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PREPARING STUDENTS FOR DIGITAL ERA CAREERS

MELISSA STANGE, PH.D.

ABSTRACT

This paper will discuss why technical skills alone will not be enough for students to have successful careers in the digital age. Much of their success will hinge on critical soft skills, such as adaptability, inner strength, holistic thinking, and a collaborative spirit. Examples will be provided for inclusion with a computer science program, but in a way that is easily adaptable to other disciplines.

INTRODUCTION

Digital transformation trends refers to the transformation activities, processes, competencies and models used to improve outcomes (Roe, 2018). According to 3700 executives nationwide, only 44% believe that their employees are ready for any possible disruptions (Kane, 2016). Of this group, only 18% stated that technological skills were the most important skill, most want forward thinking, change-oriented mindset, leadership, and collaborative skills (Kane, 2016). These are key skills that sometimes are forgotten in the scramble to ensure technical ability. Simply put — we need to ensure our technology graduates are successful by ensuring they are prepared with these soft skills.

My industry experience, diverse educational background, and experiences as an educator in computer science, cybersecurity, and information technology have allowed me combine

technical competencies and industry soft skills into a unique learning experience in the classroom. It is from my experience with this unique approach that I discuss the value of embedding soft skills within technical learning.

WHY TEACH TECHNOLOGY WITH A SOFT SKILL PERSPECTIVE?

Millennials and Generation Z's have grown up in a digital environment; however, that does not mean that they embrace change and are equipped to navigate in an uncertain work world. Louise Morman, the Executive Director of the Lockheed Martin Leadership Institute in the College of Engineering and Computing at Miami University, states, "Technical skills alone won't be enough for career success in the digital age. It's much more than teaching people to code" (Morman, 2019). Therefore, educators must equip students with critical soft skills, adaptability, inner strength, holistic thinking, and a collaborative spirit to survive the fast-paced digital disruption within all industries. Today's industry is quickly implementing more machine learning, deep learning, expert systems, security, decision systems, robotics, quantum computing, mobile and cloud technology; so everyone agrees that a technology graduate needs technical skills in these areas. Morman (2019) adds, "Employers are realizing more and more that career success hinges on critical soft skills — the things that computers don't do as well as humans."

While educators can talk about soft skills, students often do not learn them until applied to hands-on experiences. Chapman (2020) writes, "Soft skills are personal traits or attributes that can enhance interpersonal communication and be used in a multitude of ways, ranging from defusing conflict to motivating others." The approach used with the Computer Science (CS) program at Lord Fairfax Community College for the last couple of years is known as AEHC (Adaptability, Evolved, Holistic, and Collaboration) mindset, in order to make sure CS graduates are competent technologists.

ADAPTABILITY IS CRITICAL

Adaptability is a critical soft skill to ensure that students can adjust to the ever-changing work schedules, operation procedures, deadline changes, and innovative technology improvements. As Chapman (2020) states, “Employees with high adaptability are better equipped to take on new tasks, learn new technologies, and develop new proficiencies, all skills that provide positive benefits to companies working to keep up with the changing times.” Being adaptable will also improve a student’s ability to think fast and problem solve as they are confronted with changes that they had not planned for initially. Adaptability instills the mindset that it is all right to make mistakes and know how to apply the knowledge gained by the mistake to improve the process in the future.

Often professors provide students a schedule of course topics and homework assignments within the syllabus with due dates and the professor rigidly sticks to these posted dates and activities. In industry though, plans change and often product delivery dates go out the window for unexpected reasons or additional tasks go on an existing order. If students have not experienced these simulations of change, how can they understand adaptability? In short, they cannot! To help students experience and learn to adapt, professors can simply adjust a due date, add an additional requirement to an already posted assignment, or switch team members’ roles around, allowing enough time for the assignment to still be completed. In addition to adaptability challenges by initial course plan modification, educators should consider textbooks that include industry case studies that demonstrate adaptability in the specific discipline. By providing these extra challenges to students, we are making them more comfortable with uncertainty, allowing them to work in

unstructured environments, teaching them to embrace change when it is not their idea, and teaching how to learn from failure.

EVOLVING THE COMMUNITY COLLEGE STUDENT THROUGH AWARENESS

Community colleges play a vital role in society. They provide a welcoming learning environment for learners from high school age to elderly. Self-awareness is a critical aspect within the evolving student. Self-awareness is about understanding our own needs, habits, and everything else that makes us unique. The more we know about yourself, the better we are at adapting to life's changes. Srivastava (n.d.) writes, "Research shows that self-awareness is directly related to both emotional intelligence and success." Closely related to self-awareness is mindfulness, which the Oxford Dictionary defines as "a mental state achieved by focusing one's awareness on the present moment, while calmly acknowledging and accepting one's feelings, thoughts..." (Oxford Dictionary, n.d.). Evolving means one must also practice humility, which keeps one in touch with the reality that much is unknown to us in our lives. Rick Hensley, an executive with Messer Construction, explains humility as what "makes for a more harmonious and collaborative work environment because people feel they can share their ideas without fear of being 'one-upped' or put down" (Baldoni, 2009). As a student evolves, they need to understand that conflict may occur whenever people disagree over values, perceptions, or ideas and while these differences may look, but they may actually trigger strong feelings or conflict. Instead of a student practicing conflict avoidance, they need to learn to embrace it to resolve it — otherwise the inability to do so will be their downfall.

Computer science students need to understand that conflict between software testers and developers is inevitable but mindful there is a responsibility to minimize the effect of conflict on development projects through communication, mutual respect, even social interaction (Cohen,

Birkin, Garfield, & Webb, 2004). Andrade and Huang (2016) show that the use of various technologies for online students will improve their soft skills when working within virtual teams. Some examples of assignments would be macro and microblogging, video conferencing, collaborative virtual worlds, and gaming. Through these virtual classroom experiences, CS students have shown improved communication skills with one another and are better able to complete assigned remote team tasks in a timely manner. Students are more comfortable with admitting mistakes, are more respectful when they find someone else has made a mistake, tend to focus on their team members strengths instead of the weakness, and embrace teamwork with a lightened up environment. I started co-presenting with students at conferences to help them not only get public speaking experience, but to learn to deal with peer feedback and to become more self-aware of themselves. Depending on the level of the student's involvement, select a conference that will be a positive learning experience. The Virginia Community College Association (VCCA) and the New Horizons Conference teams have both allowed students to co-present (Stange, Stange, & Buchanan, 2019). If the student is further evolved, then encourage discipline specific conferences to assist them in building their network in their field. I have traveled with students to Washington D.C; Shreveport, Louisiana; Portland, Oregon, and Boston for them to present at computer science and cybersecurity conferences (Stange, Stange, & Coffman, 2019).

STRATEGIC THINKING IS EFFECTIVE AND VISIONARY

Community College professors often says things like, “We are teaching students for jobs that have yet to be defined.” If that is true, how can education actually do that? The answer is by guiding students to be creative, strategic, big picture, system thinkers with a little openness to endless possibilities. Jo Alice Blondin, the President of Clark State Community College, explains that, “community colleges can extend beyond skills training in their workforce development

programming. Holistic workforce development can also create significant positive results for the community and economy” (Blondin, 2020). Strategic thinkers have the ability to do the following:

- use the logical and creative sides of their brain
- think with a strategic purpose while creating a visioning process
- clearly define their objectives and develop a strategic action plan
- design flexibility with a benchmark review progress
- recognize internal and external clues
- commit to lifelong learning
- learn from each of their experiences
- be non-judgmental (Center for Simplified Strategic Planning, Inc., n.d.) (Bowman, 2019):

Often students are so focused on the disciplines higher education uses to define their career direction. For example, one may be enrolled in an accounting program but enjoy computer science but they are unable to see how the two can work together in careers like forensic accounting because professors often do not provide examples of cross-discipline careers. I often bring in speakers who are working in one discipline, but were initially educated in computer science such as physical therapists, neo-scientists, biochemists, and marketing directors. Students are often amazed to find out how the concepts of one discipline carry over into another. A customer focused project that CS students at Lord Fairfax Community College have enjoyed to help them learn to be more system thinkers is by participating in virtual exchanges. The first time it was with students in Jordan to solve a global sustainability project for the tourism industry in both countries (Stange & Stange, 2020) and another time it was with a cybersecurity program in Ireland to develop a bot that assisted the visually impaired to design avatars for the Second Life application. These were holistic learning with hands-on application development.

COLLABORATIVE SPIRIT AND INTELLIGENCE TO PROMOTE PROBLEM SOLVING

When a student develops a collaborative spirit and intelligence, they demonstrate their passion and heart for their chosen discipline as well as their community. Providing students opportunities to participate in community service and outreach fosters the spirit of responsibility to others. It also provides student an opportunity to problem solve spontaneously as they have to think on their feet, as they become the teacher to the community (Stange & Coffman, 2019). Faculty can be collaborative role models to students by collaborating with local industry on projects and internships. Through this collaboration, students are empowered to solve problems, troubleshoot research, consult other professionals, and complete real-world tasks putting their classroom knowledge to the test (Stange & Coffman, Providing Students hands-on experiences and volunteerism through Community, 2018). Some faculty expect students to come into their classrooms with a passion, but passion is not necessarily inherent, but rather cultivated (Bauer-Wolf, 2018). This cultivation occurs by observation, participation, overcoming fear, working with peers, and openness to learning and failure.

While this approach design was with Generation Y (Millennials) and Generation Z's (Gen Z) in mind, it can aid any students who assume they will have clear directions and expectations given to them always. All disciplines, but specifically technology programs, must stop focusing solely on technical competencies and start focusing on the student's adaptability, involvement, holistic, and collaboration mindset to ensure their students will be successful in the workforce.

REFERENCES

- Andrade, J., & Huang, W. (2016). Technological tools to enhance workplace learning among virtual team members. In V. Wang, *Handbook of Research on Learning outcomes and Opportunities In the Digital Age* (pp. 308-328). IGI Global. doi:[ttp://doi:10.4018/978-1-4666-9577-1.ch014](https://doi.org/10.4018/978-1-4666-9577-1.ch014)
- Baldoni, H. (2009, November 05). *Use humility to improve performance*. Retrieved from <https://hbr.org/2009/11/use-humility-to-improve-perfor>
- Bauer-Wolf, J. (2018). Don't find your passion -- cultivate it, psychologists say. *Inside Higher Ed*. Retrieved from <https://www.insidehighered.com/news/2018/07/24/study-creating-your-passions-more-effective-finding-them>
- Blondin, J. (2020, January 04). *Holistic workforce development: A collaborative approach*. Retrieved from Evollution.com: https://evollution.com/revenue-streams/workforce_development/holistic-workforce-development-a-collaborative-approach/
- Bowman, N. (2019, September 23). *How to demonstrate your strategic thinking skills*. Retrieved from Harvard Business Review: <https://hbr.org/2019/09/how-to-demonstrate-your-strategic-thinking-skills>
- Center for Simplified Strategic Planning, Inc. (n.d.). *Strategic thinking: 11 critical skills needed*. Retrieved from www.cssp.com: <https://www.cssp.com/cd0808b/criticalstrategicthinkingskills/>
- Chapman, J. (2020, March 3). *Adaptability should be your new hire's top soft skill. Here's how to test for it*. Retrieved from Fast Company: <https://www.fastcompany.com/90482018/adaptability-should-be-your-new-hires-top-soft-skill-heres-how-to-test-for-it>
- Cohen, C., Birkin, S., Garfield, M., & Webb, H. (2004, January). Managing conflict in software testing. *Communication of the ACM*, 47(1), 76-81. doi:<https://doi.org/10.1145/962081.962083>
- Kane, G. P. (2016, July). Aligning the organization for its digital future. *MIT Sloan Management Review*. Retrieved from <https://sloanreview.mit.edu/projects/aligning-for-digital-future/>
- Morman, L. (2019, May). How do we prepare the next generation for a career in our digital era? *Computer*, 52(5), 72-74. doi:10.1109/MC.2019.2903328
- Oxford Dictionary. (n.d.). *Mindfulness*. Retrieved from Lexico: <https://www.lexico.com/en/definition/mindfulness>
- Roe, D. (2018, March 8). *Why a digital mindset is key to digital transformation*. Retrieved from CMS Wire: <https://www.cmswire.com/digital-workplace/why-a-digital-mindset-is-key-to-digital-transformation/>
- Srivastava. (n.d.). *The importance of self-awareness*. Retrieved from White Swan Foundation: <https://www.whiteswanfoundation.org/article/the-importance-of-self-awareness/>

- Stange, M., & Coffman, H. (2018). Providing students hands-on experiences and volunteerism through community. *Innovations in Cybersecurity Education*, 53. Retrieved from <https://www.nationalcyberwatch.org/resource/2018-innovations-in-cybersecurity-education/>
- Stange, M., & Coffman, H. (2019). Authentic competency-based learning to develop an industry ready cyber science graduate. *Innovations in Cybersecurity Education*, 30-31. Retrieved from <https://www.nationalcyberwatch.org/resource/2019-innovations-in-cybersecurity-education/>
- Stange, M., & Stange, R. (2020, February). Integrate global sustainability virtual exchange Into teaching computer science concepts. *SIGCSE '20: Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, 1286. doi:<https://doi.org/10.1145/3328778.3372580>
- Stange, M., Stange, R., & Buchanan, A. (2019). Female students: Technology aspirations and awards. *New Horizons Conference*. Roanoke, VA: VCCS.
- Stange, R., Stange, M., & Coffman, H. (2019). Increasing K-12 educator knowledge to prevent cyberbullying & enhance K-12 cybersecurity courses. *Community College Cybersecurity Summit (3CS)*. Shreveport, LA, USA: National Cyber Watch.

ABOUT THE AUTHOR

Dr. Melissa Stange has served as a faculty member in Virginia and West Virginia since 2004 and is currently the Lead Professor for the Computer Science program, and she enjoys teaching transfer-oriented as well as career and technical education courses in Computer Science, Cybersecurity, and Information Technology. She is currently serving as the Virginia Community College System's Technology Peer Group lead, as a member of the ACM CCECC committee, and on the Career and Technical Education Advisory Committee for Frederick County Virginia Public Schools. She is also an ABET Program Evaluator for CAC Cybersecurity programs. Melissa earned her Ph.D. in Applied Management and Decision Science from Walden University with a dissertation topic of "A Limited Assessment of the Curricula of Selected Information System Technology Associate Degree Programs," M.B.A. degree in Business Administration from Averett University, M.S. in Computer Science from Nova Southeastern University, B.S. in Computer Information Systems from Shenandoah University, and an A.A.S. degree in Data Processing from Chattahoochee Valley Community College. Melissa's research interests include

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