

# Mapping Health Informatics Education and Industry Job Competencies in the United States: Literature Trends and A Case Study

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## Introduction

The health informatics (HI) field is highly interdisciplinary and always evolving with rapid changes in health information technologies. The HI curricula shall be reviewed and updated regularly to meet workforce needs and equip graduates with essential knowledge and skills for career development and success. Existing synthesis on HI education has focused on core competencies and skills across general career pathways and mapping professional skills to a UK or Canadian HI healthcare context or frameworks<sup>1,2</sup>. Since healthcare policy and industry vary in settings and countries, there is a gap in synthesizing HI education in the context of the United States (US) and capturing the demands and requirements of its unique healthcare industry. Therefore, this study addressed this gap by exploring two research questions (RQs). RQ1: What HI competencies and skills are specific to US HI industry jobs? RQ2: How well does the current HI education align with US industry requirements? The results from this study have informed our institutional HI curriculum updates for master's-level degrees, providing insights for other programs regarding updating curricula to meet the healthcare industry demands.

## Methods

This study took a multi-source comparative analysis to address the RQs. (1) We conducted a systematic literature review<sup>3</sup> adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for comprehensive literature search, results aggregation and deduplication, study selection, and reporting. (2) We applied key search terms from the literature review to a job search on Indeed.com in November 2024, limiting the job postings to North Carolina, where our institution is situated. The industry-required job qualifications and skills stated in job postings were manually collected and analyzed descriptively. (3) We collected our HI program graduates' job data (e.g., degree, job title, employer) from curated records and updated them by checking their LinkedIn profiles. Finally, we mapped the analysis from each method to the American Medical Informatics Association (AMIA) core competencies<sup>4</sup> for applied health informatics education at the master's degree level for cohesive insights for our HI master's-level curricula updates.

## Results

We identified 12 eligible studies published from 2014 to 2024 across seven health informatics journals and conference proceedings. AMIA core competencies F2 and F4 were consistently identified as top US industry-required competencies, appearing in over 80% of included studies (Table 1). More than half of the studies disclosed the misalignment between industry needs and academic HI education. Our search at Indeed.com identified 47 eligible HI-related job postings within a 15-day job posting search range. The top-ranked job competencies were F1 (77% of the job postings), F8 (68%), and F2(64%). Our institutional HI program has 185 master's level graduates so far, and 97 of their job data are available, highlighting F2 (58% of job records) and F1 (45%) as two core competencies.

**Table 1.** Heat map of identified industry job competencies mapped to AMIA Core Competencies.

| AMIA Core Competencies                                                         | Literature Review | Local Indeed Job Postings (Nov. 2024) | Institutional HI Graduates Job |
|--------------------------------------------------------------------------------|-------------------|---------------------------------------|--------------------------------|
| F1. Health                                                                     | 0%                | 77%                                   | 45%                            |
| F2. Information Science and Technology                                         | 83%               | 64%                                   | 58%                            |
| F3. Social and Behavioral Science                                              | 0%                | 0%                                    | 0%                             |
| F4. Health Information Science and Technology                                  | 92%               | 28%                                   | 11%                            |
| F5. Human Factors and Socio-Technology                                         | 8%                | 0%                                    | 2%                             |
| F6. Human Factors and Socio-technical Systems                                  | 17%               | 2%                                    | 0%                             |
| F7. Social, Behavioral, and Information Science & Technology Applied to Health | 0%                | 0%                                    | 0%                             |
| F8. Professionalism                                                            | 42%               | 68%                                   | 2%                             |
| F9. Interprofessional Collaborative Practice                                   | 17%               | 4%                                    | 0%                             |
| F10. Leadership                                                                | 50%               | 38%                                   | 24%                            |

## Discussion and Conclusions

This study identified F2 Information Science and Technology as the top core competency across the three sources we examined and a misalignment between industry needs and academic programs, consistent with similar studies based on non-US health settings<sup>1,2</sup>. This study highlighted the latest industry-driven HI competencies and offered evidence-based guidance for educators and employers on developing and strengthening the HI workforce in the US context.

## References

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