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Bridging Foundational Disciplines and Everyday Life: Development of a Liberal Arts Curriculum for Convergent Thinking*

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Abstract

Purpose: This study aims to develop a university liberal arts course designed to cultivate convergent thinking skills and integrated problem-solving competencies required in a rapidly changing and diversifying knowledge-based society. **Research design, data and methodology:** Drawing on foundational disciplines and theories of convergence education, this study developed a liberal arts course titled “Understanding the World with Convergent Thinking: A Convergent Approach to Everyday Problems,” which approaches everyday social issues from various academic perspectives. The study employed literature analysis to establish a theoretical foundation and applied curriculum development research methods. **Results:** To systematically cultivate convergent thinking, critical thinking, creative problem-solving, communication, ethical judgment, and collaboration competencies, the course was designed using a “process-oriented learning framework” consisting of the following stages: Recognition of Real-World Problems → Analysis of Perspectives by Discipline → Convergent Interpretation → Proposal of Practical Alternatives → Self-Reflection and Expansion. **Conclusions:** This study is significant because it proposes a practical convergence-oriented liberal arts course grounded in the integration of foundational disciplines, thereby contributing to the cultivation of convergent thinking competencies.

Keywords: Convergent thinking, Integration of foundational disciplines, Development of liberal arts courses, Liberal arts education, Convergence education

JEL Classification Code: E44, F31, F37, G15

1. Introduction

1.1. Research Rationale

As the convergence of science and technology—including big data, artificial intelligence (AI), and biotechnology—continues to deepen, society is rapidly evolving into a complex knowledge-based system that drives innovation and creates new value. In this context, complex and multifaceted problems can no longer be

comprehensively addressed through the fragmented knowledge of a single discipline; instead, interdisciplinary thinking has become essential for creative problem-solving.

Accordingly, in the education sector, increasing emphasis has been given to the importance of convergence education grounded in the integration of foundational disciplines. Convergence education is an educational approach that transcends the boundaries of various academic fields—such as the humanities, social sciences, and natural sciences—by integrating knowledge and methodologies from diverse disciplines to foster a holistic understanding

of knowledge regarding real-world problems. Through this approach, learners can develop multidimensional thinking skills and cultivate integrated problem-solving abilities through the generation of creative ideas and collaboration. However, in liberal arts education, boundaries between disciplines are often rigid, leading students to acquire knowledge in a fragmented manner. Such a learning structure is insufficient for fostering the integrative thinking and convergent problem-solving competencies necessary to address complex social issues.

Therefore, this study aims to develop an interdisciplinary liberal arts course grounded in the integration of foundational disciplines and aligned with the core competencies required in a rapidly changing and diversifying knowledge-based society. The course is designed to support students in reflecting on everyday life issues and social phenomena from diverse academic perspectives in an integrated manner. Ultimately, this study seeks to present a practical curriculum design model that fosters the creative, convergent problem-solving skills and collaborative abilities demanded by the era of the Fourth Industrial Revolution.

This study is also significant in the field of well-being studies because it aims to support the holistic growth and improve the quality of life of university students through the development of a convergence-oriented liberal arts curriculum based on fundamental disciplines. Contemporary research on well-being has expanded beyond narrow understandings of physical health or subjective happiness toward a more integrated conception encompassing meaningful living, self-understanding, social relationships, and the capacity for sustainable living. From this perspective, university liberal arts education aligns with the interdisciplinary orientation of well-being studies, as it contributes not only to the transmission of knowledge but also to the enhancement of learners' cognitive, emotional, social, and civic well-being.

1.2. Research Objectives

This study aims to develop a liberal arts course tentatively titled “Understanding the World with Convergent Thinking: A Convergent Approach to Everyday Problems” that applies the principles of convergence among foundational disciplines to enhance students' ability to creatively address various social issues encountered in everyday life. To this end, the study designs a curriculum that integrates academic perspectives around real-life topics faced by students.

The specific research objectives are as follows:

First, to identify the theoretical foundations of convergence education and liberal arts education based on the integration of fundamental disciplines, and to propose

the principles and directions for course development. Second, to design course content centered on practical applications and case studies under the theme of a “convergent approach to everyday problems.” Third, to develop a curriculum that includes teaching and learning materials (activity sheets, discussion assignments, and project guides) aimed at promoting interdisciplinary convergent thinking.

2. Research Content and Methods

2.1. Exploration of Theoretical Foundations

2.1.1. The Importance of Fundamental Disciplines in Liberal Arts Education and the Necessity of Integration Among Fundamental Disciplines

The importance of foundational disciplines and the necessity of their integration are central issues in liberal arts education that aligns with the evolving direction of university education. Foundational disciplines are essential in liberal arts education because they cultivate basic thinking skills required to understand human beings and society. Furthermore, the integration of these disciplines can expand such thinking skills into an integrated intellect capable of addressing real-world problems. Therefore, liberal arts education must be restructured into an educational model that “teaches fundamental disciplines solidly and connects them rather than isolating them.”

Fundamental sciences are academic fields that investigate the essence of phenomena (What & Why), fundamental principles, and methods of inquiry that form the basis of knowledge. The roles of fundamental sciences can be categorized as follows: First, the humanities cultivate critical thinking skills that enable learners to reflect on human ways of thinking, values, and lives based on prior knowledge of human beings. Second, the social sciences foster judgment skills necessary for analyzing complex social phenomena and proposing alternatives grounded in public values. Third, the natural sciences serve as the foundation for scientific reasoning and rational methods of inquiry used to elucidate natural phenomena.

In the era of the Fourth Industrial Revolution, the integration of foundational disciplines has become essential in liberal arts education for the following reasons:

First, such integration is necessary for solving complex social problems. Modern societal issues—such as population aging, climate crises, and AI—require multidisciplinary approaches that simultaneously incorporate ethical reflection, social analysis, and scientific understanding. Second, integration promotes a holistic understanding of knowledge. Moving beyond fragmented, subject-specific knowledge, it establishes an organic system

of knowledge by connecting diverse academic perspectives. Third, integration enhances convergent thinking skills and creativity. By transcending disciplinary boundaries, it enables students to move beyond stereotypical assumptions and strengthens their capacity for convergent innovation through shifts in perspective. Fourth, integration strengthens the identity and purpose of liberal arts education by prioritizing a “holistic understanding of humanity and the world,” rather than focusing on the acquisition of fragmentary knowledge.

2.1.2. Definition of Convergence Education

Social phenomena in the era of the Fourth Industrial Revolution are interdisciplinary and complex, making them difficult to address within a single academic discipline. In response to this challenge, convergence education has emerged as an educational approach that seeks to solve complex problem situations by transcending the boundaries between various academic fields and integrally connecting diverse knowledge and thought systems. In other words, convergence education pursues practical education that encourages learners to view problems from multifaceted perspectives and generate meaningful alternatives. Furthermore, convergence education has evolved from STEM education (Science, Technology, Engineering, Mathematics) to STEAM education through the inclusion of the Arts (Gong, 2019).

The core competencies emphasized in convergence education can be summarized as follows. First, Convergent or Integrative Thinking refers to the ability to recognize and solve problems by connecting and integrating various academic disciplines or domains of knowledge (Sun, 2022). Second, Creativity & Problem-solving Competencies involve the ability to explore and solve complex, novel, or multidimensional problems in innovative ways (Choi et al., 2020). Third, Humanistic Sensibility and Cultural Literacy emphasize the importance of considering human-centered, ethical, and social contexts (e.g., expanding thinking through art), rather than encouraging education that is solely centered on technology and science (Gong, 2019). Fourth, Collaboration, Communication, and Convergent Value Creation refer to the ability of individuals from diverse disciplinary backgrounds to collaboratively create new value (Choi et al., 2020).

2.2. Development Design of Convergence Liberal Arts Course Based on the Integration of Fundamental Disciplines

2.2.1. Development Stages of Convergence Liberal Arts Course Based on the Integration of Fundamental Disciplines

2.2.1.1 Development Goal

This study aims to construct a practical convergence-oriented liberal arts model that promotes organic linkages among fundamental disciplines and fosters interdisciplinary problem-solving competencies, focusing on key issues encountered in daily life (aging, health, consumption, technology, environment, etc.).

2.2.1.2 Topic Selection and Analysis of Convergence Potential

The process of topic selection and convergence potential analysis involves identifying everyday social issues that are conducive to interdisciplinary convergence and examining the potential for convergent exploration across academic fields. As this stage is critical to the success of curriculum design, a topic is strategically selected as the “cross point of disciplines” where diverse disciplinary perspectives can intersect to create synergistic effects.

Therefore, the basic principles guiding topic selection are relevance, convergence, problem-solving orientation, reflectivity, and participation.

Relevance: Topics must include social, environmental, or technological problems that learners experience or encounter in their daily lives. In this context, learning gains meaning only through the “continuity of experience” (Dewey, 1938).

Problem orientation: Learning is structured around “authentic problems”—real-world issues—that originate from everyday life (Barrows, 1986; Hmelo-Silver, 2004; Kolb, 1984).

Integrability: Convergence education is the “process of reconstructing knowledge for multidisciplinary problem-solving” (Klein, 1990). Its structure enables a holistic understanding of problems by integrating diverse academic perspectives (humanities, social sciences, science, and arts) (Dewey, 1938; Klein, 1990; Yakman, 2008).

Reflexivity: This is a compositional principle that allows learners to reflect on the meaning, value, and ethical implications of the knowledge they acquire, from the perspective of self-awareness: “Liberal arts education must cultivate civic imagination and ethical judgment” (Nussbaum, 2010; Schön, 1983).

Participation: The course design ensures that learners participate not merely as recipients of knowledge but as active co-learners (Vygotsky, 1978; Wenger, 1998).

Several learning activities incorporate these compositional principles. First, students write “reflection journals” after completing each unit. These journals encouraged them to consider questions such as: “What social responsibility have I newly understood regarding this topic?” and “What role can my field (major) play in solving the problem?” Second, through “metacognitive activities,” students are required to examine their own thought

processes (what I thought / why I changed). Third, at the end of a semester, students submit an “integrated portfolio” that documents the relationship between interdisciplinary integration and personal growth. Through these activities, learners transition from being “consumers of knowledge” to becoming “creators of meaning,” thereby acquiring ethical awareness and civic responsibility.

2.2.1.3. Application Method

Each unit of the course is designed to guide students through a step-by-step process of convergent thinking centered on real-world problems, given as follows: Recognition of Real-World Problems – Analysis of Interdisciplinary Perspectives – Convergent Interpretation – Proposal of Practical Alternatives – Self-Reflection and Expansion. This structure aims to sequentially cultivate problem recognition skills, interdisciplinary analysis, integrative thinking, practical judgment, and self-reflection abilities.

The meaning and functions of each stage are given as follows:

Recognition of Real-World Problems: This stage clarifies the necessity and direction of learning by presenting realistic and relevant social problems.

Analysis of Interdisciplinary Perspectives: At this stage, students examine how different disciplines approach a given problem. Through this process, students develop an understanding of the perspectives and analytical frameworks of diverse disciplines.

Convergent Interpretation: This stage integrates disciplinary perspectives to achieve a more comprehensive understanding of a problem. Rather than interpreting issues through a single lens, students analyze causes and effects as parts of a complex structure.

Proposal of Practical Alternatives: At this stage, learners propose realistic and actionable alternatives to problems based on convergent knowledge. They are encouraged to design solutions that are grounded in evidence.

Self-Reflection and Expansion: Finally, learners review the entire learning process and examine changes in their own perceptions and attitudes. This enables experiential learning that remains active and relevant in real-life contexts.

Given below are the expected educational outcomes of the course:

First, the course strengthens fundamental competencies. Through an integrated exploration of the humanities, social sciences, and science and technology, students develop convergent thinking, critical thinking, logical thinking, and practical problem-solving skills.

Second, it expands learners’ awareness and promotes creative thinking. Students become active learners who can independently interpret real-life problems and seek creative

/alternative solutions.

Third, the course proposes a practical model for convergence-oriented liberal arts education. Thus, it helps students overcome the limitations of fragmented liberal arts education and establishes a standard model for convergence education.

3. Results

3.1. Development of a Convergence-oriented Liberal Arts Course Based on the Integration of Foundational Disciplines

3.1.1. Course Design and Development

Course Title: Understanding the World with Convergence Thinking : A Convergent Approach to Everyday Problems

Target Audience: Undergraduate students

Course Type: General Elective (Open to students from all majors)

Credits and Duration: 3 credits; 15-week semester

Educational Objectives:

To strengthen convergent thinking and creative problem-solving abilities for addressing complex problems rooted in everyday life.

To enable analysis of social, environmental, and technological issues through the frameworks of foundational disciplines and to explore practical alternatives from convergent and creative perspectives.

Teaching and Learning Methods:

Problem-based learning (PBL), collaborative learning, inquiry- and discussion-centered classes

Team projects based on real-life social problems

Convergent inquiry utilizing digital resources (news, data, videos, etc.)

3.1.2. Designing a Teaching-Learning Model

The course adopts a learning flow model structured as follows:

Problem Recognition: Recognizing problems emerging from everyday life and exploring academic approaches to understand them

Inquiry: Multidisciplinary analysis and data-based research

Integration: Synthesis of diverse perspectives and development of creative solutions

Reflection: Presentation, feedback, sharing and reconstructing learning experiences

3.1.3. Development of Evaluation System

Evaluation Principles: Competency-, Performance-, and Process-based Evaluation

Evaluation Elements:

- Team assignments (20%)
- Portfolio and self-reflection journals (30%)
- Participation in presentations and discussions (20%)
- Rubric-based evaluation of convergent thinking and

creative problem-solving skills (30%)

Evaluation Tools: Checklists, peer evaluation, rubrics, self-assessment

3.1.4. Example of Course Structure (15 Weeks)

Table 1: Learning content of the understanding the world through convergent thinking course

Part I. Understanding Convergent Thinking			
1. Convergence: The Beginning of Interdisciplinary Discussions	Learning Objectives		
2. Learning Starting from Everyday Problems: The Structure of Problems in Daily Life	① Understand the definition and necessity of convergent thinking.		
3. Changing Frameworks of Perception: The Encounter between Humanities, Social Sciences, and Science	② Explain how different disciplines contribute to solving everyday problems.		
	③ Construct a framework for analyzing everyday issues from convergent perspectives.		
Part II. Problems in Daily Life and Convergent Inquiry			
	Exploring Disciplinary Perspectives	Practical Tasks and Inquiry Projects	Expected Learning Outcomes
4. Climate Crisis: Is It a Limitation of Technology or Human Responsibility?	Humanities: Critiques of Anthropocentrism Science: Greenhouse Gases and Energy Circulation Social Sciences: Climate Policy and the Role of Citizens Convergence Activity: Carbon Footprint Reduction Experiment	① Recording My Carbon Diet ② Local Climate Dashboard ③ Research on Developing an Energy Generator ④ Brainstorming Solutions to the Climate Crisis	Convergent Thinking: understanding and explaining the climate crisis as a complex system by integrating perspectives from the humanities, social sciences, and science and technology. Ethical Sensitivity: gaining insights into individual and collective responsibilities regarding the climate crisis, and making ethical judgments aimed at living a sustainable life. Creative Problem Solving: Creatively designing feasible alternatives (that address the climate crisis) by combining policy, technology, and everyday practice.
5. Sustainable Table: The Journey of the Food We Eat	Science: Food Production and Ecosystems Social Sciences: Global Consumption and Fair Trade Humanities: The Meaning and Culture of Eating Convergence Activity: Designing My Sustainable Diet	① Diet Remodeling: Healthy Eating Project ② Local Food Exploration Report ③ Fair Trade Product Marketing Plan ④ Food Talk: Discussion on the "Meaning of Food"	Integrated Thinking: Connecting food-related issues across perspectives from the humanities, social sciences, and natural sciences. Ethical Sensitivity: Recognizing the moral significance of consumption behaviors. Creative Problem-Solving: Proposing practical alternatives for sustainable and practical consumption (e.g., designing sustainable diets).

6. The Science of Waste: Disposal and the Other Side of Society	① Science: The Technology of Circulation - Recycling and Decomposition ② Social Sciences: Consumption Structures and Waste Issues ③ Humanities: "Waste" and the Culture of Emptying and Sharing ④ Convergence Activity: Zero Waste Campaign Planning	① Environmental Logbook: Trash Diary ② Proposals for a Waste-Free Life ③ Circular Economy Hackathon: Solution Contest ④ Eco-Art Workshop	① Convergent Thinking: Analyzing waste issues through interdisciplinary perspectives. ② Ethical Sensitivity: Recognizing the social responsibilities associated with the act of thoughtless discarding. ③ Creative Problem-Solving Skills: Proposing policy-oriented, technological, and cultural solutions to reduce waste generation. ④ Will to Act: Practicing sustainable consumption and developing circular lifestyle practices.
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Part III. My Convergence Project			
7. How Can I Explore Problems in My Everyday Life? 8. Presenting a New Framework for Problem Solving 9. Collaborative Convergence: Reflecting and Growth	Learning Objectives: Cultivate the ability to identify everyday experiences as subjects of academic inquiry. Foster creative and convergent problem-solving abilities by transcending conventional frameworks of thought. Promoting collaborative learning through collective problem-solving and reflective practice.		

4. Example: Unit 6 – Garbology or Waste Studies: The Science of Discarding and the Hidden Side of Society

4.1. Raising Real-World Issues

We “discard” things every day.

However, the items we carelessly throw away never truly disappear. Plastics, packaging materials, and food waste discarded in daily life do not mark an end. Rather, they enter new cycles, accumulating in landfills and oceans, eventually leaving profound traces within social structures and human consciousness.

This unit analyzes the essence of “discarding” through the lens of “waste” as the hidden side of modern civilization. Moving beyond simple environmental issues, it integrates

perspectives from the humanities, social sciences, and science and technology to explore creative and sustainable solutions to everyday waste-related problems.

Science: The Technology of Circulation—Recycling and Decomposition

Social Sciences: Consumption Structures and Waste Problems

Humanities: “Waste” and the Culture of Emptying and Sharing

Convergence Activity: Planning a Zero - Waste Campaign

4.2. Exploring Perspectives by Discipline

(1) Scientific Perspective — “Technology of the Circular Cycle of Recycling and Decomposition”

Key Concepts: Recycling, Biodegradation, Circular Economy, Energy Recovery

Summary of Contents:

Waste Decomposition Mechanisms and the Microplastic Problem

Actual Efficiency of Recycling: Experimental Verification of the “Illusion of Separate Collection”

Circular Economy Models and New Materials Science (e.g., Biodegradable Plastics, Waste Heat Recovery Systems)

Inquiry Activities:

Experiment: Comparing Decomposition Rates of Plastics and Biodegradable Materials

Data Analysis: Current Status of Waste Treatment in Korea (Utilizing Statistics from the Ministry of Environment, Korea)

(2) Social Science Perspective — “Consumption Structure and the Waste Problem”

Key Concepts: Consumerism, Mass Production, Social Responsibility, Environmental Policy

Summary:

Structural Causes: Corporate production logic and consumption trends that foster a disposable, fast-consumption culture

Policy Responses: Current status and limitations of the Circular Resources Act, EPR, and ESG management

Social Costs: The “Dark Side of Discarding” in waste disposal and separate collection

Activities:

Documentary Viewing: “Mountains of Trash” (KBS Documentary)

Discussion Topic: “Whose Responsibility Is Trash? — Individuals vs. Corporations vs. Government”

(3) The Humanities Perspective — “Waste” and the Culture of Emptying and Sharing

Key Concepts: Ownership, Waste, Aesthetics, Traces of Existence

Summary:

The Philosophy of “Discarding”: Focusing on Desire and Consumption

Images of “Trash” in Literature: Ha Sung-ran’s “Mold Flower” and the novel titled “Birch Forest”

The Ethical Significance of “Minimalism” and “Zero Waste”

Activities:

Essay: “Traces of the Past: Discovering My Present Self Within Objects I Discarded or Let Go of in the Past”

Art Appreciation: Case Analysis of “Recycle Art” Works

4.3. Convergent Interpretation: Planning a Zero-Waste Campaign

Waste is a complex product encompassing scientific, social, and cultural dimensions. Therefore, the fundamental solution to waste problems must commence with redefining the “philosophy of consumption” beyond the technical dimension.

The Direction of Convergent Thinking is as follows:

A “society that does not waste” can be realized only when the following three axes operate organically:

- Science: Development of waste minimization technologies
- Social Sciences: Establishment of institutional and policy-based circular structures
- Humanities: Transformation of human desires and values

4.4. Proposal of Practical Alternatives

Table 2: Practical Alternatives

Activity	Goal	Details
Environmental Record Diary: Trash Diary	Recognition of waste generation levels	Recording and categorizing waste generated over one week and suggesting waste reduction strategies
Environmental Record Diary: Trash Diary Proposal for a Trash-Free Life: Zero-Waste Campaign Planning	Community practice	Planning an on-campus “Tumbler Week” or an “Unpackaged Shopping Challenge”
Circular Economy Hackathon: Solution Contest	Development of convergent solutions	Proposing waste recycling strategies that combine social science, engineering, and design perspectives
Eco-Art Workshop	Humanities- and Arts-based Reflection	Small-scale exhibition including artworks created using waste materials (production of upcycling artworks)

4.5. Self-Reflection and Expansion

In the final stage of the unit, students engage in reflective inquiry to critically examine their own consumption patterns and waste management practices.

mption habits, values, and social responsibilities related to waste and sustainability. They address the following questions:

- How aware am I of the act of “discarding”?
- Is reducing waste a matter of individual conscience or a social system?
- What is the boundary line separating “waste” from “abundance”?
- Can technological advancement alone solve waste issues in the face of ceaseless consumer desires

4.6. Design for Teaching and Learning Utilization

Table 3: Teaching and Learning

Item	Content
Study time	2 weeks (a total of approximately 6 hours)
Learning Method	Problem-Based Learning (PBL) + Project-Based Learning + Discussion
Faculty Activities	Provision of preliminary materials → Recycling experiment → Discussion and feedback → Project exhibition
Learning Assessment	Participation (30%) + Research Report (40%) + Reflection Essay (30%)
Learning Materials	Waste plastic samples, circular economy policy materials, upcycling case studies (videos)
Expansion Activities	Conducting a “Trash-Free Campus Campaign” in collaboration with the local community

4.7. Expected Learning Outcomes

- Convergent Thinking: Students will be able to analyze waste-related issues from integrated perspectives drawn from the humanities, social sciences, and natural sciences.
- Ethical Sensitivity: Students will recognize the social responsibilities embedded in everyday acts of thoughtless disposal.
- Creative Problem-Solving Skills: Students will be able to propose innovative alternatives for reducing waste generation through policy-based, technological, and cultural strategies.
- Will to Act: Students will practice sustainable consumption and adopt circular lifestyle habits in their daily lives.

5. Discussion: Establishing Fundamental Disciplines as a “Category of Knowledge”

This course intentionally adopts broad epistemic domains—the humanities, social sciences, and natural sciences—rather than subdivided individual disciplines as its primary

framework. This choice is grounded in the following educational and theoretical considerations.

First, convergence-oriented liberal arts education based on fundamental disciplines aims to achieve the “essential convergence of ways of thinking” rather than including them as separate academic fields. Therefore, our course emphasizes the logic and intellectual pathways through which knowledge is produced, rather than simply transmitting accumulated knowledge outcomes. Hence, we have redefined the categories of fundamental disciplines to clearly elucidate our original intent: education aimed at fostering convergent thinking.

Second, such education aligns with the educational goal of fostering creative problem-solving competencies and civic responsibility. Since our course seeks to cultivate reflective citizenship through convergent perspectives that transcend disciplinary boundaries, the establishment of broader epistemic categories is consistent with our objectives.

Third, as this course is designed for liberal arts education rather than specialized academic instruction, it focuses on “training in thinking based on fundamental disciplines.” Therefore, rather than simply presenting lists of individual disciplines, the course adopts a higher level of abstraction appropriate for the goals of liberal arts education.

Fourth, the conceptualization of foundational disciplines in this course closely aligns with recent trends in educational research. Contemporary discussions on liberal arts and convergence education have emphasized a shift in focus—from a knowledge-transmission-centered “discipline-based education” to the cultivation of “disciplinary ways of thinking” or “epistemic literacy.” From this perspective, our course demonstrates differentiated educational value by redefining foundational disciplines not as objects for knowledge accumulation but as sources/frameworks of thought.

6. Conclusion

This study proposes a new model of liberal arts education that addresses complex social issues based on an interdisciplinary and convergence-oriented approach. In particular, we focus on enhancing the intrinsic value of liberal arts education by redefining foundational disciplines not merely as introductory tools for specialized majors but as essential principles of thought and cognition.

The course developed in this study is significant because it serves as a practical alternative that overcomes the limitations observed in existing liberal arts education, including academic discontinuity and the limitations of mere knowledge transmission. Through a process-oriented learning framework—consisting of recognizing real-world problems, analyzing interdisciplinary perspectives,

engaging in convergent interpretation, proposing practical alternatives, and conducting self-reflection and expansion—learners confront real-world, everyday social issues. We demonstrate that learning grounded in fundamental disciplines is a highly effective and balanced teaching and learning model for cultivating integrated thinking skills, ethical insight, and collaborative capabilities. Furthermore, by incorporating the principles of PBL, Inquiry-Based Learning, and STEAM education, the curriculum encourages active learner participation and facilitates the transformation of abstract disciplinary concepts into practical problem-solving competencies. In particular, by concretizing interdisciplinary connections through topics directly related to life, such as the waste problem, this study holds significance in demonstrating that the integration of fundamental disciplines is not merely a theoretical discourse but a practical educational model that can be implemented in classroom settings.

In conclusion, the course developed through this study possesses strong potential as a standard model for liberal-arts higher education that simultaneously fosters convergent thinking and civic responsibility. More broadly, this study reconfigures the identity of university liberal arts education, moving beyond fragmented functional training and advancing toward “convergent education for understanding the world” grounded in fundamental disciplines.

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References

- Bang, G. C. (2018). A study on liberal arts education of convergence in the 4th industrial revolution era. *Korean Journal of Japanese Language and Literature*, 1(79), 63–89.
- Barrows, H. (1986). A taxonomy of problem-based learning methods. *Medical Education*, 20(6), 481–486.
- Choi, H. C. (2019). For the new paradigm of convergence of the liberal education. *Korean Journal of General Education*, 13(5), 153–170.
- Choi, Y. K., Oh, T. J., Lee, H., Lim, K. O., Hong, J. H., & Jeong, S. R. (2020). A study on creativity convergence competency for developing creativity human resources. *Journal of Korea Academia-Industrial Cooperation Society*, 21(1), 656–664.
- Dewey, J. (1938). *Experience and education*. Macmillan.
- Ennis, R. H. (1985). A logical basis for measuring critical thinking skills. *Educational Leadership*, 43, 44–48.
- Gong, S. Y. (2019). *Development of art-based STEAM education program: Focused on 6th grade in elementary school* [Master's thesis, Jeju National University Graduate School of Education].
- Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, 16(3), 235–266.
- Hymes, D. (1972). *On communicative competence*. University of Pennsylvania Press.
- Jho, H. K. (2017). The changes of higher education and the tasks of general education according to the fourth industrial revolution. *Korean Journal of General Education*, 11(2), 53–89.
- Johnson, D. W., & Johnson, R. T. (1999). *Learning together and alone: Cooperative, competitive, and individualistic learning* (5th ed.). Allyn & Bacon.
- Klein, J. T. (1990). *Interdisciplinarity: History, theory, and practice*. Wayne State University Press.
- Lee, H. Y. (2012). Development status of the convergent subject in general education and its development direction. *Korean Journal of General Education*, 6(4), 263–292.
- Lee, J. Y. (2020). A case study on the development of liberal arts lectures for the training of creative convergence talent. *The Journal of General Education*, 12, 227–256.
- Nussbaum, M. (2010). *Not for profit: Why democracy needs the humanities*. Princeton University Press.
- OECD. (2018). *The future of education and skills 2030*. OECD.
- Rest, J. R. (1986). *Moral development: Advances in research and theory*. Praeger Publishers.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.
- Sim, J. H., Lee, Y. R., & Kim, H. K. (2015). The issues facing STEAM in the Korean context. *Journal of the Korean Association for Science Education*, 35(4), 709–723.
- Sun, J. S. (2022). Current status and challenges of integrated liberal education in AI in the age of the fourth industrial revolution. *Study on Liberal Education Practice*, 6(1), 53–66.
- Torrance, E. P. (1974). *Torrance tests of creative thinking (TTCT)* [Database record]. APA PsycTests.
- Vygotsky, L. S. (1978). *Mind in society*. Harvard University Press.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press.
- Yakman, G. (2008). *STEAM education framework for teaching across disciplines*. Virginia Polytechnic and State University.
- Yoon, J. W., & Kim, M. S. (2025). Exploring the theoretical foundations and practical directions of liberal arts convergence education in higher education. *Studies on Humanities and Social Sciences*, 29(4), 277–303.
- Yun, M. H., & Oh, H. S. (2023). Exploring strategies for designing and operating discussion-based college interdisciplinary liberal education: The case of S university's interdisciplinary liberal courses. *Journal of Education & Culture*, 9(4), 277–303.