The Challenges of Interdisciplinary Education for Digital Humanity

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# Future Jobs Survey 2018

## Stable Roles
- Managing Directors and Chief Executives
- General and Operations Managers*
- Software and Applications Developers and Analysts*
- Data Analysts and Scientists*
- Sales and Marketing Professionals*
- Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
- Human Resources Specialists
- Financial and Investment Advisers
- Database and Network Professionals
- Supply Chain and Logistics Specialists
- Risk Management Specialists
- Information Security Analysts*
- Management and Organisation Analysts
- Electrotechnology Engineers
- Organizational Development Specialists*
- Chemical Processing Plant Operators
- University and Higher Education Teachers
- Compliance Officers
- Energy and Petroleum Engineers
- Robotics Specialists and Engineers
- Petroleum and Natural Gas Refining Plant Operators

## New Roles
- Data Analysts and Scientists*
- AI and Machine Learning Specialists
- General and Operations Managers*
- Big Data Specialists
- Digital Transformation Specialists
- Sales and Marketing Professionals*
- New Technology Specialists
- Organizational Development Specialists*
- Software and Applications Developers and Analysts*
- Information Technology Services
- Process Automation Specialists
- Innovation Professionals
- Information Security Analysts*
- E-commerce and Social Media Specialists
- User Experience and Human-Machine Interaction Designers
- Training and Development Specialists
- Robotics Specialists and Engineers
- People and Culture Specialists
- Client Information and Customer Service Workers*
- Service and Solutions Designers
- Digital Marketing and Strategy Specialists

## Redundant Roles
- Data Entry Clerks
- Accounting, Bookkeeping and Payroll Clerks
- Administrative and Executive Secretaries
- Assembly and Factory Workers
- Client Information and Customer Service Workers*
- Business Services and Administration Managers
- Accountants and Auditors
- Material-Recording and StockKeeping Clerks
- General and Operations Managers*
- Postal Service Clerks
- Financial Analysts
- Cashiers and Ticket Clerks
- Mechanics and Machinery Repairers
- Telemarketers
- Electronics and Telecommunications Installers and Repairers
- Bank Tellers and Related Clerks
- Car, Van and Motorcycle Drivers
- Sales and Purchasing Agents and Brokers
- Door-To-Door Sales Workers, News and Street Vendors, and Related Workers
- Statistical, Finance and Insurance Clerks
- Lawyers

Note: Roles marked with * appear across multiple columns. This reflects the fact that they might be seeing stable or declining demand across one industry but be in demand in another.
Japan Rethinks Higher Education in Skills Push

Wall Street Journal: 2015/08/02

Liberal arts will be cut back in favor of business programs that emphasize research or vocational training

- Prime Minister Shinzo Abe’s goal is to transform Japan’s government-funded universities into either global leaders in scientific research or schools focused on vocational training. He has called on them to “redefine their missions” and restructure their curricula.

- Japan’s former Minister of Education, Culture, Sports, Science and Technology Shimomura Hakubun had asked Japan’s 86 public universities to reevaluate their organization and work, and to emphasize on their specialties and their contribution to society. He also formally suggested that universities abolish their colleges in humanities, education etc. Future government funding will be based on how much each university’s plan corresponds with those of the government. Given 70% of public university funding comes from the government, these universities have little choice but to comply.

- According to a survey conducted by NHK, published on July 17, over 80% of Japan’s public universities are planning to merge or abolish their humanities colleges. Some universities are also planning to decrease the number of students in humanities as a response to the declining birthrate.
The different viewpoints from humanity

- A government report of Swiss at 2013
  - The unemployment rate of graduation of humanity is lower than other 5 years after graduation.
  - Unemployment Rate is not related to the setup of Academic departments
  - In the case of the University of Lucerne, for Master’s graduates in languages studies, their unemployment rate 1 year after graduation is 5%, and for all graduates, it’s 6%.

- Alain Boillat, Dean of the Faculty of the Arts, University of Lucerne, Swiss
  - The learning and research in Humanities and Social Sciences can provide people with a holistic understanding of the world
  - The research of humanities and social sciences are rooted in problems faced by the current society.
  - The problem with humanities is that it requires long term internalization and the ability to transfer such knowledge into practice before we can see their impacts in our economy or our daily lives. This makes their impact difficult to see.
Digital Economy – Human Resource Trend Report

20170227

104 Human Resource Bank
Finding 1

Digital Economy related Job growth in the last 5 years is 120%. The impact was observed across all sectors, as digital economy is characterized by cross industry innovation and integration.

Finding 2

Top 13 jobs in the digital economy: Software jobs still tops the chart, but artistic designs, marketing, and financial jobs are also in great demand.

Finding 3

Lots of opportunities in Information Management. Humanities as well. Master’s degree is not a must in the digital economy.

Finding 4

Competency in Digital skills can greatly enhance pay (up to 70% higher)

Finding 5

The Ability to Analyze Data is common across all jobs. Knowing human nature is the only way to success.
Among job positions that accept applicants with no prior work experience, 80% have no university major requirement.

2016 Job Openings for New College Graduates, 796,000 positions

- New College Graduates, specific majors only (128,000 openings, or 16%)
- New College Graduates, all majors welcomed to apply (668,000 openings, or 84%)
Since Website Marketing Specialists, Game Planners require editing and writing skills, many employers have also hired Chinese-Language majors. Humanities majors can also work in the Digital Industry.
Marketing/Website Planner

- Responsible for marketing planning, to enhance company image and product competitiveness through commercials, PR efforts etc.

- Website Planner will manage the planning and online marketing of the company; increase visits to the website, number of members, and the sales of our products.

- Since the Internet is a critical medium for promotions and information gathering, ideal candidate will possess the following skills: image/video processing, ability to accurately capture real-time online trends and opinions, analysis of social media management.
Game Planner

Transform history into game context, utilize history to form characters, storyline, and challenges; create an authentic and immersive environment to allow players to reenact historical events as the lead character.
Commercial Technical Writer

Create, write, and edit client promotional projects/texts, and publish such works via mass media.
Digital Learning Material Editor

To convey knowledge and information through pictures, videos, or animation/games instead of pure text.
Analytical Linguist

Label text/words by their parts of speech, grammar rules, pronunciation principles, etc. for the construction of lingual database, to enable computers to accurately identify and understand what real people mean, and pronounce and answer questions.
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Challenges and Developmental Trends in Higher Education

- Globalized Competition
- Rapid Development of New Digital Technology
- Low Birth Rate
- Changes in the Skills Needed in the Job Market
- Digital Transformation, Online Education
- International Student Recruitment
- College Mergers and Acquisitions
- Industry-Academia Linkage
Teaching & Learning in the Humanities

• The value of education in the humanities should not be written off

• In the face of new technology and its impact on the global job market, there are several problems humanities education needs to resolve:

  1. Low information technology understanding and competency among humanities students
  2. Low acceptance of digital instruction among humanities instructors
  3. Weak linkage with industry among humanities instructors and students
  4. Humanities research and learning is more personal and not as much team-work oriented.
Some Policies that can change learning of students, teaching & research of teachers in Humanities of NTNU
Develop computational thinking and cultivate programming ability through group work.
Launch Computational Thinking and other CT+X courses, Customized based on the needs of each college, to Develop professional programming and application abilities

- Started offering Computational Thinking courses in 2017; visualized the implementation of computational thinking and problem solving process. Launched Instructors’ professional community for computational thinking. Researched and created an online practice platform. The number of non-science and engineering students who took CT courses has continued to increase in the last 3 years. In 2018, 41% of Freshmen took CT related courses. Overall, 41% of the undergraduate students took CT courses.

CT Course Feedback

- My computational thinking skills have been enhanced
  - Agree 42%
  - Strongly Agree 49%

- I have acquired basic programming skills
  - Agree 38%
  - Strongly Agree 53%

- I have acquired skills that allow me to solve problems through programming
  - Agree 40%
  - Strongly Agree 46%

Ratio of Science/Engineering colleges vs. Non-science/engineering colleges students taking CT courses

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<thead>
<tr>
<th></th>
<th>Science &amp; Engineering Colleges</th>
<th>Non-Science &amp; Engineering Colleges</th>
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<tbody>
<tr>
<td># of Students, Fall 2018</td>
<td>382</td>
<td>210</td>
</tr>
<tr>
<td># of Students, Spring 2019</td>
<td>201</td>
<td>223</td>
</tr>
<tr>
<td># of Students, Fall 2019</td>
<td>214</td>
<td>281</td>
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Applied Information Science Certificate Program

**Common Core**

**Computational Thinking & Programming**

**Programming Related Courses**

**Science, Tech & Engineering**

- Mobile App Programming & Development
- Introduction to Internet of Things and its Applications
- Science and Programming
- Data Science & Programming
- Information Systems

**Edu, Soc. Sci., Management, Sports & Rec**

- Database Management
- Statistical Analysis
- Applications in Education

**Liberal Arts, Arts, Music**

- Courses in Digital Humanities & Arts

**Specialization Courses**

- Applied Information Technology Certificate Program
- Techniques & Applications in Artificial Intelligence Certificate Program
- Learning and Information Certificate Program
- Digital Humanities and Arts Certificate Program
Encourage Interdisciplinary Learning: Reform Rules on Double Major, Minor, and Certificate Programs
Reforming General Ed. Requirement towards Interdisciplinary Learning

Foundational Competence / 10 Credits
- Chinese Language – Reading & Speculative Philosophy, Writing & Expressions (4 credits)
- English (6 credits)

Liberal Arts / 8-14 Credits
- Humanities & Arts
- Social Sciences
- Natural Sciences
- Logics & Computation

Cross-Disciplinary Exploration 4~10 Credits
- College General Ed. (First course for all Double Major and Minor Students)
- Cross-Disciplinary Course (First course for all Double Major and Minor Students)
- Introduction to University Life and Learning

Self-Directed Learning / 0-6 Credits
- Themed Inquiries
- MOOCs (NTNU、Coursera、Udacity & edX)
AR/VR Textbook
Industry Internship Requirement

Students are required to have industry internship experience before graduation.
Learning Technology
Online Courses and Tools

**Asynchronous**

LMS (Moodle)
- PPT, Notes
- Reading Material
- Assignments/Online Tests
- Interactive Discussion
- Reference Material
- Exams and other Assessment

**Asynchronous**

LMS

Record Lectures
- Cell Phone
- EverCam
- Zoom
- Upload to Office365-Stream
  - YouTube
  - Upload to Moodle
  - Moodle Link

**Synchronous**

Live Courses
- Cell Phone
- U Meeting /U Webinar
- Zoom/ Microsoft Teams
- Adobe Connect
- Skype conference
- Youtube live
Libraries Services for Research of Digital Humanity

**Infrastructure to Support Research**

- Digital Archives
- Digital Learning Platform & Tools
- Digital humanities research platform
  - NTU DocuSky (humanities research platform)
  - Academic Sinica digital humanities research platform
- Taiwan Digital Humanities Forum

**User Education**

- Data literacy
- Digital learning tools
- Tool training/instruction
- Digital humanities research platform training (GIS, Visualization, data mining)
- Author’s right
- Publication outlets, dissemination channel, self-archiving
- Impact assessment
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本平台由國立臺師大學數位人文研究中心、資訊工程學系數位典藏與自動推論實驗室規劃，並由郭俊宏博士設計開發。

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關於數位人文研究平台

中央研究院數位文化中心根據人文研究的需求，發展協同學者提升研究質量的數位化工具與平臺，期望結合研究者、研究資料與研究工具之效，擴大研究的規模及縮短研究的時間，以提升人文研究的品質。數位人文研究平台提供一個完整的研場環境，讓研究者可以透過雲端服務取得研究中所需的資料與工具。研究者可上傳文本與圖像，也可使用平台中其他開放的文本與圖像資料來進行研究。數位人文研究平台具有自動標記文本的功能，並可使用組織方式分類標記詞。標記文本完成後，可進行標記詞與XNPLX可視化統計，以呈現空間關係，再統計相關性。文字雲、社會網絡分析圖、地圖等資料視覺化方式呈現。此外，平台提供相似內容比對、正規表示法查詢、多圖間距查詢與統計辭典功能，讓研究者可以更容易地進行研究。

- 資料集：本集中心研究資料庫所匯集的資料(2048位元)。文獻強化資料庫(Kanripo)文本(513位元)。學術論文資料庫(中文哲學電子化計圖Class(256位元)人名/識辨/標記工具，提供研究者基礎的研究素材。

- 時間標記：提供多人可共同標記文本、標記詞、標題與文字的標記工具，讓研究者可依不同的研究對象，形成不同的研究社會。

- 內容複雜：提供文本分析與內容標記，可進行文本瀏覽、標題與文字的標記與統計查詢，並可對文本與標記詞進行統計分析，讓研究者可以依內容提供最重要的詞、標記詞等。

- 資料分析：為文件長度、標記詞數、標記詞像素、詞頻變化圖、共詞網狀分析等，讓研究者可以從大規模資料中優化資料中的研究類別。

- 檢索系統：提供同義詞、異音詞、文獻、社會關係分析圖、地理資訊系統等工具，以圖形方式呈現文本分析之結果，讓研究者可以更直接地將資料中隱含的現象。

數位人文研究平台主要功能：
1. 上傳個人的文本與標記詞，亦可匯入其他系統的資料(匯入電子文獻資料庫、中哲哲學電子化資料庫、Kanripo 資料)
2. 加入平台中其他人開放的資料，或將自己的資料開放分享
3. 網頁與行動装置下載
4. 選出與複雜的查詢(正規表示式查詢、多圖間距查詢等)
5. 比對相似文本
6. 詞頻統計(標記詞、N-Gram)
7. 時間標記與統計
8. 資料視覺化(直方圖、網絡圖等)
9. 設定整合呈现(GIS)

此外，我們也持續發展數位人文研究的相關工具與技術，包含結合開放資料(Linked Open Data, LOD)、國際間圖像互操作框架(International Image Interoperability Framework, IIIF)、中文語法圖像文字辨識技術(Optical Character Recognition, OCR)、命名實體區別技術(Named Entity Recognition)等技術與工具發展成熟後，我們將開放工具與服務供研究者使用。

http://dh.ascdc.sinica.edu.tw/member/
Funding Project for Education of Humanity and Social Sciences from Government

Subsidy
The Challenges of Interdisciplinary Education and Research for Digital Humanity

• Only a few humanities students dared to cross over to the Science, Technology, and Engineering fields.

• In humanities departments, only a few instructors with science and technology background participated in the digital humanities project.

• Solving complex social problems requires both a technology mind and a humanities heart.

• Academic librarians can help students and faculty of humanity cross over more and better than before.
Thank you
Welcome any comments