

## FOSTERING PERSONAL, PROFESSIONAL AND COURSE IDENTITY IN CYBER SECURITY DELIVERY

### A Case Study by THALITA VERGILIO

<b>1</b>	In which subject was your case study used?
	Cyber Security
<b>2</b>	<b>How many</b> students has your work/example involved?
	Approximately 200 over 3 levels
<b>3</b>	<b>How long</b> have you been doing this work for?
	2 years
<b>4</b>	Was it <b>designed into</b> the course originally <b>or</b> added in and <b>subsequently embedded</b> ? Explain in relation to your work
	The changes were added in at course (Discord) and module (Team Project and Production Project) level.
<b>5</b>	<b>What was the aim</b> of your work?
	To enhance the delivery of current modules and, ultimately, the student experience.
<b>6</b>	What was the <b>main purpose</b> of this work and <b>how does it link to the course and module learning outcomes</b> ?
	To create a continuum of life and learning experiences and thus enhance belonging and foster identity amongst cyber security students whilst promoting reciprocity and cooperation and ensuring students understand that what they produce for us is industry-standard <sup>1</sup> .
<b>7</b>	What <b>academic level</b> are the students? <b>Why is it most suitable/suited for them</b> ?
	Undergraduate levels 4, 5 and 6. At level 4, the goal was to promote identity by establishing a continuum with previous life and learning experiences and with existing identities. At level 5, the challenge was to make the learning content relevant and to promote identity by making sure the assessment components directly reflected real-world processes and reports. At level 6, the goal was to make students less reliant on tutors and more on each other for technical feedback, and to ensure they rehearsed roles soon to be undertaken in the professional world such.
<b>8</b>	Does your case study relate to any of the <b>literature</b> outlined in the introductory literature review? (Maybe pick no more than 2-3 strong links)?
	According to Wonkhe-Pearson's (2022) survey on belonging and inclusion, 35% of students reported feeling lonely at university. Of those who felt they did not belong, 73% reported feeling lonely. Our students reported that the use of Discord as a social platform and the introduction of a group element to the Production Project module reduced the feelings of loneliness and isolation. Moreover, the changes at all three levels provided opportunities for students to get to know each other and develop closer friendships, actions highlighted by Wonkhe-Pearson's (2022) survey as paramount in developing a sense of belonging.

<sup>1</sup> This is directly linked to the course's learning outcomes, particularly that which states that students will have "the skills and understanding to undertake projects to a professional industry recognised standard".

**9** Is your work **embedded** into a module/throughout a course?

Some elements such as Discord were targeted at cyber security students of all levels. Others were module-specific, such as the introduction of industry-standard reports as part of the assessment for Team Project or the use of Agile techniques in the Production Project module.

**10** Was your work **assessed? How? Does this assessment build on any of the key themes?**

The reports for Team Project were assessed, and feedback was conveyed in terms of the impact each report would have had in the real world.  
The Agile aspects introduced to Production Project were not assessed. This could be an enhancement for the future, for instance, points could be awarded for active participation in group meetings, as well as for the overall quality and depth of peer feedback.

**11** **Main theme:**  
**What did your work do to maximise your students' sense of belonging?**  
**Can you outline how it impacted on academic and social belonging and how?**

The introduction of Discord as the main communication platform for cyber security students was particularly effective at promoting identity and belonging amongst level 4 student. Originally a games platform, Discord became an associative learning space for us as positive gaming experiences were transferred to learning. Students regarded it as a safe place to make mistakes, to offer opinions, and to admit to not knowing things. They felt comfortable asking questions and knew how to give the right level of help without giving away the answers.

Discord was enabling in that it gave all students equal access to shared learning. The platform could be accessed on or off-campus, or even on mobile phones. This proved crucial during the years of 2020 and 2021 when restrictions imposed by the covid-19 pandemic led to the closure of the university campuses. Not only did Discord enable students to continue learning from home, but they often helped each other through technical issues unrelated to specific modules they were studying. Moreover, the platform was used by students and staff to interact and socialise in non-academic channels, thus strengthening course bonds and fostering a sense of personal identity and social belonging.

At level 5, the Team Project module was enhanced to promote a sense of course, personal and professional identity. Each team of students was responsible for producing an industry-standard penetration testing report to be used as evidence in a simulated court case. The work was identical to what professionals would be paid to produce in the real world, both in terms of process and outputs. A professional attitude was adopted through the duration of the module, and students were marked on project management as well as on the quality of the reports, thus ensuring the assessment resembled, as closely as possible, the way professionals are assessed in the real world.

As a result, students found identity within their roles as they took collective ownership of the reports, management tasks and cross-examination performance. Moreover, cross-examination by a real barrister reinforced professional identity as students realised, they were the experts (the barrister did not have the specialised technical knowledge that they do).

At level 6, the Production Project module was enhanced to ensure individual projects were developed from within a realistic professional context. In the real world, security professionals are not normally given extensive development tasks with a deadline that spans several months, particularly on entry-level roles. Instead, they work as part of dynamic cross-functional groups on smaller tasks with shared ownership. The changes to the module were borrowed from the Agile methodology, employed almost ubiquitously in the software industry. Students were organised in small expert groups and had regular planning, progress

and review meetings where their role as technical experts/reviewers was as important as their role as developers.

As a result, students' sense of course, and professional identity was reinforced as they embraced the role of providing technical feedback to peers. They learned to rely on peer (not tutor) feedback in preparation for entering the professional world, and to be confident in providing technical opinions. Being part of a group also promoted a greater sense of belonging, as students in the past had often associated the module with a profound sense of isolation and lacked motivation and purpose for their work. Regular meetings and peer feedback at key stages of product development encouraged students to keep progressing towards the next milestone. Additionally, being clear about why they were doing things a certain way and how this would benefit them in the immediate future proved instrumental in the success of this approach.

#### 12 Sub-themes:

- Did your work also address any/all of the following subthemes? (All the case studies do to a greater and lesser extent...)
- Inclusivity in its broadest sense (embedded, flexible learning environment, flexible assessment, relatable .... etc.
- Students as developing professionals
- Employability skills such as confidence building, impression management, collaboration and teamwork?

**Inclusivity:** as part of the Team Project module, students learned how to effectively deal with diversity amongst team members, differences in levels of motivation and ability, differences in work ethic, differences of opinion, whilst still cooperating to produce the final reports.

**Students as developing professionals:** this is effectively addressed at levels 5 and 6 and is a main theme within the current case.

**Employability skills:** as above.

#### 13 Main benefits and successes of your work (for example, student feedback, sustainable, improved data/ results, noticeable change in behaviours, good feedback from stakeholders and employers, measurable change in metrics)

At levels 4 and 5, the success of this work is mainly evidenced by student and staff feedback. Discord became a major platform for course and social interaction for our cyber security students and remained active during non-teaching periods such as summer holidays. There was student activity not only in social channels, but also in the technical channels, despite there not being any modules running. It was also noted that alumni chose to stay connected to the platform, taking the initiative to host "ask-me-anything" sessions as well as posting placements, job offerings and other opportunities to help current students. This reinforces the idea of identity through collective ownership of the social space.

The changes at level 6 led to a significant increase in the quality of the projects submitted. "Very professional" was a common theme in marking and moderation. The model was met with interest by other colleagues and has since been adopted by other tutors. Three students who participated in the first run of the module changes stayed in touch and performed markedly well in group-based graduate selection centres. These students went on to secure highly competitive graduate positions, and employers were impressed with their maturity and professionalism.

**14 Main challenges for your work** (for example, is it scalable, manageable again, too difficult to evaluate, resource heavy, too risky, not enough ownership...?)

The main challenge with Discord is to ensure it continues to have the same widespread adoption after the end of covid-19-imposed restrictions. With Production Project, the challenge is to scale it consistently to module level. The original case used a sample of 10 students from a cohort of 80, based on who their first supervisor was. In order to ensure greater adoption, it will be necessary to secure the buy-in of other supervisors.

**15 Main outcomes**  
How do you know it was successful? (was your work measurable? Any Data? Student views? Feedback from colleagues? Other evaluation such as change at wider course and institutional level?)

Following are student views/quotes:

“Honestly, I’ve never been fully committed to education and disliked college and high school heavily. I feel like university has been one of the most enjoyable experiences of my life and I am so lucky to have had someone as amazing as you to study under!”  
(Level 6 Production Project student)

“Would you consider asking literal police on how to effectively manage this project cheating?”  
(Level 5 Team Project student fully embracing the simulation and taking the initiative to liaise with real professionals to understand how they work)

“For everyone just joining Discord for the first time, XXX and XXX have set up a server to further help students out with regards to specific modules or just general advice about the course. (...) Welcome to Leeds Beckett!”  
(Alumni taking the initiative to create a space on Discord for mentoring, teaching and learning, thus displaying a shared sense of ownership of the platform and of belonging to the community)