

Outreach, Inreach, and The Age of Reason: Technology Education for a New Age of Learning

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ABSTRACT

Educational institutions are in the middle of great changes following trends in demographics and broad availability of online education at comparatively infinitesimal costs for traditional and other students alike. While the response over time has been a combination of efforts we term *Outreach* and *Inreach*, we argue that a refreshed view on how education can be sustainably delivered in the future is required.

CCS CONCEPTS

• **Applied computing** → **Education**; *Distance learning*; • **Social and professional topics** → **Computing education**; *Informal education*; *K-12 education*; *Adult education*.

KEYWORDS

Higher education; lifelong learning; outreach

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1 INTRODUCTION

The coronavirus pandemic of 2020 has increased the challenges faced by universities multi-fold: decreasing enrollments and tuition challenges, low levels of public funding, increased numbers of learners utilizing MOOCs and online certifications, and heightened costs to deliver required services on aging infrastructure. Increasingly, post-secondary degree institutions are challenged to deliver the promises of higher education using the common approach illustrated in Figure 1. Significant *outreach* efforts begin with the *childhood* K12 realm, with STEM fields commonly leading the way. Once on *campus*, students typically pay tuition as well as room and board and make extensive use of all resources the university has to offer as part of the *inreach*. After helping students to launch their *professional* career, they become part of the alma mater and are continuously asked to give back to their prior university in

one way or another as part of *outreach*. This continues into *retirement*, where also programming for life-long learning might be offered. In recent years, universities have increasingly focused on professional and retired learners to become part of *inreach* again, whereby program and course offerings are provided, e.g., through certificates for learners in their professional careers or on-campus living communities to fill the empty on-campus housing.

2 QUO VADIS?

In the New Age of Learning, the *Campus* will become an integrative place for learning, rather than one of out- and inreaching to generate revenue from different streams. In this talk, we argue that this is the opportune time to rethink education back to an holistic but specialized, life-long endeavor where learning materials are generally available, as already witnessed online. One could assume that overall, this trend should lead to a monopoly for each subject matter: the highest-level expert will generate the online content for the subject. However, in-person subject-matter experts will provide the individualized support that subject-domain novices need in order to move towards subject mastery *in context*, e.g., for industry-specific application scenarios. Even more importantly, this approach can break the boundaries of traditional classes and allow for any desired combination of credentials and year-round on-boarding of students.

In turn, local instructors become peer leaders that provide the on-demand help to learners, connected in-person or online. This could take the form of scheduled hours or day-long subject-matter *camps*, where students work on assignments with instructors at the ready to help. This will likely lead to higher interaction rates between peers and instructors, as the instructor's role continues to evolve along the current active learning trajectories. In turn, the microcredentials-based course amalgamations will be instructor-supported, not instructor-led, calling for students to provide an intrinsic desire to learn about a specific subject matter aligned with their long-term career aspirations.

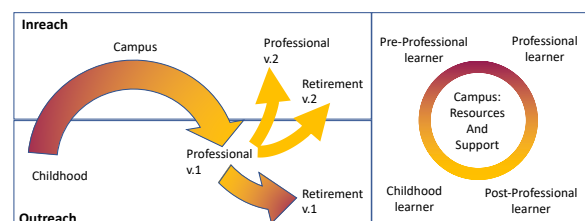


Figure 1: The current common university operations (left) and the new age (right), with the role shifted to provide guidance and support for learners at all stages based on skills.

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