Educating the Next Generation of Mainframers

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Introduction:

Prior to 2000, companies would hire new mainframe candidates based on a variety of criteria: college degrees, written assessments, personal recommendations, etc

They would then put them through an intense and sustained training program, sometimes lasting several years.

Over time, as training budgets were reduced, companies began to search for cost effective ways to onboard new mainframers.

Before the late 1990s, most college programs had some mainframe technology in their curricula.

After 2000 colleges began to strip mainframe technology out of the programs (that is another conversation).

Because before the late 1990s most CS and IS programs had mainframe technology in their programs, companies could assume candidates had some exposure to things like COBOL and JCL

After 2000 college students were no longer exposed to anything related to mainframe, so new hires' first exposure to it was when they were hired

Companies began using screening criteria like a high GPA in CS or IS

Over time, this proved lacking in predicting who would make a good mainframer.

So companies were left needing a set of skills NOT taught in the colleges

And massive retirement in the mainframe space is accelerating

How I got into this...

I began teaching at an Historically Black College/University (HBCU) in 2004

I noticed immediately that HBCUs faced challenges that larger, better-resourced, higher-profile schools did not

My students needed a strategic advantage as an entry point into IT

Mainframe was clearly an area where this could be accomplished

Since2004 I have taught at 4 HBCUs and 1 non-HBCU (ECU). At every HBCU it was exactly the same story:

    Mainframe attracts companies to the school that did not recruit there before

    The companies then not only hire mainframe candidates but also hire across all disciplines of IT

    Rinse, repeat...

This approach has worked for over 400 students

What I have found as an IT professor about teaching mainframe at a college/university:

First, many (most?) academic CS/IS/IT depts don't keep close contact with industry, and their curricula reflects this.

CS/IS/IT Faculty often have mostly an academic background, with little recent industry experience. They lack the perspective to move students from the classroom to the shop floor.

The tenure process itself is an impediment to teaching mainframe in the colleges: Junior faculty are focused on getting tenure (which has little to do with mainframe), and senior faculty have research priorities that don't include mainframe. There is no way to incentivize junior faculty to teach it.

The hard sell: college faculty, college administrators. Why? They are resistant to something they see as old and antiquated.

The easy sell: the students themselves. Why? Because once you show them how much the global economy relies on the mainframe they want IN!

How to make a mainframe program work at a college/university:

It is essential to have at least ONE internal ally: faculty or administration.

They in turn need to secure signatures up and down the line:

At the end of the day you will need signoff from the affiliated dean, the affiliated chair, and the faculty member that will teach the course. If you have all these, you are in good shape.

It's best if you have employers waiting for the candidates. You don't want to offer a class and no one gets hired in mainframe. You also want to let the students know about the course early in the preceding semester.

Non-curricular Programs: Apprenticeships, Bootcamps, and Self-study

Formal academic programs that teach mainframe have been, and perhaps always will be, few and far between.

I am seeing tremendous growth in bootcamps and apprenticeships.

They require less administrative buy-in from a school, and have several advantages that degree programs do not.

Advantages:

> Students focused on specific technology; instructors usually have expertise in the topic; usually current and relevant; candidate does not need a four-year degree

Disadvantages:

> Peripheral skills like communication and collaboration are usually not the focus.

Bootcamps: Give intense focused training, and can last anywhere from 4 to 12 weeks or more.

Apprenticeships: Give sustained, broad training, and can last anywhere from 6 mos to 2 years.

The US Dept of Labor has hundreds of millions of dollars in grants and contracts to support apprenticeship programs:
https://www.apprenticeship.gov/employers

IBM has a wonderful apprenticeship program (that I helped get off the ground):
https://www.ibm.com/us-en/employment/newcollar/apprenticeships/?mhsrc=ibmsearch_a&mhq=apprenticeship

USDOL will help you set up an apprenticeship program for your organization from scratch

IBM will give you a template to follow and the administrative work can be done by an apprentice "intermediary" like Franklin Apprenticeships: https://www.franklinapprenticeships.com/

Companies like Knowledge Transfer Consulting Services can help you with 12-week bootcamps:
https://www.knowledgetransferinc.com/

Assess the Current State of Training for your Company:

- Are you doing more or less training than before?

- What is the focus of this training? Which technologies?

- Are you focusing on getting fully trained applicants or do you have an internal training plan?
- A quick look at the industry's demographics will reveal that the number of experienced IT people- especially mainframers- is diminishing each day, and will continue to do so at an increasing rate.

Internal training might increase retention and loyalty:

US Dept of Labor data clearly shows that alums of apprenticeship programs-degreed and non-degreed- have appreciably higher retention rates

The dilemma has always been having high starting salaries to attract entry-level candidates has to be offset by the delay in their becoming productive.

US DOL Registered Apprenticeships and less formal apprenticeship-like programs have been an effective solution to this problem

The candidates go through a 1-2 year training program at a reduced salary while they undergo focused training, and are gradually raised to full pay upon completion of the program.

Successful implementations of this program can be found at IBM, Ensono, Broadcom, Rocket, and several other companies.

This is an issue that WILL be addressed… sooner or later

Each quarter you don't deal with the need to have a skills plan is only postponing the inevitable.

Delay will only make the process more difficult and expensive.   Schools do not teach mainframe and do a questionable job of preparing students for the workplace in all IT disciplines (from a college IT professor of nearly 20 years).

Organizations that can help (whether you seek to start an apprenticeship, give focused bootcamps, or just ad hoc mainframe training:

The Open Mainframe Project:
www.openmainframeproject.org

The IBM Apprenticeship Program:
https://www.ibm.com/impact/feature/apprenticeship

The Enterprise Computing Community:
https://www.ecc.marist.edu

THANKS!