interesting to note that STs at UCL consider promoting the value of "open-mindedness" as the most important focus of their future teaching ($M=4.83$). This is the highest mean score on any item of the scale. On the other hand, STs from Türkiye and Pakistan consider promoting "respect for diversity" as the most important focus of their future teaching. Although, for STs at UXP, mean scores for teaching values are closer to '4' or above '4' (agreement level in the Likert scale used in this study), they are relatively lower than the scores of those from UCL and Türkiye.

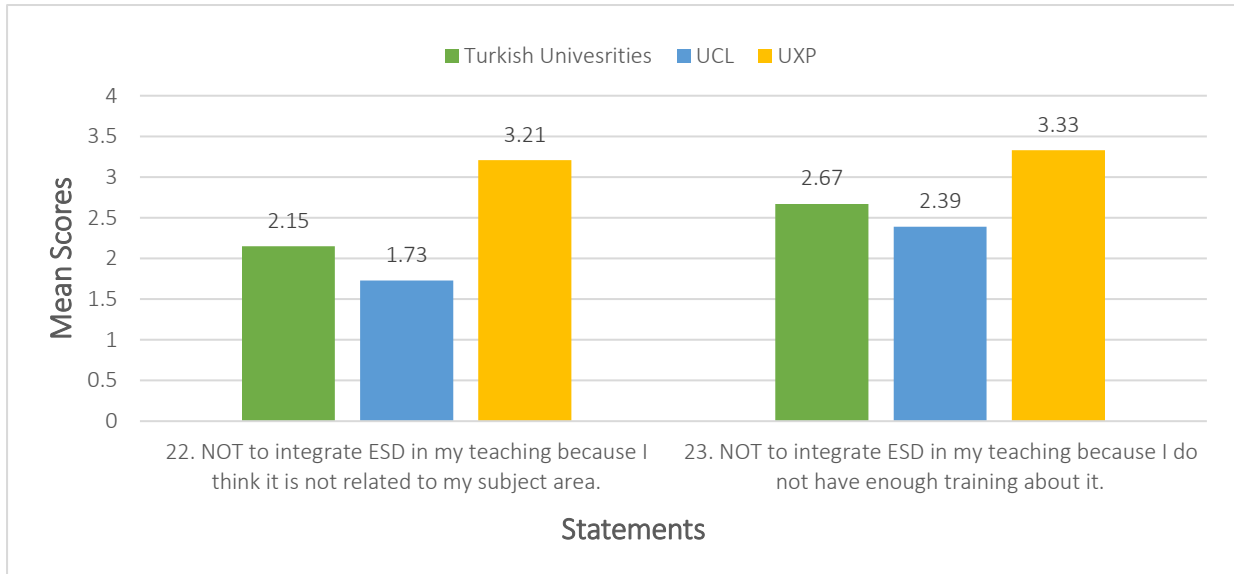
Figure 4: Student Teachers' Commitment to Employ ESD Pedagogies



The data analysis (Figure 4) shows that the STs at the Turkish universities are slightly more committed to employing ESD pedagogies in their teaching as compared to the STs at UCL, who in turn are more committed than the STs at UXP. STs at UCL are slightly more committed to promoting critical questioning and exploring local and global connections. Although many STs agree to integrate ESD skills into their future classes, most STs in UXP seem unsure about promoting critical questioning among their students.

To learn more about STs' future engagement with ESD, two more items (item 22 and 23) were included in the questionnaire. These items were phrased in reverse manner. The results of the items have been presented in Figure 5.

Figure 5: Student Teachers' Overall Future Commitment with ESD



The mean scores in the above figure indicate that STs at UCL and Turkish universities disagreed with the statements about not integrating ESD in their future teaching. Mean scores (on item 22) of STs from UCL and Turkish universities further indicate that the STs at UCL seem fully convinced that ESD can be integrated in different subjects. One sample t-test result ($t=1.36$, $p>.05$) showed that the mean score of '2.15' is not statistically different from '2'. The mean scores of the STs from UCL and Turkish universities on item 23, indicate that the STs from these institutions seem quite confident about their ability/ preparation to teach for ESD in future. Contrarily, the mean scores (on item 22 and 23 that have been worded negatively) of the STs from UXP are above '3' indicating that STs from UXP are not sure about integrating ESD into their future teaching as they feel that ESD is not related to their subject area. Moreover, they are not sure about their preparedness to teach for ESD.

Awareness about ESD

STs' commitment to ESD in the future can be explained by examining their awareness of SD. Statistics presented in Table 2 indicate that a total of 87% of STs from UCL, and 82.6% of STs from two Turkish universities, mentioned that they were aware of the term SD. On the other hand, only 64.7% STs from UXP mentioned that they were aware of the term SD. It is interesting to further note that the percentage of STs from UXP and Turkish universities who claimed to be aware of both SD and ESD was quite closely matched. In the case of UXP, 64.7% STs mentioned that they were aware of SD whereas 62.5% mentioned that they were aware of ESD. In the Turkish universities, 82.5% mentioned that they were aware of SD and 81% mentioned that they were aware of ESD. At UCL, there was inconsistency with reference to their awareness about SD and ESD. A larger percentage (87%) of STs from UCL claimed to be aware of SD while only 63% claimed to be aware of ESD. On the basis of these figures, it can be claimed that awareness of SD influences STs' future commitment for ESD.

ESD in Teacher Education

It is also important to note that a large percentage of STs (71%) from Turkish universities claimed that ESD is discussed in their teacher education programmes whereas 50% STs from UXP and UCL mentioned that ESD is discussed in their teacher preparation courses. These figures indicate that including ESD in teacher preparation can help in raising awareness of ESD as 81% of the Turkish STs mentioned that they are aware of ESD. A relatively lower percentage of STs at UXP and UCL claimed to be aware of ESD. It is also important to note that, although 51% of the respondents from UCL claimed that SD is not discussed in teacher education courses at UCL, 87% of STs at UCL are aware of SD. Their awareness of SD might be attributed to their prior studies, overall institutional culture, media, environmental or social justice movements (such as: Black Lives Matter, #MeToo, climate justice, Greenpeace etc.). The reasons for STs awareness of SD require further investigation.

Table 2: Teacher Education and Student Teachers' Conceptions of ESD

	University College London		University X, Pakistan		Turkish Universities	
	Yes	No	Yes	No	Yes	No
24. Are you aware of the term Sustainable Development (SD)?	87%	13%	64.7%	35.3%	82.6%	17.4%
25. Is SD discussed in any of your courses?	49%	51%	58.8%	41.2%	73%	27.3%
26. Are you aware of the term Education for Sustainable Development (ESD)?	63%	37%	62.5%	37.5%	81%	19.3%
27. Is ESD discussed in any of your courses?	50%	50%	50%	50%	71%	29.4%

The data analysis (Table 3) indicates that 80% of STs from Turkish universities mentioned that their universities promote ESD by offering a standalone course on ESD. On the other hand, 5.4% of STs from UCL and 12.5% of STs from UXP mentioned that ESD is promoted in their universities through a standalone course. A majority of the STs from both universities mentioned that ESD is included as a theme within a specific course/ module in their teacher education programme.

The data analysis of item 29 (Table 3) indicates that most STs from UCL believe that ESD should be promoted by making it an underpinning approach/ philosophy of the training programme or by including it as a theme in more than one course. Many Turkish STs, and those from the UXP also believe that ESD can be promoted by integrating ESD in more than one course, and making it a philosophy of the whole programme. However, majority of the Turkish STs (45%) also believe that ESD can be promoted by including a standalone course on ESD. It is important to note that the majority of the STs from UCL and UXP have not recommended including a standalone course on ESD. It is also notable that a considerable number of STs from UXP (21.32%) do not want ESD to be promoted in teacher education. This finding also requires further research to understand the reasons for them not being convinced to promote ESD.

Table 3: Student Teachers Perceptions about ESD and Their Teacher Education Programmes

Item	UCL	UXP	Turkish Universities
28. How is ESD (in its broadest sense) promoted in your department at the university? Mention all that apply.			
a) Not at All	29.35%	27.94%	4.1 %
b) As a Standalone	5.4%	12.50%	80 %
c) As an approach/philosophy to the training programme	17.4%	19.12%	5 %
d) As a theme within a specific course/ module	35.87%	41.91%	23.1 %
e) As a theme in more than one courses/ modules	25%	17.65%	19.8 %
29. How do you think ESD (in its broadest sense) should be promoted within teacher education/ preparation programmes?			
a) Not at All	7.61%	21.32%	2 %
b) As a Standalone	11.96%	21.32%	45 %
c) As an approach/philosophy to the training programme	47.82%	25%	36.4 %
d) As a theme within a specific course/ module	33.69%	33.82%	11 %
e) As a theme in more than one courses/ modules	41.3%	27.21%	38 %

5. Qualitative Data Analysis

The qualitative data were analysed to understand STs' ESD conceptions, and their preparation and future engagement with ESD. The data were initially analysed using *a priori codes*. However, an additional theme also emerged from the data. That theme was also made a part of analysis. Altogether, there were six major themes (Figure 5 and 6). Theme 1 has been further elaborated under three sub-themes i.e., ESD as a set of topics related to environmental issues, ESD as a set of topics related to economic issues, and ESD as a set of topics related to social issues. All quotes are anonymized and a prefix of IOE (for Institute of Education, UCL), UXP (for University X) and 'T' (for STs from two Turkish universities) have been added before ST (student teacher) code. For instance, the code 'IOE-ST2' represents Institute of Education, UCL, Student Teacher 2.

Figure 6: Themes Regarding Student Teachers' Conceptions of ESD

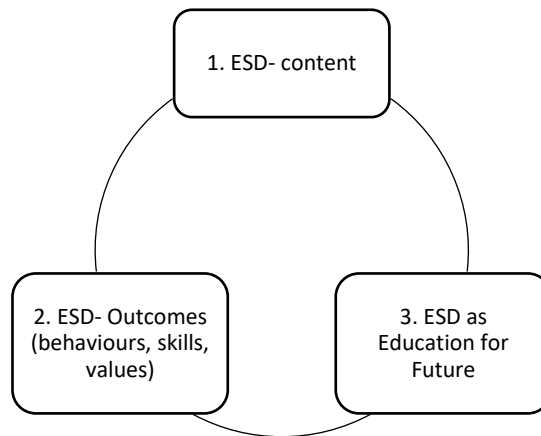
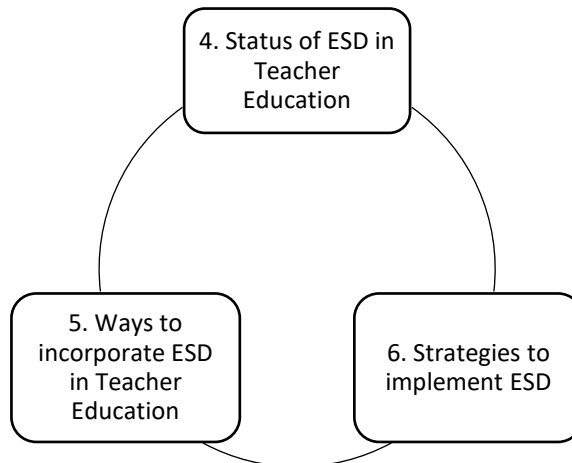


Figure 7: Themes regarding Student Teachers' Preparation and Engagement with ESD



ESD - Content

The majority of the STs from all four participating institutions mostly described ESD as a set of different topics such as: climate change, pollution, poverty, justice, human rights, sustainable

development goals etc. Along with ESD content, the STs also mentioned outcomes of ESD such as awareness about sustainability issues and change in learners' behaviours, values, actions, or attitudes. For example:

'ESD means including key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption.' [UXP-ST6]

'ESD means educating people about the issues related to SD. Whether a student gets higher education or not, everyone should get ESD. We can do it through formal as well as informal education. ESD is not restricted to school. TV channels and social media should also contribute... [ESD should teach about] gender equality, justice, poverty alleviation, ways to remove hunger and smog.' [UXP-ST11]

'...what comes to my mind is this: there are a number of problems in the world we live in, there are problems that threaten our future, and there are many more social-political wars, such as global warming or poverty such as these. Education for sustainable development also seems to me to be in the name of our future and to eliminate or minimize these threats by educating people in schools, that is, by educating them in schools, and informing people about these issues.' (T-ST5)

'...it's just enforcing that, being climate-aware and trying to live a life where you're aware of climate, ... rise of the climate in the world and trying to basically stop that or putting your bit in to try and stop that and trying to alleviate any consequences.' (IOE-ST1)

STs from UCL and the two Turkish universities emphasized ESD content again when they spoke about their future plans to implement ESD. They insisted that they would include the topics of citizenship education, climate change and pollution, ethnicity, poverty, effects of humans on the planet, impacts of historical events on people and the planet, slave trading, links between the events, colonialism, health related issues, democracy, and respect. STs from Türkiye maintained that they would teach topics related to environmental issues such as recycling, conservation of flora and fauna/ water resources, love and respect for nature, energy, water consumption, freedom, respect, gender equality, and empathy.

ESD as a set of topics related to environmental issues

Six out of seven STs from Turkish universities mentioned environment as a focus of ESD. They generally referred to a clean environment, environmental protection, environmental consciousness, recycling, air pollution and teaching children 'love for nature'. Three STs mentioned about water shortage and consumption. It is interesting to note that, although climate change is today often regarded within education as the most important issue related to the environment, only one ST mentioned it. Similarly, the idea of ecological footprints was also mentioned by one ST.

Eight out of eleven STs from UXP described ESD as an education that could address environmental problems.

'In summer, glaciers are melting fast and cause flood in the rivers. In summer, heat is increasing and in winter become colder. We can control these factors by including ESD in our education.' [UXP-ST3]

'ESD means including key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption.' [UXP-ST6]

All five STs at UCL mentioned environment related content in ESD. They also indicated an awareness of cross-curricular teaching of ESD and mentioned that ESD can be integrated into science, engineering, geophysics, natural sciences, and geography. They stated that ESD should emphasize *environmental sustainability* and include content about *pollution (noise pollution, traffic, carbon, and air quality)*, *climate change*, *natural environment*, *environmental impacts*, *reproduction*, *deforestation*, and *eco-systems*. *How to stop environmental problems* and also *how to use recycling methods* and the use of electric cars were also highlighted by the STs as part of ESD content.

In addition, they indicated the importance of teaching *the relationship between social and environmental sustainability*, highlighting the relation between them and indicating topics such as *environmental poverty*, *effects of Westernisation on nature*, *environmental justice*, *equilibrium*, and *resource management*. The data shows that the STs from UCL identified more topics related to environment as compared to the students from Türkiye and UXP. It is also important to note that some of the STs at IOE talked about the relationship between three dimensions of sustainability. One participant stated:

'...for instance, ... in Edmonton, there's an incinerator which gives really toxic gases and all of that stuff into the air, the atmosphere. And in Edmonton there's a lot of ethnic people...And they're not very rich...and it's not a rich area. And now they're going to bring a second incinerator there which will create even more pollution. So, I think that a lot of pollution is located in really small areas where there's poor people or ethnic people. So, I will talk about maybe pollution poverty as well...' [IOE-ST1]

ESD as a set of topics related to economic issues

Only a few STs from Turkish universities and UXP mentioned economy related topics as a part of ESD content. One student from UXP and one from Türkiye referred to 'poverty' as a part of ESD content.

'I think poverty alleviation is a very important issue. We cannot eliminate it but can reduce it. We should also include human-rights in it.' [UXP-ST8]

Although all STs from Türkiye mentioned that they were aware of the three dimensions of SD, they did not highlight economy related topics or discuss the relationship between economy and other dimensions of SD. They mostly referred to consumption habits of people, but did not mention the connection between consumption and environment.

'I think it is a planning for the future in terms of the consumption habits of individuals for the future, their view of the environment, their behavior towards people'. (T-ST6).

On the other hand, four STs out of five at UCL mentioned that ESD needs to include topics of colonialism, post-colonialism, slave trade, poverty, inequalities, production lines, minerals and raw materials, and finite resources. They think that ESD should guide STs on sustainable living and having responsible consumption habits.

ESD as a set of topics related to social issues

STs from UCL highlighted several societal issues that should be a part of ESD. They were: social justice, inequality, health inequalities, ethnic discrimination, global awareness, empathy towards the

world, spiritual and moral development, effects of Westernisation on people, indigenous communities, gender, diversity and inclusion, the relations between social and environmental sustainability, slave trade, and citizenship. One of the STs maintained that there is an emphasis on social sustainability more than environmental sustainability.

Four of seven Turkish STs mentioned a variety of social issues such as migration, intercultural knowledge, wars, epidemic and famine, empathy, and corruption, that could be addressed in ESD. One of the STs just used a general term as *social relations/problems*. One ST mentioned about disadvantaged groups and integration of immigrants (particularly of Syrian children) into the Turkish education system, highlighting the importance of inclusive education.

'...for example, we are having a lot of trouble in the education process with Syrian refugees today. For example, they start the first grade without any orientation. It's hard for them and it's hard for the teachers. You know, a plan can be made for this... About migrations. Something can be done for the children of immigrants in terms of inclusion in society and integrating them to society.' (T-ST6)

'Two of them mentioned equality and gender equality, 'if we can explain that different genders do not have superiority over each other, if we can explain the concept of equality, I think there will be a better world.' (T-ST1)

Another student mentioned about the corruption of societal values in Turkish society and expressed her desire for amelioration of these values through education.

'I think social values also need to be addressed. Because I see that there is a little bit of corruption right now. I don't know (why this happens), but education can be done in this way. In this context.' (T-ST6)

Unlike STs from IOE and Türkiye, STs from UXP highlighted social issues less. While talking about ESD concept, only two STs out of eleven mentioned inequality, gender issues, and human rights.

However, seven STs at UXP mentioned the values of justice, four STs mentioned about shared responsibility and tolerance. They also mentioned social values of collaboration, freedom, equity, and empathy.

ESD - Education for the Future

Some of the STs from all participating institutions described ESD as *education for the future*, to address the issues of unsustainability. Turkish STs' description of ESD revealed that they are aware of economic (preserving resources, conscious consumption, poverty), social (human relations) and environmental (water shortage, climate change) aspects of SD. All STs believed that education has a key role in helping society overcome the problems it faces. They regarded ESD as a future-oriented concept, educating people and children for future world and future generations.

'In the years we live in, especially everything is focused on consumption. We strive to make more money. Education for sustainable development is in the name of education in itself, how can we make education better, more economical? And I think it's about how we can educate students for a better future.... not just in terms of saving, but how can we raise smarter customers for example, who will buy things both when they are students and when they become adults in the future. How can we educate students about this?' (T-ST3)

One ST from UCL described ESD as:

'...my understanding of education for sustainable development comes from... UNESCO report... it's thinking about, um, how the curriculum, can challenge some of these problems in relation to sustainability to think about, ... how to make sustainable future but also how to give the students... to create that future themselves, uh, and how really that's key to the thinking about sustainable development in education.' [IOE-ST2]

Similarly, four STs from UXP also described ESD as a means for SD. Two STs described ESD as educational content to make learners' aware of UN SDGs. One of the STs mentioned:

'ESD means educating people about the issues related to SD. Whether a student gets higher education or not, everyone should get ESD. We can do it through formal as well as informal education. ESD is not restricted to school. TV channels and social media should also contribute... gender equality, justice, poverty alleviation, ways to remove hunger and smog...' [UXP-11]

Some students from UXP described sustainable development as a development that sustains over time and ESD as education that sustains or education for a sustainable future or education for future.

ESD Outcomes

STs from all four participating institutions highlighted awareness about sustainability issues, sustainability values and skills as different ESD outcomes. STs from UCL listed an associated range of skills. However, it is important to note that they hardly mentioned any skills or values in their direct descriptions of ESD. That description was mostly content-oriented. Most of the skills which they highlighted are not specific to ESD, but rather considered essential targets of education. For example, literacy skills, written presentation, summarising, active participation, literacy skills, analysis, creative thinking, working in groups, soft skills, public speaking, professional writing, teamwork, digital literacy, leadership, discernment, factful thinking, numeracy, presentation skills, analytic thinking, comprehension skills, statistical analysis, debating, policy making, the skill of interpreting evidence, decision-making skills. Critical thinking and problem solving skills particularly are the focus of any educational programme, and while they are mentioned in ESD literature, they are frequently mentioned in non-ESD-focused educational literature too. One student from UCL mentioned holistic thinking. This skill is frequently mentioned in ESD literature (Sterling, 2003; Wiek et al., 2011). In addition to the skills, STs also mentioned environmental activism, youth empowerment, and political activism as ESD outcomes.

STs from Türkiye also mentioned the skills of critical thinking, group work, cooperative thinking, open-mindedness, establishing empathy, thinking out of the box, problem preventing, problem solving, creative thinking, expressing one-self, analysing, synthesizing, leadership, being action-oriented, being competent in different research methods/research skills, effective use of internet, project writing, scientific thinking, discovery method, discussion skills, thinking skills, and humanitarianism. Problem solving was the most mentioned skill. STs maintained that social or global issues cannot be solved individually, but rather require a holistic approach from within the society itself. One of the STs emphasized the importance of leadership skills and taking actions. Being active agents in a society as an aspect of leadership is considered as an essential skill to solve the problems. She explained the importance of leadership as follows:

'...leaders are actually courageous people. I think we need to give courage to people. It's thought about within a community and it's said, for example, there's

beach pollution somewhere, let's clean it up. Everyone agrees that it should be collected. But no one is taking action. I think that's the problem of our generation. There is an idea, there is a thought, there is a solution, but there is nothing to do. We see it constantly on the agenda. The incidents are getting a lot of repercussions on social media, but I don't see anyone doing anything.... This is actually a sub-topic of leadership, taking action, mobilizing people. I think this should be taught.' (T-ST2)

This description of leadership is action-orientated which is an important focus in ESD (Wiek et al., 2011).

All the STs from the UXP, Pakistan agreed that ESD should develop students' skills. However, only five respondents named some of the skills which have been identified (in literature) as a key outcome of ESD.

'ESD should promote life skills to preserve resources for future generations.' [UXP-ST3]

'ESD should teach critical reflection, creative thinking, teamwork and participatory learning.' [UXP-ST5]

'Disaster management skills for survival.' [UXP-ST9]

Some students mentioned those skills which are considered as the targets of education such as developing students' creativity, communication skills, presentation skills, data analysis skills, computer skills. For example, a respondent said:

'ESD is about promoting creativity and confidence among students instead of rote memorization.' [UXP-ST2]

One respondent from UXP mentioned that ESD should promote both hard and soft skills. Two students mentioned development of vocational skills, online entrepreneurship skills and career counselling as an ESD focus. For example:

'I think we should promote sustainable development in students especially at vocational level. We actually do not give children counselling. Children do not know in which field they are going what would be their professional life. This is all which lacks in our education regarding sustainable education.' [UXP-ST8]

STs from UCL mentioned different values as a part of ESD, or as an outcome of ESD. It is also important to note that they mentioned some skills as values. They mentioned diversity, multiculturalism, healthy life, human rights, critical thinking, empathy, futuristic thinking, equality, holistic thinking, common-sense, non-anthropocentrism, sustainability, compassion, soft skills, non-political values, shared value of the planet, democratic rights, valuing animals, democracy, value judgements, appreciation of people and the world, ensuring prosperity, discrimination, justice, social equity, responsibility. Most of the mentioned values by STs at UCL fall under environmental and social dimensions of sustainability.

STs from Türkiye identified the following values as a part of ESD or outcome of ESD: respect for nature/ environment, justice, self-respect, respect for differences, tolerance, fairness, love (love for family/ nature/ animals), freedom, empathy, freedom of thought, responsibility (for people in need), protecting the environment, trustworthiness (trust other people who are in need of help), peace, cooperation, inclusivity, equality, support for national culture, protection of natural resources, preventing waste. Most of these values are either related to environment or social issues.

Similarly, STs from UXP also mentioned social and environmental values as a focus of ESD. The values highlighted by them were: equality/ justice, shared responsibility, tolerance, collaboration, freedom, equity, empathy, conserving resources, planting trees, respect for nature, recycling, care for own health, care for other species, responsible consumption, use of public transport.

Strategies to Implement ESD

STs from the four universities highlighted a range of strategies that they intend to apply to implement ESD in future. While talking about the strategies, STs from UCL and the two Turkish universities also spoke about the content/ topics that they would like to teach. STs at UCL insisted that they would implement ESD in the future through cross curricular approaches. They indicated that they would integrate ESD into different disciplines (such as geography and science) to teach it. They mentioned that they would focus on the content of economic, social, environmental, and political aspects of sustainable development. For example, citizenship education, climate change and pollution, ethnicity, poverty, effects of humans on the planet, impacts of historical events on people and the planet, slave trading, links between events, colonialism, health related issues, democracy, and respect.

STs from UCL identified a range of strategies that they intend to use in the future. The strategies they mentioned overlapped with expected learning outcomes too. The strategies were: kinaesthetic learning strategies, independent and collaborative learning strategies, experiential learning, popcorn reading, debates, hands on activities, discussions, awareness raising activities, use of senses, use of visuals, active learning strategies, surveys, and presentation. Along with the strategies, they mentioned the following outcomes as a part of strategies: critical thinking skills, literacy skills, summarising skills, analysis, debating, building self-confidence, valuing own actions, responsibility, holistic thinking, reasoning, curiosity, research, and data analysis.

Like STs at UCL, STs from the Turkish universities also mentioned the content that they would like to focus on as future teachers. They stated they would teach topics related to environmental issues such as recycling, conservation of flora and fauna/ water resources, love, and respect for nature. As teachers, they wanted to raise children that are conscientious about ESD. One ST highlighted:

'In other words, we must raise students who both take responsibility and are willing to take responsibility. To protect the environment, to improve the environment, we must strengthen their feelings on this issue.' [T-ST3]

Individually, various STs mentioned ESD content about global warming, nuclear energy, raising self-sufficient students, and helping students learn empathy. The economic aspect was the least mentioned. Another important topic was consumption habits and consumer awareness in terms of nature and resources. Three STs mentioned raising students who are conscious consumers. One of them mentioned energy and water consumption. In terms of social aspects of ESD, freedom, respect, gender equality, empathy were mentioned. One of the STs stated that:

'I also attach great importance to gender equality because I think there is a general problem in Türkiye about it. If they learn at least at a young age, I think maybe we can go to better places.' [T-ST4]

Regarding strategies, Turkish STs who are studying pre-school teaching expressed the need to involve the parents of children they are educating to disperse ESD effectively. They emphasized the role of parents in raising awareness among pre-school children. STs also mentioned the ineffectiveness of lecturing methods in ESD and underlined the importance of hands-on learning.

Pre-school teachers would like to focus on using games. One of the STs mentioned using fishbone analysis, another one talked about the discovery method. They also favoured brainstorming, having students prepare posters, 3D works about environmental issues, classroom discussions on solving societal problems, raising autonomous learners, strategies that motivate students, skits that promote real life learning related to ESD, and the use of think-pair-share. One Turkish ST from the English Language Teaching stream mentioned the use of the Content and Language Integrated learning approach. Another ST referred to the effect of high-stakes tests in the education system in Türkiye. He insisted that, for ESD to be taken more seriously by the students in K12, it should also be inserted into the assessment system; the topic should be integrated into these high-stakes tests.

Like STs from UCL and Turkish universities, STs from UXP also identified a range of strategies that they intend to use in the future. These strategies included: modelling pro-sustainability behaviours and values, seminars, or lectures by experts, telling students about environmental and climate issues, subject integration, role playing/ drama, reading books/ literature, movies, project-based learning, collaborative learning activities, teaching the subject of environmental science, educational games, media talks. In addition to these strategies, one respondent said that Mathematics should be taught to students as it helps students learn problem-solving. Moreover, one respondent mentioned that she would provide opportunities to the students to help them develop their presentation skills. The respondents also suggested the use of modelling, lectures, awareness seminars and question/ answer sessions, community service as strategies to implement ESD in teacher education programmes. One student said:

'We can display posters, arrange seminars in universities to show students the importance of environment.' [UXP-ST3]

'...When students engage in local issues, opportunities arise for them to learn more about their community.' [UXP-ST6]

One respondent also suggested making mental health issues a part of the teacher education programme. Another respondent emphasised the need of producing creative teachers. They insisted that *'creativity should also be taught to teachers. If we, ourselves, are not creative, then we are not going to train our students to be creative in future'* [UXP-ST9].

Some strategies like activity-based teaching, integration of ESD, educational games, drama/ role playing were mentioned by STs from all four institutions that were included in the study. It is interesting to note that lecturing was considered ineffective by Turkish respondents, but it was mentioned by three STs from UXP. Similarly, the strategies of modelling, showing movies, reading sustainability related books and the use of media were only mentioned by the STs from Pakistan. It is noteworthy that none of the STs from any participating institutions referred to using 'transformative pedagogies' to teach for ESD.

ESD in Teacher Education

All Turkish STs believed that ESD should be integrated to all subjects whenever and wherever possible. Four STs from Türkiye insisted that ESD should be offered as a standalone course in teacher preparation programme. One ST said:

'I think it [ESD] should definitely be a mandatory course. It should be continuously mentioned in other courses. Every academician should have knowledge about this subject and integrate it into their own courses.' [T-ST1]

Five STs from Türkiye stated that ESD should be integrated into other courses in the department as well. They believe that education holds a key role for the success of SD and ESD. One of the STs underlined this idea as follows:

'I think it (ESD) should be compulsory in all of the educational courses. Regardless of the section. Because it is the teachers who actually shape the future. Therefore, I think that the teaching profession is very effective in sustainable development education. Hence, it can be given as a compulsory course. Because the more students become aware, the more effective the studies for the future will be. Therefore, I am in favor of being included as a compulsory course in every programme, regardless of the department. [T-ST6]

Another ST also stated that:

'I think because it is a very comprehensive topic.... we said that certain courses included it.... it can be integrated into every lesson. Because it doesn't have to focus on a single topic.... A lesson that teaches us to be human at the same time, in our daily lives. A lesson that teaches us how to build a better life. So, I think it can be integrated into every lesson.' [T-ST3]

However, it should also be noted that even though ESD is given as a standalone course at Turkish universities, because it is an elective course, not all STs have a chance to take this course. One of the issues that was mentioned by STs is that, even though they have heard about ESD, they did not have a clear concept of what it means or involves. One of the Turkish STs who did not take this elective course stated that he believed ESD is related to economic development and that was why he didn't take this course:

'Be sure that when I heard about Education for Sustainable Development, I did not know that these issues were discussed. I didn't know that global problems were being addressed. I haven't given much thought to the name of sustainable development education. the name didn't attract me.... When I think of sustainable development, I think of something like 'how schools should be financed' or how materials can be financed in a lesson. I don't like politics at all about topics like economics. So, it didn't catch my attention.' [T-ST5]

It is also worth mentioning that even though ESD is provided as a standalone course, the interviews revealed that the attitude of instructors in the teacher education programme towards ESD is limited or non-existent depending on their personal interest and knowledge of ESD. STs expressed their desire for instructors to integrate ESD into their lessons more fully.

'I can say that it is related to the attitude of the teachers, or he may have recommended it to us about his field of interest because he considers it important. But I didn't see that from every teacher.' [T-ST7]

The course content also affects the inclusion of ESD in the courses. The biology program, due to its nature, involves more issues related to ESD even though it is more focused on environment. Similarly, a Community Services Practice course also involves some social issues of ESD. However, STs expressed their desire to integrate ESD in all courses across teacher education programmes, hinting that it should be an overarching philosophy across the curriculum. It would also be more meaningful for STs who do not take this elective course.

'I think because it is a very comprehensive topic.... we said that certain courses included it, (but) it can be integrated into every lesson. Because it doesn't have to focus on a single topic A lesson that teaches us to be human at the same time

in our daily lives. A lesson that teaches us how to build a better life. So, I think it can be integrated into every lesson.' [T-ST3]

The STs on the PGCE Secondary Programme at UCL stated that ESD is not taught as a stand-alone subject, but it is integrated into their programmes especially as a part of a Professional Studies course. They further mentioned that they are engaged in ESD-focused activities such as the analysis of environmental and human rights educational protests, debates on diversifying and decolonising the curriculum and empowering students.

'I think integrated in what's existing already would work quite effectively. I think in the number of parts that exist of the PGCE already, it's already sort of in very numerous units and parts. Adding an additional section on top of that I think would add to the occasionally burdensome nature of PGCE. [laughs] I don't mean that in, necessarily in a negative way. But it is a burdensome task, it's a difficult task. So, whereas integrating it into what's there, it, the structure that's there already I think would, it would be most effective in terms of delivery and also in terms of student teacher satisfaction.' [IOE-ST4]

Another ST talked about ESD integration as:

'...it is, thinking about integrating a, sort of an agenda for protection of the climate, for protection of, you know, planet ecology into sort of teaching, into the teaching profession with it being part of us having sort of an active stance and an active role in promoting knowledge, action, perhaps even shaping, you know, feeling and sentiment, amongst our students, in relation to those topics... related to environmental protection, that's how I would understand it.' [IOE-ST5]

Seven STs from UXP, Pakistan mentioned that they had not studied ESD. Three said that they had studied different aspects of sustainability in their courses such as 'comparative education', 'contemporary trends in education' and 'curriculum'. One student mentioned that she studied an elective course on ESD. All the respondents mentioned that ESD should be a part of their teacher education programmes. The respondents who told that they had not studied ESD suggested different ways to promote ESD in teacher education.

6. Discussion

The findings have been discussed under three themes (Student Teachers' Conceptions of ESD; Student Teachers' Engagement with ESD in Future; Inclusion of ESD in Teacher Education) in order to answer the following questions:

1. How do student teachers in England, Türkiye, and Pakistan interpret the concept of ESD?
 - a. Do student teachers' conceptions of ESD-content equally cover three dimensions of sustainable development i.e., society, environmental and economy?
 - b. Are student teachers' conceptions of ESD holistic with reference to ESD-content, ESD-processes, and ESD-outcomes?
2. How do student teachers in the three countries plan to implement or engage with ESD in their classrooms?
3. How do student teachers in the three countries perceive the inclusion/ presence of ESD in their preservice teacher education programme/ courses?

Student Teachers' Conceptions of ESD

The qualitative as well as quantitative data (mean scores on item 1 which were very close to '4' or above '4') indicate that majority of the STs view ESD as educational content related to the issues of sustainability such as citizenship, climate change and pollution, ethnicity, poverty, giving effects of human on the planet, impacts of historical events on people and the planet, slave trading, colonialism, health related issues, democracy, recycling, conservation of flora and fauna/ water resources, biodiversity, energy, water consumption, freedom, respect, and gender equality. This indicates that STs from the participating institutions understand or interpret ESD with reference to sustainability content. However, their conceptions of ESD-content with reference to three dimensions i.e., environment, economy, and society varied considerably in the four participating institutions.

All five student teachers at UCL talked about environmental and societal issues, while four of them also talked about economic issues. In addition, some of them talked about the relationship between environmental, economic, and social issues. This indicates that their conceptions of ESD are reasonably holistic with reference to three dimensions of sustainability. This finding is contrary to the findings of Soysal and Ok (2021) and Ozturk (2018) who noticed that student teachers describe ESD with an environmental focus. The reason behind this contradiction seems to be the commitment of IOE and UCL to sustainability. IOE is incorporating a strong social justice and sustainable development component into all aspects of its teaching and research. Although ESD is not taught as a standalone course at IOE, ESD seems integrated in teacher education programmes. IOE launched a new centre in 2022 - the Centre for Climate Change and Sustainability Education, which aims to provide teachers with the expertise to teach about climate change and sustainable development. News of this new initiative might have positively impacted on student teachers' understanding of ESD. However, this claim requires further investigation.

STs at the UXP and the two Turkish universities described ESD content with reference to environmental issues. Social issues were highlighted as a part of ESD by four out of seven STs at Turkish universities. However, economic issues were mentioned by only one ST at UXP and a few at

Turkish universities. It is also important to note that STs at UXP and Turkish universities did not mention the relationship of environmental issues with social or economic issues.

The findings indicate that the STs at UXP view ESD as synonymous with environmental education. These findings are aligned to the findings of Soysal and Ok (2021) and Ozturk (2018) who also noticed that student teachers describe ESD as environmental education. ESD conceptions of some of the student teachers from the UXP are in line with Evan et al.'s (2012) findings where the respondents described ESD as education that is continuous; education about ecological systems and environmental systems; education that is active, hands-on, local, and relevant; and education for the future. Moreover, many pre-service teachers (student teachers) described ESD as education *about* the environment. Like the findings from Evans et al.'s (2012) study, student teachers from UXP also do not conceptualize ESD in the way it has been presented in the scholarly literature on ESD. This shows that they are unfamiliar with the concept of education for sustainability.

The qualitative data in the current study indicated that the student teachers from UXP and Turkish universities mostly conceptualize SD in terms of environment. Accordingly, they view ESD as an education that leads to promoting pro-environmentalism. This finding is in line with the work of Bezeljak et al. (2020) with 60 Slovenian and 60 Austrian biology student teachers. They found that student teachers' view of ESD was environment-focused. Moreover, they did not have an understanding of the interconnections between social, economic, and environmental aspects of SD. Hagevik et al. (2015) also found in their research that participants' conceptions of sustainability lacked an understanding of the interconnectedness between environment, economic, societal, energy, and technological issues.

The current study indicates that the student teachers from UXP and the Turkish universities emphasized a range of social values (such as: respect for diversity, equality, equity, multiculturalism, healthy life, human rights, critical thinking, empathy, futuristic thinking, holistic thinking, soft skills, democracy, justice, and responsibility) when they were asked to talk about ESD values. However, when they were asked to define ESD, a majority of the respondents did not talk about social dimensions of ESD. This finding is in line with recent research by Ferguson et al (2021), which found that teachers' perspectives on ESD were less associated with citizen participation. Similarly, Summers and Child (2007) had also noted that student teachers were generally aware of all the dimensions of SD, but the aspects of citizenship and preservation of diversity were missing in their conceptions. The reasons for a lack of holistic understanding of ESD among STs at UXP could be that ESD is neither an underpinning philosophy of teacher education programmes at the UXP, and nor are ESD concepts integrated into different courses. Kalsoom et al. (2019) noted that only 5% sustainability related content was covered in the B.Ed. Honours curriculum.

STs highlighted a range of skills and values that are expected to be developed among students who receive ESD. However, it is also important to note that, except for problem-solving skills, critical thinking skills and holistic thinking, other skills mentioned by the STs are not specific only to ESD-outcomes. For example, development of the following skills is a focus of any educational programme offered at K-12 or higher education level: critical thinking, decision making, literacy skills, summarising, literacy skills, analysis, creative thinking, working in groups, soft skills, public speaking, professional writing, digital literacy, leadership, discernment, numeracy, presentation skills, analytic thinking, comprehension skills, statistical analysis, debating, policy making, interpreting evidence. Some STs talked about vocational skills and online entrepreneurship skills which are the focus of vocational or further education. This indicates that STs' understanding of ESD-outcomes is partially aligned to the outcomes mentioned in ESD literature. Some students talked about ultimate outcomes of ESD such as achieving SD or contributing to SDGs. However, this broader focus did not

show their understanding of specific outcomes related to individuals such as: *“learning to ask critical questions; learning to clarify one’s own values; learning to envision more positive and sustainable futures; learning to think systemically; learning to respond through applied learning; and, learning to explore the dialectic between tradition and innovation”* (Tilbury, 2011). It is also important to note that most STs do not view ESD as a way to transform students’ worldviews. This indicates that STs’ understanding related to ESD-outcomes is not fully aligned to scholarly debates on ESD outcomes.

It is also important to note that, although STs from the participating institutions did not mention any ESD strategies or processes while describing ESD, they highlighted a number of constructivist strategies which they intend to employ in future. This indicates that they are aware of some ESD-processes such as processes of collaboration and dialogue, and processes of active and participatory learning (Tilbury, 2011). This finding is in line with the results of Bezaljak’s (2020) study, which found that students were aware of and supportive of pedagogical approaches such as active learning and transformative education within ESD. The findings of the current study also highlight that the STs are aware of some of the ESD processes.

Reflection and critical reflection are also considered key ESD processes (Kalsoom and Khanam, 2017). However, STs from the participating institutions did not mention these processes. The findings indicate that STs mostly interpreted the concept of ESD with reference to ESD content. Their conceptions regarding ESD outcomes and ESD processes are less visible compared to their conceptions in terms of ESD content. In Turkish universities, ESD is offered as an elective course while at UCL and UXP, ESD is not offered as a standalone course. As a result, STs are not exposed to different elements of ESD.

Student Teachers’ Engagement with ESD in the Future

Both qualitative and quantitative data (mean scores on item 9-21) indicate that, although STs from all the participating institutions intend to include ESD in their future teaching, STs from UXP feel less prepared to teach for ESD. Moreover, their responses on item 22 indicate that STs from UXP do not see ESD as a transdisciplinary concept which can be integrated into different subjects. However, on the other hand, their mean scores on item 9-21 indicate that they plan to integrate ESD content as well as ESD processes to promote ESD outcomes. Similarly, qualitative data also indicate that STs from all participating institutions intend to teach for ESD in the future. STs mentioned a range of strategies that they intend to use in the future. This indicates their awareness of useful educational tools that can lead to making learners aware of sustainability issues. It is also interesting to note that most of the strategies mentioned by the STs are active, and participatory such as: independent and collaborative learning strategies, experiential learning, debates, use of senses. It is also important to note that some of the STs are aware of the scope of ESD beyond formal education. They talked about the use of media and parental roles in promoting pro-sustainability behaviours. STs’ future engagement with ESD can be explained with reference to presence of ESD in teacher education programmes.

ESD in Teacher Education

The quantitative data (mean scores on items 22 and 23) indicated that the STs from UCL and the two Turkish universities are equally committed to teach for ESD in the future. However, STs from Pakistan showed less commitment towards ESD in their future teaching. Quantitative data indicated that more than 70% STs from Türkiye claimed that SD and ESD were discussed in some of their

courses. This percentage is considerably higher than the percentage (50%) from UCL respondents. From UXP 59% and 50% STs mentioned that they had studied SD and ESD respectively as a part of their courses. These findings indicate that STs' future commitment towards ESD cannot be fully explained with reference to their study programmes. This finding requires further investigation. The findings from the Turkish universities can be explained with reference to the experimental study of Andersson et al. (2013) who found that the students who participated in a SD course wanted to teach for SD more as compared to the students who did not participate. However, the findings from UCL cannot be explained in the light of the study of Andersson et al. (2013).

The qualitative as well as quantitative data indicated that the university context, and educational experiences of the STs are the determinants of their ESD conceptions and their future engagement with ESD. Since ESD is offered as a standalone course in the Turkish universities, STs' ESD-conceptions, and their commitment for ESD was significantly greater as compared to that of STs in Pakistan. Although STs at UCL did not study ESD as a standalone course, they studied the different elements of ESD in other courses and had an orientation of sustainability issues. They also showed high commitment to be ESD educators in future.

Impact of ESD Integration in Teacher Education

The way ESD is integrated into the programmes (either as the underpinning programme philosophy or integrated into different courses/ modules) shape STs' conceptions and future commitments about ESD. ESD as a standalone course can be one of the reasons for more developed conceptions as this course presents a chance to learn about ESD and the related concepts directly. Secondly, the way it is integrated into the whole curriculum as a philosophy or as a topic in more than one course may promote the construction of the concepts of ESD implicitly. However, the detailed analysis of interviews indicates that integration of ESD into the whole programme as a philosophy or its inclusion as a topic in more than one course provides more opportunities for students to come across the concepts of ESD and this encourages more holistic ESD conceptualisation. This can be followed from the way they describe ESD - they mention the skills and values of ESD and the way they are planning to integrate ESD into their future courses.

On the contrary, although integration of ESD as a standalone course provides more direct descriptions of basic ESD concepts, the conceptions of STs are not reinforced in different courses. This results in developing limited conceptualization of ESD. University X, Pakistan follows the standardized curriculum of BEd prepared by the Higher Education Commission of Pakistan (HEC). In that curriculum, ESD is not a focus in any of the courses. The university has now started offering an elective course on ESD, but it is taken by few students. The lack of emphasis on ESD in the BEd curriculum (developed by HEC) seems the major reason for relatively less developed ESD-conceptions among the STs enrolled there.

Another point shaping the development of ESD conceptualisation can be the pedagogies used in the integration of ESD into the programmes. As Bourn and Soysal (2021) indicated, not many ESD courses are promoted with transformative learning strategies, however, in England, transformative learning strategies are used more for the integration of ESD into the programmes. As transformative strategies include the use of collaborative, active learning strategies, problem solving and hands on activities, STs' conceptualisation of ESD becomes more effective and deeper. However, as transmissive learning strategies focus more on knowledge transfer, the conceptions of students become limited.

7. Conclusion

This mixed methods study leads to some important conclusions regarding student teachers' ESD conceptions and their commitment towards ESD as future teachers. The findings indicate that the institution's own commitment to sustainability and ESD is pivotal in developing student teachers' conceptions of ESD, and empowering them to act as ESD educators in their future teaching. Student teachers who study in sustainability committed institutions become more aware of the concepts of sustainable development and ESD. In addition to institutional commitment towards sustainability, the overall ethos of the teacher education programme also determines student teachers' ESD conceptions and their future engagement with ESD. Student teachers who experience an ESD-focused teacher education programme (with ESD as the underpinning philosophy of the programme, ESD as a standalone course, or ESD integrated courses) demonstrate more holistic understanding of ESD and are more committed towards ESD in their future teaching. The finding that the student teachers' understanding of ESD specific outcomes and transformative pedagogies in ESD is relatively less developed indicates a need for introducing more ESD literature to the student teachers so that they become more aware of different aspects of ESD.

8. Recommendations

Based on the study findings, here are some recommendations for teacher education programmes and researchers in the area of ESD:

- Teacher education programmes should apply ESD as an overarching approach or philosophy for the whole programme to allow student teachers to learn about the ESD content in different course/ modules and participate in ESD-processes and ESD-focused assessment.
- Teacher education programmes should offer standalone courses on ESD to help student teachers become aware of ESD elements i.e., ESD content, processes, and outcomes and help them develop their capacity to teach for ESD in future.
- Researchers may investigate how student teachers' experiences of different teaching approaches and processes impact their conceptions of ESD-processes and ESD-outcomes.
- Researchers may investigate the relationship between student teachers' ESD conceptions and their engagement with ESD in the future.

9. References

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Appendix 1

QUESTIONNAIRE

Dear Student Teacher,

You are requested to participate in a study entitled **“Student Teachers’ Understanding and Engagement in Education for Sustainable Development in England, Türkiye and Pakistan”**. It will take you approximately 20 minutes to complete the questionnaire. The study is being undertaken by a team of researchers based in different universities; Professor Douglas Bourn, the principal investigator, from Institute of Education, UCL; Dr. Qudsia Kalsoom from Beaconhouse National University, Pakistan; Dr. Burtay Ince from Gazi University, Türkiye; and Dr. Nese Soysal. The study aims to understand student teachers’ conceptions of Education for Sustainable Development (ESD), the importance they perceive of sustainable development as part of their future teaching, and their perceptions about the importance given to ESD in their teacher education programme/ courses.

Participation in the study is on a voluntary basis. Your answers will be kept strictly confidential and evaluated only by the researchers; the obtained data will be used for scientific purposes. The questionnaire does not contain questions that may cause discomfort to the participants.

In case of filling a paper-pencil questionnaire, for any reason, if you feel uncomfortable, you are free to quit at any time. In such a case, it will be sufficient to inform the data collector.

We would like to thank you in advance for your participation in this study. For further information about the study, you can contact Dr. Qudsia Kalsoom (qudsiakalsoom@gmail.com) or Dr. Nese Soysal (nesesoyal@yahoo.com).

University Name: _____

Department/ Subject: _____

Gender (please leave it blank if you prefer not to respond): _____

Would you like to participate in a follow up interview? Yes/ No

If yes, please provide an email address for contact. _____

Please indicate your level of agreement with the statements in the table below (1-Strongly disagree; 5-Strongly agree)

•	Statement To me, ESD is:	• Level of Agreement				
		• 1	• 2	• 3	• 4	• 5
• 1	A body of knowledge about social, economic and environmental issues.	•	•	•	•	•
• 2	A set of processes (such as collaboration, dialogue, reflection) that can promote pro-sustainability attitudes and behaviours.	•	•	•	•	•
• 3	A kind of education that promotes the values of justice, open-mindedness and respect for diversity.	•	•	•	•	•
• 4	About building students' capacities to question things.	•	•	•	•	•
• 5	About employing learner-centred pedagogies.	•	•	•	•	•
• 6	About employing transformative pedagogies.	•	•	•	•	•
• 7	A goal for societal transformation.	•	•	•	•	•
8	A way of empowering people to take responsibility for present and future generations.	•	•	•	•	•
	As a future teacher, I plan/ intend to:	•	•	•	•	•
• 9	Integrate environment related content (e.g., climate change, waste management; resource depletion, clean energy, biodiversity, environmental protection etc.) in my teaching.	•	•	•	•	•
• 10	Integrate economy-related content (e.g., poverty, over-population) in my teaching.	•	•	•	•	•

• 11	Integrate content related to social issues (e.g., diversity, human rights, and peace) in my teaching.	•	•	•	•	•
• 12	Promote critical questioning (e.g., questioning stereotypes, taboos, power structures, injustice etc).	•	•	•	•	•
• 13	Help my students to clarify their own values regarding society, environment and economy.	•	•	•	•	•
• 14	Promote futuristic thinking among my students.	•	•	•	•	•
• 15	Engage my students in collaborative learning activities.	•	•	•	•	•
• 16	Engage my students in dialogue and reflection on sustainability issues.	•	•	•	•	•
• 17	Promote the value of fairness among my students.	•	•	•	•	•
• 18	Promote the value of open mindedness among my students.	•	•	•	•	•
• 19	Promote the value of respect for diversity.	•	•	•	•	•
• 20	Help my students to understand local and global connections.	•	•	•	•	•
• 21	Promote holistic thinking among my students.	•	•	•	•	•
• 22	NOT to integrate ESD in my teaching because I think it is not related to my subject area.	•	•	•	•	•
• 23	NOT to integrate ESD in my teaching because I do not have enough training about it.	•	•	•	•	•

24. Are you aware of the term Sustainable Development (SD)?

____ Yes

____ No

25. Is SD discussed in any of your courses?

____ Yes*

____ No

*If so, please give the name of the course _____

26. Are you aware of the term Education for Sustainable Development (ESD)?

____ Yes

____ No

27. Is ESD discussed in any of your courses?

____ Yes*

____ No

*If so, please give the name of the course _____

1. How is ESD (in its broadest sense) promoted in your department at the university?

- a. Not at all
- b. As a theme within a specific course/ module
- c. As a theme in more than one courses/ modules
- d. As a stand-alone course
- e. As an approach/philosophy to the training programme

2. How do you think ESD (in its broadest sense) should be promoted within teacher education/ preparation programmes?

- a. Not at all
- b. As a theme within a specific course/ module
- c. As a theme in more than one courses/ modules
- d. As a stand-alone course
- e. As an approach/philosophy to the whole programme

23. Could you indicate the level of importance given to ESD (in its broadest sense) within your courses from a level of 1 - 5 (with 5 being most important level)?

____ 2. ____ 3. ____ 4. ____ 5. ____

*This is the end of the questionnaire. Thank you for your participation.

Appendix 2

INTERVIEW QUESTIONS

1. How would you describe Sustainable Development?
2. How would you describe Education for Sustainable Development (in its broadest sense)?
 - What comes to your mind when you hear ESD?
 - What do you think about the content of ESD? Which topics should be covered in ESD?
3. Do you think ESD includes teaching of some skills? If yes, which skills are or should be included for teaching ESD?
4. What values should ESD promote?
5. How do you (as a future teacher) plan to teach ESD in your classes? Can you give some examples?
 - Which topics, skills and values would you focus on?
6. Which strategies would you use to promote ESD in your classes?
7. How has ESD been addressed in your teacher education programme/ courses in the university?
 - Which topics, skills and values are addressed?
 - Which activities are emphasised?
8. How would you like ESD to be covered in teacher education programmes?



The IOE, UCL's Faculty of Education and Society, is a world-leading centre for research and teaching in education and social science, ranked number one for education worldwide in the 2017 QS World University Rankings. Founded in 1902, the Institute currently has more than 8,000 students and 800 staff. In December 2014 it became a single-faculty school of UCL, called the UCL Institute of Education.

About the Development Education Research Centre

The Development Education Research Centre (DERC) is the UK's leading research centre for development education and global learning. The Centre conducts research on development education, global learning and education for sustainable development. It runs a Masters' Degree course, supervises doctoral students and produces a range of reports, academic articles and books. DERC is located within IOE, UCL's Faculty of Education and Society.

About UCL's Global Engagement Fund

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