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Final Reflection

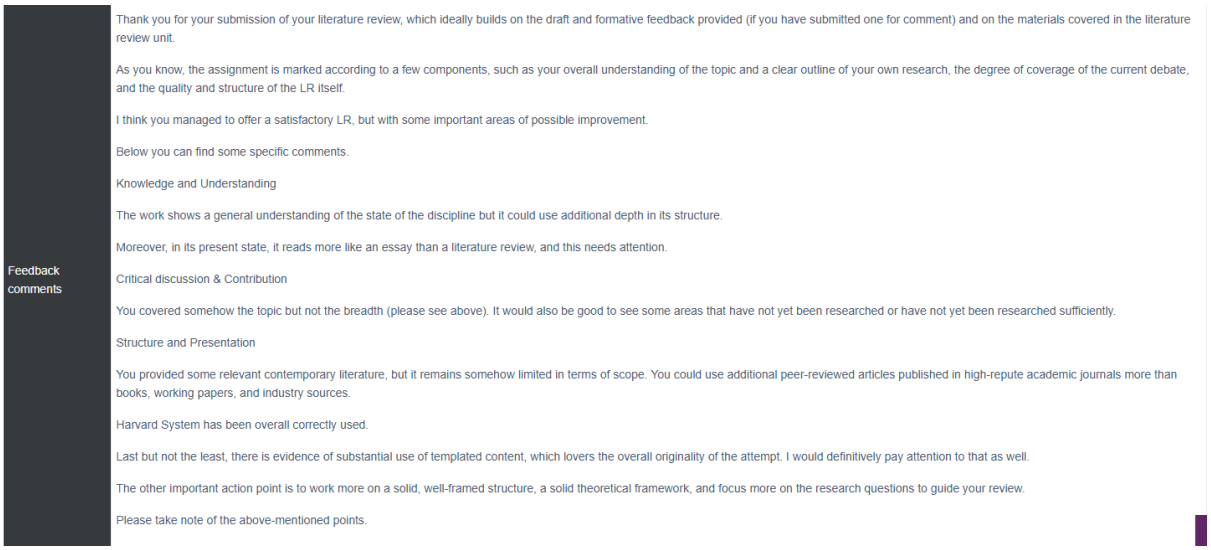
Within this module, I have aimed to develop my knowledge of research methodology processes, together with developing my statistical analysis skills. To aid my reflection on these issues, I have employed Rolfe, Freshwater & Jasper's (2001) approach to critical reflection, utilising their 'What?', 'So what?', 'What next?' format to structure my insights.

What?

Due to personal reasons, having more limited time to study for this module meant that I somewhat rushed the research process for my literature review. I also feel that I rushed into writing the review before having a clear idea of my research question. This resulted in a lack of focus, and ultimately my receiving my lowest grade so far on this course. Although I agreed with the development points made, my confidence suffered as a result and I had to battle against this when seeking to develop other skills relating to research methodology processes.

So what?

I believe resilience to be one of my main strengths and I thrive on challenging myself to improve. This helped me to eventually muster a positive attitude towards the feedback received from my literature review.



Feedback comments

Thank you for your submission of your literature review, which ideally builds on the draft and formative feedback provided (if you have submitted one for comment) and on the materials covered in the literature review unit.

As you know, the assignment is marked according to a few components, such as your overall understanding of the topic and a clear outline of your own research, the degree of coverage of the current debate, and the quality and structure of the LR itself.

I think you managed to offer a satisfactory LR, but with some important areas of possible improvement.

Below you can find some specific comments.

Knowledge and Understanding

The work shows a general understanding of the state of the discipline but it could use additional depth in its structure.

Moreover, in its present state, it reads more like an essay than a literature review, and this needs attention.

Critical discussion & Contribution

You covered somehow the topic but not the breadth (please see above). It would also be good to see some areas that have not yet been researched or have not yet been researched sufficiently.

Structure and Presentation

You provided some relevant contemporary literature, but it remains somehow limited in terms of scope. You could use additional peer-reviewed articles published in high-repute academic journals more than books, working papers, and industry sources.

Harvard System has been overall correctly used.

Last but not the least, there is evidence of substantial use of templated content, which lovers the overall originality of the attempt. I would definitively pay attention to that as well.

The other important action point is to work more on a solid, well-framed structure, a solid theoretical framework, and focus more on the research questions to guide your review.

Please take note of the above-mentioned points.

Figure 1: tutor feedback comments on literature review.

I therefore saw the research proposal presentation assignment as an opportunity to develop my research skills further, as I knew that I needed to use more relevant

research articles to inform my proposal. I found that, by acting on my tutor's advice on searching for peer review articles from high-repute academic journals (see Figure 1), I discovered high quality articles that revealed more in-depth research and analyses into the use of large language models (LLMs) in education. As per Dawson's (2015) suggestion, I then located related studies by using the reference list from these articles. This strategy resulted in my decision to change the direction of my research and alter my research question; I pivoted to investigate the effects of professional development practices on teachers' LLM attitudes and usage patterns. Again, in response to feedback from my tutor (see Figure 1), I focussed in on this research question to guide me towards more relevant literature where I was able to extend ideas and apply them to a new scenario where I believed there to be a gap in the research. I also discovered an opportunity for a real-world application – designing and delivering professional development workshops in my place of work - which bolstered my motivation further. Indeed, finding a real-world application for a research project is said to increase student motivation, where there is a subsequent higher degree of perceived accountability (Dawson, 2015).

In reading quality journal articles and by using core texts books, I was able to further develop my prior knowledge of qualitative and quantitative research methods, and especially the latter; my previous experience with research methodologies favoured qualitative methods, having chosen a sociology-based dissertation topic as part of my Sport Science undergraduate degree. However, as a result of reading many different academic journal articles within this module, I have seen the importance of quantitative data analyses in different scenarios. Combined with my completion of the statistical analysis exercises, this has given me a new-found appreciation of how quantitative data analyses can inform research projects. I have also discovered a number of mixed-method research studies within my reading that have informed my research proposal (see Figure 2), giving a good balance between the 'what' and the 'why' in terms of explaining primary teachers' LLM usage patterns (Paladini, 2025).

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The results of the pre-workshop questionnaire and the 2 post-workshop questionnaires (immediately after the final workshop and again 3 months later) will be analysed. For each construct, mean averages will be calculated for each of the 4 responses' Likert scores and converted to a positive or negative score. The mean averages will be compared across the 3 questionnaires to examine patterns of attitude changes over the course of the study. Individual and collective patterns will be presented and discussed.

Patterns of actual usage will also be analysed, with the pre-questionnaire self-reported data relating to actual LLM usage compared to a frequency measure of actual usage taken from Copilot chat histories taken 3 months after the workshop interventions. Again, individual and collective patterns will be presented and discussed in relation to this data.

Qualitative content analyses of chats will be used to compare pre ('cold') and post ('warm') workshop assessment tasks to help measure learning progress in relation to each professional development session. Each participant will then be given an 'assessed progress score (APS)' based on this analysis. Data from each post-workshop questionnaire relating to self-reported effectiveness will be combined with each participant's APS to provide an overall measure of the effectiveness of each workshop.

A qualitative content analysis of participants' chat histories taken after 3 months will also be made. Judgements will be made in relation to effectiveness of prompts in achieving intended outcomes. These judgements will be compared to recorded attitudes to see if there is a correlation between certain attitudes and adoption. They will also be compared with workshop effectiveness scores to uncover further correlations there.

Figure 2: Excerpt from the 'research design' section of my research proposal transcript, pertaining to a mixed-method approach to my research.

What Next?

I am going to use my tutor feedback and positive experience of writing my research proposal to inform the process of researching for my dissertation literature review. I will also apply what I have learnt about mixed-method processes within my research.

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I will now reflect on how I was able to improve my statistical analysis skills within this module.

What?

I felt more pessimistic about achieving the objective of developing my statistical analysis skills due to two main factors: a lack of confidence in working with statistics, as well as my inexperience in using key statistical analysis methods required within this module (see Appendix 2).

So What?

I believe that my low levels of self-efficacy in relation to working with statistics was fostered in school, where I experienced low confidence and felt a low level of expectation from my GCSE Statistics teacher. Consistent with Malmberg & Martin's (2019) findings, I have found this difficult to overcome, with the perceived low expectations of my then teacher negatively affecting my efforts in this area. Again, I drew upon my resilience to overcome these barriers, trying to embrace the challenge and keep in mind the end goal of developing these skills to better aid my data analysis within my dissertation project.

I also found the statistical analysis tasks in units 7, 8 & 9 to be both useful and enjoyable; the examples and steps detailed really helped me to learn how to apply analysis tools and, although I had to read a lot around t, f and p tests in particular, felt that I was gaining an understanding of what the resulting data represented (see Figure 3).

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	Variable 1(M)	*Variable 2(F)*
Mean	52.91333333	44.23333333
Variance	233.1289718	190.1758192
Observations	60	60
Pooled Variance	211.6523955	
Hypothesized Mean Difference	0	
df	118	
t Stat	3.267900001	
P(T<=t) one-tail	0.000709735	
t Critical one-tail	1.657869522	
P(T<=t) two-tail	0.00141947	
t Critical two-tail	1.980272249	
Difference in Means	8.68	

Exercise 7.2: The t-stat of 3.268 shows that the 8.68 difference in means is significant enough to reject the null hypothesis.

The P one-tail value shows that the probability of seeing this result is extremely low (much lower than the 0.05 significance threshold).

This test assumes equal variability in male and female data. An F-test would validate the analysis by determining the type of t-test needed.

Figure 3: my interpretations of data relating to a t-Test.

By reading around mean averages within this module, I became more knowledgeable about how an understanding of the spread of values can give extra insight into data (Berenson et al., 2020). I found that this was complemented by completing the statistical analysis exercises, particularly those centred around variance (see Figure 4, below). I can now see first-hand why a mean average reading can be deceiving (Berenson et al., 2020).

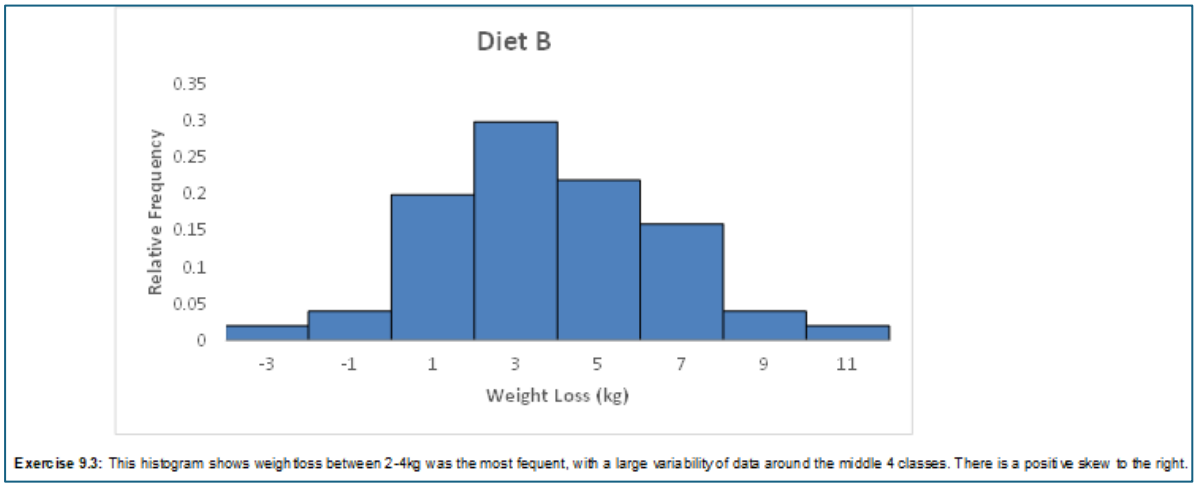

Figure 4: a histogram I constructed as part of a statistical analysis exercise, together with interpretation – such exercises helped me to understand the importance of data spread.

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What next?

I have gained the confidence to apply my new-found statistical analysis skills to data collected within my dissertation project. As I found myself to enjoy the statistical analysis tasks, I have also decided to enrol in Codecademy's 'Learn Data Analysis with Pandas course' to further develop these skills and with the hope of further developing my ability to explain what the results of the analyses show (see Appendix 3).

References

Berenson, M., Levine, D., Szabat, K. A., & Krehbiel, T. C. (2020) *Basic business statistics concepts and applications*. 14th edition, edn. Harlow: Pearson Education Limited.

Dawson, C. W. (2015). *Projects in computing and information systems: a student's guide* (Third edition.). Harlow: Pearson Education Limited.

Malmberg, L. E., & Martin, A. J. (2019) 'Processes of students' effort exertion, competence beliefs and motivation: Cyclic and dynamic effects of learning experiences within school days and school subjects', *Contemporary Educational Psychology*, *58*, p. 299-309. Available at: https://doi.org/10.1016/j.cedpsych.2019.03.013 (Accessed: 14.10.25).

Paladini, S (2025) 'Validity and Generalisability' [Lecturecast]. *RMPP_PCOM7E: Research Methods and Professional Practice*. University of Essex Online. Available at: https://www.my-course.co.uk/mod/scorm/player.php?a=20203&currentorg=articulate_rise&scoid=40485&sesskey=wl3nw9BNP1&display=popup&mode=normal (Accessed: 22 September 2025).

Rolfe, G., Freshwater, D. & Jasper, M. (2001) *Critical reflection in nursing and the helping professions: a user's guide*. Basingstoke: Palgrave Macmillan.

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Appendices

Appendix 1: SWOT Analysis A

University of Essex | **Objective: to develop my knowledge of research methodology processes**

	Helpful **to achieving the objective**	**Hamper** **achieving the objective**
Internal origin (attributes of the system)	Strengths 1. The topic of my research interests me and I enjoy reading around it 2. Motivated – see purpose of learning these skills to help me with my dissertation	Weaknesses/Areas for further development 1. Assessed literature review lacked depth 2. More solid theoretical framework needed 3. More focus on research question needed 4. Need to improve structure of literature review so it is less essay-like
External origin (attributes of the environment)	Opportunities 1. Access to core textbook 2. Access to tutor feedback/advice 3. Access to course material – lecturecasts, seminars 4. Access to UoE e-library	Threats 1. Reduced time to study

Appendix 2: SWOT Analysis B

University of Essex **Objective: to improve my statistical analysis skills, ready to apply these to my dissertation project**

	Helpful **to achieving the objective**	**Hamper** **achieving the objective**
Internal origin (attributes of the system)	Strengths 1. Resilience – enjoy a challenge 2. Motivated – see purpose of learning these skills to help me with my dissertation	Weaknesses/Areas for further development 1. Lack of confidence in working with statistics 2. Inexperience with methods, e.g. using t and p tests
External origin (attributes of the environment)	Opportunities 1. Access to core textbook 2. Access to tutor feedback/advice 3. Access to course material – lecturecasts, seminars	Threats 1. Reduced time to study

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Appendix 3: Professional Skills Matrix

Competency	Essex Graduate	Skill	Skill Level	Evidence
Professional	Literacy, Communication, Language Skills	Express information effectively to technical and non-technical audiences	Proficient	Staff guidance documents created in current employment role. Logged support entries for third-level support from external IT company in current employment role.
		Create documents to aid your communication (reports, diagrams, legal descriptions, plans, manuals and charts)	Proficient	RMPP Module: Research proposal presentation
	Commercial Awareness	Keep current with tools of the industry, as well as emerging technology	Trained	GCSE Computer Science Subject Knowledge certificate; A-level Computer Science Subject Knowledge certificate
		Seek opportunites to improve and share knowledge of tools and technology that may improve productivity	Trained	RMPP Module: Research proposal presentation; Learn Data Analysis with Pandas course (Codecademy)
		Participate in scientific and professional organisations	Trained	Became member of Isaac Computer Science (part of the National Centre for Computing Educaution) and shared its resources in school.
		Emphasise quality, customer satisfaction and fair application of policies.	Trained	Email communications to staff in current employment.
		Demonstrate familiriaty with codes of conduct for the Computing field.	Trained	RMPP e-Portfolio Activity: Reflective Activity 1 – Ethics in Computing in the age of Generative AI
	Subject understanding, research, critical thinking, time management	Critically analyse complex ideas in concepts in the field of Computer Science	Proficient	SEPM Module: Collaborative Discussion 2: Factors Affecting User Experience
		Recognise inconsistencies and gaps in information, and search for additional information when needed…	Proficient	RMPP Module: Research proposal presentation
		Explore complex real-world problems in a Computing context	Proficient	SEPM Module: Development Individual Project: Presentation
Legal and Ethical	Ethical Awareness	Comply with the letter and spirit of applicable laws	Proficient	Email communications to staff in current employment.
		Maintain privacy and confidentiality of company, co-worker and customer information	Proficient	Email communications to staff in current employment.
Social (inc. Teamwork)	Cultural Awareness	Act in the best interest of the community at large - Social (Community) Responsibility	Trained	RMPP Module: Research proposal presentation
	Teamwork, Leadership and Resilience, Time Management	Collaborate effectively in diverse teams to achieve team goals	Proficient	SEPM Module: Development Team Project: Project Report
		Meeting team objectives using teamwork skills	Proficient	SEPM Module: Reflective piece
		Demonstrate skills in leadership and team building	Proficient	SEPM Module: Reflective piece
		Give and receive constructive feedback	Proficient	NS Module: Collaborative Discussion 1: Digitalisation – What are the Security Implications of the Digital Economy?
	Creativity, Entrepreneurial, Problem solving, Initiative, Decision	Create, discuss and deliver strategies for sustainability for all stakeholders (company, community and environment)	Trained	SEPM Module: Development Individual Project: Presentation
		Able to make a decision on a complex matter/scenario using multiple sources of information	Proficient	LCS Module: End of Module Assignment
Technical (Data Science)	IT and Digital, Numeracy	*Technical skills relevant to your degree programme:*		
		SQL for database querying	Trained	LCS Module: Assignment 1: Part 3 of 3
		Python Programming	Proficient	OOP Module: Summative Assessment: System Implementation
		Java	Aware	
		Python	Proficient	OOP Module: Summative Assessment: System Implementation
		noSQL	Aware	
		Scripting Language (Python)	Aware	
		Statistical Language (R)	Trained	
		Gits - repository development and maintenance	Trained	https://github.com/tedge85
		Use of conferenceing technologies and Moodle (VLE)	Trained	https://tedge85.github.io/e-portfolio/index.html
		Use of Word Processing tools and Spreadsheets	Proficient	All modules' reflective pieces; RMPP Module: Unit 7, 8 & 9 tasks
		Effective use of e-library resources	Proficient	LCS Module: End of Module Assignment
Subject Application	Global Citizen, Teamwork, Leadership, Emotional Intelligence	Take into account other people's perspectives	Proficient	SEPM Module: Collaborative Discussion 2: Factors Affecting User Experience
		Work constructively with differences in viewpoints	Proficient	NS Module: Collaborative Discussion 1: Digitalisation – What are the Security Implications of the Digital Economy?
		Actively participate in a range of community activities as an informed citizen	Trained	Professional Development Workshop run as part of current employment
	Decision Making, Initiative, Emotional Intelligence, Ethical Awareness	Develop, articulate and clarify your personal values and ethics	Proficient	RMPP Module: Collaborative Discussion 2 - summary post

Appendix 4: Action Plan

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What do I want/need to learn? Provide a specific description of the desired changes (e.g. skills to gain, knowledge to acquire, topics/themes/content to cover)	**What do I have to do to achieve this?** Some examples, a new/ongoing course, conference, self-development (like wider research or reading), coaching/mentoring, job shadowing	**What resources or support will I need?** Some examples, teaching staff support, library support, student advisor support, line manager, etc.	**How will I measure success?** Some examples, appraisals, course assessments, team feedback, tutor feedback	**Target dates for review and completion** Note that these need to be realistic/achievable
To improve statistical analysis skills, ready to apply these to my dissertation	Complete statistical analysis tasks in Units 7, 8 & 9 and submit these for formative feedback from tutor.	Core text book - Basic Business Statistics: Concepts and Applications (Berenson et al., 2020)	Tutor feedback	19.10.25
To develop my knowledge of how to effectively research a topic, in preparation for my dissertation project	**Complete Unit 3 Lecturecast** **Attend Unit 3 seminar** Undertake reading: Dawson, C. (2015) *Projects in Computing and Information Systems: A Student's Guide*. Harlow: Pearson. ▪ Chapter 2 Section 2.3 p 26-27. British Research Methodology (BRM). (2018) *Research Design.* University of Liverpool Academic Skills. (no date) *Introduction to research methods and methodologies.* QuestionPro. (2021). *What is research?* Sage. (2021) *Sage Research Methods: Methods Map.*	e-library	Tutor feedback	22.09.25