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Woody Powell Brings Leadership Skills

GSE faculty and EdLeaders program team up for media-rich virtual course on organizational leadership

Iterating and upgrading is crucial to good instruction. Professor Walter "Woody" Powell knows this well. His course, *Organizational Behavior and Analysis*, has steadily transformed over the years with a persistent aim towards relevance and applying theory to practice. “This course gets people to think about organizations as things to be designed and improved,” he notes. “It got tweaked a bit each time in response to students’ interests and current events.”

The scope of the course mirrors Prof. Powell’s expertise. He is the Jacks Family Professor of Education, and, by courtesy, Professor of Sociology, Organizational Behavior, Management Science and Engineering, and Communication at Stanford University. The Organizational Behavior and Analysis course presents learners with real-life cases and practical knowledge that draw from a broad spectrum of frameworks in organization theory, economic sociology, and the study of civil society organizations.

In early 2019, Prof. Powell came across an additional opportunity for iteration: developing a scaled, fully online version of the *Organizational Behavior and Analysis* course for education leaders. He was approached by the EdLEADers team, led by Executive Director of EdCareers Nereyda Salinas, EdLEADers Program Manager Heidi Chang, and GSE IT Director of Digital Solutions Shawn Kim. EdLEADers, a professional certificate program and collaboration with Stanford Graduate School of Business, was established in 2018 to address the unique opportunities and challenges of current and aspiring superintendents nationwide via a 16-month, 100% virtual, cohort-based program. Having produced courses with GSE faculty like Janet Carlson and David Brazer, Prof. Powell’s leadership-minded course made for an ideal complement to the program.

Prof. Powell saw value in the collaboration, as well. First, it would give a diverse set of education leaders an opportunity to connect. The virtual format would also afford a broader dissemination of expertise, as EdLEADers cohorts include participants from districts across the US. Further, the online format provides flexibility, which is crucial for an executive audience with busy schedules.

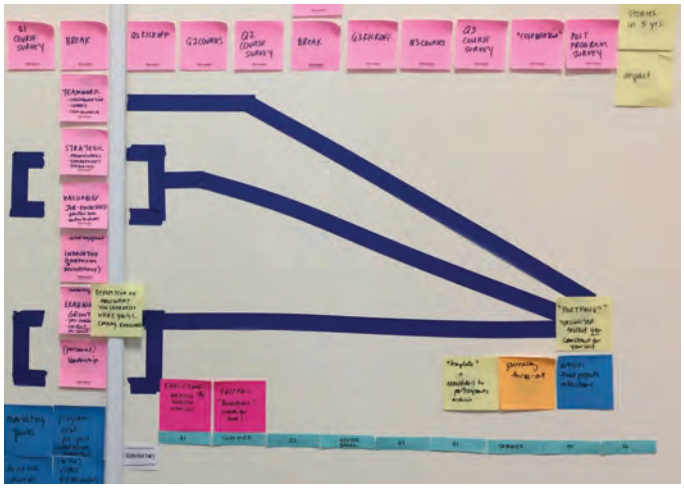
Prof. Walter "Woody" Powell

Planning for iteration

The group first established a vision for the project. Principally, the course would take shape around authenticity and rigor. Prof. Powell saw it as a unique challenge: “Is there a way to take important and somewhat complex ideas, and make them accessible and real to people in the trenches? That’s a fun process.” Authentic and meaningful material would be tailored for full-time education leaders like early-career superintendents, charter management officers, and educational consultants.

As a first step, the EdLEADers team familiarized itself with the course material. Team members sat in on classes and took note of ideal content to convert to an online context, all the while considering the technical feasibility. The team noted how Prof. Powell made an effort to incorporate relevant current events, and how these materials complemented "time-tested" materials such as theory-based readings.

The team then considered Prof. Powell’s instructional style. His personable lecture format and theory-plus-application approach, signatures of the *Organizational Behavior and Analysis* course, would be incorporated and preserved as much as possible.



When moving material online, the team extensively planned activities and alignment to match the spirit of the original course.

Equally crucial to interaction was the variety of cases from inside as well as outside education that were discussed in class. With cases, notes Prof. Powell, “people can have divergent points of view. That’s one of the most important things.” To get the full flavor of the course, EdLEADers team members sat in on the full 3-hour class sessions each week.

From classroom lecture to high-quality video

The team then set out to capture the unique qualities of the live graduate level course in a way that could be translated to a virtual experience. The first element was lecture. Digital Media Producer Joe Sherman recorded class sessions, while Instructional Designer Leslie Cook took notes on key points of communication and interaction. Leslie and Joe then condensed the lectures into bite-sized videos that could easily be viewed online.

From the transcriptions, Julie Braly, a freelance instructional designer and GSE alumna, distilled Prof. Powell’s live presentation material into a series of compact, seven-minute scripts. The process was initially met with incredulity. “We just had a three-hour class, and you turned it into seven minutes,” commented Prof. Powell, laughing. But then he discovered there were often three scripts per class, and that creating a high-quality seven-minute segment required significant collective effort.

With polished scripts in hand, the team headed to the studio. Joe arranged sessions at Stanford Video, a professional video recording facility on campus, and guided the team in producing a series of high-quality videos replete with motion graphics and expert editing. “From a faculty member point of view, translating a course into a series of videos was easy, interesting, and energizing,” reflects Prof. Powell. “The actual filming part was a blast.”

Custom motion graphics were sketched out with the media team (left), then developed into high-quality instructional video, and finally embedded in the course (right).

EdLEADers team members monitor the recording process (left) as Prof. Powell interviews Heather Kirkpatrick, GSE alumna and founding president of the Alder Graduate School of Education, in the Stanford Video studio (right).

Capturing the on-campus experience

In addition to lectures, the team wanted to preserve the nature of classroom discussions and assignments. A central feature of the course was the weekly memo assignments in which participants analyze cases by applying theory learned in class. The argumentation in these memos was crucial to connecting concepts throughout the course. Leslie and Julie regularly met with Prof. Powell to determine the fit for these adapted assignments, taking pains to maintain the spirit of the activity in the new online format.

Education leaders regularly collaborated in forums, team activities, and weekly web-conferences (above).

Interaction was the last piece of the puzzle. A novel online platform, NovoEd, was chosen based on its collaboration model. NovoEd features an interface and module design that is collaboration-friendly and conducive to remixing ideas with peers. Additionally, in an effort to re-create the live course’s in-class breakout groups and peer-to-peer interactions, the team leveraged NovoEd’s functionality for weekly team discussion and share-out assignments; perspectives were analyzed within teams, and then shared out across the cohort via the course’s discussion forums.

Take-aways and reflection

Looking back at the process, Prof. Powell is proud of what he and the EdLEADers team created — what both he and his online students endearingly term "Survival 101" for education leaders. The case method endures, with real-world scenarios to anchor discussions, allowing learners to practice theory application, share points-of-view, and strengthen decision-making skills. Discussions around complex issues thrive online, and are finding new purchase with a diverse set of busy, full-time professionals.

At the same time, Prof. Powell notes the obstacles along the way. "Iterating on the scripts was a bit of work" and required flexibility on the part of everyone, he admits. "For many scripts, I said 'this is too dense, let's break it up.' And so one session evolved into several." Flexibility and communication were paramount, particularly as content was honed and media was developed.

The most indispensable element of the course building process was ultimately the shared sense of mission. As a partner in the process, Prof. Powell kept an open mind to the possibilities of digital media, and gave leeway for bolstering instructional materials if it meant a better student experience. In turn, the team is appreciative of Prof. Powell's learner-centered approach, how far the *Organizational Behavior and Analysis* course has come, and how they could be a part of this iteration to move the course online.

If you would like to explore creating a blended or fully online experience for degree-bearing courses, contact shawnkim@stanford.edu; for professional learning, contact heidic@stanford.edu.

Instruction in the Age of Machine

Advancements in computation and interface design potentially revamp roles of instructors and decision-capable software

"Never felt more useless in my life," tweeted DotACapitalist, a professional gamer, "but we're having fun at least." An artificially intelligent (AI) computer system had just thrashed the world's top players in Dota 2, a video game that demands ingenuity and teamwork. Most striking, perhaps, was the AI system's observable behavior, particularly pace and quality of decisions. "[It] just doesn't need the processing time that humans require," reported The Verge, "which made its play appear unnatural — but only in the speed and crispness of the decision-making, not in the content of those decisions."

While AI may feel unnatural, its utility is undeniable. In the case of Dota 2, the computer system gained the experience of 120 years' worth of playing in a single 24-hour period, all the while tweaking its strategies against more capable versions of itself. This capacity for self-improvement with an established data set and rules, known as machine learning, has existed for decades. However, recent improvements in training methods, in particular a branch called deep learning, have accelerated AI systems in areas like gameplay; chess, Go, and Dota 2 masters have all fallen at the hands of deep learning in recent years.

For many of these masters, defeat spurred a new perspective on how humans and AI systems interact. Following his defeat, Go master Lee Sudol marvelled at the computer's computational breadth and focus: "I cannot accept a technical superiority, but in that [concentration/psychological] area, I believe it [AlphaGo] will be difficult to beat for humans." Indeed, the unique combination of human-plus-AI teams are frequently more effective than either AI- or human-only teams, as evidenced in hybrid team formats like Advanced Chess.

The new role of AI operator

Chess grandmaster Garry Kasparov, whose defeat in 1997 by IBM's Deep Blue spurred human-computer hybrids in chess, goes one step further. He sees human-computer interaction (HCI) and machine learning as soon-to-be defining traits of everyday tasks. Computational breadth and focus is only useful to a point, he says; without humans to anticipate, integrate, and communicate unforeseen factors, decisions fail. "Are we doomed to a future where things maybe work more effectively, but we're frustrated all the time because there's no human-to-human interaction to ease [comprehension]?" The answer: "There will be other humans who will be supervising machines."

As AI systems eclipse human in games like Go and chess, hybrid team play has emerged as an optimal alternative. Human operators supervise AI decisions, resulting in innovative gameplay that often bests AI-only systems.

Human-computer teams that use machine learning are increasingly popping up in education. On a fundamental level, search engines have amplified learning through discoverability and optimization. For each student that has let Google autocomplete or refine via "Did you mean...?", a better and more precise resource has been delivered. But now this partnership has received a boost through better

interface design coupled with the iterative power of machine learning.

A notable example is Wekinator, a kid-friendly machine learning interface. Its creator, Dr. Rebecca Fiebrink, Senior Lecturer in Computing at Goldsmiths, University of London, envisioned a system that could enable non-experts like artists and musicians to train a computer in much the way you would train a puppy. When one behavior (say, a hand wave) is performed, you can train the machine learning system to perform a response (say, a musical note). Over time, you provide more examples and contexts. Just as a trained dog would accumulate norms and commands that guide its behavior, the machine learning system comes to exhibit a unique set of expressions.

Wekinator, a simple machine learning interface, helps elementary school students train a computer to interact with everyday phenomena like hand gestures.

Crucially, this all occurs without any coding. Dr. Fiebrink designed the interface so that "you're making a program by providing examples rather than writing code," opening the door for non-technical domain experts like composers to leverage rapid computation and iteration. "In a sense, people are spending time doing things they're good at or interested in," she notes. "In the best case, machine learning takes over for some of the things we can't do as well."

Looks like an app, feels like an assistant

Time-consuming tasks once performed by teachers are increasingly managed by intelligent systems. Take, for example, a peer review activity. Traditionally, instructors would tally up peer responses per student, evaluate the quality of feedback, and identify those students not pulling their own weight. Peerceptiv, an edtech company that employs machine learning techniques, now provides all of these services in a single, code-free interface. Moreover, the machine learning ties into rubrics and data visualizations to streamline the feedback flow.

Many edtech companies are taking the same approach, marrying machine learning with code-free interfaces. Cerego, a learning platform, maps out skill trajectories and recommends templates and materials. As the program observes the user's habits over time, it can adjust to the pace and instructional needs of the learner. Separately, Pearson, a publisher, teamed up with IBM Watson, a machine learning engine, to devise a digital tutor. Each click or idea expressed by the learner is tracked and then integrated into a learning profile, producing customized resources and feedback akin to one-on-one instruction.

Learning alongside AI increasingly occurs on mobile devices. Quizlet Learn, a smartphone app, looks through a database of study patterns to determine an optimal study schedule for someone in your situation. Liulishuo, popular in China, will polish your English pronunciation by noting patterns phoneme-by-phoneme. And AdmitHub, a virtual admissions counselor, can walk prospective students through deadlines and paperwork in 100 different languages. Each of these AI-enabled experiences is designed mobile-first to match the on-the-go needs of modern learners.

Out in the world

With interface design becoming more intuitive, intersections of non-technical fields with machine learning will continue to blossom. Musician Brian Eno's app, Wavepaths, invokes principles of neuroscience to generate therapeutic soundscapes that morph over time to fit each patient's needs — all with basic visual cues. Mozilla, a digital research organization, has opened up $225,000 in grants to "media makers" that can creatively communicate machine learning's effect on society.

All this points to a tighter integration of interaction-minded machine learning with day-to-day activities, whether teaching in a classroom or playing with a toy. To address these potentially disruptive forces, courses are popping up at MIT and Stanford to guide ethical questions around intelligence augmentation and machine learning's role in society. On the industry side, Palo Alto-based Institute for the Future has disseminated Ethics OS, a guide to building foresight into the product development cycle.

As machine learning finds its place in the pedagogical process, educators will become even more instrumental to student achievement. As Kasparov notes, machine learning systems need operators, namely "[s]omeone who can work out the most effective combination, bringing together human and machine skills." These operators must have deep expertise in the applicable domain, in this case pedagogy.

In the end, adaptivity will be essential for all parties involved. New applications and spaces will emerge with the promise of efficacious learning. But perspective will remain paramount. For designers of machine learning systems, imagination is fundamental. "The first step," notes Dr. Fiebrink, "is getting your head around 'what do I do with it?' and 'what is the space of possibilities?'" Once you understand the system, the learning can really begin.

Digital Initiatives highlights innovative research, design, and implementation around learning technologies at Stanford Graduate School of Education.

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