California AI Pre-& Registered Apprenticeships: Essential Skills and Stacking Occupational Framework

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Key Abbreviations Used

- Artificial Intelligence (AI)
- Human Resources (HR)
- Knowledge, Skills, Abilities, and Competencies (KSACs)
- Large Language Models (LLMs)
- Machine Learning (ML)
- Natural Language Processing (NLP)
- On the Job Training (OJT)

Slidedeck Structure & Organization

- 1. AI Impacting Current and Future Workplace/Workforce
- 2. AI Soft Skills Sets Elevated to “Essential Skill Sets”
- 3. Development of Aligned Pre-Apprenticeship and Registered Apprenticeship Pathways
- 4. Stacking AI Work Roles at All Levels of the Career Ladder

The Dawn of the AI Era

- AI is fueling a global technology revolution and continuing to innovate and evolve since the release of generative AI (2022).
- AI is impacting social, economic, political, and cultural issues worldwide and in real time.
- With a trillion dollars of investments in recent years on developing AI hardware (chips), data centers, and apps/software is significantly impacting the global economy and markets.
- AI impacting government operations, decision-making, and processes. (i.e. automated HR AI that makes decisions on who is qualified for the job and who gets interviewed.

AI Impacting Current and Future Workplace

- The nature of workplace is changing due to innovative technology like cybersecurity, remote work, and the usage of AI daily.
- Job descriptions and work roles are being redefined; routine positions or with many machine-based tasks are increasingly replaced by AI.
- Entry level work roles are often affected; also, occupations like coding or software design with many machine-based work tasks.
- AI is also impacting all levels of the career ladder from entry level, intermediate, advanced, and executive positions.
- It is critical that AI is reflected in modern education, training, and workforce preparation and not to be ignored. Pandora's box is open, and we must prepare the workforce for the future.

AI Impacting Current and Future Workforce

- Changing nature of jobs, duties, and tasks due to the growing utilization of AI in the workplace across many industry sectors.
- The way we prepare and educate the future workforce must keep up with the new nature of the workplace.
- Workforce Development Knowledge, Skills, Abilities, and Competencies (KSACs).
- Workforce Preparation process is changing under AI- Education, Industry Certifications, and on the Job Training (OJT).
- We need to align AI KSACs into Pre- and Registered Apprentices.
- We need to include youth, foster kids, disabled persons, and economically disadvantaged individuals in the AI Tech revolution.

AI and Apprenticeships

- AI is the altering the future of the workforce.
- Planning for the apprenticeships of the future.
- Forward thinking education and workforce development.
- AI is not coming for your job– people with AI skills will be more competitive for many jobs in the future.
- The key is reskilling people through the apprenticeship model.
- What are needed AI skills and literacy?
- AI skills and competencies are being elevated to “Essential Skills” needed across industry sectors and throughout the career ladder.

AI Soft Skills Sets Elevated to “Essential Skill Sets”

AI Soft Skill sets are growing in importance. They are becoming essential skills in the current and future workforce.

AI Skills and Competencies

- AI Awareness & literacy
- Digital and Information Literacy
- Critical thinking skills
- Data and analytical competencies- data science
- Equity and bias- ensure equal access
- Ethical use of AI
- Human centric use of AI
- AI in a growing number of work processes

Key Human-Centric AI Skills

- Critical Thinking and Evaluation: Validating, auditing, and questioning AI-generated content to ensure accuracy and reduce bias.
- AI Ethics and Governance: Managing data privacy, bias, and responsible AI usage.
- Creativity & Contextual Reasoning: Applying human perspective to complex problems that AI cannot fully replicate.
- Adaptability & Continuous Learning: Staying updated with rapid AI advancements and changing technologies.
- Collaboration & Communication: Working alongside AI tools and effectively communicating AI-driven insights.

Key Technical AI Skills

- Prompt Engineering: Crafting precise, effective queries to maximize GenAI output quality.
- Data Analysis: Handling, interpreting, and querying data to make informed, AI-driven decisions.
- Programming: Proficiency in languages like Python or JavaScript for building and maintaining AI systems
- Machine Learning/Algorithms: Understanding the core concepts and functionality of AI models.
- Cloud Computing Basics: Familiarity with platforms that host AI services.

Pre-Apprenticeship and Registered Apprenticeship Pathways

AI Apprenticeship Pathways

- We need to align AI KSACs into pre-apprenticeships and registered apprenticeships.
- Engage with employers to determine currents skills and competencies needed on the job.
- Build out Related Training Instruction (RTI) for stacking apprenticeship and link to OJT occupational frameworks.
- Develop stacking apprenticeship programs for high demand entry level, intermediate level, and advanced level AI work roles.
- Include mechanisms to update occupational frameworks as AI continues to evolve.

Apprenticeship Pathway Architecture

- AI Pre Apprenticeships (basic AI literacy)
- Domain specific knowledge
- AI Stacking Registered Apprenticeships
  - Entry level work roles
  - Intermediate level work roles
  - Advanced level work roles

Stacking AI Work Roles and Domain Experience

AI is impacting all industry sectors and occupational clusters.

Thus, AI is affecting all domains and must be included in future workforce preparation.

AI Jobs and Developing Domain Experience

- The next few pages provide a list of AI jobs at all levels of the career ladder.
- Entry Level Positions in AI
- Intermediate Level Positions in AI
- Advanced Level Positions in AI
- **AND, Domain Experience in many Key Sectors and Policy areas**
- Advanced Manufacturing, Education, Healthcare, Equal Employment Opportunity, Homeless & Foster Youth, Information Technology, People with Disabilities, and Public Sector

Entry-Level AI Jobs

- AI/ML Engineer (Junior)- Build and test ML models – w/ supervision
- AI Dara Analyst- clean, process, and visualize types of data
- Prompt Engineer- Design and refine LLM prompts
- AI Ethics and Governance Specialist- monitor compliance, fairness, and bias in AI Systems
- AI Trainer/ Model Supervisor- label data, fine tune models, and monitor outputs
- AI Product Associate- Support AI product lifecycle, testing, deployment

Intermediate-Level AI Jobs

- AI/ML Engineer (Intermediate)
- Data Scientist
- AI Ethics and Compliance Analyst
- AI Product Manager (Associate)
- Natural Language Processing (NLP) Specialist
- Synthetic Data Engineer

Advanced-Level AI Jobs

- AI Research Scientist
- AI Solutions Architect
- Machine Learning Engineer (Senior)
- AI Ethics Lead
- AI Product Manager (Senior)
- AI Data Scientist (Senior)
- AI Security Specialist

In Conclusion

- AI literacy is a baseline KSAC in a modern and technical society.
- It is used daily at all levels of the career ladder, by students, and in our personal lives.
- AI is changing the nature of work roles and job preparation.
- The Apprenticeship model is ideal for preparing the AI workforce.
- We need to develop guardrails to ensure that AI serves humans and not the other way around.

Questions, Comments, and Suggestions

- This is a work in progress. Suggestions are welcome.
- If you have any questions or comments, please reach out to Dr. Keith Clement, IACA IT Subcommittee Chair
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