

Summary of Research Findings on Developing Competences in Bachelor's Degree Education to Address the Challenges of Contemporary Society (2021-2023)

Abstract

This study examined how Japanese universities are addressing societal expectations for undergraduate education in the 21st century. It aimed to identify effective initiatives for developing students' abilities to tackle contemporary societal challenges and to understand how universities are improving their undergraduate education in response to these expectations. Nationwide surveys of 374 universities and 750 human resources (HR) personnel of industry organizations, supplemented by interviews with five universities and two economic organizations, revealed that reforms tended to begin with general education and liberal arts programs, while leveraging faculty resources to embed relevant content into existing courses or create interdisciplinary clusters. Universities follow both institution-wide and unit-level processes, adapting existing decision-making structures to design new curricula. The study also highlighted a perception gap between universities and employers: although universities actively pursue reforms, their efforts are not always fully recognized by employers. Expanding communication between universities and society is therefore essential to align educational outcomes with societal expectations. In summary, Japanese universities are steadily advancing reforms to cultivate future-oriented competencies, but bridging the perception gap with society remains crucial for the further development of higher education.

1. Members of the Research Committee

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2. Objective

This study aims to examine how Japanese universities are responding to societal expectations for undergraduate education in the 21st century. Specifically, it has two main objectives:

- To identify notable initiatives for developing students' abilities to address contemporary societal challenges.
- To clarify how universities autonomously translate the current structure of undergraduate education, which consists of general and specialized education, into new curriculum designs in response to changing societal needs.

Through nationwide surveys of universities and corporate HR personnel, supplemented by in-depth interviews with selected universities and economic organizations, this study seeks to provide empirical evidence on current practices and reform processes. The findings aim to inform both institutional curriculum design and broader discussions on the future development of liberal arts education in Japan, highlighting effective approaches and potential gaps between university practices and societal expectations.

3. Methodology

This study employed a mixed-methods design consisting of a nationwide questionnaire survey, interviews with selected institutions and economic organizations, and a prior review of relevant practices and research to identify key elements of 21st-century liberal arts education.

3-1. Questionnaire Survey of Universities

A questionnaire survey was conducted with 787 national, public, and private universities in Japan (excluding graduate-level universities). The survey instrument included both multiple-choice and open-ended items designed to capture current practices in 21st-century liberal arts education. Respondents were asked about the perceived importance of key competencies, related curriculum structures, organizational reform efforts, and successful initiatives. Definitions of major terms, such as "21st-century liberal arts education," "STEAM," and "DX" were provided to ensure a shared understanding across institutions. A total of 374 universities responded (response rate: 47.5%). Table 1 summarizes the number of institutions surveyed and the responses received by institutional type.

Table 1. Distribution of Respondents by Institutional Type

Category	Total	National	Public	Private
Universities Surveyed	787	82	94	611
Responses Received	374	52	48	274
Response Rate	47.5 %	13.9 %	12.8 %	73.2 %

3-2. University Interview

Based on the results of the university questionnaire survey, five universities were selected for follow-up interviews, taking into account institutional size, type, faculties, and geographical location (one national university and four private universities). Semi-structured interviews were conducted online between August and September 2022.

3-3. Questionnaire Survey of Industry Organizations

To understand societal expectations regarding undergraduate competencies, an additional questionnaire survey was administered to companies, public organizations, and non-profit institutions. The survey was conducted online in May 2022 and targeted HR personnel aged 30 to 69. A total of 750 valid responses were obtained. The distribution of respondents by organizational type and gender is presented in Tables 2 and 3.

Table2. Distribution of Respondents by Organization Type

Category	Total	Companies (1,000 or more employees)	Companies (fewer than 1,000 employees)	Public and Non-Profit Organizations
Respondents (HR personnel)	750	250	250	250
Rate	100.0 %	33.3 %	33.3 %	33.3 %

Table 3. Distribution of Respondents by Gender

Category	Total	Male	Female
Number of Answers	750	661	89
Rate	100.0 %	88.1 %	11.9 %

3-4. Company and Organization Interviews

Based on the findings from the university and company questionnaire surveys, two economic organizations were selected for interviews, conducted between August and September 2022.

The range of companies, public institutions, and other organizations is broad in terms of industry and size, making it impractical to conduct interviews with individual companies across all types. Therefore, interviews focused on two organizations with extensive knowledge of corporate contexts and experience providing recommendations to universities. In addition to exploring expected competencies of graduates, perceptions of university education efforts, and alignment between employer expectations and actual student skills, the interviews aimed to understand the social and economic contexts behind survey responses, including changes in the external environment and the sense of urgency or challenges perceived by organizations.

4. Scope and Study Items

This study focused on undergraduate programs at Japanese universities and on employer expectations for graduate competencies, examining both educational practices and societal perceptions related to 21st-century liberal arts education.

4.1. University Questionnaire

The university questionnaire comprised both multiple-choice and open-ended items and collected basic institutional information, including university name, number of faculties and graduate schools, student enrollment, and disciplinary fields of faculties. Respondents were requested to evaluate the perceived importance of key competencies for 21st-century liberal arts education, such as data science, digital transformation (DX), STEAM, integration of arts and sciences, SDGs, ELSI, intercultural understanding, critical thinking, citizenship, agency, systems thinking, design thinking, and entrepreneurship. For each competency, respondents were asked to indicate whether relevant courses are offered and the extent to which these competencies are emphasized.

The survey further solicited information regarding initiatives designed to cultivate these competencies, including the responsible organizational unit, concrete examples, background and objectives, start date, efforts to disseminate practices through faculty development, associated organizational reforms, outcomes achieved, and challenges encountered. Definitions and explanations of key terms were provided to ensure a shared understanding across institutions.

4.2. University Interviews

The interviews explored the details, background, and purpose of ongoing initiatives; the

processes used to establish supportive structures; efforts to sustain initiatives (e.g., through faculty development or dedicated units); methods for monitoring and evaluating outcomes; current outcomes; initiatives related to diverse talent development; and the challenges and future prospects.

4.3. Company Questionnaire

Similar to the university survey, the company questionnaire examined respondents' perceptions of the importance of key competencies. It also investigated the relative importance of specific outcomes from four-year undergraduate programs, the criteria considered when hiring graduates, the methods used to assess students' acquired skills and competencies, and the channels through which employers communicate their expectations to universities.

4.4. Industry Organization Interviews

Interviews with two economic organizations were conducted to gain insights into employer expectations and challenges in human resource development. Topics included the competencies sought for 21st-century graduates, expected learning outcomes of undergraduate programs, the degree to which companies prioritize immediate job readiness versus long-term capability development, employer perceptions of universities' responses, evaluation and development systems, competencies lacking in Japanese graduates compared with international peers, initiatives related to diversity and talent development, collaboration with universities, and expectations of accreditation agencies.

5. Analysis

The collected data were primarily analyzed through simple tabulations and visualization. For the university survey, patterns in responses were examined in relation to institutional attributes, such as the number of students. Cross-tabulations were also conducted to examine the relationships between the implementation of faculty development (FD) programs or organizational reforms and the presence of specific initiatives.

For the company survey, response patterns were analyzed according to three respondent attributes: HR personnel from companies with 1,000 or more employees, HR personnel from companies with fewer than 1,000 employees, and HR personnel from public or non-profit organizations. The findings were further compared with other relevant corporate surveys to

provide contextual understanding.

6. Key Findings

6-1. Findings from University Questionnaire

[Awareness and Implementation of 21st-Century Liberal Arts Education Keywords]

- All 13 keywords were regarded as important, with strong interest in Data Science, Intercultural Understanding, SDGs, Critical Thinking, Citizenship, and DX.
- A modest gap existed between perceived importance and actual course offerings. National universities and institutions with five or more faculties tended to offer more related courses.
- Many course titles spanned multiple fields, reflecting efforts to utilize diverse faculty expertise to cover the keywords.

[Necessary and Actual Initiatives for 21st-Century Liberal Arts Education]

- Key necessary initiatives included revising general education, reviewing specialized curricula, and introducing new keyword-related courses.
- Actual initiatives aligned with these priorities but showed limited integration of keywords into existing syllabi, with efforts such as creating university-wide structures for liberal arts education, introducing new interdisciplinary courses, and embedding quantitative/data science components.

[Decision-Making and Organizational Involvement]

- Revisions of general education were mainly led by dedicated university-wide or liberal arts organizations. Specialized curriculum reforms were primarily conducted at the faculty or departmental level.
- Cross-faculty or university-wide bodies were commonly involved, indicating reforms required multi-unit collaboration.

[Motivations and Drivers]

- General education reforms were led by university-wide bodies, while specialized reforms were handled at the faculty level.
- Reforms were concentrated in 2016–2021. About half the universities conducted FD programs, which were linked to more concrete implementation.
- Around 40% undertook organizational reforms, and these institutions showed more

substantial educational initiatives.

[Outcomes and Challenges of Initiatives]

- Reported outcomes included strengthened interdisciplinary learning, such as interdisciplinary courses fostering critical and analytical thinking, ESTEAM-based cross-disciplinary programs, and expanded double-major or major–minor options.
- Challenges included securing faculty, curriculum design, operational support, and building internal consensus.

6-2. Findings from University Interview

[Reorganization of University Education in Response to Societal and Student Needs]

- Universities reorganized undergraduate education to respond to societal and student changes, while accounting for each institution’s history and mission.
- Initiatives emerged from long discussions among faculty and administration, reflecting each university’s specific situation and institutional mission.

[Integration of Societal Issues and Interdisciplinary Frameworks]

- Societal issues drove the introduction of interdisciplinary education and SDG-related frameworks.
- Support structures and awareness-building efforts were developed in parallel.

[Implementation and Institutionalization]

- Initiatives began within responsible units and gradually became institutionalized.
- The process led to observable outcomes, demonstrating the integration of new approaches into the university’s education system.

[Challenges]

- Common challenges included limited personnel resources.
- Variations in faculty and staff awareness hindered implementation.
- Existing organizational structures and FD/SD systems were often insufficient to fully support reforms.

[Implications for Leadership and Support Structures]

- Redefining graduate competencies may be necessary to align with societal needs.
- Presidential leadership and coordinated curriculum management are important.

- Specialized educational development and learning-support personnel may be required for sustained reform.

6-3. Findings from Industry Organization Questionnaire

[Emphasis on Competencies and Liberal Arts Education Keywords]

- Industry organizations valued public-mindedness, social responsibility, citizenship, and the SDGs, while areas such as Integration of Arts and Sciences and STEAM were lower priorities.
- Global competencies (e.g., English proficiency, intercultural understanding) were not highly valued, likely reflecting the domestic orientation of many respondents.

[Competencies Valued in University Education and Hiring]

- Logical thinking, problem-solving, domain knowledge, application skills, and data analysis were highly valued, while behavioral attributes such as collaboration, ethics, flexibility, initiative, and willingness to take on challenges were also emphasized.
- Leadership, motivation, stress tolerance, and lifelong learning were particularly important in hiring.
- These competencies were viewed as difficult to develop through lectures alone and more effectively fostered through active or project-based learning and internships.

[Evaluation Methods for University Learning Outcomes]

- Individual interviews were the most common evaluation method (about 90%).
- Group discussions, presentations, and written assessments were used far less frequently.

[Communication Gaps in Conveying Expectations to Universities]

- Expectations for students were typically communicated through student-facing company briefings rather than directly to universities, indicating limited dialogue between universities, industry, and government.

[Response Patterns by Organization Type and Size]

- Large companies emphasized key competencies most strongly, followed by public/non-profit organizations, while smaller companies assigned comparatively lower importance.
- Public/non-profit organizations prioritized public-mindedness and social responsibility but placed less emphasis on entrepreneurship.
- All organization types emphasized domain-specific knowledge, application ability, and problem-solving, with public/non-profit organizations placing higher value on behavioral

attributes such as initiative, ethics, motivation, and leadership.

6-4. Findings from Industry Organizations Interviews

[Future-Oriented Competency Development]

- Industry representatives emphasized developing talent able to anticipate societal and economic changes, highlighting *Sōzō-ryoku* (creativity + imagination) as essential for creating new value and addressing social challenges.

[Expectations Beyond Disciplinary Knowledge]

- Employers now expect students not only to acquire disciplinary knowledge but also to develop values that guide decisions in complex, cross-cultural, and socially embedded contexts, applying their knowledge through *Sōzō-ryoku* to real-world issues.

[Observations on Japanese Students]

- Japanese students were perceived as having lower tolerance for diversity and weaker cross-cultural understanding than foreign students or graduates of overseas universities.

[Role of 21st-Century Liberal Arts Education]

- 21st-century liberal arts education was seen as fostering dialogue on societal issues grounded in humanistic perspectives, with universities appropriately emphasizing different elements according to their mission and discipline.

[Shifts in University Expectations]

- Employers reported rising expectations for universities to help students understand societal and cultural contexts, cultivate values that guide decision-making, and apply their knowledge with *Sōzō-ryoku* to address challenges beyond disciplinary boundaries.

7. Conclusion

This study provides a comprehensive view of how Japanese universities are responding to societal expectations for undergraduate education in the 21st century. It combines findings from nationwide surveys of universities and HR personnel in industry organizations with in-depth interviews of selected universities and economic organizations. The findings reveal both progress and gaps in aligning university education with contemporary societal needs.

First, the competencies that society expects students to acquire have evolved significantly over time. Skills and knowledge associated with digital transformation (DX), ELSI, sustainability, and global awareness are increasingly emphasized, reflecting societal and economic changes. Universities are actively responding to these demands by reforming their curricula, particularly through common education and liberal arts courses, while also integrating specialized education. Initiatives often start by leveraging existing faculty resources, embedding key competencies into current courses, or grouping related subjects to create interdisciplinary offerings. These approaches form a model for implementing 21st-century liberal arts education that connects liberal arts and specialized domains.

Second, the process of curriculum reform demonstrates that universities exercise considerable autonomy while adapting to existing institutional structures. Educational reforms are typically deliberated within responsible units and subsequently shared across the university. This approach aligns with traditional decision-making processes in Japanese universities, allowing institutions to implement new educational designs while working within existing frameworks. Although challenges such as limited HR, varying awareness and engagement among faculty and staff, and sustainability concerns persist, universities have been able to make meaningful progress.

Third, despite these efforts, a gap remains between universities' educational initiatives and the perceptions of employers. While companies and other organizations value competencies such as logical thinking, problem-solving, domain-specific knowledge, and creative application of knowledge, the degree to which university reforms are recognized externally varies. Employers also highlight the importance of emotional and behavioral attributes, including collaboration, ethics, initiative, and adaptability, which are cultivated through active learning, project-based learning, and internship experiences rather than traditional lecture-based instruction. Furthermore, many employers convey their expectations regarding students' learning outcomes and competencies indirectly through recruitment events rather than directly to universities, suggesting that communication on these aspects between academia, industry, and government remains limited.

Finally, this study underscores the critical need to enhance communication between universities and society. Expanding the dialogue around learning outcomes, graduate competencies, and the broader objectives of higher education may help bridge the understanding gap and support the continued development of undergraduate education in Japan. The findings suggest that



universities are making considerable efforts to respond to societal needs, but further engagement with employers and other stakeholders is essential to fully realize the potential of 21st-century liberal arts education.