The Pedagogy of Modern Apprenticeships:

A case study into the research-based practices to inform work-based learning for Industry 4.0 skills

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Apprenticeships are a powerful learning tool, currently experiencing a revival within the U.S. while continuing to be prevalent in Europe

They create **pathways into in-demand, well-paying jobs using** an "earn-as-you learn" model.

Learning is **socially enabled** through connection between the experienced other and apprentice.

They can increase opportunities for people, particularly from **underrepresented communities**.

However, limitations exist within today's approach

They are **not a one-size fits all solution** to address the needs of Industry 4.0 and society's digitalization.

They often leverage historical models of **craft apprenticeships focused on trade skills.**

Many are primarily recruitment strategies that **lack learning design** to support the development of Industry 4.0 skills.

Putting the modern apprenticeship in conversation with learning sciences makes their design a learning problem instead purely of a labor problem

This research aims to benefit modern apprenticeship by identifying:

- **New tools for supporting workers** in pursuing meaningful careers.

- Techniques for employers to create **support for dynamic career trajectories**.

- Information to support the growing application of this **model for talent acquisition.**

- Insights into **meeting the needs of talent** within the context of learning.

- Greater opportunities to **expand professional networks** and relationships.

- **Implications for future study** of learning design in work-learn practices.

The **modern apprenticeship** accounts for the increased need for **digital, social, and creative skills** in all forms of work as a result of globalization and digitalization. The modern model allows for a **broader application in job areas** such as professional services, finance, information technology and security, among others.

Our Research Questions

1 **How do participants in modern apprenticeship programs describe their experiences, and how do they connect them to what they do today?**

2 **What are the features of a modern apprenticeship program, and how do they relate to the empirical learning sciences research on situated learning?**

Guided by these questions, the study set out to address three aims:

- Investigate successful participants' experience in modern apprentice programs

- Identify the relevant features of the pedagogy of modern apprenticeship

- Provide an archetypal study of a modern apprenticeship

Methodology

Qualitative

5 apprenticeship 'graduate' interviews

Conducted by doctoral researcher using established protocol including negative case identification

Quantitative

Thematic data analysis of:

- **interviews**

- **historical participant surveys**

- **program outcomes data**

Conducted by doctoral researcher to overlay, integrate, and combine insights to deepen and further the pedagogy

Case Study

Compilation and examination of Accenture's North America apprenticeship program development over time

To study and test against the findings of qualitative and quantitative research

Methodology
Qualitative | Interview Participants

Participants signed up via a convenience sampling approach that included sending an optional sign-up email to a pool of former apprentices who still worked at Accenture. While not intentional in sampling, each of the participants was from a different major U.S. city and region and have diverse prior backgrounds.

Pseudonym [1]	U.S. Region	Pathway to Program	Prior College	Prior Work Experience
Olivia	Mid-West	Technology Bootcamp	Did not complete	Moderate
Nelson	Atlantic	Workforce Development Program	Did not complete	Extensive
Carlos	South	Workforce Development Program	Did not complete	Limited
Pia	Northeast	Via Recruiter	Community College	Limited
Hani	West	Via Recruiter	None	Moderate

[1] Names and transcripts of individuals were de-identified before sharing memo-level insights with Accenture

Quantitative | Interview Analysis

This analysis involved thematic data analysis using the software tool atlas.ti and drew upon both inductive and deductive coding strategies.

The analysis allowed for emergent themes as well as identification of pedagogical features:

Coding
- The five theoretical principles discussed in the Pedagogy of Modern Apprenticeship (Morley Ryan, Forshaw & Driscoll, in press) were coded for

Thematic memos
- Written for each interview, as well as a deidentified case study of each participant's experience

Deductive coding approach
- Data points were triangulated under each of our central claims to "cross-check information and conclusions" (Johnson, 1997).
- This included constructing a negative case for each pedagogical feature

Negative case identification
- Intentionally looking for data, quotations, examples that do not fit with the cases identified or fit within the edges to guard against confirmation bias

Quantitative | Survey & Program Data Analysis

Historical program participant survey results and outcomes expanded the data set to complement inputs from participant interviews.

Historical apprenticeship participant surveys

- Anonymized data from program participant surveys representing 270 responses from 2020-2023
- Collected and deidentified by Accenture

Deidentified program outcomes data

- Anonymized data on hiring channel, program completion, conversion and retention of each program participant over a 7-year period
- Collected and deidentified by Accenture

Statistical analysis

- Conducted by doctoral researcher to maintain objectivity and analytical rigor
- Intentionally looked for data and trends that do not fit with the cases identified or fit with our central claims to guard against confirmation bias

Case Study | Accenture's NA Apprenticeship Program

Used as an archetype of a modern apprenticeship program to study, test and implement

Program Scale

2016
- 1 annual cohort
- 5 apprentices
- 1 U.S. city

Today
- 8+ cohort starts per year
- 2,000+ apprentices 2017-2023
- 40 cities in the U.S. & Canada
- Goal of 20% of entry-level hiring

Modern Digitized Workplace

- Digital core (*machine learning, AI, Cloud, etc.*)
- Digitally supported collaboration
- Rapidly evolving

Participant Qualifications

- High School Diploma or equivalent
- Strong collaboration and communication skills
- Interested in learning new skills and getting hands on experience

- Training and/or limited work experience in one area:
  - Project Management
  - Programming Code
  - Data Analysis
  - Graphic Design

Program Outcomes

- High conversion at program end
- Program graduates have higher retention than industry average

Accenture's Apprenticeship Program Structure

The program is a full-time, year-long earn-and-learn employment model; Apprentices are paid with benefits and receive Paid Time Off. Training includes, on average, 240 hours of structured learning across technical and professional skills – customized to the role track
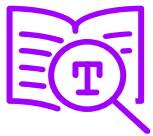
12-month alternate entry level on-ramp

Cohort experience and support network

Competitive wage with benefits

Technical & professional training & skills development via internal learning department

On-the-job learning with on-going feedback

Career opportunity at program end

Apprentice Role Tracks include:

1. Application Development
2. Data analysis
3. Project management
4. Cybersecurity
5. Business analyst
6. Customer service
7. Recruiting
8. Human resources

Accenture's Apprenticeship Program Structure

Sample Track Curriculum and Certification Pathways

Application Development Curriculum Sample Highlights

Professional services

- Excel formulas
- Effective communication
- Design thinking
- Project management fundamentals
- Problem solving
- Agile ways of working

Technology

- Front end, back end, full stack development
- Test execution & defect triage
- DevOps
- System administration
- Process automation
- Business process modeling
- Requirements gathering & analysis
- Use case development
- Building critical skills to resolve tickets

Common certification paths

- AWS Cloud Practitioner
- Salesforce Administrator
- Oracle Cloud Infrastructure Foundations

Certification Partners:

Microsoft   Google Cloud   aws   SAP   salesforce

- Azure
- Service Now
- Oracle and others

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Note: Curriculum subject to change

Pedagogical Framework Utilized for this Study

Learning happens...

In Context
(e.g., the industry, the organization,
the culture, the work)

Among Community
(e.g., the team, peers, colleagues, cohorts,
affinity groups, resource groups)

Through Development
(e.g., managers, mentors,
career counselors)

With Agency
(e.g., the learner)

Towards Flexibility
(e.g., future jobs, roles, tasks,
organizations, context)

Findings | Apprenticeship Pedagogy Framework

Overall, 100% of participants shared examples of experiences during their time in the program that could be thematically allocated to each of the five pedagogical features. Additionally, the frequency of occurrence of examples of each feature is evenly distributed, suggesting similar levels of significance to the participant

Feature of Pedagogy	Percent of interviews where theme arises	Number of mentions across Interviews	Percent of mentions across Interviews	Negative cases identified
Learning in Context	100%	35	23%	1
Learning among Community	100%	31	20%	0
Learning through Development	100%	32	21%	1
Learning towards Flexibility	100%	28	18%	0
Learning with Agency	100%	28	18%	1

Learning | **In Context**

Learning in context refers to the circumstances around a digital ecosystem that inform when and how an individual engages with digital tools to learn and do work that is global, cross industry, and adjust quickly to changing demand and pressures.

Related Program Choices:

Embed apprentice roles into the project teams

Access to full company's suite of digital tools

Working alongside experienced others on authentic tasks, including:

- Talent matching
- Conducting marked research for a healthcare company
- Addressing testing issues during a human resources information system implementation
- Designing User Acceptance Test for an Enterprise Resource Planning implementation

"

For the first couple of tasks and roles...we would have our buddies shadow us and then they would see what we would need improvement on and then as the weeks went by, **once we got it down, we were able to release the training wheels.**

"

Hani
Apprentice
Moderate work experience
No prior college
Referred by recruiter

Learning | Among Community

Learning among community refers to the relationships between apprentices, their cohort, support system and the broader organization.

Related Program Choices:

Intentionally provide opportunities and encouragement to connect with people in the wider organization by:

- Offering a robust support network of varying levels and apprentice community calls led by program graduates

- Connecting apprentices to organization-wide employee resource groups from Week 1

- Fostering a culture of inclusion for example by engaging apprentices in office- and company-wide events

- Leveraging digital tools to further drive connection by removing physical barriers and giving access to local, national, and global experiences.

"

*Networking is very, very huge. **They stress that you build your team, build your network**, know who your network is... meeting a managing director that you did not know before, meeting an apprentice that you did not know before...*

"

Carlos
Apprentice
Limited work experience
Some prior college
Referred by workforce development program

Learning | **Through Development**

Learning through development refers to the actions taken by the multiple experienced others to intentionally support and develop the apprentice throughout their experience and program emphasis on preparing the experienced other to do so.

Related Program Choices:

Go beyond the traditional "master" structure by:

Providing access to multiple experienced others

Training and coaching experienced others on the topics critical to provide feedback on and how to deliver on-going training, coaching and feedback to apprentices

Delivering structured performance feedback via documentation and performance discussions

Setting clear timelines and actions for completing work tasks and leveraging resources

"
*I would say about, **six or seven people who are still with me today, helping me throughout Accenture.**"*

Olivia
Apprentice
Moderate work experience
Some prior college
Referred by technology bootcamp

Learning | **With Agency**

Learning with agency refers to the combined role of the learning environment, experienced other, and apprentice to prioritize agentic behavior from motivated and self-efficacious learners.

Related Program Choices:

Encouragement to support internal initiatives beyond their day-to-day assignments that align to their interests and talents

Agency modeled by experienced others

Varied learning environments to support learner's needs including self-paced and instructor-led content

Safe learning environment in which asking for help is normalized

Support to pursue additional learning experiences that support their aspirational career direction

> *I do want to learn UX, UI design, to eventually move to that side of the company, which I'm doing on my own right now. Just like **I do it after work or like when I have free time during work, I'll do it.***
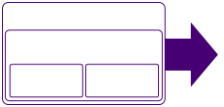
Nelson
Apprentice
Extensive work experience
Some prior college
Referred by workforce development program

Learning | **Towards Flexibility**

Learning towards flexibility refers to the awareness of the diverse use of skills and knowledge across contexts or to novel problems.

Related Program Choices:

Apprentices transition between multiple projects over their 12-month experience

Experienced others support identification of transferable skills from past and current experience

Emphasis on building complementary skills related to current tasks and will support translation to future roles

Opportunities for apprentices to reflect upon and transfer knowledge to be well-equipped for on-going career pathways

> *I was a team lead for my department... I had to make sure that I can resolve issues with anybody and kind of keep a neutral perspective on things.*
> ***And that was very transferable.***

Carlos
Apprentice
Limited work experience
Some prior college
Referred by workforce development program

Apprenticeship programs have the potential to address some of the most pressing issues we face in our workforce and economy.

The modern apprenticeship pedagogy supports an understanding and implementation of practices that meets our obligation to workers and people by:

- Providing a **framework for tapping into the diverse strengths** of the workforce

- Establishing a standard vision for reflecting upon and **improving on-the-job learning experiences**

- Emphasizing the **importance of learning design in enhancing key strategic priorities** within the workplace

- **Informing future research on learning models** in constantly disrupted work environments

Thank you

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