As an ICT professional with more than twenty-five years of experience team-based delivery is quite familiar, and it is commendable that the Essex Secure Software Development module is attempting to bring that experience to its students. The call to increase student’s practical skill levels through software project rather than rote regurgitation of computer science theory has been going on for more than twenty years (Chouseinoglou & Bilgen, 2014), and it is reasonable to expect those with a keen interest in technology to fully engage in such projects (Raibulet & Arcelli, 2018). Unfortunately, fifty percent of the team had not information technology experience which created a tremendous headwind as the project neared completion.

The project premise, design and develop a secure file repository to operate in a constrained environment is realistic, ambiguous requirements definitions and limited clarification from clients is also not uncommon (Fewell, 2010). Fewell goes on to state in his article that anticipating change and being prepared to adjust is essential, a lesson reinforced again in my third Essex group project. The initial module deliverable, a design brief, is conceptual in nature allowing one member with limited technical skills to meaningfully contribute alongside the two experienced ICT professionals. Unfortunately, during this design phase a fourth member took a sudden leave of absence replaced by a new member with no practical technology experience. Despite the disruptions, the design document was completed and received a mark of distinction, the shortfalls coming from document presentation matters versus the conceptual understanding of the problem and proposed solution.

Rereading the professor’s feedback and reflecting on my participation in this phase, which was everything from creating the diagrams to researching privacy and intellectual property laws in space as well as writing 80% of the document, I do think that core application and security requirements section (fig 1) is good work.

Graphical user interface, text, application

Description automatically generated

Figure Portion of design brief written by Doug Leece

During the first post design brief team meeting all three of my team members indicated they had little to no programming experience. I did offer to train and support those with an interest, creating accounts for them on a lab server and suggesting they take one small module each to be integrated into the final project. While there was initial enthusiasm, and one person did reach out to get assistance with the Flask equivalent of “hello world”, not a single line of the program was written by anyone but me (Fig 2). Fortunately, the other IT professional took full ownership of the data tier allowing me to focus on the software programing.

Graphical user interface, text, application, email

Description automatically generated

Figure Screen shot of software creation activity Doug Leece

Despite multiple invitations to participate it was the two IT professionals who transformed the design into a functioning solution, and I suspect the reluctance to participate was due to one of two reasons. Either the solution and required work were conceptually difficult to grasp by someone outside the industry or like many adults, there simply isn’t the time to commit fully to continuing education (Steele & Erisman, 2016). Practical software development skill takes considerable time (Shuhidan, et al., 2009) to develop.

Although I do not envy Essex faculty having to balance industry demand, academic tradition, and commercial realities, I do question if it is realistic to expect people still struggling with programing basics to reasonably comprehend secure software development in six weeks. The difference in student skill levels cannot be eliminated entirely but without measures to improve the understanding of those new to the industry, employers will continue to devalue degrees in favour of proven experience (Milligan & Kennedy, 2017). Unfortunately this tends to negatively affects those with industry experience who seek the recognition a post graduate degree had previously all but guaranteed. Competency based qualifications like Micro-Credentials and certifications also have limitations, knowing how to do something is different than knowing why it works the way it does, and in my opinion cyber security needs both types of skills. My concern is those entering cyber security from outside the conventional STEM path may exit prematurely in frustration without direct interactive support on foundational concepts, directing them to reading materials and additional self-study is difficult without that foundation and they were likely struggling to find the time already (Steele & Erisman, 2016).

My action plan after this module is to take a leave of absence, using that time to revisit all the material outside of the coding project deliverable as well as material from other Essex modules I would have liked the time to explore more fully. My concern with making such a move is the lack of motivation to return, so I need to remind myself of my desire to increase my scientific capabilities with respect to cyber security.

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