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CHAPTER 1

Artificial Intelligence in Foreign Language Education: Transformation, Teacher Roles, and Educational Policies

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Artificial intelligence (AI) brings shifts in numerous fields, with education among them. The impact of AI technologies stands out in how people learn foreign languages. From one period to another, AI-based translation mechanisms, voice detection systems and personalized learning patterns grow in sophistication. These developments cast doubt on traditional instruction practices. Translation programs equipped with AI capabilities have taken significant steps forward since their start. At present, these applications turn text into other languages with speed and exactness. Such advancements make it possible for individuals to express thoughts across language barriers without spending time in classrooms. But the rise of these tools puts traditional teaching concepts into question, as older methods require extended dedication for language mastery.

Voice-to-text technology expands AI's impact in language education. Translation programs convert speech into writing instantly, thus enabling clear communication across different tongues. As a result users receive quick responses from these tools leading to better study outcomes or increased individual progress (Rahimi & Tafazoli, 2022). On another note personalized AI learning systems present tailor made education routes for every person. The programs assess linguistic abilities, identify weak points and create targeted practice sessions to address shortcomings. Through this individualized approach, students grasp new languages faster and need less time to reach proficiency (Yeh, 2024).

The arrival of AI in language education brings up fundamental questions regarding instructor roles in coming years. Despite its beneficial resources and tools, human teachers maintain their central position in offering cultural insights teaching analytical thinking and fostering personal connections. Education professionals need to combine AI solutions with their instruction, particularly in areas where human contact stands as a priority (Ji et al., 2022). Through AI's growing presence in language classes, education guidelines and curricula demand adjustments. Policymakers need to include AI expertise, cultural understanding and computer skills alongside basic language requirements as new technologies enter educational institutions (Kreinsen & Schulz, 2023).

The financial and ethical considerations of AI language programs need examination. Creating these systems takes large amounts of money and restricted access causes divisions between well funded and under resourced students. Questions about personal information safety, AI bias plus maintaining cultural

customs require answers. Benefits of AI need to match standard teaching principles.

A shift from traditional language learning to education centered on AI and cultural abilities receives increasing backing. Understanding of AI programs becomes essential as these tools merge into daily tasks. Social awareness remains needed for good communication between individuals including acceptance of different beliefs and traditions.

2. Trends in Artificial Intelligence Language Tools

2.1 Current Translation Tools

The emergence of computer based translation services changes how people learn and connect across linguistic borders. These applications combine mathematical processes with data interpretation to convert languages accurately in seconds. AI translation creates a shift in how students acquire foreign tongues and interact internationally. Present-day translation engines rely on information networks that process entire texts at once. In practice this yields precise results. Through neural processing methods, translation software takes a significant leap. For instance Google's system analyzes complete phrases rather than individual terms. Because of its grasp of meaning, the output reads naturally. This technique preserves intended messages better during conversion between languages.

The translations adhere to linguistic structures and social expressions since the system learns from countless prior examples. By analyzing massive amounts of data, it creates conversions that fit smoothly into their intended use. But the outcome gives readers clear, contextual understanding through this data driven approach. Through comprehensive pattern recognition, modern translation tools deliver text that maintains its original significance leading to improved cross cultural dialogue (Shanshan, 2024; Son & Kim, 2023).

2.1.2 Educational Applications

A new development appears in transcription services for language education. Teachers convert recordings to match student comprehension. This process reduces preparation needs and adds appeal to classroom tasks. Basic computer programs serve as tools alongside standard teaching and help student progress. The text removes complex terms, maintains natural flow and preserves core ideas in three sections. Each portion starts with direct statements and incorporates basic language. The addition of computer tools to education brings concern among

teachers. But experts question how these programs affect standard teaching roles and school structures.

On classroom floors instructors display doubt toward computer applications. Their hesitation stems from false beliefs about benefits combined with real challenges in daily use. The changes require adaptation from both students and faculty members. The integration needs careful steps to address fears from education professionals. The role of AI translation tools adds value to classic teaching practices but does not replace them. Such software helps students learn in multiple ways:

- Language assistance provides instant feedback for pronunciation plus sentence structure details.
- During text assignments, students receive real time translation support.
- Cultural exchange improves through interactions between speakers of various languages.

The digital tool changes according to individual requirements through custom translation features. A course instructor adds these systems to give learners a chance to process information in their native speech before transitioning to the target language. Such an approach benefits newcomers or mid level participants who need help to absorb complex concepts in unknown forms of communication.

2.1.4 Impact on teaching methodology

Teaching methods need updates in response to AI translation tools. Instructors must change their techniques to teach proper translation assessment. The new approach contains multiple parts. In class assignments blend computer assistance with traditional learning methods. Pupils acquire various translation verification techniques plus error detection skills. Through established boundaries for translation software in assignments, students grasp acceptable usage parameters. Practice sessions point out both societal nuances and situational interpretation. AI translation presents opportunities alongside complications in language instruction. Such programs offer quick results and task assistance. But achievement stems from educational targets combined with moral standards. Usage protocols determine student interaction with AI during lessons. As AI expands its presence in academia, a middle ground approach becomes essential. Scholars maintain that technology supports instructional aims alongside personal connections between teachers and learners. These aspects form the base of

effective education (Bigcas et al., 2024; Damsa, 2023; Eury & Hawk, 2023; Jaleniauskiene˙ et al., 2023; Suyo-Vega et al., 2024; Tirri & Toom, 2020; Yeh, 2024).

2.2 Real-Time Speech Recognition

2.2.1 Core Technologies and Processes

Speech-to-text conversion in real time stands as a notable advancement for artificial intelligence tools. This process turns spoken words into written form at once connecting people across different tongues. At its core the system takes multiple actions: analyzing sound waves from the source converting meanings, then producing written results. Due to these tasks the operation needs substantial processing capabilities plus an exhaustive collection of data to interpret word context. The mechanics allow instantaneous transformation of spoken sounds to written form letting people bridge their linguistic gaps. Through several organized phases, the entire operation flows:

- A complex sequence starts when the program detects patterns of audio waves in speech.
- A translation step changes these sound components into different symbols.
- Through a last operation, the system creates text in line with preset language settings.

2.2.2 Technical Challenges and Solutions

A combination of powerful computers along with extensive word databases makes accurate predictions about meanings really possible. A primary obstacle lies in the recognition of varied pronunciations across languages. Such differences often create communication barriers in live translation of spoken words. But AI speech systems continue to advance through various applications. AI chatbots or smart tutoring programs demonstrate highly promising results for language education along with cross language interaction (Duret et al., 2023; Gong et al., 2023; Kim et al., 2023; Sun et al., 2023).

2.2.3 Educational Implementation

The creation of concrete assessment tools and metrics for evaluating system effectiveness remains a work in progress. The emergence of AI in language instruction sparks conversations regarding the role of instructors. Current AI

applications aid language learners but these platforms fall short of the nuanced reasoning exhibited by human teachers.

A discussion persists regarding the merit of AI-assisted education and instructor roles. Large-scale implementation of AI platforms for language training lacks definitive success records. But the advent of AI translation services diminishes the need for traditional teaching approaches and educators. The evaluation includes monetary considerations tied to language training programs.

Educational institutions require cost effective AI tools to modify language instruction through updated guidelines. These adjustments need to equip both educators and pupils with AI comprehension, cross cultural understanding and varied capabilities for the future. The integration of AI solutions into language classes leads to sustained improvements in student achievement. The adaptation of educational standards and lesson content becomes essential to encompass AI expertise and intercultural proficiency. Teachers incorporate AI resources alongside conventional methods resulting in an improved educational framework. At this point the fate of traditional foreign language instruction hangs in question.

3. Impact on Language Learning Processes and Teachers

The emergence of artificial intelligence (ai) causes basic changes to language education and alters a teacher's regular activities. Basic ai applications - text conversion tools, voice assessment systems plus interactive learning platforms - modify how instructors teach students. These programs create learning situations suited to individual requirements, thus reducing an instructor's workload (Kannan & Munday, 2018; Kohnke et al., 2023). Such developments necessitate new approaches to teaching methods and instructor functions.

Through ai powered language systems, instructors spend less on teaching English to non native speakers. The applications take over numerous teaching duties including speaking practice and feedback steps (Almutairi et al., 2020). These digital tools analyze student data and tailor content according to personal learning patterns. At present personalized teaching approaches exist as concrete applications. Scientific progress indicates tangible outcomes - not mere concepts - in handling technical challenges plus opening additional educational paths (Kannan & Munday, 2018).

Teachers integrating AI for language instruction need extensive digital expertise. Due to increasing numbers of AI systems appearing in education, instructors require both pedagogical knowledge and computer abilities to incorporate this technology into daily teaching activities (Kohnke et al., 2023;

Yeh, 2024). In addition to understanding AI advantages, teachers must identify potential problems and develop solutions to minimize setbacks. Changes in regulations and educational practices stand necessary to defend teachers' financial stability and professional standing (Kamalov et al., 2023).

Questions emerge about AI tools in schools. Teachers face matters regarding student information safety and uneven computer decisions. Changes in AI create a need for teachers to work together with administrators and researchers toward improvements in language teaching methods. As translation software and learning programs grow more common, instructors express concerns about their job security. The addition of AI systems to language rooms leads to uncertainty about employment paths for instructors. Teachers require specific instructions about AI equipment operations because of rapid growth in educational settings.

New automated systems change standard teaching practices and modify the profession (Ji et al., 2023). These tools complete grammar checks and supervise pronunciation exercises. Because of this automation, teachers need less involvement in certain tasks (Yeh, 2024). Education through computers grew fast, thus reducing old teaching methods - a shift that accelerated during covid times (Dmitrenko & Akhmadullin, 2023). Today's digital platforms create individual learning programs for students plus added functions that do some teacher tasks. But an educator's influence extends past giving information. A teacher builds reasoning skills, guides talks about society and develops ethical thinking - areas where current digital tools fall short. As machines handle certain duties, teachers stay necessary for their complete educational role. The language teachers now spend less time on basic instruction and turn to computer knowledge, between culture abilities or knowledge across subjects. This change turns teachers into mentors for tech understanding and social awareness instead of simple language teachers (Florio-Hansen, 2018). Programs like Computer-Assisted Language Learning (CALL) let teachers keep their own style as they meet new demands. These systems support a shift where teachers make methods that fit students' current needs (Tafazoli & Meihami, 2022).

For education to transform, administrators need to implement clear rules and teaching standards that keep teachers in meaningful roles at their schools. Research shows how better equipment, group procedures and correct preparation help technology based language tools succeed, as demonstrated through the pandemic. Teachers required suitable knowledge and equipment to include computer methods in their work. Due to translation software, voice detection tools and educational programs, standard foreign language classes became less

relevant. In response education officials and school leaders joined forces to confront these shifts. But official recommendations assist both educators and families to grasp proper digital tool application. The resulting expertise aids students to gain current skills that align with job market needs.

Their mastery of these concepts leads to improved classroom outcomes. Through systematic updates to teaching approaches, learners receive instruction suited to present day requirements. Yet without proper guidance, even experienced educators face obstacles in tech integration. Institutions need comprehensive frameworks to guide this educational evolution.

The core responsibility of governing bodies centers on creating an ideal environment for alternative teaching approaches. In addition leadership teams need to supply adequate tools for linking current day devices to learning spaces. Adjustments in education demand novel concepts; thus, practical modifications emerge in existing academic frameworks that benefit neighborhoods. Throughout nations the shift toward computerized instruction continues, yet supervision from residents plus detailed evaluation of drawbacks remains scarce (Roumate, 2023). Due to limited community participation, numerous individuals consider tech specialists or administrative offices as the sole directors of these adjustments. But official guidelines from decision makers need to tackle these potential issues and align technological advancement with educational objectives. The plans must reflect what students truly need to learn.

Focus on integrating artificial intelligence (ai) into language instruction stands as a necessity for teachers in today's landscape. Due to rapid advances in technology, education methods need adaptation. Through ai incorporation, educators and learners acquire practical competencies. Research by Walter (2024) places ai at the heart of educational practices. Modern instruction calls for preparation in ai equipped settings. Students need to reason analytically, address challenges as well as interact with digital systems.

The number of academic publications regarding ai applications in language pedagogy indicates widespread academic attention. Recent developments in natural language processing create additional pathways for learning assistance tools. Studies centered on ai in english education have grown substantially since 2014, states Crompton et al. (2024). But teacher preparation programs lag behind these advancements.

At present ai solutions for language instruction evolve rapidly necessitating curriculum revisions, notes Jaleniauskienė et al. (2023). Through automated

translation platforms and voice recognition technology, traditional language classes become less essential, reports Ali (2020). This shift raises concerns about instructor roles. Despite ai handling basic instruction tasks, teachers remain essential guides for analytical reasoning development. Instructors facilitate cultural understanding and moral considerations. The integration of ai education requires both technical competence and awareness of societal implications.

4. Projections

4.1. Balance, Innovation, and Ethical Dimensions

Artificial intelligence creates different approaches to foreign language instruction than in previous times. Translation applications combined with voice recognition technology and personalized learning platforms simplify the acquisition process for students. Each individual receives instruction according to their specific learning patterns. Translation software delivers precise results and digital speech tools interpret conversations in a natural manner. Such developments provide quick feedback plus opportunities to exchange thoughts in numerous languages. Students achieve fluency sooner or connect with native speakers at improved levels. The rise of technology in language studies sparks discussions about traditional educational methods. The function of instructors requires a redefinition in these circumstances (Alshumaimeri & Alshememry, 2024; Christina & Panagiotidis, 2024; Gentile et al., 2023; Tutton & Cohen, 2025).

Electronic translation tools offer basic language help, feedback next to personalized study materials to learners. But these applications fall short in explaining deeper cultural elements - a necessary aspect of language study. Face-to-face sharing of traditions, expressions, real world context next to social norms requires teachers in the role of mentors. Current AI platforms (as of Mar 2025) remain limited compared to flesh-and-blood educators in teaching analytical thinking, imaginative expression and group interaction.

AI brings advantages to foreign language education. Learners benefit from physical teachers who modify their techniques, convey cultural insights and give emotional guidance. Through a dual method that puts digital aids alongside human instruction, students receive improved results. The role of AI belongs in supporting education - not in taking the place of real teachers during language learning.

4.2. Ethical Concerns in AI-Powered Multilingual Communication

From linguistic interactions to computational safeguards, artificial intelligence brings changes to education. These developments demand protocols for personal information protection. Cultural elements shape the application of such tools in academic settings. Schools now incorporate AI features in classrooms, yet this necessitates more than academic proficiency (Aler Tubella et al., 2023; Chan, 2024; Holmes et al., 2021; Nguyen et al., 2022; Renz & Vladova, 2021). The advantages of digital applications depend on guidelines that uphold basic social principles. Through such adjustments, educational institutions adapt their instruction methods to fit modern requirements. But precise regulations need to guide the use of AI resources in education since disparities in student access create educational differences.

The rules aim to establish fair opportunities for every student to prevent social gaps at local and national levels. Students learn better by engaging with AI instead of accepting pre made answers. They need to understand these systems' functions, think analytically along with follow ethical guidelines.

A thorough educational plan links AI knowledge to cultural understanding and basic communication skills. These programs include AI components that build problem solving abilities and ethical judgment. Students gain abilities to join AI-influenced groups. The purposeful use of AI starts with human considerations. Educational centers need to set AI standards based on community values, ethics next to personal rights. Studies about AI education continue to expand to help decision makers base their choices on proven data.

4.3. Harmonious Collaboration Between Humans and Technology

The effects of AI tools in language teaching shape today's approach to student learning. Instructors stay at the center, yet computer systems provide additional help for education tasks. Learning a language requires more than memorizing rules. Students get familiar with traditions from other places, improve their speaking abilities and build thinking skills through practice. Together with face-to-face lessons, digital tools lead to improved comprehension as learners discover different ways of life. AI-powered translation software, personalized learning websites and automated assessment tools transform the study process into an experience tailored to each person's needs.

The AI programs create custom lessons that match how each student learns, needs next to speaks. Studies on AI's effect on teaching and speaking (Bozkurt et al., 2021; Muhammad et al., 2024; Niveditha et al., 2023; Zhai et al., 2021) point

out that these tools assist teachers to guide students instead of taking their place. But translation and learning software centers on big languages. This creates a risk for small language groups and local ways of speaking. Research about education rules and technology progress (Alzankawi, 2024; Carmelin, 2022; El Shaban & Abobaker, 2022) shows that AI requires changes for both large and small languages to keep different ways of speaking alive.

At present AI programs need to include both common and rare languages as a practical answer to keep various speaking groups alive. The use of AI in teaching matches good education methods. A mix of computers and teachers in class creates personal learning for students. Through this the room turns active and open for all learners. Education goes past machines. Teaching needs an ethical base that accepts different societies and forms of speaking. The pairing of teachers with AI leads to good outcomes. They help students learn in lasting ways. Such a fair mix brings true steps forward in speaking new languages.

4.4. Global Power Dynamics and Educational Policies

The impact of artificial intelligence on education extends through individual instruction into institutional policies and teaching practices. Shifts in international authority relationships shape the formation of national technology guidelines and decision processes.

Between major technology corporations and regional educational initiatives lies a significant tension regarding equal learning opportunities. Tech giants provide AI-based individual instruction platforms to students. But smaller community enterprises struggle to stay relevant as providers. Such disparity increases the technology separation and creates dependency on external solutions.

Due to its cross border nature, education necessitates flexible systems for multinational integration. Academic activities now spread across countries leading governments to establish common standards and exchange knowledge through digital channels. The preservation of community customs and area specific teaching approaches remains essential.

For educational technology, a precise balance of international and local elements becomes necessary. Any assessment of technological progress needs to consider fair distribution and long term advantages above market performance or governmental objectives. The digital shift touches ethical principles, community frameworks along with financial dimensions of academic institutions - a reality that fair regulations need to address.

4.5. Prioritizing AI Literacy in Teacher Training

The expanding presence of artificial intelligence (AI) creates a need for teachers to master digital skills according to recent studies (Brandão et al., 2024; Hornberger et al., 2024; Tenberga & Daniela, 2024; Walter, 2024; Zhao & Luo, 2022). School leaders now concentrate on developing instructors' teaching methods alongside computer knowledge as technology advances.

A well organized approach to teacher preparation gives educators the tools to handle AI with expertise and care. Training sessions need to contain these basic components:

- **Ai capabilities and boundaries**

  Educators require knowledge about classroom AI applications to recognize benefits and limitations for responsible integration. Teachers should grasp how these tools support instruction methods in pursuit of improved learning outcomes.

- **From bias to moral questions**

  Built-in prejudice exists in AI programs requiring careful examination by instructors. Professional development enables faculty to detect algorithmic errors, implement ethical guidelines during decision making and convey moral values to their pupils.

- **Ai classroom implementation**

  In addition to theoretical foundations, teachers need direct experience testing these applications during actual instruction. Development sessions address learning management systems grading automation tools and student response mechanisms that show promise.

Professional growth remains essential for educators. Because of rapid tech changes, instructors need to incorporate artificial intelligence applications into their lessons. Through systematic learning programs combined with guidance from experienced peers plus team efforts, institutions support their staff. Such steps let teachers grasp AI-driven approaches through direct experience. After integrating these digital tools into classrooms, educators discover advantages besides technical gains. The application of artificial intelligence enables them to present information with greater impact plus develop course materials from different angles.

4.6. Economic Dimension and Investment Strategies

Initial expenses for AI education systems include steep monetary demands and extensive facility updates. In time automated processes and expandable programs reduce operating costs. The appropriate combination of these systems decreases expenses and creates individual study routes, updates content based on needs and opens education to more people (Chalkiadakis et al., 2024; Dhananjaya et al., 2024; Sharif & Uckelmann, 2024). Administrators need to examine spending from both advancement and instructional standpoints (Kavrayıcı, 2024). The incorporation of AI in schools requires detailed predictions, as quick responses to trends fall short. A seamless shift demands comprehensive policy strategies.

The directives need to cover digital instrument implementation and ways to bridge technology differences, prepare instructors along with distribute learning materials equally (Joseph et al., 2024). Through this transformation, institutions face roadblocks: resistance to new methods, budget constraints as well as insufficient preparation. The resolution of these challenges determines the success rate of AI integration in education (Joseph et al., 2024; Rivera-Gutiérrez et al., 2024). Personalized education paths and inter school cooperation add to community progress and societal advancement (Rivera-Gutiérrez et al., 2024).

For public schools a structured project management approach centers on need assessment with stakeholder input and implementation adjustments for improved outcomes (Animashaun et al., 2024). The introduction of online learning systems demonstrates this method in action (Animashaun et al., 2024). Strategic frameworks and policies stand as pillars of change. But community impact requires consideration. At universities AI systems promote eco conscious practices and student participation. Such progress contributes to economic development and social cohesion (Kennedy et al., 2024). The road to AI integration demands continuous ethical assessment and creative solutions that benefit every societal segment.

5. Conclusion

The incorporation of AI into language instruction adheres to specific guidelines alongside technical advancement. Basic teaching standards plus administrative duties shape these modifications in conjunction with appropriate regulations. Multiple factors guide AI implementation in learning spaces.

A structure based on moral conduct plus enduring benefits determines AI inclusion in teaching sessions. Guidelines need explicit descriptions of AI

functions in pedagogical approaches. Such directives safeguard student records, personal freedoms plus instructor expertise. Education authorities bear responsibility to detail AI data usage practices. Through this approach privacy concerns remain addressed according to Chaudhary plus Jedlickova in 2024.

Progress in educational AI requires instructors to develop superior computer based teaching abilities. Complete instructor training combines direct experience using AI applications plus broad electronic competencies. The creation of reliable assistance programs aids teachers to add AI into daily instruction. These support structures turn AI from a basic computational resource into a legitimate educational asset (Rodríguez, 2024; Tammets & Ley, 2023; Triberti, 2024; Walter, 2024).

But implementation of AI educational resources without strategic preparation increases disparities between advantaged plus disadvantaged learners. Equal AI distribution stands as an immediate requirement (AI Success Relies on Access, 2024). The establishment of improved electronic infrastructure plus support initiatives for students in resource limited areas constitutes essential steps toward equitable education. The electronic divide spans more than hardware - it encompasses teaching strategies plus societal elements that demand attention.

As artificial intelligence makes its entrance into education, numerous shifts occur in teaching practices across regions. Governing bodies need to study digital systems' effects on communities and economics, then develop guidelines aligned with educational objectives in their territories. Through localized AI learning content adapted to specific dialects and cultural norms, education becomes reachable for all segments of society (Zawacki-Richter et al., 2022). The role of AI stands as a complement to educators rather than their replacement. Despite AI providing personalized academic journeys, direct contact between instructors and students remains central to learning processes. Teachers offer guidance and mental support. They interpret AI data to address particular learning gaps.

On school premises AI programs assist educators in class management (Holmes et al., 2023). But incorporating AI into language instruction extends past technological advancement. This integration demands harmony with academic policies, ethical guidelines next to social considerations. Through calculated AI deployment, education systems persist in balancing digital capabilities with human elements. For AI instruments to bear fruit in academic settings, meticulous organization becomes necessary. The blueprint must encompass ethical, pedagogical along with community based elements to create benefits across all participant groups.

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CHAPTER 2

Renewable Energy Sources and Environmental Ethics Awareness in Science Education

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INTRODUCTION

The challenge facing humanity today is to meet human requirements in a world with increasing population, energy, ensuring food, and water security (Amulya et al., 2016). Until the turn of this century, the growth has relied on fossil fuels, which are not only limited in resources but also exposed to environmental conclusions regarding greenhouse gases pollutants, gas emissions, and climate changes (Ang et al., 2022, Duarah et al., 2022, Wang and Wang, 2015). Big scale fossil fuel exploitation contributes to global warming by releasing high levels of CO_2 into the atmosphere each year, warning of serious health risks for humans and the environment (Okeke et al., 2022). Renewable energies are emerging as a possibility to fill this gap and provide a path to a sustainable world (Allegretti et al., 2024).

Renewable energies are energy produced by natural resources that are naturally renovated at a rate lower than they are consumed. They are almost inexhaustible, but the amounts of energy available per units of time are limited (IEA, 2022). Renewable energy sources, hydroelectric, wind, solar, bioenergy (biofuels, biomass, biogas), geothermal, and marine stand out. Despite their characteristics, every source can contribute to sustainability issues such as carbon emissions and global warming potential, job creation, pollutant emissions, resource depletion, and rate of renewability. The production and use of renewable energies are promoted as part of the worldwide strategy for sustainable development. This is a commitment that has been expressed by 196 countries since 2015 (UN, 2022). Renewable energy is an opportunity to ensure long-term energy security for all countries, especially developing ones (Chu et al., 2023, Nizami et al., 2017; REN21, 2020).

Renewable Energy Sources

***Solar Energy*:** The sun is both a continuous and renewable source (Emlik, 2017). Additionally, solar energy is clean and environmentally friendly as it does not cause the damage to nature that fossil-based energies do (Varınca and Gönüllü, 2006; Bedeloğlu et al., 2010). Today, solar energy is used in homes and workplaces, industry, agricultural technology, transportation and communication tools, automation, and electricity generation (Kumbur et al., 2005).

Solar energy is the radiant energy that results from the conversion of 4 million tons of mass into energy per second through the fusion process, where hydrogen gas in the core of the sun, which is a continuous fusion reactor, is converted into helium (Kılıç, 2015). Sunlight is converted into electrical energy through solar

cells. The most important advantage of solar energy is that it is considered unlimited (Ünal, 2023). Solar energy is a clean, renewable, and environmentally safe energy source (Köroğlu et al., 2010). Apart from being a sustainable energy type, it is the source that causes the least harm to the environment when used (Mertoğlu, 2019).

***Wind Energy*:** It is a type of energy that humans have utilized for thousands of years, from windmills to modern wind farms for electricity generation (Emlik, 2017). Wind energy is formed when the earth's surface heats up differently, causing temperature, humidity, and pressure differences in the air, which leads to the displacement of air masses due to these pressure differences. Like other energy sources, wind also derives its source from the sun, and approximately 2% of the energy that reaches the earth from the sun is converted into wind energy. Thanks to the wind, energy can be produced quickly and reliably without the need for any fuel (Çolak and Demirtaş, 2008; Ertuğrul and Kurt, 2009).

Wind energy is expected to play a very important role in future energy production due to its clean and inexhaustible nature. When we look at the source of wind energy, we see that it is formed as a result of the conversion of solar energy (Baysal and Daşdemir, 2021). Hot air heated by solar energy rises and atmospheric pressure decreases. Cold air masses fill the place of rising hot air masses. This airflow causes the formation of wind. The wind carries kinetic energy. The energy to be obtained from wind depends on the wind's power and duration. Wind energy attracted people's attention even before Christ. In those periods, it was mostly used for irrigation purposes. With the invention of the windmill, it was used to grind agricultural products (MEB, 2011).

***Geothermal Energy*:** It is called a hydrothermal mass consisting of water and steam containing molten salt, minerals, and gases in regions with varying temperatures at various depths of the earth's crust, which forms the potential of the waters in the basins on the earth. In short, the thermal energy stored under ground constitutes geothermal energy (Emlik, 2017). The systems formed by some granite and similar hard rocks under ground are shown as a source of geothermal energy although they do not contain water. Although these hard rocks do not show any fluid properties, they are hot dry rocks whose heat can be utilized by some methods and techniques (Etemoğlu and İşman, 2004; Aracı, 2013; Yörükoğlu, 2014).

***Hydroelectric Energy*:** Today, water energy is the most common renewable energy source. This energy is produced by conversion the potential energy of water into kinetic energy by establishing hydraulic power plants in areas with

rivers and streams (Emlik, 2017). For this purpose, water is collected in dams with the melting of rain and snow. Dam gates control the flow of water. Large diameter pipe systems carry the water from the dam to the turbines and hydrostatically pressurized turbines operate and generate electrical energy through the generator system to which the turbines are connected (Kumbur et al., 2005; Aksungur, 2011).

Nuclear and fossil fuel geothermal, thermal, and natural gas power plants as well as hydroelectric power plants (HPPs) are used in electricity generation. These power plants have two important characteristics: renewable and peak operation. In terms of initial investment cost, HEPP can compete with nuclear and thermal power plants except for natural gas. Their operation is economical and environmentally friendly (Gençoğlu, 2002). It is also a domestic resource that is not dependent on foreign resources for our country. Turkey's theoretical hydraulic potential constitutes 1% of the world's theoretical potential and its economic potential constitutes 16% of the European potential (Republic of Turkey Ministry of Energy and Natural Resources, 2021a).

***Biomass Energy*:** It is defined as municipal solid wastes, recyclable wastes, all municipal wastes including hazardous wastes from households, agricultural wastes, sewage sludge obtained from wastes from forest products that have no industrial value (Republic of Turkey Ministry of Energy and Natural Resources, 2023). It is energy produced from biomass-derived materials. Bioenergy is divided into two groups in terms of its use. The first is the traditional use and refers to the burning of biomass in forms such as coal, animal waste, and wood (Ünal, 2023). Modern bioenergy includes plants, wood heating systems, and liquid biofuels produced from other technologies (IRENA, 2021b). Turkey is a very rich country in terms of biomass. It has sufficient environmental conditions and opportunities to develop this resource. Priority should be given to energy forestry and energy agriculture to reduce external dependency. More importance should be given to the development of biofuel production from wastes and biogas to be obtained from waste, garbage, and fertilizers (Topal and Arslan, 2008).

***Wave Energy*:** This energy is produced by the pressure created by wave action in the seas (Ünal, 2023). Winds, earthquakes on the seabed, tides, and collapses create sea waves. For wave energy production, dams should be built at the mouth of the bays and the incoming water should be retained. Electricity can then be generated by turbines by utilizing the height difference of the water (Bayraç et al., 2018; Kerimoğlu, 2020). Since it is known that 2/3 of the world is water, it

can be thought that a significant part of the energy need can be met from wave energy by giving the necessary importance (Bayraç et al., 2018).

***Hydrogen Energy*:** It is a synthetic fuel that can be obtained from fossil fuels such as water, biomass, natural gas and coal as well as renewable energy sources such as solar, wind, and hydraulic energy (Emlik, 2017). Hydrogen is not an energy source but an energy carrier. It carries energy efficiently compared to electricity. Hydrogen can disperse rapidly and thanks to this, it is not as dangerous as other gases because it is volatile in case of any danger. In the event of a fire, it does not create destruction around it like other gases and fuels, it burns immediately and goes up quickly. Hydrogen, which has a high thermal value, is also used as fuel in space vehicles (Güvendiren and Öztürk, 2003; Yelmen and Çakır, 2011; Çelik, 2012).

Objectives of Renewable Energy Education

Education is one of the most effective ways of providing solutions to the problems facing the community. Renewable energy education is essentially the consideration of a variety of topics and issues relating to renewable energy sources and technology as an individual subject. The wide objectives of renewable energy training aim to provide the operational knowledge and understanding of the concepts, facts, principles, and technologies for the utilization of renewable energy sources. Therefore, depending on its level, the role of a renewable energy education program should be educational, investigative, informative, and creative (Kandpal and Broman, 2014). The target audience for renewable energy education and energy education in a broader sense should be the entire population. The specific objectives of a renewable energy education program can include the following (Berkovski and Gottschalk, 1996; Garg and Kandpal, 1996; Jennings, 2009; McVeigh, 1982; Broman and Ott, 1992**).**

Developing an awareness about the nature and reasons of the energy-relevant challenges facing humanity (increasing shortages and prices of fossil fuels and climate changes worries).

- Making students aware of the variously non-renewable and renewable energy sources, the technologies, their resource potentials, available to harness them, the economics with energy of these technologies, and environmental, sociocultural, and institutional issues related to their utilization and development.

- To prepare and motivate students to strive towards the development and implementation of alternative strategies to address the various challenges facing

the energy sector, including the provision of more energy to meet the growing global energy demand in an environmentally sustainable manner, with particular emphasis on the effective and efficient use of renewable energy sources.

- Developing students' attitudes and functional values towards using renewable energy sources and related socio-economic and environmental dimensions.

Characteristics of Renewable Energy Training Programs

Renewable energy education programs should be effective (provide relevant inputs to the goal group in a minimum amount of time), economical (educate the maximum number of people within present financial resources), and effective in achieving the requested objectives. the desirable features of a university level renewable energy education program might include (Benchikh, 2001; Bhattacharya, 2001; Garg and Kandpal, 1995; Hasnain et al., 1998).

- Cover all renewable energy sources, with special emphasis on some specific sources depending on local needs and resource availability.

- It should cover all aspects related to the development and diffusion of renewable energy technologies, including (a) resource assessment, (b) design, production, performance monitoring, installation, troubleshooting, and maintenance of technologies, (c) economic, financial, and energetic aspects of renewable energy technology use, (d) socio-cultural acceptability and (e) assessment of relevant environmental impacts.

- Resource assessment is the evaluation of (a) design, fabrication, performance monitoring, installation, troubleshooting and maintenance of technologies, (b) financial, economic, and energetic aspects of renewable energy technology use, (c) socio-cultural acceptability (d) related environmental effects.

- It should provide a balance between practical and practical aspects. Therefore, its curriculum should include lectures, tutorials, assignments seminars, etc., as well as demonstration and laboratory experiments, troubleshooting, design, production inputs.

- It should be dynamic and flexible to allow for future improvements in the content and structure of the teaching/training program.

- Be in line with global efforts to facilitate effective and mutually beneficial experience-sharing and interaction with other institutions around the world.

- Teaching/training programs at the university level, particularly in renewable energy education, and all other initiatives in general, should, to the extent possible, ensure that students are employed/self-employed upon successful completion.

Forms and Levels of Renewable Energy Education

Energy education and renewable energy education in particular, should be supplied at a mass level on a global scale. Therefore, both formal and non-formal education methods should be widely used for this aim. Formal education contains training in schools, colleges, universities, etc., and is expected to be well-planned with purpose-oriented learning experiences based on the identified requirements and goals. On the other hand, the informal form of education involves learning from the mass media or organizations that do not provide organized education. This form of education can help those who have never been to school, unemployed school dropouts, and adults who want to acquire new knowledge and skills. Informal delivery of renewable energy education would be more appropriate for developing countries, as a large proportion of their children do not receive any formal education. It is important to undertake initiatives to improve public understanding (Broman and Kandpal, 2010).

It is now widely recognized that renewable energy education needs to be delivered at different levels, including schools, colleges, universities, and other academic institutions (Kandpal and Broman, 2014) (Table 1).

Table 1. Possible levels of education on renewable energy (Kandpal and Broman, 2014).

Age Group (Years)	Institution	Formats/type of program
5–10	Primary School	Introduction of basic concepts in environmental sciences and/or any other related subject area
10–13	Middle School	Introducing related concepts and demonstration experiments in the science curriculum
13–16	High school/middle school	Introduction of related concepts in science and biology curriculum, demonstration experiments. Introduction of pre-vocational courses in the field of renewable energy technologies
15–18	High School	Introducing relevant concepts, technologies, demonstrations and laboratory experiments from the Chemistry, Physics, and Biology curricula Introduction of vocational courses in the field of renewable energy technologies
>17	Technical Colleges, Polytechnics,	Certificate-level programs for technicians and mechanics Undergraduate and graduate-level programs

Age Group (Years)	Institution	Formats/type of program
	Engineering Colleges Institutes of Technology	Short-term/on-the-job training courses to update skills and knowledge
>25	Any appropriate organization	Mid-career courses, retraining, and installers, updating for technicians
At any age	Any appropriate organization	Awareness and sensitization programs for national, regional, and local government officials, policymakers, managers as well as the general public

Renewable Energy Education at School Level

The future prosperity of humanity will also depend on its ability to use existing non-renewable energy resources wisely (with due appreciation of intergenerational equity in their consumption and use) and to harness new and renewable energy sources. These challenges are both urgent and long-term. Since most of the feasible solutions will be developed in the future, one of the most important responsibilities of the current generation of energy educators is to provide appropriate education or training at the school level to facilitate the understanding of all the complex energy related issues and also to motivate them to seek appropriate solutions. Intensive efforts should be made to improve school students' knowledge and appreciation of renewable energy sources and Technologies (Kandpal and Broman, 2014).

Many other groups around the world have also developed school curricula and packages. For example, the Solar Energy Council of Victoria in Australia initiated a renewable energy education program in schools, for which primary and secondary school teaching packs were developed (Charters, 1990). The packs were distributed at nominal cost to Victorian primary schools in 1987 and in-service training courses were organised for teachers interested in using the packs. Similarly, a new course for secondary school and educational solar laboratories was launched at the Moscow Institute of New Technologies in Education (Koltun and Gukhman, 1993). It was increasingly recognized that school students needed to develop an understanding of the challenges of engineering design of energy systems and to be able to follow such a design project from manufacture through to testing and performance evaluation. To this end, in 1990 secondary school students in Victoria (Australia) were invited to design and build model solar cars and participate in a competition with each other (Wellington and Mellor, 1992). A considerable amount of work has also been carried out at the Florida Solar

Energy Centre in the USA in the field of energy education at the school level (LaHart, 1986).

Interest in the utilization of renewable energy sources using appropriate technologies can be instilled at the school level by demonstrating the direct importance of renewable energy use for people and their environment. Simple laboratory-scale demonstration models can be used for this purpose (O'Mara and Jennings, 2001). This approach also helps to dispel doubts about the causes and consequences of any challenge facing humanity (such as climate change through the greenhouse effect). Appropriate awareness-raising initiatives at the school level are very effective in changing the behavior of students and their parents (Zografakis, 2008). The basics of renewable energy sources and technologies need to be included in the science curriculum of schools. It is also recommended to provide hands-on experience and problem-based learning opportunities at the school level (Close, 2003; Chagwedra Sydney, 1991; Halder et al., 2011; Klanin, 1997; O'Mara and Jennings, 2001; Ravindranath and Shailaja, 1997; Shukla, 1998). Adequate consideration of the techno-economics and financing of renewable energy technologies is often not included in most existing teaching programs. As there is a huge potential for decentralized diffusion of renewable energy technologies at the household level worldwide, it is also critical that socio-cultural issues and aspects related to the diffusion of renewable energy technologies are appropriately addressed in university-level curricula (Kandpal and Broman, 2014).

The Relationship Between Renewable Energy and Environmental Education

Within a scenario of increasing environmental awareness, all potential energy solutions will likely be very tightly guided by their short and long-term impact on environmental and sustainable development considerations. All energy source-technology combinations (envisaged to be used to fulfill both the present and future energy requirements of the global society) must be environmentally sustainable. Thus enabling the development of sustainable energy pathways, as well as the implementation of renewable energy technology with a proper awareness of its potential role. Conversely, efforts to provide environmental education should ensure that students are provided with sufficient inputs to enable them to make an in-depth assessment and evaluation of various potential energy supply options to meet the growing global energy demand. Therefore, it is necessary to provide inputs for both energy and environmental education synergistically. As the extraction, conversion, and utilization of conventional

(fossil fuel) energy sources are the primary causes of environmental degradation, both energy and environmental planning strategies and initiatives must be harmonized. It is also important to ensure synergies between initiatives to develop human resources in the renewable energy sector and manpower requirements for energy efficiency and energy conservation activities, as both contribute to the goal of sustainable development. Therefore, it is necessary to ensure that relevant inputs are provided to students in a holistic manner without any lack of inputs (Kandpal and Broman, 2014).

Environmental Education

Environmental education is an educational program for people at all different levels to understand the environment, to realize their place and role in it, to be aware of all factors affecting the environment as much as possible and to become conscious in this context (Özbuğutu et al., 2014). The human influence on the ecosystem has intentionally or unintentionally increased to such an extent that it has become a necessity to use all available means in the most rational way to respond to environmental destruction. However, in terms of property relations, the relationships between environmental disciplines, practitioners and academics, policy makers and ordinary citizens involved in the process have become so complex that a multi-dimensional intervention from the field of academia is required (Uğurlu and Demirer 2008). Gigliotti (1990), who emphasized what the deficiencies in environmental education are, why we cannot be successful in environmental education and what we should do to solve these problems, stated that environmental education does not raise individuals who will solve today's environmental problems. He stated that although individuals' environmental sensitivity has improved, they still do not have information about the root causes of environmental problems. He underlined that environmental education should also undertake the task of creating personal commitment in individuals to improve the environment. For this, he stated that environmental education should become the focal point of education from primary education to higher education (Keleş, 2007).

Environmental education is the process of developing attitudes, value judgments, skills, and knowledge for the protection of the environment demonstrating environmentally friendly behaviors, and seeing their results (Erten 2006). Environmental education can be explained as the acquisition of knowledge, skills, and behaviors that will enable individuals to live in harmony with their environment, raising people who are responsible for everything from water consumption to garbage production, from energy consumption to the use

of natural resources, and ensuring active participation in solving problems (Demirkaya, 2006).

In the Seminar on National Environmental Strategy and Implementation Plans for Environmental Education and Training in Turkey, organized by UNESCO and the Undersecretariat of Environment of the Prime Ministry, education for the environment was defined as: developing environmental awareness in individuals, gaining positive, permanent behavioral changes that are sensitive to the environment, protecting natural, cultural, historical and socio-aesthetic values, taking part in solving problems, active participation (Güler, 2009). The main aims of education for the environment is for the individual to comprehend his/her environment as a whole, to develop a critical perspective in his/her interaction with the environment, and to grow up as a sensitive, conscious, sociable "eco-citizen" and "world citizen" who protects his/her planet (Atasoy and Ertürk, 2008).

In line with this aim, environmental education activities at all education and training levels will provide a great contribution to raising individuals who have sufficient environmental awareness, are sensitive, and protect, and safeguard the environment they live in. According to Başal (2003), the main purpose of environmental education is to allow the individual to perceive the real environment, to develop sensitivity about protecting and using the real environment by positively affecting the values and behaviors relating to the environment. While an environmental education course is given in schools, this course should have some general objectives. The main objectives of environmental education:

- *Awareness*: Providing individuals and societies with awareness and sensitivity about all environmental conditions and problems
- *Information*: Providing individuals and society with basic information and experiences about the environment and its problems
- *Attitude*: Providing individuals and societies to develop certain values and awareness towards the environment and to make them want to actively participate in the protection and improvement of the environment
- *Skills*: Providing individuals and societies with the skills to describe and analyze environmental problems

- *Participation*: Individuals and communities must be allowed to actively participate at all levels in efforts to find solutions to environmental problems (Kınacı et al., 2011).

The sooner environmental education starts, the better. Because the interests and attitudes that are formed in preschool and school age form the base of future desirable behaviors. Especially the values judgments and attitudes which are formed in childhood and young age are very significant in the development of empathy about nature and the formation of love for nature at an early age. These periods of development will be learnings to be kept in mind in the emotional domain and will help individuals develop conscious behaviors that are beneficial to the environment (Özbuğutu et al., 2014).

Environmental Awareness Ethics

While the concepts of environmental awareness have a wide range of uses the area where it manifests itself most intensely today is politics. As emphasized by many scientists, environmental awareness aims at environmental knowledge, attitudes toward the environment, and behaviors that are useful to the environment. We can describe them as follows (Erten, 2004):

Environmental knowledge: Environmental problems, and solving these problems, advances in the ecological area, all information about nature.

Approaches to the environment: All of the positive or negative Approaches and thoughts that people show towards environmentally useful behaviors such as value judgments, fears, anger, restlessness, and being ready to solve environmental problems.

Enviromental useful behaviors: Actual behaviors demonstrated for the protection of the environment. This kind of behavior is referred to as environmentally friendly or environmentally beneficial behaviors in the literature. However, so far, research in the field of environmental awareness has shown that the effect of environmental knowledge on environmentally useful behaviors is low and that attitudes towards the environment are not very significant on environmentally beneficial behaviors. In addition to environmentally friendly behaviors, an environmentally conscious person is a person who does not remain impartial and insensitive to the deterioration of the environment, does not behave egotistically, and does not convert personal gain into ambition (Erten, 2004).

It is extremely important to provide environmental education both in classrooms and directly in nature to provide the necessary equipment effectively (Duru and Bakanay, 2021). Visual applications should be carried out frequently, especially to provide permanent sensitivity. It is among the effective educational practices for individuals to witness the ecosystem by examining the environment in the field and closely observing the projects (Yıldız et al., 2002). Ensure social awareness, it is extremely effective in achieving the goal and preventing environmental crises to provide permanent behaviors to individuals. The following items can be applied as examples of the suggestions developed for these solutions (Demirkaya, 2006):

- Every individual in society should receive an education that includes all information about the environment. There should be no distinction between professions in this regard.
- Students should be informed practically from pre-school to higher education. Environmental education should be included in compulsory course legislation.
- Public officials should also be provided with awareness-raising training that can be applied within the scope of service and in daily life.
- The impact of social media on society should be utilized and training should be supported through these platforms.
- Awareness should be created to design and consume environmentally friendly products to reduce harm to the natural environment and to minimize damage in the field of production.
- Learning centers should be established under the name of science corners to convey the necessary information about the environment.
- Participation should be ensured in studies carried out within the scope of UNESCO, UNEP, and European Union research funds.

If it is necessary to evaluate environmental awareness, especially in terms of Turkey, there is a great inadequacy in terms of conscious individuals. Unfortunately, it is not possible to transfer the environment and resources to the next generations if the necessary awareness is not established (Bildik, 2011). Some of the inadequacies of environmental awareness of individuals in Turkey are as follows;

- Not making efforts to reduce waste

- Not being economical and frugal in energy use

- Not using water economically

- No behavior such as preferring products with a deposit in their shopping

Educators are expected to have qualifications according to four levels. Qualities such as learning the ecological level, having awareness at the conceptual level, having the ability to examine and evaluate, and being solution-oriented should be present in the trainers selected to instill environmental awareness (Duru and Bakanay, 2021). In addition, it is also necessary to include environmental education in the programs implemented during the training of educators (Kuhlemeier et al., 1999). To raise environmentally literate individuals, environmental education should be among the main goals of formal education (Keleş and Ertan, 2002). It is observed that basic nature concepts are taught especially by preschool teachers. Therefore, teachers' ethical attitudes towards the environment will also determine the way they transfer their knowledge on this subject to students.

Environmental ethics is a philosophical approach that considers the moral and ethical relationship of humans with the environment. In other words, humans have a moral obligation to protect and care for the non-human world (Mishra, 2016). According to the concept of environmental ethics, the main goal of sustainable development of a society is the establishment of a system of values and normative attitudes that define harmonious relations between man and nature (Nasibulina, 2015). As seen from space, our planet is both valuable and vulnerable as it is the common natural environment of humanity and other living things (Tozdan, 2022). The Earth can be subjected to mistreatment due to the living creatures living on it. In such cases, a global ethic that applies to individuals, organizations, and countries concerned with the environment becomes indispensable (Attfield, 2015). Recently, environmental problems such as global warming, reduction of freshwater resources and water pollution, reduction of green areas, endangered species, destruction of the ozone layer, and destruction of natural areas have become environmental crises. As the world has lost its balance, the importance of environmental ethics has increased as we need to face these problems (Saka and Sürmeli, 2013). People use resources as if they were unlimited, regardless of the cost of their possessions. This leads to wasteful consumption and environmental damage (McGowan ve Buttrick, 2017).

Environmental ethics argues that all beings in the ecosystem have the right to life and that these rights to life should be respected, and therefore human behavior should be at peace with nature. However, the idea of human beings living "by nature" has been around since the earliest periods of humanity. This was first put forward by Socrates, Plato, and Aristotle. Therefore, the origins of environmental ethics date back to Ancient Greek philosophers (Fırat, 2003). However, systematic studies on environmental ethics begin with Aldo Leopold (Çetin, 2009). However, Leopold could not create much awareness of environmental ethics in the 1940s, the period when he first appeared about the philosophy of ecology and environmental ethics. However, after 1970, studies on environmental ethics intensified as environmental destruction came to light. With the increasing importance of the global nature of environmental problems, its validity has increased much more in the 21st century (Ertan, 2015). The last quarter of the twentieth century was a period in which the human-nature conflict intensified, global ecological problems became widespread, and as a result, the social, economic, and cultural crises into which humanity was dragged intensified. Towards the end of this period, environmental rights, environmental awareness, and environmental ethics were discussed seriously for the first time (Atasoy, 2005). The aims of environmental ethics are,

- Establishing norms and principles for the protection of nature to ensure that individuals are happy in their personal and social life
- Protecting the environment, animals, and the ecosystem as a whole (taking measures against all human-induced pollution and degradation in nature to protect the environment, preventing animals from suffering and harm to protect animals, and protecting natural habitats to protect the ecosystem)
- It is stated as a warning to humanity to protect both humans and nature from the harms of technology and expressing that technology can be used for bad purposes (Kılıç; 2008).

Approaches to Environmental Ethics

Environmental philosophers have developed a range of theoretical approaches to help us see our ethical responsibilities towards the environment more clearly (Tozdan, 2022). The aim of environmental ethics in response to environmental problems is not just to convince us that we should be concerned about the environment; it focuses on the moral basis of environmental responsibility and how far this responsibility extends (Enger and Smith, 2010). Some approaches

have come to the forefront to solve environmental problems. As ethical approaches to the environment emerged, criticisms and new approaches were defended as a reaction. This situation has led to an increase in the value given to the environment. Ethical approaches to the environment are generally under three headings: anthropocentric (anthropocentric), biocentric (biocentric), and ecocentric (ecocentric) approaches (Kayaer, 2013). Although each of these approaches supports environmental responsibility, their approaches differ from each other (Enger & Smith, 2010).

Anthropocentric Ethical Approach

From the past to the present, especially starting from the Ancient Greek period, human beings and human relations are considered the focal point of moral values (Duru and Bakanay, 2021). According to this approach, human beings are seen as the most important creatures created on earth and have the chance to use environmental conditions with their own will and desire. In addition, in this approach, Aristotle stated that plants were created for animals and animals were created for humans. Protagoras placed man at the center of the world with the view that man is the measure of everything (Keleş and Ertan, 2002). From the moment this approach was adopted, the human-centered approach became widely accepted over time. After the revolutions in the field of industry and with scientific changes, the control of individuals over the environment has been realized at an optimum level. With this perception, a philosophical view has emerged that the environment has been offered to the use of human beings in parallel with the dominant production-consumption relationship in the world. These philosophical perceptions provided an infrastructure in line with science and kept people at the focal point in their relations with the environment (Ergün, 2014). People who adopt this approach think that nature has instrumental value. According to this approach, nature exists for people and people consume natural resources to meet their own needs (Saka and Sürmeli, 2013). Anthropocentric environmental ethics is explained with four main points;

- Human beings have priority over other living beings.

- Man is intelligent compared to other beings.

- Man uses natural resources for his purposes.

- Only humans can find solutions to the problems that arise in nature.

Only human beings have moral responsibility. Therefore, it is natural for humans to benefit from other living and non-living beings (Dombaycı, 2014).

Biocentric Environmental Ethics

While the anthropocentric approach argues that humans are superior to other living beings, the anthropocentric ethical approach says the opposite (Tozdan, 2022). Biocentric ethics does not accept that humans are superior and privileged over other living things in nature. Therefore, the anthropocentric ethical approach draws attention to living things other than humans, animals, plants, and other living things (Akalın, 2019). The anthropocentric approach asserts that all life has an intrinsic value. Since all life things have life, they all have rights. All living beings have the same or varying degrees of self-awareness, memory, reason, sensitivity, desires and psychological identity (Aydın, 2016). In addition, Taylor (1986) identified four rules with the idea that humans have no special superiority over other living beings. The rule of non-maleficence: It includes not killing organisms and not destroying a species.

- Non-interference rule: The policy of not restricting the freedom of organisms.
- The rule of loyalty: The rule not to abuse the trust that wild animals place in humans, not to deceive or mislead animals, and to be honest with them.
- The rule of compensatory justice: When humans harm an animal or a plant when they violate justice, humans must take on the task of restoring the balance of justice (Cevizci, 2005).

Ecocentric Ethical Approach

Within the scope of the ecocentric approach, aims to eliminate the negative effects of environmental hazards arising from the anthropocentric approach and has been developed in an opposite structure (Duru and Bakanay, 2021). This approach does not consider human beings as the masters of nature but as a part of the earth. The fact that humans can use their minds does not mean that they do not come from a common source like other living things. Therefore, it is not possible to think of human beings as separate from the environment. The environment-centered ethical approach values all the beings in the world as a whole, without distinguishing them as living or non-living. In line with this view, each individual should feel himself/herself as a part of nature and develop a feeling of responsibility for the conservation of nature. In particular, individuals who perceive the importance of all animals and plants whose species are at risk of extinction and who are aware of the protection of environmental conditions

can ensure continuity as a whole (Güneş and Coşkun, 2004). According to Elliot (1997), moral thinking extends to rocks, fossils, mountains, rivers, waterfalls, and hills. In addition, it is seen that the scope of moral value is a basis for strong environmental ethics that includes not only living beings but also all-natural beings (Yücel, 2005). In the animate-centered ethical approach, the value and importance of non-living environmental assets are ignored. The ecocentric approach, on the other hand, tries to explain environmental protection by including all living and non-living beings (Akalın, 2019). Therefore, ecocentric environmental ethics is also called holistic environmental ethics. Earth ethics and deep ecology approaches also fall within the scope of holistic environmental ethics.

Futurist Approach

This approach emphasizes that all resources in the environment are borrowed from future generations (Tozdan, 2022). Therefore, the center of the futurist approach is future generations. This approach includes not only future generations of humans but also all living and non-living beings (Akalın, 2019). Therefore, futurism, which centers on the future, argues that the resources in nature are not ours; they are borrowed from future generations. Accordingly, future generations, who are considered as the owners of the environment, will be as valuable as the environmental conditions they will leave to later generations (Kayaer, 2013). According to the futurist approach, it is the future generation that is prioritized. As the future generation, it emphasizes not only humans but also the future generation of all living and non-living beings (Özer, 2015).

The relationship between renewable energy and environmental ethics is shaped by values such as sustainability, environmental protection, and human rights. Renewable energy stands out as energy types that are less harmful to the environment and use natural resources efficiently compared to fossil fuels. Environmental ethics advocates the understanding that nature should be protected and a healthy environment should be created for humanity. Environmental ethics argues that people should minimize their impact on nature. Renewable energy, obtained from sources such as wind, sun, water, etc., causes less damage to the environment and prevents the depletion of these resources. Thus, in line with environmental ethics, sustainable use of natural resources is ensured. Renewable energy contributes to the fight against climate change by emitting less carbon emissions than fossil fuels. Environmental ethics advocates a fair and equitable distribution of resources, so renewable energy systems are important for building a sustainable society. It is necessary to be sensitive to the environment during

energy production and use. The use of renewable energy can slow global warming and climate change, especially by reducing carbon emissions. Environmental ethics advocates the use of resources without jeopardizing the quality of life of future generations. At this point, renewable energy will enable future generations to live in a healthy environment by taking an environmentally sensitive and ethical approach.

As a result, renewable energy and environmental awareness ethics converge around common values such as nature conservation, sustainable resource use, fair energy distribution, and the rights of future generations. The relationship between these two is critical for ensuring environmental sustainability and ethical energy use.

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CHAPTER 3

Accreditation Practices in Universities: Institutional and Program-Focused Processes

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1. Introduction:

The global landscape of higher education is undergoing profound transformations, driven by advancements in technology, increasing internationalization, and the growing demand for accountability. At the heart of these dynamics lies accreditation—a systematic process that evaluates and certifies the quality of education provided by institutions and their programs. This chapter seeks to explore the critical role accreditation plays in shaping the future of higher education, focusing on its institutional and programmatic applications.

Accreditation is not just an administrative requirement; it is a cornerstone of quality assurance and institutional credibility. As higher education expands to meet the needs of diverse populations, the demand for standards that ensure educational quality and relevance becomes more pressing. Accreditation provides a structured framework for institutions to assess their strengths, identify areas for improvement, and align their practices with both national and international benchmarks.

Moreover, accreditation serves as a bridge between educational institutions and their stakeholders, including students, employers, and policymakers. It offers assurance that graduates are equipped with the competencies and skills necessary for success in the global workforce. In an era where students and employers increasingly seek programs with global recognition, accreditation enhances the competitiveness and attractiveness of institutions on the international stage.

This chapter delves into two primary dimensions of accreditation: institutional and programmatic. Institutional accreditation examines the overarching quality of a university, including its governance, infrastructure, and overall academic environment. In contrast, programmatic accreditation focuses on the quality and relevance of specific academic programs, ensuring they meet professional and industry standards. Together, these approaches provide a holistic view of how accreditation fosters continuous improvement and accountability.

The discussion also addresses the strategic benefits of accreditation, such as fostering a culture of quality, supporting international collaboration, and enhancing institutional transparency. By highlighting best practices and lessons learned, this chapter aims to provide a comprehensive understanding of how accreditation can be a transformative tool in higher education.

As this chapter unfolds, it will become clear that accreditation is more than a regulatory exercise; it is a catalyst for innovation, inclusivity, and excellence. By

embracing the principles of accreditation, higher education institutions can not only enhance their operational effectiveness but also contribute to the societal and economic development of their communities.

In conclusion, this chapter underscores the significance of accreditation as a strategic mechanism to navigate the challenges and opportunities of modern higher education. Through its focus on continuous improvement, transparency, and global competitiveness, accreditation stands as a vital pillar in the quest for educational excellence in the 21st century.

2. Definition and Purpose of Accreditation

- ***Definition and Fundamental Objectives of Accreditation***

Accreditation is a systematic process that evaluates and certifies the compliance of an educational institution or program with predefined quality standards. Typically conducted by an independent organization, this process encourages institutions to aim for excellence in education, research, and community service activities. Accreditation is recognized as an indicator of quality assurance and compliance with standards in both national and international contexts.

"Accreditation is a system that evaluates whether higher education institutions meet national and international quality standards and is seen as the foundation of quality assurance" (Eaton, 2021, p. 45). "Quality assurance involves not only ensuring excellence in education but also providing assurance to students and employers" (Altbach et al., 2009, p. 32).

Eaton (2021) defines accreditation as "a quality assurance mechanism that evaluates and formalizes the compliance of higher education institutions with quality standards." This definition emphasizes that accreditation is not merely a certification process but also a quality control tool focused on continuous improvement.

The primary objectives of accreditation are to ensure the quality of education, promote continuous improvement, and provide assurance to stakeholders. These objectives can be summarized as follows:

- Ensuring Quality Assurance: Accreditation confirms that an institution or program complies with national and international standards, providing confidence to students and other stakeholders (Altbach, Reisberg, & Rumbley, 2009).

- Supporting Continuous Improvement: The accreditation process encourages institutions to conduct self-assessments, addressing deficiencies and continuously enhancing the quality of education.
- Promoting Transparency and Accountability: Accreditation ensures that higher education institutions operate transparently and adhere to the principle of accountability to their stakeholders.
- Enhancing International Recognition and Competitiveness: An accredited program or institution gains wider acceptance internationally, giving graduates a competitive advantage in the global job market (Harvey & Green, 1993).
- Creating Opportunities for Students and Graduates: Accreditation enhances the employability of graduates and facilitates access to national and international labor markets.
- ***Accreditation and Quality Culture***

Accreditation is a process that aligns the education, teaching, research, and administrative processes of higher education institutions with specific national and international standards (Stensaker & Harvey, 2019). This process ensures continuous monitoring and improvement of education quality, creating a more efficient and effective learning environment (Sadler, 2014).

Beyond being an external validation mechanism, accreditation contributes to the establishment of a quality-oriented culture within institutions. This culture is shaped by the participation of all stakeholders, from faculty members to students and administrative staff, and fosters a continuous understanding of learning, innovation, and development (Ehlers, 2013). Through accreditation, institutions review and improve their educational processes continuously, providing students with a higher-quality education. Furthermore, they enhance their international competitiveness by aligning with global standards and adopting a more responsible approach to societal expectations.

In this context, accreditation serves as both a mechanism that enhances internal quality and a tool that reinforces external success (Stensaker & Harvey, 2019).

- ***The Role of Accreditation in Education: A Strategic Tool for Quality and Assurance***

Education is one of the most critical factors that develop individuals' knowledge, skills, and competencies while contributing to societal and economic development. However, a system is needed to evaluate the quality of services provided by educational institutions and to ensure continuous improvement. At this point, accreditation becomes an essential tool in education.

Accreditation is a process that evaluates and certifies the compliance of educational institutions with specific standards. This process not only enhances the quality of education but also promotes transparency, accountability, and a culture of continuous improvement (Middlehurst & Woodhouse, 2019). In modern higher education, accreditation has gained significance as a mechanism that increases institutions' international recognition and competitiveness (Harvey & Williams, 2010).

3. Accreditation in Universities

- ***Importance of Accreditation in Universities***

Accreditation serves as a quality assurance mechanism that ensures higher education institutions achieve specific standards in their educational, research, and community service functions. The importance of accreditation in universities goes beyond guaranteeing quality; it supports institutional development, enhances national and international competitiveness, and promotes accountability to society (Eaton, 2012).

Quality Assurance and Continuity : Accreditation guarantees that educational programs meet specific quality standards. This process ensures that students receive high-quality education, supporting their professional and personal development. Quality assurance enables universities to adopt a continuous improvement cycle in their teaching, learning, and research activities (Stensaker & Harvey, 2011).

National and International Competitiveness: Accreditation plays a critical role in boosting the competitiveness of universities at both national and international levels. International accreditation, in particular, enhances the global recognition of graduates and facilitates participation in student and academic staff exchange programs (Altbach, Reisberg, & Rumbley, 2009). This strengthens the position of higher education institutions within the global education system.

Accountability and Transparency: Accreditation ensures that universities operate in line with the principle of accountability to the public and other stakeholders. The process enhances transparency in institutional activities and fosters trust within the community. Accountability is especially crucial for the effective use of public resources and meeting stakeholder expectations (Brennan & Shah, 2011).

*Benefits for Students and Graduate*s: Accredited programs provide students with a high-quality educational experience. As a result, graduates gain a stronger position in the labor market. Furthermore, an internationally recognized diploma enables graduates to achieve a competitive edge in the global workforce (Martin & Stella, 2007).

Promotion of a Quality Culture: Accreditation encourages the development of a quality culture within universities. The process not only ensures compliance with specific standards but also aims at continuous improvement. This culture helps academic staff and administrative units embrace quality as a core principle (Harvey & Williams, 2010).

*Societal and Economic Contributions:*Accreditation enhances the societal and economic contributions of universities. Qualified graduates contribute innovative solutions to the labor market, adding value to society. Moreover, the assurance provided by the accreditation process increases public trust in universities and facilitates stronger collaborations with the business world (OECD, 2012).

4. Accreditation Process in Universities

The accreditation process consists of a series of steps that evaluate and confirm whether higher education institutions or academic programs meet specific quality standards. This process involves internal assessments by institutions, external evaluations by an accreditation body, and finally, decisions regarding accreditation (Berdrow, 2020). The process typically includes the following steps:

- ***Application and Preparation***

The accreditation process begins when a higher education institution or academic program applies for accreditation. During this stage, the institution gathers the necessary documents and information for the application (Pappas, 2021). The application process includes:

- Internal Assessment: The institution conducts an internal assessment to prepare for accreditation. This involves analyzing its current status, objectives, and shortcomings (Zawacki-Richter et al., 2020).
- Reviewing Accreditation Requirements: The institution carefully examines the standards and requirements set by the chosen accreditation body (Harvey & Green, 2021).

- ***Self-Assessment***

An essential step in the accreditation process is the institution's internal review of its educational, managerial, research, and infrastructural practices (Bers et al., 2020). During this stage, the institution evaluates:

- The content of its educational programs, teaching methods, learning outcomes, and student achievements (Frenay, 2020).
- The support, advisory services, and career development opportunities provided to students.
- Internal management processes, resource management, and decision-making mechanisms.

The self-assessment process helps the institution identify its strengths and weaknesses, enabling it to take action to address gaps (Wilkins & Huisman, 2022).

- ***External Evaluation and Site Visit***

Following the self-assessment, external evaluators appointed by the accreditation body conduct an in-depth review of the program or institution seeking accreditation (Gravestock, 2022). External evaluation includes:

- Evaluators examine the institution's physical infrastructure, educational materials, course content, and teaching methods on-site (Kehm & Teichler, 2021).
- Interviews are conducted with students, faculty, and administrative staff. These discussions provide insights into the effectiveness of the institution's quality assurance mechanisms (Bers, 2020).

- ***Report Preparation and Submission of Evaluation Results***

Based on on-site reviews and collected data, the external evaluation team prepares a report (Pappas, 2021). After completing the report, the institution’s

accreditation application and evaluation results are submitted to the accreditation body.

The report contains recommendations and evaluations regarding the accreditation process. The conclusions in the report typically take the form of full approval, conditional approval, or denial (Frenay, 2020).

- ***Decision-Making and Granting Accreditation***

The accreditation body makes a decision based on the evaluation report and the institution's improvement plan (Wilkins & Huisman, 2022). The decision may include:

- Full accreditation if the institution or program successfully meets all criteria (Bers et al., 2020).
- Conditional accreditation if some criteria are not fully met.
- Denial of accreditation if the required standards are not met (Kehm & Teichler, 2021).

- ***Monitoring and Continuous Evaluation***

After accreditation is granted, institutions are monitored periodically and continually evaluated to ensure they maintain quality and adhere to accreditation requirements (Gravestock, 2022). Monitoring may involve periodic re-evaluations or reporting.

- ***Reaccreditation***

Accreditation is typically granted for a specific period (usually 3-10 years). At the end of this period, institutions must reapply for accreditation (Harvey & Green, 2021). The reaccreditation process may differ from the initial application but usually follows the same steps.

5. Institutional and Program Accreditation

The accreditation process evaluates and certifies the compliance of higher education institutions with specific quality standards. This process typically begins with institutions or programs applying for accreditation. The preparation phase includes evaluations at both institutional and program levels. Below are the detailed steps involved in preparing for institutional and program accreditation.

- ***Institutional Accreditation***

Institutional accreditation assesses the compliance of an institution's educational, teaching, research, administrative, and infrastructure services with quality standards. The preparation process for institutional accreditation includes the following stages:

Internal Evaluation and Analysis

The first step in the institutional accreditation process is the institution's self-assessment. During this phase, the current state, strengths, weaknesses, educational processes, research activities, and administrative practices of the institution are analyzed. Internal evaluation typically covers the following areas (Pappas, 2021):

- Quality of educational programs, teaching methods, learning outcomes.
- Competence of academic and administrative staff, organizational structure, decision-making processes.
- Educational tools, digitalization, student support services.
- Alignment of the institution's mission, vision, and strategic goals with its operations.

Review of Accreditation Standards

The institution thoroughly examines the quality standards set by the accreditation body or agency it applies to and prepares accordingly (Harvey & Green, 2021). This step identifies the criteria for evaluation and enables the institution to create improvement plans for any deficiencies.

Data Collection and Reporting

The institution gathers the necessary data for the accreditation process. This includes areas such as student achievements, teaching evaluations, financial data, and student satisfaction. Using this data, the institution prepares a report to evaluate its academic and administrative processes (Gravestock, 2022).

Communication with Internal Stakeholders

The institution involves all internal stakeholders in the accreditation process. Meetings with faculty, administrative staff, students, and alumni are an essential part of the preparation phase. Their feedback helps identify shortcomings and areas for improvement (Zawacki-Richter et al., 2020).

Process Improvement and Preventive Measures

Based on findings from internal evaluations and data collection, the institution develops action plans to address deficiencies. These improvements may involve enhancing educational programs, upgrading infrastructure, or increasing student support services (Bers et al., 2020).

- **Program Accreditation**
  Preparation Process

Program accreditation assesses the compliance of a specific academic program with the quality standards set by the accreditation agency. The preparation process for program accreditation involves the following steps:

Assessment of the Current State of the Program

The first step in program accreditation is evaluating the current state of the academic program. This evaluation covers the curriculum, teaching methods, faculty qualifications, student achievements, and graduates' positions in the workforce (Frenay, 2020). This stage involves examining:

- The program's objectives, curriculum content, and expected learning outcomes for students.
- The delivery of courses, teaching methods, and effectiveness of technology and materials.

Evaluation of Program Compliance with Accreditation Standards

The program assesses its compliance with the quality standards established by the accreditation agency it applies to (Harvey & Green, 2021). This step reviews the program's educational quality and the adequacy of student support services.

Collection of Feedback from Students and Alumni

The opinions of students and alumni are crucial in program accreditation. Student satisfaction surveys and alumni feedback help determine the program's educational quality and the employability of graduates (Bers, 2020). These inputs highlight deficiencies and areas needing improvement.

Performance and Evaluation Systems

The program must have suitable evaluation methods to measure student performance and success. These methods assess both the effectiveness of

teaching and the accuracy of the skills students are expected to acquire (Gravestock, 2022).

Consultations and Reviews with External Evaluators

The program accreditation process concludes with an external review. During this phase, experts from the accreditation agency visit the program to assess its quality. Evaluators conduct interviews with faculty, students, and alumni to examine all aspects of the program (Pappas, 2021).

Implementation of Improvement Plans

Based on the findings and reports from external evaluators, the program develops improvement plans. These plans may include updating the curriculum, revising teaching methods, or enhancing student support services (Bers et al., 2020).

- ***Preparing a Self-Study Report***

A Self-Study Report (SSR) is a critical document used by institutions or academic programs during the accreditation process to evaluate their compliance with quality standards and identify areas for improvement. This report typically includes internal assessments, analysis of the current situation, and plans for future enhancements. The SSR is central to the accreditation process and provides accurate, detailed, and reliable data to support this endeavor (Pappas, 2021).

Introduction Section of the Report

The introduction provides a general overview of the institution or program and may include the following:

- Mission and Vision of the Institution: General objectives and long-term strategic plans of the institution.
- Historical Background and Structure of the Institution: Information about the year of establishment, organizational structure, and areas of operation.
- Purpose of Accreditation: Explanation of why the report is being prepared, application for accreditation, and the importance of the process.

This section should clearly state the mission and vision of the institution, emphasize its general goals, and highlight the significance of the accreditation process (Harvey & Green, 2021).

Institutional Performance and Internal Assessment

This section details the general performance of the institution and program, as well as the internal evaluation process. The institution assesses the following areas:

- Quality of Education: Program content, teaching methods, and student achievements.
- Research and Publications: Quality of academic research and the impact of research outputs.
- Student Support and Services: Services supporting students' academic and personal development (e.g., counseling, career planning, psychological support).
- Management and Administrative Structure: Organizational structure, management processes, and decision-making mechanisms.

Using data and examples, this assessment should clearly demonstrate how programs operate and the challenges they face (Zawacki-Richter et al., 2020).

Evaluation Criteria and Standards

The institution explains how it evaluates its performance based on the criteria and standards set by the accreditation agency. This section includes the following steps:

- Review of Standards: Analysis of the quality standards determined by the accreditation agency and the internal evaluation related to these standards.
- Compliance with Criteria: Explanation of how the institution and program meet the specified standards.
- Deficiencies and Challenges: Assessment of any deficiencies, challenges, or areas needing improvement.

Harvey and Green (2021) emphasize that this process must be conducted in a detailed and objective manner.

Data and Evidence

The SSR should be supported by data that provide concrete evidence of the academic and administrative operations of the institution or program. Examples of such data include:

- Student Performance and Achievements: Academic performance data showing students' success levels.
- Student Satisfaction Surveys: Feedback from students and survey results.
- Graduation Rates: Graduation and employment rates of alumni.
- Faculty and Staff: Qualifications of academic staff and their education and experience levels.
- Financial Data: Financial status of the institution, resource utilization, and budget management.

These data enhance the credibility of the report and accurately reflect the overall performance of the institution (Bers, 2020).

Improvement and Future Plans

This section outlines plans for improving the current state of the institution or program. Key components of this section include:

- Areas for Improvement: Identification of deficiencies and weaknesses in the institution or program.
- Action Plans: Steps to address these deficiencies and ensure future development.
- Timeline and Resources: A timeline for implementing the improvement steps and the resources required.

This section is critical because continuous improvement is essential for the success of the accreditation process (Gravestock, 2022).

Conclusion and Evaluation

The Self-Assessment Report concludes with an overall evaluation and conclusion section. In this part, the institution or program provides a summary of the process and makes an assessment on whether the accreditation process has been successful or not. This conclusion will serve as a guide for future development and strategic plans (Wilkins & Huisman, 2022).

- ***External Audit (Site Visit) and Evaluation Process***

External audit (site visit) is a critical stage in the accreditation process for universities or programs. This phase involves the on-site evaluation of the institution's or program's compliance with the standards set by the accreditation agency. The external audit aims to test the accuracy and applicability of the self-assessment report and plays a determining role in the accreditation decision made by the accreditation agency.

External audit is one of the most crucial steps in the accreditation process. It provides the opportunity to directly observe the education, research, management, and support services provided by the institution or program. These observations are verified against the information presented in the self-assessment report, showing how well the institution adheres to quality standards. The purpose of the external audit is to evaluate the accuracy of the institution's internal processes, gather feedback from students and staff, observe the effectiveness of teaching processes, and review the operation of quality assurance systems (Sursock, 2015).

Steps of the External Audit Process:

Pre-Preparation and Planning: The external audit process typically follows a timeline and plan established by the accreditation agency. Before the audit begins, the institution sets the dates for the auditors' visit and collects all necessary data to prepare for their report. This phase includes:

- Formation of the Audit Team: The accreditation agency assigns an audit team for the evaluation of the institution. The team usually consists of external experts, academics, and professionals with experience in the relevant field.
- Visit Dates and Program: The audit team contacts the institution to determine the dates of the visit and creates a program for how the audit will be conducted.
- Provision of Preparation Information: The institution provides all required documents and information to the audit team (academic programs, student performance data, faculty resumes, financial reports, etc.) (Bresciani, 2017).

On-Site Evaluation (Site Visit):

The on-site evaluation is the most intensive stage of the external audit. The audit team visits the institution's campus and conducts observations in various areas. This stage includes:

- Examination of Internal Audits and Management Processes: A range of areas, such as educational programs, teaching methods, management structures, student services, and support services, are examined on-site.
- Interviews: The auditors conduct face-to-face interviews with faculty members, students, administrative staff, and managers. These interviews provide feedback on the institution's quality assurance practices, the effectiveness of educational processes, and student satisfaction.
- Observations: Observing classrooms, laboratories, libraries, student lounges, and other physical facilities is critical for assessing the effectiveness of teaching processes and the student experience (Huisman, 2019).

Reporting and Evaluation:

After the external audit, the audit team prepares a report based on the data and observations collected during the visit. This report typically includes:

- Observations and Findings: The audit team presents its findings based on the on-site observations and interviews. These include the institution's strengths, weaknesses, areas that need improvement, and existing deficiencies.
- Recommendations: The audit team provides suggestions for how the institution can make improvements in specific areas.
- Conclusions and Evaluation: The accreditation agency reviews the external audit report along with the institution's self-assessment report and makes a final decision. This decision is the final judgment on whether the institution will receive accreditation (Kuh & Ikenberry, 2017).

Post-Audit Monitoring and Improvement Process:

After the external audit process is completed, the institution begins working on the identified areas for improvement. The accreditation agency monitors how

the institution implements the action plans it has set. This monitoring process usually occurs at regular intervals, assessing how successful the improvement processes are. If necessary improvements are not made, the accreditation process may be revisited (Schroeder & Jankowski, 2017).

The external audit is a critical stage in the accreditation process for universities and programs. On-site observations and evaluations provide an important opportunity to test the institution's adherence to the quality standards set by the accreditation agency and identify areas for improvement. This process lays the foundation for continuous development and supports efforts to enhance academic quality.

6. Accreditation Decision and Post-Process Improvement

The accreditation process is a critical tool for determining the compliance of universities and programs with quality standards. This process highlights the strengths of institutions and areas that need improvement. After the accreditation decision, institutions focus on the identified areas for improvement, working towards continuous development. The accreditation decision should be viewed not only as a temporary approval but also as an opportunity to promote continuous development.

The accreditation process concludes with a final decision made by the accreditation agency after reviewing the external audit (site visit) and self-evaluation reports. This decision determines whether the university or program is approved for accreditation. The accreditation agency's decision may be:

- Full Accreditation: If the institution or program fully meets the accreditation standards, it receives full accreditation. In this case, the accreditation is valid for a specific period (usually 5-10 years).
- Conditional Accreditation: If the institution or program meets certain standards but needs improvement in specific areas, it may receive conditional accreditation. In this case, the institution is expected to address these deficiencies within a specific period.
- No Accreditation: If the institution or program does not meet the required standards, accreditation may not be granted. In this case, the institution may need to address the identified deficiencies and reapply for accreditation (Bresciani, 2017).

Post-Process Improvement and Monitoring

After the accreditation decision, institutions must address the deficiencies and areas for improvement identified during the accreditation process. This

improvement process is critical for ensuring the continuity of quality assurance systems and supporting institutional development. The improvement and monitoring process may include the following steps:

Development of Improvement Plans

After the accreditation process, institutions develop an improvement plan to address the deficiencies highlighted in the accreditation agency's report. This plan consists of strategic objectives and action steps aimed at improving the institution's current situation. Improvement plans generally include:

- Specific Goals: Concrete goals are set for the areas in which the institution needs to develop.
- Timeline: The necessary time to achieve the goals is specified.
- Resources and Support: Resources (human resources, financial support, infrastructure support, etc.) required for the improvement process are allocated.
- Evaluation and Monitoring: Tools and methods are used to monitor and measure the success of the improvement process (Sursock, 2015).

Monitoring and Reporting

After initiating the improvement process, institutions regularly monitor it and report progress. This monitoring process can be done periodically as defined by the accreditation agency. Institutions set up monitoring mechanisms to evaluate the effectiveness and success of the improvements. Each stage of the improvement process is reported to the accreditation agency, and the agency evaluates whether the institution has implemented the necessary improvements. This process typically occurs in the following stages:

– Annual Reports: Institutions report the progress of their improvement plans to the accreditation agency at regular intervals (usually annually).

– Interim Reports: If conditional accreditation has been granted, institutions may be required to submit interim reports on addressing the identified deficiencies.

– Final Evaluation: After the improvement process is completed, the institution may undergo another review to assess the sufficiency of the changes made (Bresciani & Pimentel, 2019).

Continuous Development and Quality Assurance

The accreditation process and the subsequent improvement process are not just about addressing deficiencies. They also provide an opportunity for the institution's quality assurance systems to evolve continuously. Continuous development involves:

- Enhancing Educational Quality: Efforts to update educational programs, improve teaching methods, and enhance the student experience.
- Internal Auditing and Evaluation: Institutions strengthen their internal quality assurance systems, improve processes, and continuously conduct evaluations.
- Collaboration with External Stakeholders: Institutions work with industry experts, sector professionals, and international educational organizations to develop strategies for improving educational quality (Schroeder & Jankowski, 2017).

Reevaluation and Renewal of Accreditation

After the accreditation process ends, the institution may need to reapply for accreditation after a certain period. The re-accreditation process, usually conducted every few years, is repeated to assess the institution's compliance with accreditation standards. This process provides an important opportunity to review the improvements and developments made since the previous accreditation decision. Reevaluation serves as a critical mechanism for the institution's continuous development (Huisman, 2019).

Conclusion

The accreditation decision determines whether a university or program meets quality standards. However, the accreditation process is not just a confirmation procedure; it offers an opportunity for continuous development. Developing improvement plans, regular monitoring and evaluation, building a culture of continuous development, and the re-accreditation process are steps taken by institutions to improve quality.

7. Conclusion

Accreditation in higher education is not merely an evaluation and certification process but also a strategic tool for fostering the continuous development of

institutions. Throughout this book, the institutional and programmatic dimensions of accreditation have been explored, focusing on its core components such as quality assurance, international recognition, accountability, and continuous improvement. Together, these elements illuminate the central role of accreditation in shaping the future of higher education and the opportunities it offers.

Contributions of Accreditation to Higher Education

Accreditation processes in higher education not only ensure compliance with quality standards but also enhance the national and international competitiveness of institutions. In an increasingly globalized world, international accreditations provide graduates with employability opportunities not only in local markets but also on a global scale. Additionally, international recognition facilitates student and academic staff exchanges, fostering global collaborations.

However, accreditation processes should not be seen solely as external validation mechanisms. Accreditation helps establish a **quality culture** within institutions. This culture involves all stakeholders, from faculty and students to administrative staff and management, creating an environment where educational programs are continuously reviewed, teaching methods improved, and infrastructure strengthened. These efforts result in more efficient and effective learning environments.

Accountability and Transparency

In modern societies, one of the most critical expectations from higher education institutions is transparency and accountability. Accreditation processes enable institutions to regularly assess their activities, identify strengths and weaknesses, and address areas for improvement. This transparency builds public trust and confidence among stakeholders while ensuring the efficient use of public resources and aligning with societal expectations.

National and International Collaborations

Accreditation serves as a cornerstone not only for individual institutions but also for national and international higher education systems. At the national level, setting standards and ensuring adherence strengthens educational systems. Internationally, accreditation facilitates knowledge and student exchange among countries, fostering harmony and cohesion in higher education. These processes promote educational equity and encourage intercultural dialogue.

Continuous Improvement and Innovation

One of the most significant contributions of accreditation is its encouragement of a mindset centered on continuous improvement. Updating educational programs, leveraging digital transformation tools, and enhancing teaching methods with innovative approaches contribute not only to student success but also to the overall well-being of society. Technologies such as artificial intelligence and big data integration further optimize accreditation processes, enabling institutions to align with global standards more effectively.

Challenges and Future Perspectives

Despite its many advantages, accreditation processes can pose challenges, particularly due to their complexity and intensity. Developing countries' higher education institutions often face limited resources and infrastructure, making it difficult to meet accreditation requirements. In such cases, international collaborations and support mechanisms become crucial in facilitating their participation in accreditation processes.

Looking ahead, accreditation processes are expected to become more digital, accessible, and flexible. The proliferation of online education programs will necessitate the development of new evaluation methods and the adaptation of accreditation criteria to this emerging reality.

Final Thoughts

This chapter has examined various aspects of accreditation in higher education, emphasizing its importance in enhancing educational quality, promoting transparency, and fostering continuous development. Accreditation is not only a tool for quality evaluation but also a strategic element that secures institutions' positions in the international arena. These processes encourage innovative approaches in higher education, equipping individuals, institutions, and societies to shape the future.

In conclusion, accreditation is both an opportunity and a responsibility for higher education institutions seeking to adapt to the dynamics of the 21st century. Institutions that embrace these processes will not only provide higher-quality education but also take critical steps toward building a stronger and more sustainable future.

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CHAPTER 4

Grammar-Lexis Debate in English Language Teaching

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Introduction

Although different approaches have been used in English language teaching (ELT) over the years, the perception that grammar is the essence of language learning has largely remained unchanged. Research studies have revealed that traditional ways of teaching grammar have been challenged by text linguists and by researchers who have conducted corpus studies in the field of ELT. Specifically, research on corpus linguistics and educational developments has reshaped our understanding of grammar and vocabulary as interconnected rather than separate domains (Sinclair, 2000). As a result, the last decades have witnessed educators' arguments which claimed that "without grammar very little can be conveyed" as well as arguments which asserted that "without vocabulary nothing can be conveyed" (Lewis, 1993, p. 115).

These discussions have led to the never ending 'grammar' or 'lexis' debate in language teaching with Krashen's supporters arguing for the need to acquire language structures and Lewis' supporters arguing for the acquisition of lexical chunks (Scheffler, 2015). This chapter explores these two opposing views by providing a historical review of developments in ELT and discusses the influence of these developments on English language teaching-learning practices. Also, sharing different views on the 'grammar over lexis?' or 'lexis over grammar?' dilemma, this chapter highlights that a balanced focus on grammar and lexis through the use of the lexico-grammatical approach is essential for enhancing teaching and learning practices in English language classrooms.

Early days in the history of ELT

Grammar, which originated from the ancient Greek word 'Grammatike', was once considered synonymous with learning classical languages of Latin or Greek (Burton, 2020). As accuracy was held important in those days, English language teachers were required to teach rules that enabled their students to use the language correctly. In the 1990s, English language educators began focusing "on describing language as it is used, rather than prescribing how it should be used" (Nunan, 1999, p. 97). Thus, there was a shift from prescriptive grammar to descriptive grammar (Burton, 2020).

Prescriptive grammar became popular when grammar translation method was widely used. At the time, grammar was taught deductively following a rule-based curriculum with minimal attention given to the application of theory-driven insights on grammatical meaning in English lessons (Marsden & Slabakova, 2019). Similarly, in the audio-lingual approach grammatical structures were very

carefully sequenced from basic to more complex and "mimicry of forms and memorization of certain sentence patterns were used extensively" (Celce-Murcia, 1991, p. 460).

In the early days, linguists were only concerned with formal relations and they overlooked the meaning or the function. However, this view was later challenged by text linguists who claimed that confining language in only form meant limiting the scope of linguistics since factors like the context, the mind, or achieving meaning are equally important in learning English as a second language (ESL) or as a foreign language (EFL) (Marsden & Slabakova, 2019). Text linguists explained that when English language users receive a message, they pay attention to not only the linguistic structures but also facial and gestural expressions of the interlocutors (Cook, 1992). For example, when we are talking to people, we pay attention to what they are doing with their faces, eyes, body and so forth. They also noted that the setting plays an important role in sending or receiving messages in communication as it determines language users' cultural and social relationship with the person they are communicating with. Cook (1992) highligted the significance of these factors in language education in the following way:

> These factors take us beyond the study of language, in a narrow sense, and force us to look at other areas of inquiry-the mind, the body, society, the physical world- in fact, at everything. There are good arguments for limiting a field of study to make it manageable; but it is also true to say that the answer to the question of what gives discourse its unity may be impossible to give without considering the world at large: the *context.* (Cook, 1992, p. 10)

This explanation marked a turning point in ELT as it clarified that grammar is more than the explanation of certain rules. With this explanation ESL and EFL teachers understood that teaching grammar involves skills like recognizing the examples of the structure when spoken, identifying a structure in written form, understanding its meaning in context, producing both the spoken and written form of a structure as well as producing meaningful sentences with that structure. In light of these developments, they also realized that "communication is the goal of second or foreign language instruction and that the syllabus of a language course should not be organized around grammar but around subject matter, tasks/projects, or semantic notions and/or pragmatic functions" (Celce-Murcia, 1991, p. 461). Consequently, perceiving language "as a system that is used to communicate rather than an abstract entity that exists independently from human

experience" (Matsumoto, 2021, p. 116), led ESL/EFL teachers to revise their traditional ELT practices, which had emphasized the theoretical aspects of language while disregarding the practical aspects of its use for communicative purposes.

In response to these changing perspectives, research has sought to investigate the specific mechanisms through which language input contributes to acquisition. For instrance, studies examining whether and how input affects second language acquisition and how it affects it, have revealed different views on the effects of input in second/foreign language acquisition. For instance, Krashen asserted that language acquisition takes place when input contains forms and structures that are just beyond the learner's current level of language competence (Ellis, 1997). However, researchers have cautioned that acquisition may not occur unless input is processed by the learner's internal mechanisms. In other words, they emphasized that for language learning to take place input must become intake. To explain the difference between input and intake, Ellis (1985) stated: "Input is the L2 data which the learner hears; intake is that portion of the L2 which is assimilated and fed into the inter-language system" (p.159).

Although researchers called attention to the need for further research to understand the cognitive processes that the learners go through when they are exposed to input, many theorists highlighted the importance of comprehensible input. For example, Micheal Long stated that comprehensible input is "most effective when it is modified through the negotiation of meaning" (Long, 1996, p. 451). Another theorist who focused on the importance of input is Evelyn Hatch. According to Hatch (1992), syntactic structures can be derived from the process of building discourse, and one way this may occur is through scaffolding as "learners use the discourse to help them produce utterances that they would not be able to produce on their own" (p. 170). Likewise, Vygotsky noted that "development manifests itself first in social interaction and only later inside the learner" (Ellis, 1997, pp. 47-49). As these theorists have highlighted, input plays a very significant role in second language acquisition but output is equally important in fostering language learning as explained below:

> It is important to recognize that the output Hypothesis in no way negates the importance of input and input comprehension. The intention is to complement and reinforce, rather than replace, input-based approaches to language acquisition so that learners will go beyond what is minimally required for overall comprehension of a message. (Izumi & Bigelow, 2000, p. 244)

The above explanation clarifies that output cannot replace input but should instead complement it. As underlined in research, output facilitates implicit knowledge by making learners aware of linguistic features in the input that they might otherwise ignore. Accordingly, scholars suggest providing opportunities for language learners to test out their hypotheses while learning the target language because when language learners have the opportunity to use the language for communication, they can integrate the structures they have learnt into a creative system for expressing meaning (Borg, 1999; Ellis, Baştürkmen & Loewen, 2001; Hughes & McCarthy, 1998; Nobuyoshi & Ellis, 1993). In addition, conscious and sub-conscious learning "are activated when learners are involved in communication with the second language" (Littlewood, 1984, p. 91) because in communicative activities learners focus not only on the language itself but also the communication of meanings. Therefore, course designers and language teachers need to consider integrating communicative tasks into the syllabus as well as assessment procedures. In this way, students can be encouraged to use the language productively and through tests a wash back effect on teaching can be created. This experience may also have a positive effect on students' overall language learning process as participation in communicative activities provide learners the opportunity to bring real language use to the fore instead of exams which are emphasized unnecessarily in centralized education systems.

Shift of focus from grammar to lexis in ELT

Although language educators have been occupied with the development of grammatical and communicative competence for a long time, English language teachers and learners have continued to face difficulties in teaching-learning processes. These difficulties have led ELT professionals to question their own practices prompting them to ask the following question: Does learning a language mean learning its grammar?

When examining the natural language acquisition process, it becomes evident that children first learn to speak in isolated words first before progressing to the production of language in the form of noun and verb chains. This is similar while learning English as a second language or a foreign language (EFL) since ESL/EFL students tend to pick up vocabulary first and then develop more complex sentences. Although vocabulary is considered an essential part of the language learning process, a historical overview of language teaching reveals that teaching of vocabulary has not been a central concern in English language teaching for many years. Lewis (1993) highligted this issue by quoting from

Summers: “There have been changing trends-from grammar translation to direct method to the communicative approach- but none of these has emphasized the importance of the learner’s lexical competence over structural grammatical competence” (p. 115).

Likewise, in many ESL/EFL contexts, grammar has been regarded as the essence of language learning, while vocabulary instruction has received little attention. According to Widdowson, focusing solely on grammar and neglecting vocabulary teaching undermines its significance in the learning process because “lexis is where we need to start from, the syntax needs to be put to the service of words and not the other way round.” (Lewis, 1993, p. 115). Given that English consists of several hundred thousand words and knowing a word requires multiple skills, such as understanding a word when it is written or spoken, recalling it when needed, using it with the correct meaning, using it in a grammatically correct way, pronouncing it correctly, knowing which other words you can use it with, spelling it correctly, using it in the right situation and knowing if it has positive or negative associations, many ESL/EFL teachers have questioned how learners and instructors should handle approach learning or teaching of the infinite English lexicon.

A review of vocabulary teaching practices in ELT indicates that the attitudes of second/foreign language teachers and learners towards vocabulary have evolved with the advent of every new approach in ELT methodology. As different skills have been prioritized with each emerging approach, English language education has witnessed the swing of the pendulum in many ESL/EFL teaching contexts. A review of methods used in language teaching demonstrates that vocabulary has played varying roles throughout the history of English language education.

Grammar-Translation Approach

The primary focus of this approach was on teaching grammatical rules. Students had to do lengthy translation exercises using word lists or dictionaries, so the main emphasis in this approach was on recognizing written words or producing written translations (Palmberg, 1986; Larsen-Freeman & Anderson, 2011).

Reading Approach

The primary aim in this approach was intensive-extensive reading skills, so it can be stated that this approach assigned a central role to the teaching of vocabulary (Palmberg, 1986; Larsen-Freeman & Anderson, 2011).

Direct Method

Since the Direct method did not involve native language use, translation exercises were not inclused in this method. Hence, learners were expected to learn vocabulary in context as an integral part of each lesson (Palmberg, 1986; Larsen-Freeman & Anderson, 2011).

Audio-lingual Method

In the Audio-lingual method, vocabulary teaching was kept to the minimum to enable learners to develop a firm control of the basic structural patterns and concentrate on pronunciation (Palmberg, 1986; Larsen-Freeman & Anderson, 2011).

Cognitive Approach

In this approach, vocabulary was emphasized only after teaching grammatical rules, sounds, structures. However, it is possible to say that there was a renewed interest in vocabulary, especially in the expansion of passive vocabulary for reading in the Cognitive approach (Palmberg, 1986; Larsen-Freeman & Anderson, 2011).

Communicative Approaches

Since communicative approaches considered communication important, they incorporated vocabulary activities language teaching in order to provide learners the opportunity to interact with each other (Palmberg, 1986; Larsen-Freeman & Anderson, 2011).

Eclectic Method

Although the Eclectic Method has remained popular amongst many ESL/EFL teachers (Larsen-Freeman & Anderson, 2011), it has not explicitly defined how vocabulary should be taught. Since it involves blending different principles and techniques from multiple approaches, careful consideration is required in its use to avoid the application of conflicting materials and methodologies from different approaches.

Overall, a review of teaching methods and approaches used in English language teaching over the years reveals that the following question has not been properly addressed in the literature: How can vocabulary teaching be realized in a successful way so that students do not drown in the so-called lexicon chaos?

Language educators seeking answers to this question may benefit from the explanations made by prominent scholars such as Lewis (1997) who has suggested full integration of lexis "into the learners' linguistic resources so that it is spontaneously available when needed" (p. 117) or Nation (2002) who has underlined that vocabulary teaching "deserves to be planned for, deliberately controlled and monitored" (p. 267). Significantly, research studies indicated that perceptions and practices regarding vocabulary teaching have changed greatly with computer-aided research as it has disclosed how language is used in real life, how learners process and store vocabulary and which strategies can be used for vocabulary teaching and learning (Ooi & Kim-Seoh, 1996). Because of these studies, language teachers and applied linguists have better understood the role of vocabulary in learning English as a second or foreign languag.

Vocabulary teaching in ESL/EFL contexts

Researchers have reported that an average educated native speaker of English knows around 20,000 word families (Nation & Waring, 1997). This is an incredibly huge number for foreign language learners especially for those living in an EFL context. Since there are so many words to learn but neither sufficient time nor the necessary conditions for foreign language learners to learn such a high number of English words, language educators need to determine the most useful words that their students should learn. Frequency studies can be a great help in this respect. Researchers report that the most frequent 2000 words in English are the most useful because knowing these enable learners to understand about eighty per cent of spoken or written discourse (Browne, Culligan, & Phillips, 2013; Nation & Waring, 1997).

Several wordlists were published for the most frequently used words. However, the most well known one was the "General Service List" by West, also known as "West List". GSL was published in 1953 and it is the result of almost three decades of major work in English lexicometrics. Carter and McCarthy (1997) report that "The list consists of 2,000 words with semantic and frequency information drawn from a corpus of two to five million words" (p. 7). They claim that when students know these words, they can understand about eighty per cent of the words in a text. According to researchers, understanding the majority of words in a text is significant because language learners' comprehension has a

positive impact on their motivation since they can see that the words they have learnt have an almost instant return in their learning processes.

As it was not logical to expect ESL/ EFL learners to discover all common words in English in a random or natural way, the use of GSL became popular particularly in many ESL/EFL contexts. Research results related to the use of GSL in learning English are also quite positive. For example, finding out that GSL meets the needs of ESL/ EFL learners in a lot of situations, Harlech-Jones (1983) underlined that it is a vital resource that should be used by not only syllabus and material designers but also English language teachers. Similarly, Nation (2001) proposed that these high frequency words are integrated into direct or spontaneous learning experiences and vocabulary learning activities in language classes.

Over the years, a lot of discussions have been held to find out whether explicit or incidental exposure to vocabulary has led to more effective learning. Today, the tendency is towards the use of a more balanced approach that acknowledges the role of explicit instruction together with the creation of opportunities for incidental vocabulary learning (Scheffler, 2015). Obviously, it is not logical to expect English language teachers to create and use their own lexical approach in their teaching practices. It is also quite evident that it is not possible to "leave lexis to take care of itself in this random fashion and assume that students would acquire the vocabulary which best suits their needs" as noted in the literature (Gairns & Redman, 1991, p.1). Therefore, explicit vocabulary instruction seems to be an essential process in language learning for all learners of English but especially for beginner learners since their insufficient vocabulary knowledge affects their reading ability negatively (Hunt & Beglar, 2002).

According to Hunt and Beglar (2002), language learners at the beginner level should be supported with the study of the 3,000 most frequent words until they start recognizing the form and meaning of these frequently used words automatically. Likewise, Decarrico (2001) stated that explicit instruction and practice opportunities should be provided to learners because the most frequent words constitute a very high percentage of words in a text and knowing these words helps language learners to guess the meaning of new words from the given context.

In addition, DeCarrico (2001) stated that the 2000 to 3000 word-base is "a minimum threshold that enables incidental learning to take place when reading texts" (p. 289). In light of research findings related to explicit vocabulary instruction, Sökmen (1997) recommended integrating the teaching of new and

old words, providing opportunities for a number of encounters with a new word, promoting deep level processing and employ a variety of techniques as well as emphasizing independent learning strategies to promote vocabulary learning.

There are many research studies which have revealed that being able to translate target language into the native language does not mean that a student will be able to use it because knowing a word means much more than knowing only its translated meaning or its synonyms in the target language (Hunt & Beglar, 2002). That is why researchers have suggested that language teachers create opportunities for their learners to meet new or recently learnt words in new contexts together with their collocations and associations. To this end, various activities are suggested in the literature. Some of these activities are sorting lists of words and deciding on their categories, making semantic maps with lists of words, generating derivatives, inflections, synonyms, and antonyms of a word or drawing trees that show the relationships between superordinates, coordinates, and specific examples (Hunt & Beglar, 2002). According to Nation (2002), these activities can prove to be quite useful in language education because of the following reasons:

> It may seem a little strange to see meaning-focused speaking and writing as ways of expanding learners' vocabulary, but the most exciting findings of recent research on vocabulary learning have revealed how spoken production of vocabulary items helps learning and how teachers and course designers can influence this spoken production. (Nation, 2002, pp. 268-269)

Likewise, Newton (2001) noted that these tasks enable language learners to develop strategies for managing new vocabulary while maintaining a communicative focus. He explains how these activities can foster vocabulary learning with the following words: "In such tasks, learners meet language in ways that encourage the construction of multiple associations between old and new knowledge in their lexical systems" (p. 36). Hence, by using these tasks, teachers working in EFL contexts can provide their students with a variety of vocabulary learning opportunities.

Discussion

Overall, a review of literature and research studies on English language education has revealed that for many years language courses have been organized around a set of grammatical points (Richards, 1995; Scheffler, 2015). However, the shift away from explicit grammar instruction in the 1970s, with Krashen's

Input Hypothesis and research findings have demonstrated the significance of explicit instruction in language learning (Ellis, 2002). Related to explicit instruction, Nassaji and Fotos (2004) noted that its integration into meaningful communication is crucial. They have explained that rather than being taught in isolation to get the maximum benefit from explicit instruction, it should be combined with interaction-based learning.

The advent of wordlists has also been quite influential in language teaching since word frequency was initiated as the organizing principle in the design of language syllabi (Willis, 1990; Lewis, 1993). To specify, word lists, such as the General Service List (GSL) and the Academic Word List (AWL), have been used extensively in language education for many years. However, based on the rationale that they disregard the fluid nature of language use, the rigid categorization of these word lists has also been criticized by researchers (Hancıoğlu, Neufeld & Eldridge, 2008). To this end, the use of lexico-structural items in communicative tasks rather than focusing only on frequency-based word lists has been suggested in the literature.

Research findings indicate that traditional language teaching approache, which once focused on word lists and memorization have evolved to incorporate more interactive vocabulary instruction. Research studies disclosed that these wordlists by themselves were not helpful for learning the target language as students were simply left alone with these long lists of words to memorize. Also, there was no interaction between the teacher and learners to facilitate vocabulary learning processes. Therefore, as suggested in the literature, learners should be provided with ample opportunities for practising unknown or newly learnt words (Hancıoğlu et al., 2008). This can be realized by the use of various activities which contextualize these words and enable students not only to understand the relationship between words but also to internalize them. While designing vocabulary activities, it is important to consider factors like student motivation and interest, word usefulness, knowledge of word features and functions, and acquisition of vocabulary learning strategies because as Hatch and Brown (1998) explain, "motivation depends on many accompanying activities and intangible qualities, including teacher enthusiasm and preparation and individual student enjoyment of the activities" (p. 421).

The lexical approach, proposed by Lewis (1993), emphasized teaching of vocabulary and pre-fabricated language chunks over structural grammar based on the rationale that learners acquire language not by mastering grammatical rules but by internalizing lexical phrases and collocations (Hameed, 2023). This view

aligning with the findings of corpus studies which disclosed the prevalence of language chunks in native speaker discourse instigated the consideration of lexis as a starting point in syllabus design.

Consequently, through "an analysis of a corpus of natural language of twenty million words", the most common meanings and patterns in English were identified and students were offered a syllabus based on natural English use (Willis, 1990, p. 124). According to Willis (1990), the emergence of lexical syllabus offered "a more complete pedagogic description of the language and also a better-balanced description" (p. 129) for language educators. Agreeing with Willis, Scheffler (2015) explained that with the advent of lexical syllabus and the use of computer technology for collating corpora, more emphasis has been put on vocabulary and the techniques and methods used in language teaching started to change.

Although Lewis (1997) reported that the lexical approach "in no way denies the value of grammar, nor its unique role in language" (p. 41) and acknowledges the fact that "lexis is not enough and that courses which totally discard grammar are doing learners a serious disservice" (Lewis, 1997, p. 211), some researchers argued that the use of only the lexical approach in language teaching could create the risk of fossilization as students can be too dependent on the use of lexical chunks (Scheffler, 2015).

As a result, more and more language educators came to realize the importance of lexico-grammar in second/foreign language learning. For instance, Gedik (2021) finding out inconsistencies in the development of lexico-grammatical structures in English language coursebooks used in Türkiye underlıned the need to expose EFL learners to authentic language use. Gedik's arguments and suggestions for a more usage-based approach to grammar teaching aligns with the broader perspective that grammar and vocabulary should be treated not as separate domains but together as part of an integrated language learning process.

Conclusion

Over the years, ELT practices have reflected a dichotomy between grammar and vocabulary, treating them as separate entities (Sinclair, 2000). However, corpus linguistics has challenged this notion, arguing that grammar and lexis are interconnected and should be treated as a single system. To this end, Sinclair (2000) proposed adopting a lexical-grammar approach, which recognizes patterns that integrate grammar and vocabulary, thereby providing a more holistic understanding of language structure. With this approach, language education

moved beyond the Chomskyan tradition of generative grammar, which treated syntax as a separate module from the lexicon.

Although the effectiveness of a lexico-grammatical approach has been confirmed by corpus studies (Zhang, 2021), some ELT course-books still have separate sections on grammar and vocabulary, as do language curricula. In some contexts, it is also possible to see that grammar and vocabulary are taught and tested separately. However, as discussed in the literature "all words can be shown to have patterns, and words which have the same pattern tend to share aspects of meaning". Therefore, teaching grammar and vocabulary separately in ESL/EFL contexts perpetuates an "artificial divide". (Hunston et al., 1997 p. 208). Likewise, Scheffler (2015) noted that adopting only the lexical approach in language teaching is like "going on a long and dangerous journey without maps" (p. 438). According to his analogy, grammar is the map and as learners are pretty good at learning how to use this map, language educators should not let their students travel without it.

To conclude, language is not only grammar, nor is it only vocabulary: it is the integration of the two (Littlewood, 1984). As "grammar rules are real as descriptors of language: as evidenced countless grammar books that have been produced" and "lexical phenomena are real" as well, it is logical "to first explicitly teach language in chunks and then later look at these as exemplars of particular aspects of grammar" as suggested in the literature (Scheffler, 2015, p.439). The ongoing 'grammar over lexis' or 'lexis over grammar' debate necessitates a balanced approach that integrates both. Based on communicative language teaching principles, meaningful interaction or grammatical structures with lexical items can be realized in language education. Thus, in order to be safe rather than sorry, English language teachers should aim to teach grammar and vocabulary in an integrated way in their language classes but while doing so they should constantly be questioning whether what they are teaching is addressing what their learners really need to learn as suggested in up-to-date research (Burton, 2020).

In light of all these developments and research findings, language educators need to stop claiming that language is only lexis or that it is only grammar. As language is comprised of both lexis and grammar, rather than contrasting lexical and grammatical distributions, language professionals should aim to focus on the relationship between lexis and grammar as suggested in recent literature (Marsden & Slabakova, 2019). To this end, language educators need to understand that grammar and vocabulary are certainly not two distinct systems as

they are inherently connected to each other. Thus, employment of an integrative approach, also called lexico-grammatical approach, is essential in language syllabus design and teaching practices.

Recommendations

Success in the language classroom obviously depends on both teachers and learners. On the one hand, English language teachers in ESL/EFL contexts should be well-informed about when and how to make use of appropriate teaching approaches and techniques for scaffolding students in their language learning experiences. However, on the other hand, ESL/EFL students should try to assimilate and practise new words using learning styles and strategies that suit them the most. In other words, as McCarthy (1994) notes "the teacher has to present meaning in a way that is comprehensible to learners, and learners have to relate new meanings to ones already known" (p. 121) using their personal learning styles and strategies.

Various strategies can be used to acknowledge the benefits of integrative approaches and use them for fostering vocabulary learning. One way of doing this is using 'Computer Concordancers'. These are programs that store large bodies of texts, written and spoken, in electronic form. When a word needs to be examined, for example, the program scans the texts in its storage, locates all the occurrences of the word under examination, and lists these words on the screen in the form of a list within their immediate context. These compiled concordance lists enable English language teachers and learners to examine words in their natural contexts. In this way, they can see how they collocate with other words, which patterns they follow, which prepositions they go with, and so on (Willis, 1990, pp. 27-30).

Another possible way for using lexico-grammatical approach in the language classroom is focusing on language patterns. According to Hunston, Francis and Manning (1997), "patterns are the building blocks of language" which remove the artificial vocabulary and grammar distinction. They explain that "each word has its associated patterns, and it is these patterns that go together to make idiomatic English" (p. 215). In a similar vein, Scheffler (2015) states that it is possible to integrate grammar and lexis by adopting the lexical approach in ELT practices as it is based on Observe-Hypothesize-Experiment cycle. To this end, the use of input and output activities are suggested as while receiving input learners can observe and hypothesize and when they are involved in output activities they can experiment with the language. Furthermore, the use of output

activities in the language classroom can make language learners' implicit knowledge and skills more explicit and observable.

Observing their students' performance is really important for English language teachers but learners' being aware of their own performance is even more important. Through output activities language learners' awareness of their own performance can be raised and a sense of involvement can be created by making learners more active in the learning process. Hence, to create the appropriate circumstances for maintaining a dual focus on grammar and lexis input and output activities should be used in an integrated way in English language lessons.

For many years, the important role of lexis has been ignored. Thus, there is a need for further research that will focus on how vocabulary teaching can be an integral part of English language teaching practices. Although there is a growing interest in lexis in the recent years and more and more teachers are realizing that their students will be able to use the language actively only if they are lexically competent, there are still many teachers who do not feel confident in using the lexico-grammatical approach. Future studies can therefore investigate how teachers can be empowered in applying the lexico-grammatical approach in their practices. Further studies can also suggest some new ideas for teaching grammar and vocabulary in an integrated way. Most significantly, future studies can explore how corpus study findings can be used to challenge existing perceptions and practices by making 'what language is not' more clear in language educators' minds (Lewis, 1993). In this respect, while trying to improve their teaching practices it is recommended that language teachers consider the following advice: "the pedagogic process should be informed by the corpus, not driven or controlled by it" (McCarthy & Carter, 200 p. 338).

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CHAPTER 5

The Necessity of An Interdisciplinary Basic Music Education

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1. Introduction

In traditional education systems, music education is often considered a part of arts education, while interdisciplinary approaches offer the opportunity to evaluate music within a broader context. Music is directly related to mathematical structures, language development, motor skills, and emotional intelligence (Dönmez, 2025). Therefore, integrating music education with other disciplines can positively contribute to students' learning processes in different fields.

Music education has historically been approached in various ways, and nowadays, the necessity of addressing it interdisciplinary is increasingly being recognized. For example, Gardner's (1983) theory of multiple intelligences shows that musical intelligence interacts with other types of intelligence. In this context, conducting music education in different fields, such as language, mathematics, psychology, and cognitive sciences, makes the individual's learning process more comprehensive.

Interdisciplinary music education refers to integrating music teaching and learning processes with other academic and scientific disciplines' methods, knowledge, and perspectives. This approach allows for integrating theories and techniques from two or more disciplines, transcending the boundaries of a single field (Spelt et al., 2009; Golding, 2009). The intersection of music education with cognitive sciences, psychology, and art education allows for a more comprehensive understanding of complex topics and enables students to learn by making interdisciplinary connections. The importance of interdisciplinarity is emphasized in the literature; it is stated that an integrated approach develops innovative and critical thinking skills compared to teaching that focuses on a single field (Corbacho et al., 2021; Zhang, Sun & Sun, 2023).

Addressing music education within an interdisciplinary framework has become increasingly important in today's educational world. One of the main reasons for this is the changing learning environments and needs. Students are growing up in a world where digital technologies and different fields of knowledge are intertwined. In this case, music can offer students a more holistic learning experience by providing an educational opportunity that connects it with other fields of science (Chrysostomou, 2004). For example, programs that combine music technology with computer science or projects that relate music history to social studies provide students with insights that a single discipline cannot offer (Hodges, 2003; O'Leary, 2020).

When considering the necessity of an interdisciplinary basic music education, the focus is on whether music education should be an end in itself or a tool that supports other learning areas and is supported by them.

1.1.Interdisciplinary Education and Music

The contributions of interdisciplinary education to music education can be discussed under the following headings:

1.1.1.Effects on Cognitive Development

Research shows a direct relationship between music education and cognitive abilities. It has been determined that individuals who receive music education at an early age show improvement in memory, problem-solving, and analytical thinking skills (Mornell, Osborne & Kageyama, 2025).

1.1.2.The Relationship Between Mathematics and Music

The connection between mathematics and music allows mathematical concepts such as rhythm, timing, and sequences to be embodied through music. For example, note values resemble the concept of fractions and help students develop their mathematical thinking skills (Wu, 2024).

1.1.3.Language Development and Music

Music education is particularly beneficial for individuals learning a second language. Music's rhythmic and melodic structure makes distinguishing sounds easier during language-learning and enhances vocabulary development (Capponi-Savolainen, 2025). Therefore, integrating music into foreign language education can improve students' language development.

1.1.4. The STEAM Approach and Music Education

The STEAM (Science, Technology, Engineering, Arts, Mathematics) model is important at the intersection of music, art, and science. For example, the physical properties of sound waves, acoustic principles, and music technologies provide students with both a scientific and artistic perspective (Liu, 2024).

1.1.5. Development of Emotional and Social Skills

Music education develops students' emotional intelligence and social skills. Through music, teamwork, collaboration, and empathy are supported (Kinyua, 2024).

1.2. Academic Research and Findings

Recent academic studies emphasize that music education should be supported through interdisciplinary approaches.

1.2.1. Music and Programming Education: In a study conducted by Azevedo (2024), the combination of programming education and music education was examined, and significant improvements in students' problem-solving skills were observed.

1.2.2. Voice Training and Language Skills: Dönmez (2025) has addressed the impact of music education on the four basic language skills (listening, speaking, reading, writing) through a systematic analysis.

1.2.3. STEAM Model and Music: Liu (2024) examined the role of music in STEAM education and stated that future music teachers should be more trained in integrating technology and art.

1.2.4. Music Therapy and Autism: Kinyua (2024) has investigated the effects of music on improving communication skills in children with autism.

1.2.5. The Relationship Between Mathematics and Music: Wu (2024) highlights the connection between music theory education and mathematics education in China, emphasizing that music education can help students acquire mathematical skills.

1.3. Application Areas of Interdisciplinary Music Education

Interdisciplinary music education can be applied in different fields:

- In Preschool Education: Basic math and language skills can be acquired through music-based games.
- At the Middle and High School levels, Science and mathematics classes can be combined with music education.
- In University Education: Interdisciplinary programs such as music and engineering, music, and psychology can be developed.

1.4. The purpose of the research

In this study, the aim is to examine the perception of the music department from the perspective of a social studies teacher studying in the music department at Fine Arts Faculty (FAF), considering the application areas of interdisciplinary education (preschool, middle school, high school, and university levels). For this purpose, how does the music department operate from the participant's perspective? Why did you choose the music department? What were his

difficulties before and after studying in the music department? Are music classes in primary and secondary education sufficient? What are the positive and negative deficiencies when comparing teaching in social studies and teaching in the music department? What standard courses should there be in social studies teaching and music departments? What should art workshops' role be in the social studies teaching and music departments? Answers to the questions have been sought.

2. Method

This study adopted a qualitative approach and used the literature review method. Firstly, academic studies published in music education, cognitive sciences, psychology, and art education were examined. As data sources, peer-reviewed journal articles, books, and theses were primarily examined, focusing on research addressing the intersection of music education and other disciplines. During the data collection process, relevant sources were gathered using keywords such as "music education and cognition," "music education and psychology," and "interdisciplinary art education" through online academic databases (EBSCO, ERIC, Google Scholar, etc.). The obtained sources were subjected to content analysis, and themes related to the benefits of the interdisciplinary approach were identified. Among these themes are cognitive development, effects on academic success, creativity and critical thinking, and social and emotional development. In addition to being a research review, it is also a case study. This research aims to reveal the reality of new findings as they are by focusing on the questions of what and how with the case study, which is the most commonly used qualitative research method. In a case study, an examination is conducted on an event or phenomenon in the life stories of individuals who have participated in or witnessed the event. The aim here is not to introduce the individuals but to understand the event and phenomenon through their expression. Interviews and other qualitative data collection techniques can be utilized (Özden & Durdu, 2016). This research applied a semi-structured interview form consisting of semi-structured questions to a single participant. A case study was conducted since the research examines how basic music education should be provided. A case study examines a current phenomenon, situation, individual, or group in depth within their conditions (Alacapınar, 2008; Bassey, 1999; Stake, 1995; Yin, 1984). Case studies can emerge while the researcher is conducting observations. While conducting a survey or interview, the researcher may become aware of an interesting case study (Sönmez & Alacapınar, 2014). For the single-participant case study, permission was obtained from the Erciyes

University Social and Humanities Ethics Committee (No.349) for the study titled "The Necessity of an Interdisciplinary Music Education."

3. Findings

3.1. How does the music department operate from the participant's perspective?

Despite winning a place in the music department, *participant 1* (P1) did not prioritize it due to concerns that being assigned a teaching position would negatively affect their KPSS success and that they would not be able to receive training in the FAF music department. She chose the music department to complete it in 2 ½ years and leverage the academic skills she acquired in her graduate department. However, she stated that she struggled because basic music education skills were not adequately provided at the primary education level in Turkey. For this reason, FAF has stated that the music department should have a preparatory class to provide basic music education skills. It has been stated that Anatolian and fine arts high school graduates can take classes with separate curricula in different classes, such as basic, intermediate, and advanced.

3.2. From the participant's perspective, are music classes in primary and secondary education sufficient? When comparing the social studies teaching and music departments, what are the positive and negative deficiencies?

Integrating music education with other art forms and disciplines offers students a creative and holistic learning environment. In art education, an interdisciplinary approach involves teaching music alongside fields such as visual arts, literature, dance, or theater. For example, in an educational program, music and art classes can come together in a joint project, allowing students to create paintings inspired by a piece of music or, conversely, to create musical compositions based on a painting. Such practices allow students to develop their creativity by making connections between different forms of expression (Overland, 2013). According to Overland (2013), integrated arts education in music increases student engagement, encourages imagination, and makes learning more enjoyable. Indeed, practices such as classroom teachers using the music of a historical period while teaching that period in social studies or conducting an activity where students compose music for a poem in literature class facilitate a deeper understanding of music and the relevant discipline. However, the participant from the research, FAF music department stated that the issue with the educational approach in the music department stems from the professors assuming that students already know something and providing education accordingly. He stated that creative drama is the most important course

that should be taught from the 1st grade in both the social studies teaching and music departments. The media literacy course should be mainly offered in the social studies teaching and music departments. Primarily for music department students who are thought to develop only music skills but not read enough and whose interest and knowledge in subjects like History, Geography, Turkish, and Mathematics have diminished, they need courses to explore themselves and their surroundings.

3.3. What standard courses should the social studies teaching and music departments include? What should art workshops' role be in the social studies teaching and music department?

Interdisciplinary music education also harmonizes with modern educational trends such as STEM/STEAM approaches. The STEAM approach, which is formed by adding Art to the fields of STEM (Science, Technology, Engineering, Mathematics), advocates for the joint teaching of art and science. Music is important in this approach; for example, students can acquire coding skills through music technology or apply principles of physics, mathematics, and engineering through an instrument-making project. In this study, P1, supporting these views, expressed that there should be a course on material design in the FAF Music department. In the material design course, it was stated that alongside materials designed for teaching music, instruments like the guitar and ukulele, which have already been developed but are rarely used, should be taught in the FAF music department.

Interdisciplinary interaction will also enrich the social and cultural dimension of music education. Combining music history with sociology and cultural studies allows students to understand the period and social conditions behind a musical work (Schei, Espeland & Stige, 2013). In this way, music becomes an aesthetic pursuit and a tool for cultural literacy. Students develop their geography and history knowledge while studying the music of different cultures. For example, in a world music unit, students can learn about various ethnic music genres and gain knowledge about those cultures' values and historical backgrounds. This approach is also valuable in fostering tolerance, cultural awareness, and a global perspective (Karlsen, 2021). Therefore, basic music education integrated with art education and other disciplines reinforces students' artistic creativity while enabling a multifaceted learning experience and an education connected to the real world. P1 has emphasized the importance of presentation studies in the research to ensure interdisciplinary interaction. However, P1stated that although the social studies teaching department, where he studied before the music department, also conducted lessons through presentations, the content became

simpler in the following years. For example, he stated that a copy-paste presentation was prepared, that the library was not visited and that studying was only done for grades. He even mentioned that students suggested not having a final exam if a presentation was done. He stated that no presentation work was done in any course during the 3 years he studied in the P1 music department.

Research in the field of cognitive sciences reveals the positive effects of music education on brain development and cognitive functions. Learning music requires intensive use of cognitive skills such as memory, attention, perception, and executive functions. Indeed, neuroscientific studies have shown that strong connections develop between the auditory, motor, and sensory regions in the brains of musicians (Luo et al., 2012). This indicates that music education can enhance brain plasticity, potentially transferring to learning in other areas. For example, it has been reported that children who receive regular music education at a young age progress in reading and language skills compared to their peers (Hallam, 2010). Hallam's (2010) comprehensive review shows that actively engaging with music contributes to the cognitive development of children and adolescents, particularly in improving areas such as verbal memory, spatial reasoning, and language development. An experimental study conducted by Schellenberg (2004) showed statistically significant increases in IQ scores of children who took music lessons for one year compared to a control group that did not receive music education. These findings suggest that music education can support cognitive capacity and general intelligence. P1, who participated in this study, stated that he learned theoretical knowledge while studying social studies teaching. During the KPSS exam, he learned D. Kolb's experiential learning style test and experienced it during a course in the music department at FAF. By learning his style, he got to know both music and himself. Therefore, in addition to tests based on individuals' IQ scores, it is equally important to conduct tests that enable individuals to comprehend their brain development and cognitive functions.

4. Discussion, Conclusion and Suggestions

4.1. Discussion

Interdisciplinary music education enriches students' learning processes by providing different perspectives. While traditional music education primarily focuses on technical skills, an interdisciplinary approach makes learning more meaningful. The STEAM model, which combines STEM (Science, Technology, Engineering, Mathematics) and the arts, demonstrates how music intertwines

with other disciplines. In this context, it is recommended that educational policies and curricula be revised to support an interdisciplinary approach. To ensure an interdisciplinary approach, courses on material design can be offered in the FAF Music department according to the needs of primary, secondary, and adult education.

An interdisciplinary music education is seen as necessary for the multifaceted development of students. Music education should not be limited to acquiring musical skills; its relationship with other fields, such as art and science, should also be important. Educators must develop their curricula interdisciplinary, considering the potential to encourage the production of new musical ideas, facilitate cultural interaction, and enhance social skills.

It is foreseeable that an interdisciplinary music education will be beneficial in the following areas:

4.1.1. Innovative Thinking: It has been stated that P1 music education increases creativity and enhances competence in generating new ideas. It is important to teach instruments such as guitar and ukulele in music departments to develop competencies in generating new ideas. Especially an instrument like the ukulele will provide ease when accompanying songs due to its ease of play.

4.1.2. Cultural Awareness: Interdisciplinary studies offer an important opportunity for students to become familiar with music from different cultural backgrounds and to understand cultural diversity. Creative drama classes must be included in music departments to help individuals understand culture and diversity. Additionally, by including a media literacy course, it would be possible to introduce students to music from different cultural backgrounds and analyze cultural diversity.

4.1.3.Cognitive Development: Music education helps individuals understand mathematical concepts. "The relationship between music and mathematics strengthens students' analytical thinking skills" (Thompson, 2021). The interest and knowledge of music department students in subjects like History, Geography, Turkish, and Mathematics, which may have diminished, can be revived by developing their analytical skills through a media literacy course, thereby reactivating their interest in mathematics and verbal fields.

4.1.4. Development of Social Skills: Group music activities enhance social cooperation and communication skills. Music has a significant impact on the process of building social connections and developing empathy (Carter, 2022). For this purpose, applying learning style tests such as D. Kolb's experiential

learning style test will be beneficial for individuals to understand themselves through music.

4.2.Results

Interdisciplinary basic music education is an important approach that supports students' academic success and cognitive development. Integrating disciplines such as mathematics, language, science, and psychology ensures that music education is used not only as an artistic tool but also as a scientific one.

Interdisciplinary music education can be structured in various ways. For example, projects examining the relationship between music and technology teach students the historical and theoretical aspects of music while equipping them with the skills to use modern tools. Additionally, classes combining music history with literature ensure that students understand both fields deeply. Interdisciplinary foundational music education focuses on music and contributes to a broad range of intellectual and emotional development, preparing individuals for life. Therefore, it is of great importance for educational institutions to adopt an interdisciplinary approach to music education, as it ensures that students receive a well-rounded education. By harnessing the power of music, it is possible to raise future individuals as more equipped and conscious beings.

Interdisciplinary basic music education is not an option but a necessity in the modern educational environment. 21st-century education is transforming into a structure where the boundaries between various fields are blurred, and multifaceted thinking is required to solve problems. In this context, integrating music education with other fields enhances students' musical skills and develops their higher-order skills, such as critical thinking, problem-solving, creativity, communication, and collaboration (Overland, 2013; Zhang et al., 2023). The findings indicate that the interdisciplinary approach supports students' academic success and enriches them culturally and emotionally.

Ultimately, interdisciplinary basic music education should be regarded as a path that enhances the quality and depth of education. The necessity of music education is not limited to developing a musical talent; it is also a critical tool for nurturing students into better learners, more sensitive, and more creative individuals.

4.3. Suggestions

4.3.1. In the FAF music department, Different teaching methods should be explicitly emphasized for courses that provide basic music education, such as the introductory music theories course. Active music education methods such as

Kodály, Suzuki, and Orff should be exemplified, and their applications should be implemented.

4.3.2. P1 stated that a repertoire should be learned in primary education (elementary and middle school) music teaching that can be played on the bağlama. Similarly, piano lessons should have a repertoire that can accompany songs.

4.3.3. Students in the music department who take the teaching practice course in the pedagogical formation program face difficulties. To help music department students overcome these difficulties, micro-teaching, which is used during social studies teacher training, should be implemented, videos should be recorded, and these videos should be discussed in class.

4.3.4. Teaching practice: The academic responsible for teaching the course should conduct a sample lesson with the trainee students. Rhythm instruments should be designed. The lesson should be taught differently if there are no instruments like flutes. It should be taught how to teach music in the face of impossibility. Therefore, basic music education and practices, music and movement education courses, speech training practices (not theoretical), drama, and workshop classes must be included in the music departments of FAF.

4.3.5. Due to the large number of candidate teachers in teacher placements based solely on the KPSS exam score, candidates cannot be assigned to public schools. According to P1, formation should not be given to everyone for this reason. However, in the music department, students who receive pedagogical training should enhance their academic qualifications and basic academic skills (such as mathematics and verbal) to become qualified teachers.

4.3.6. FAF In the Music department, there is a lack of a workshop classroom where materials (such as maracas, etc.) can be designed and implemented for basic music education. A drama workshop must be included. According to P1, it is necessary to revitalize the learning environment in the drama workshop and conduct sample applications. In a music and movement education class that includes material design, design products should be exhibited at the end of the term.

4.3.7. According to P1, instead of memorizing the principles of educational theorists like Piaget, teaching what can be done to understand the student's psychology is necessary. For this, a course like learning and psychology, where the functioning of the human brain will be learned, is necessary.

4.3.8. According to P1, the music department must include courses such as speech training or diction, dance or drama, music, and creative dance. According to P1, the introductory music education theories course should be taught practically. Therefore, a practical, theoretical education is required in which applications such as the Orff approach, Kodály, Dalcroze, and the Suzuki method will be included.

4.3.9. According to P1, there should be a preparatory class for basic subjects such as music theory, solfeggio, and harmony. He stated that graduates from different high schools, such as Anatolian and fine arts, could study in separate classes with different curricula, such as basic and intermediate, intermediate-advanced.

4.3.10. It has been stated that there should be a practice where micro-teaching applications are implemented and the course is simulated before the music department students taking P1 formation take the teaching practice course.

4.3.11. According to P1, personal identification tests such as experiential learning style tests must be implemented. Learning styles and other tests should be applied and developed in classes.

4.3.12. According to P1, there should be a workshop class in the music department, and in this workshop class, drama, music, and movement education classes should be conducted. Regardless of the subject, there should be practical and workshop sessions.

4.3.13. According to P1, courses on learning and developmental psychology must be included. However, these courses should be taught practically alongside medical knowledge in education faculties. Because teaching by memorizing theories is not beneficial. A theoretical course in developmental psychology does not provide sufficient benefit in an era where technological development is accelerating.

4.3.14. According to P1, a repertoire that allows playing the bağlama or piano to accompany songs should be selected in music departments. In addition to the bağlama, instruments such as the guitar and ukulele should be taught, especially in the music department. Especially in elementary school, learning pieces accompanied by piano, organ, or bağlama would be beneficial.

4.3.15. According to P1, interdisciplinary music education should be included in the education curricula: The connection of music with other subjects should be strengthened. Educational programs should be developed in consultation with teachers: The competencies of music teachers providing interdisciplinary

education should be enhanced. Research and Practices Should Be Increased: Academic studies on interdisciplinary music education should be disseminated.

4.3.16. Supporting interdisciplinary music education can help individuals succeed in artistic and academic fields.

4.3.17. Education policies and school curricula should be organized to promote collaboration between music education and other disciplines. Thus, while music education receives the value it deserves, it will serve the multidimensional development of students in harmony with other disciplines.

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