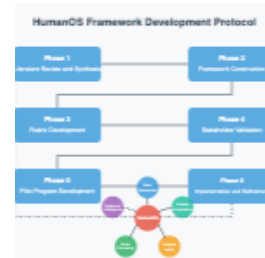


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Developing the HumanOS Framework for Structural Intelligence in AI-Integrated Environments

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Abstract

The development of human capabilities that complement artificial intelligence (AI) requires a systematic approach, especially in healthcare and higher education where AI is rapidly transforming professional roles. This protocol outlines a six-phase methodology for developing HumanOS, a novel framework that reconceptualizes traditional "soft skills" as structural intelligence in AI-integrated environments. The process includes: (1) comprehensive literature review and synthesis across multiple disciplines; (2) framework construction with five interconnected domains; (3) development of three-tier performance rubrics for assessment; (4) validation through multi-stakeholder engagement; (5) design of a 10-week pilot curriculum; and (6) initial implementation and refinement based on empirical feedback. This rigorous approach ensures that the resulting framework is theoretically grounded, practically relevant, and empirically validated. The HumanOS framework provides educators, leaders, and institutions with actionable tools to cultivate the human capabilities that remain irreplaceable in an AI-augmented future, focusing specifically on relational intelligence, moral processing, adaptive agility, creative computation, and meta-awareness.



Image Attribution

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Guidelines

Target Users

This protocol is designed for researchers, educators, and curriculum developers in healthcare and higher education who are interested in developing frameworks for human capabilities in AI-integrated environments.

Level of Expertise Required

- Advanced understanding of competency frameworks in professional education
- Working knowledge of qualitative research methods
- Familiarity with curriculum design and assessment development
- Basic understanding of AI applications in professional contexts

Limitations

- The protocol focuses specifically on healthcare and higher education contexts; other sectors may need adaptations.
- Development timeline estimates (8-12 weeks per phase) may vary depending on institutional resources and stakeholder availability.
- Framework validation requires diverse stakeholder engagement, which may be challenging to coordinate

Materials

- Access to academic databases and literature repositories
- Qualitative data analysis software (e.g., NVivo, ATLAS.ti)
- Project management tools
- Collaborative document platforms
- Virtual meeting software
- Survey and assessment tools
- Visual design software for framework representation



Safety warnings

- Ensure proper data management practices when collecting stakeholder feedback.
- Consider privacy and confidentiality when documenting case examples
- Be mindful of potential biases in framework development that could impact different demographic groups

Ethics statement

This protocol for developing the HumanOS framework has been designed with careful consideration of ethical principles relevant to educational research and professional development. The following ethical considerations have been integrated throughout the development process:

Respect for Autonomy and Informed Consent

- All stakeholders participating in validation workshops, feedback sessions, and pilot implementations will be provided with clear information about the purpose, process, and potential implications of the HumanOS framework.
- Informed consent will be obtained from all participants prior to engagement.
- Participants will be informed of their right to withdraw from the process at any point without negative consequences.

Equity and Inclusion

- The framework development team will include diverse perspectives regarding professional background, demographic characteristics, and institutional roles.
- Stakeholder engagement will prioritize the inclusion of voices from underrepresented groups in both healthcare and higher education.
- The framework will be designed to minimize potential biases that could disadvantage specific groups or reinforce existing inequities.
- Assessment rubrics will be evaluated for cultural sensitivity and contextual appropriateness.

Data Privacy and Confidentiality

- All feedback and assessment data will be anonymized and aggregated when reported.
- Personal identifiers will be removed from participant contributions used in framework development.
- Secure data management protocols will be followed for all stakeholder input and pilot implementation data.
- Institutional review board approval will be obtained as required for stakeholder engagement activities.

Beneficence and Non-maleficence

- The HumanOS framework is designed to benefit professionals navigating AI-integrated environments by providing structured development opportunities for essential human capabilities.
- Care will be taken to ensure that implementation does not create undue burden on participants or reinforce harmful stereotypes.
- The framework will be developed with sensitivity to potential psychological impacts of assessment processes.
- Feedback mechanisms will be established to identify and address any unintended negative consequences.

Intellectual Property and Attribution

- Sources used in framework development will be properly cited and acknowledged.
- Clear attribution guidelines will be established for collaborative elements of the framework.
- Open-access principles will guide dissemination of framework materials where possible, while respecting institutional intellectual property policies.



Transparency and Accountability

- The development process will be documented transparently, including methodological decisions and rationales.
- Limitations of the framework will be clearly communicated.
- Regular reporting to stakeholders will maintain accountability throughout the development process.
- A mechanism for ongoing revision based on implementation feedback will be established.

Before start

PLANNING

Establish a multidisciplinary development team that includes:

- Subject matter experts from healthcare and higher education
- AI/technology specialists
- Curriculum designers and assessment experts
- Individuals with diverse perspectives and backgrounds

Secure institutional support:

- Identify executive sponsors
- Establish resource commitments
- Determine timeline and milestones
- Create a project management structure

Prepare stakeholder engagement strategy:

- Map key stakeholder groups across sectors
- Develop engagement approaches for each group
- Create communication materials about project's purpose
- Establish feedback collection mechanisms

Conduct preliminary scoping:

- Identify initial literature search parameters
- Document assumptions and guiding questions
- Establish conceptual boundaries
- Determine prioritization criteria for framework elements

TIMING CONSIDERATIONS

- **Total estimated timeline:** 50-70 weeks
- Plan for potential delays in stakeholder engagement phases
- Allow extra time for revision cycles based on feedback
- Consider academic calendars when scheduling validation activities
- Build in regular reflection points for the development team



Phase 1: Literature Review and Synthesis

8w

- 1 Define search parameters
 - Identify key search terms: "soft skills," "human capabilities," "AI integration," "professional competencies," "healthcare education," "higher education"
 - Select relevant databases: PubMed, ERIC, Web of Science, Scopus.
- 2 Conduct a comprehensive literature review.
 - Review existing frameworks (e.g., CanMEDS, AAC&U VALUE rubrics)
 - Analyze AI impact literature in healthcare and education
 - Identify studies on human-AI collaboration
 - Examine competency models in related fields
- 3 Extract and code key competencies.
 - Use qualitative coding software to identify recurring themes
 - Map competencies across frameworks
 - Identify gaps in existing models regarding AI integration
- 4 Synthesize findings.
 - Create preliminary competency clusters.
 - Document conceptual relationships between competencies
 - Identify cross-cutting themes and potential domains.

Phase 2: Framework Construction

6w

- 5 Develop initial domain structure
 - Draft domain definitions based on synthesis of literature
 - Identify 3-5 core competencies within each domain
 - Map interrelationships between domains
- 6 Refine conceptual architecture
 - Ensure domains are distinct yet complementary
 - Verify comprehensiveness of framework
 - Test internal consistency of domain definitions
- 7 Create visual representation
 - Design visual model depicting framework architecture



- Develop accompanying one-page summary
- Create presentation materials for stakeholder engagement

8 Draft theoretical foundation document

- Articulate rationale for structural vs. soft skills framing
- Connect framework to existing theories
- Document anticipated applications in target sectors

Phase 3: Rubric Development

8w

9 Define performance levels

- Establish three-tier structure (emerging, developing, proficient)
- Draft general descriptors for each level
- Ensure developmental progression across levels

10 Develop competency indicators

- For each domain, identify 3-4 observable behaviors
- Draft specific performance indicators for each competency
- Create behavioral anchors for each proficiency level

11 Refine rubric language

- Ensure clarity and accessibility of language
- Remove ambiguous or subjective terminology
- Standardize format across domains

12 Create assessment guidelines

- Develop instructions for rubric application
- Create sample assessment scenarios
- Draft feedback templates aligned with rubrics

Phase 4: Stakeholder Validation

10w

13 Identify stakeholder groups

- Healthcare educators and simulation faculty
- Academic leadership trainers
- AI ethics advisors and policy specialists
- Higher education curriculum designers
- Graduate learners from interprofessional programs



14 Conduct validation workshops

- Present framework and rationale
- Facilitate structured feedback sessions
- Document suggestions and critiques

15 Collect and analyze feedback

- Code qualitative feedback by theme
- Identify areas of consensus and divergence
- Prioritize revision recommendations

16 Revise framework and rubrics

- Update domain definitions based on feedback
- Refine competency indicators and performance levels
- Adjust visual model to reflect changes

Phase 5: Pilot Program Development

17 Design curriculum structure

- Create 10-week modular program
- Align learning activities with framework domains
- Develop assessment strategy using HumanOS rubrics

18 Develop learning activities

- Create domain-specific experiential exercises
- Design reflection prompts and discussion guides
- Develop case studies relevant to target sectors

19 Create facilitator materials

- Develop facilitator guide with session plans
- Create slide decks and supporting materials
- Draft troubleshooting guidance

20 Establish evaluation protocols

- Design pre/post assessment instruments
- Create participant feedback mechanisms
- Develop data collection procedures for pilot evaluation

Phase 6: Initial Implementation and Refinement

12w



21 Conduct pilot program

- Implement 10-week curriculum with target participants
- Collect ongoing feedback and assessment data
- Document implementation challenges and adaptations

22 Analyze pilot outcomes

- Evaluate participant growth using HumanOS rubrics
- Analyze qualitative feedback on framework utility
- Identify strengths and weaknesses in implementation

23 Refine framework and materials

- Update rubrics based on assessment findings
- Revise curriculum based on facilitator experience
- Enhance supporting materials based on participant feedback

24 Document implementation guidance

- Create comprehensive implementation manual
- Develop sector-specific adaptation guidelines
- Establish ongoing feedback and improvement mechanisms

Protocol references

- American Hospital Association. (2023). AI and the Health Care Workforce
- Association of American Colleges & Universities (AAC&U). (2022). VALUE Rubrics.
- Brookfield, S. (2017). *Becoming a Critically Reflective Teacher*. Jossey-Bass.
- Canadian Medical Education Directives for Specialists (CanMEDS). (2022). CanMEDS Framework.
- Choudhury, A. (2022). A sociocognitive framework for clinician-AI collaboration. *JMIR Human Factors*.
- Filo, R., & Mor, Y. (2024). Co-developed AI competency framework for teachers and students. *Journal of AI in Education*.
- Goleman, D. (1995). *Emotional Intelligence*. Bantam Books.
- Gordon, M., & Thammasitboon, S. (2024). A scoping review of artificial intelligence in medical education: BEME Guide No. 84. *Medical Teacher*.
- Jong, M. (2024). HuMe-AiNE framework for medical education. *Annals Academy of Medicine, Singapore*.
- Keckler, M. (2025). Stop calling them soft skills: Why structural skills are the hard currency of the AI era. *Medium*.
- Mosley, A., et al. (2024). Workforce transition and inclusivity in AI adoption. *Journal of Healthcare Leadership*.
- National Academies of Sciences, Engineering, and Medicine. (2023). *The Future of Nursing 2020-2030*.
- OECD. (2024). *Skills for 2030 Framework*.
- Ogunbiyi, O., & Chaussalet, T. (2021). Ethical challenges in human-AI collaborative decision-making. *ArXiv*.
- Potineni, R. (2025). Workforce and competency mapping for human-AI collaboration in healthcare. *Healthcare Workforce Review*.
- Reuben, J. S., et al. (2024). Reframing stakeholder roles in medical education and care as AI-centered networks. *Frontiers in Digital Health*.
- Rosenbacke, A. (2023). Trust, heuristics, and error mitigation in clinician-AI collaboration. *JMIR Formative Research*.
- Schuitmaker, L., et al. (2025). Physicians' required competencies in AI-assisted clinical settings: a systematic review. *British Medical Bulletin*.
- Turner, L., et al. (2025). The alignment paradox: Reconciling personalized AI learning with educational standards. *ATS Scholar*.
- UNESCO. (2023). *Futures of Education: Learning to Become*.
- Wang, S., & Tai, X. (2023). Medical education and artificial intelligence: Web of science-based bibliometric analysis (2013-2022). *JMIR Medical Education*.
- Weidener, L., & Fischer, M. (2023). Artificial intelligence teaching as part of medical education: Qualitative analysis of expert interviews. *JMIR Medical Education*.
- Weidener, L., & Fischer, M. (2023). Teaching AI ethics in medical education: A scoping review of current literature and practices. *Perspectives on Medical Education*.
- Wu, J., et al. (2023). Synthesizing qualitative studies on public and clinician views on AI in healthcare. *JMIR Medical Education*.



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