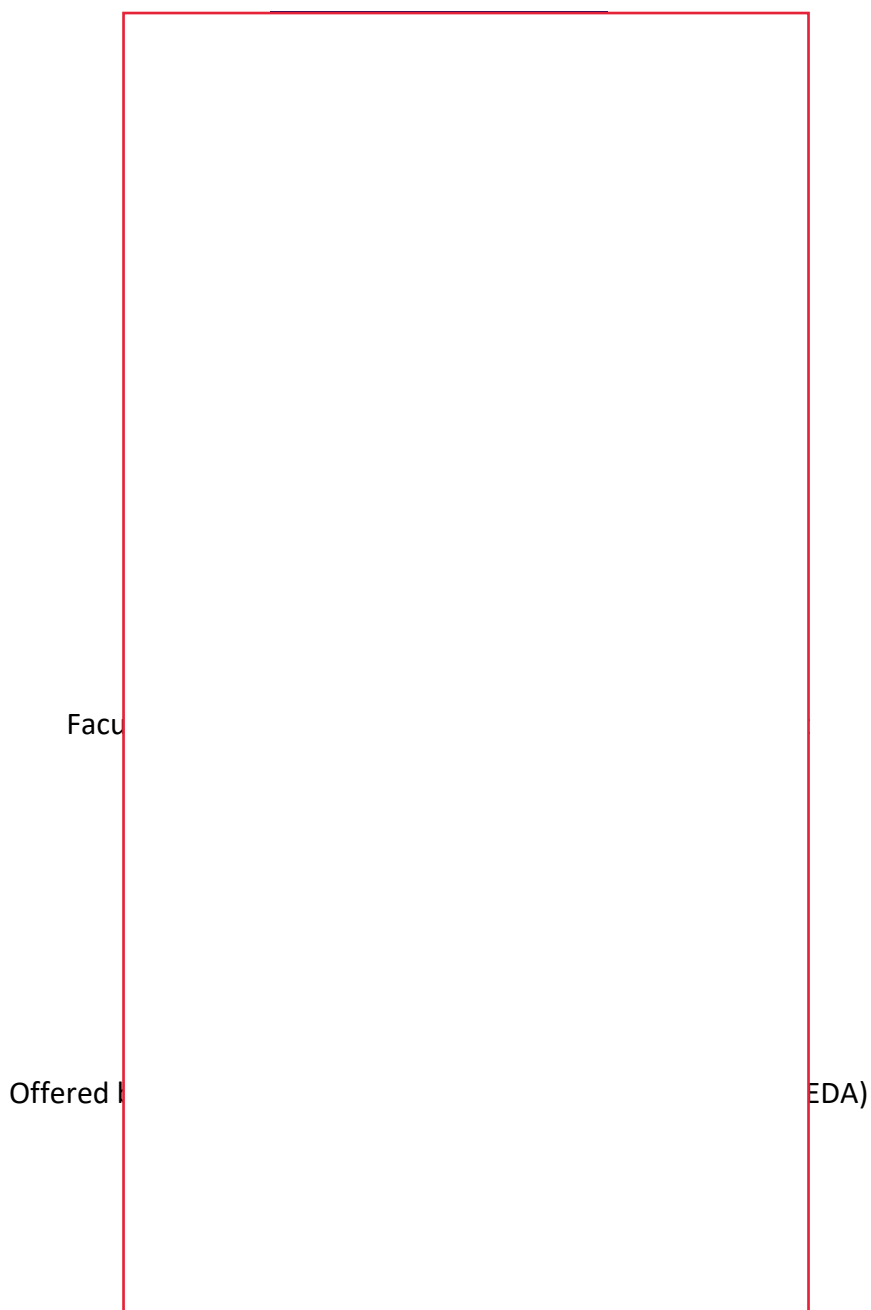


Introduction to Learning and Teaching in Higher Education (HE)



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Introduction

Currently, I am in my final year of PhD at Birmingham City University (BCU). During this role, I had an opportunity to teach MSc students about research activities. Before joining BCU, I had taught various engineering modules to BSc students in Pakistan. This was my first job related to teaching. I also had some industrial experience of computer-aided design (CAD) using 'Unigraphics'.

Since my graduation, I had a passion for doing research. The main reason is that in research, one keeps learning and growing in his field. Typically industrial jobs are set of routine tasks where a worker keeps doing his, one or more, given duties. He learns and gains expertise in that field, besides learning a few more things down the line, but it is not as dynamic and progressive as the research field.

Pursuing research lead me towards academics, especially to higher education (HE). A teacher has to learn more about a subject so that he can effectively teach and engage students. Teaching is not an easy job, as it not only requires enormous effort to prepare session, examination, student activities, and it is an art, which has to be learnt and practised. It is an art to communicate, engage, and nourish students of various backgrounds to comprehend, analyse, apply, assess, and most importantly, enjoy the subject.

My teaching philosophy

In my opinion, a teacher must have the ability to create a passion for a subject in his students. From personal experience, I learned mostly in those modules where the environment was friendly to ask questions. Richard Feynman said, "I would rather have questions that can't be answered than answers that can't be questioned". Open communication created my enthusiasm in every session of that module. There are many ways to build an individual's interest, such as by Skinner's positive reinforcement technique (Mahoney, 1991). A study suggests respecting students' emotional needs motivates them to put more effort into their lessons (Delpit, 2006).

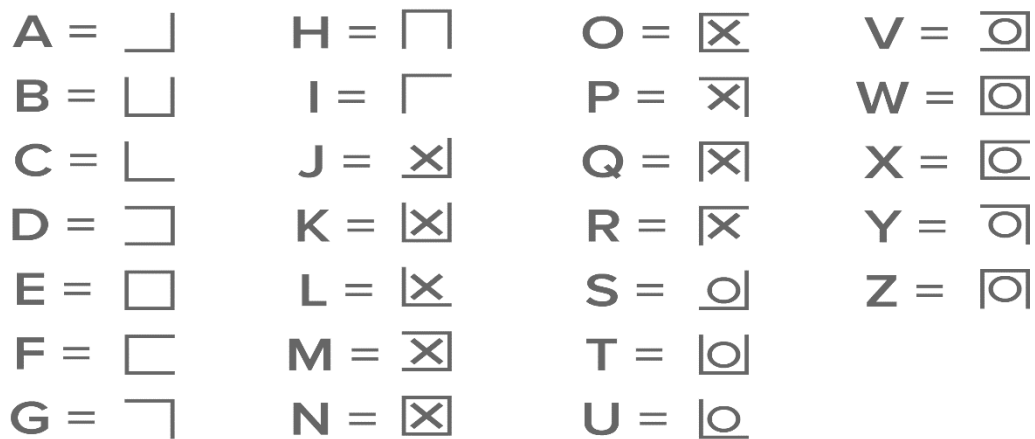


Figure 1: Alphabets based on tic tac toe

Humans generally learn through experiences, described by Kolb in his famous experiential learning theory (ELT) (Akella, 2010). A simple test of tic tac toe based alphabets¹ can reveal how difficult it is to remember new alphabets symbols (Figure 1) compared to knowing how to generate these (Table 1).

Table 1: Conversion of alphabets from tic tac toe (cross and circle are added for extension)

A	B	C
D	E	F
G	H	I

So familiarisation makes people digest any new tic tac toe-based information. This simple test shows that students cannot comprehend even a good lecture, with all details and new tools, if the session is not built coherently and stepwise.

Richard Feynman said, "I learned very early the difference between knowing the name of something and knowing something"². Traditionally pedagogical approach is sought even in HE, where a teacher mostly delivers the lecture with little or no student activity. In the end, students will know and apply the concepts learned in that subject, as some summative assessment pushes them to do so. Dr Shabaz taught mathematics to students who were weak at the subject. In 7 year span (1956-1963), 103 of his students completed master degrees, and a third of them completed PhD, in mathematics, from the best US universities. His approach was to make students understand the concept rather than merely teaching them mathematical operations (Delpit, 2006). So overall, a tilt towards a constructive approach is suitable for engineering students in HE. It is because students learn when they apply the knowledge and then explore it themselves.

Higher education is not about just job opportunities. It is about raising the collective consciousness of a society. Both Murry (1957) and Zook (1947) reports suggest that in order to create a democratic, intellectual and spiritual society, higher education is necessary (Currie, 1958) (Heller and And Heller, 2010).

In conclusion, I believe that HE is necessary for every citizen who is pursuing it. It is passed best by engaging students in sessions and letting them explore by developing passion in them. Any session should not baffle or overwhelm students. An educator must know that students learn by what they do in class and not by what teachers do.

How did I organise my session

Just recently (July 2020), I was asked to familiarise MSc students with my research to find any suitable topic for their MSc thesis from my PhD topic (summer school). Given this single aim, a four-week (24 hours) module was devised, with a stepwise approach to introducing my research.

¹ https://clubpenguin.fandom.com/wiki/Tic_Tac_Code

² https://www.goodreads.com/author/quotes/1429989.Richard_P_Feynman

Firstly I just introduced types of research, types of a research paper, and PhD importance. Then towards my research rationale, significance and background, and finally, objectives and methodology.

After the 'micro teach' session during the SEDA course, I realised that I had not included any student activity. So this time, I didn't forget to include them. A 'round' was necessary for icebreaking and introduction. After every few slides, I put a short quiz so that I could know that students are getting along, as direct feedback.

Besides quizzes, I also put some open-ended questions (some divergent thinking activity) related to my research. For instance, I asked students to list some parameters that could affect an object's heat transfer. After students have brainstormed, I introduced the equation and the relevant parameters. This activity made them develop interest, grasp the theory and self-correct. A followed up question proved this when they solved it quickly.

Breaks are necessary to maintain the student's retention span during a session (Bligh, 1998). I made it clear that any student could leave the class for appropriate necessity during the start of the module. Hence, I didn't give breaks in my session but to refresh students, and I gave all the activities after 20 to 30 minutes. By doing this, they were still involved with the session objectives but not listening to the lecture.

Even before COVID-19 widespread, teaching and learning involved classroom-based and online learning. Teaching tools have substantially been improved in the last two decades, especially (Hofmeyer *et al.*, 2015). However, my sessions were face to face but still interacted with students through email for lectures, feedback and assignment. Videos showing the working of an engine proved better than showing just its diagrams.

The module outcomes were not defined but an overall aim. So I decided to make learning outcomes and objectives. Members of the BCU faculty well received my session plan.

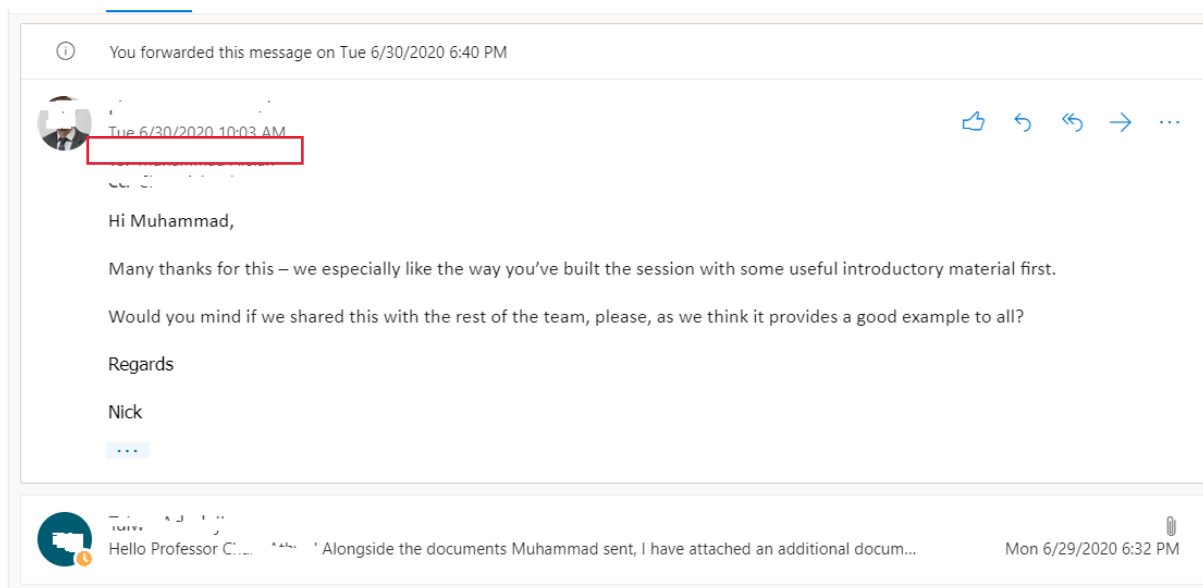


Figure 2: Acknowledgment email by a BCU faculty member

At first, I introduced myself and asked students to introduce themselves and their expectation from the course. Followed by a general discussion about the topic, its importance, classification and practicality. Then I included videos and quizzes for details and feedback. At the end of each topic, I put a summary, rather than at the end of the session. So I had multiples summaries in each session. This was done to make an easy distinction where topic ends (each session had multiple topics), and the summary also cleared what they must know about each topic.

The discipline in my class was somewhat lacking. Students were regularly using their cell phones with their ringtones switched on. For every incoming alert, the ringtone disturbed the continuity of the lecture. Overall, I ignored it unless someone was doing it persistently. I need to lay out some ground rules for future sessions. I can also make an undeclared rule of giving surprise assessment in such event (like quiz) so that students do not unnecessarily engage with their gadgets.

During the lecture, sometimes I forgot keywords to explain a phenomenon. Basically, it was not part of the lecture, but I could not recall these while answering to students. Somewhat similar happened during the micro-teach session.

In both micro-teach and summer school, my audience was from different disciplines. For an engineering course, it may not occur, but sometimes MSc students change their course direction from 'Management' to 'Engineering'. For such a diverse class, examples related to their previous discipline are essential, especially at early stages, to make it easy for them to learn.

In summary, a module must be well designed for effective student engagement. Adding different student activities in sessions helps to achieve modules objectives. The activities must be aligned with the lecture and assessments. Videos, handouts, notes are necessary to explain a topic besides the class lecture. Learning objectives must be covered in each session, and further details can be added in notes, or referred to books and research papers.

A self-evaluation

Like every profession, teaching is continuously evolving in its methods due to a teacher's professional development. It is said reflective teachers are effective teachers and effective teachers had ineffective sessions.

Looking back to my Pakistan career, what I lacked in my teaching was constructive alignment. The course was based on some international examination agency module. I used to teach them the same module, but I always gave them past papers of that organisation for assessment. That made my student alienated from my teaching sessions. They considered my sessions as compulsory to attend but not crucial to listen. One other thing was time management of the overall module.

It is clear to me now that students learn the most for what they do in a class. They usually consider that learning occurs by a teacher, when he delivers the lecture. However, I think an introduction lecture is needed for every class explaining students' learning concepts besides modules breakdown.

Designing a satisfactory assessment is vital for engaging students effectively. In my experience as a student, I have come across quiz, assignment, project and final assessment. Having read about the different assessments and their objective, like the rubric for moderation, reliable assessment for standardisation, I consider that constructing an assessment holds a critical role in achieving learning outcomes. All the minor and major assessments during the module or at the end of it must be designed to produce such student activities that enable them to achieve module objectives.

One other thing I learnt during the micro-teach session is not to overwhelm the students. The session must be split into digestible bits so that students do not lose interest. For that, the PowerPoint slides must include self-explanatory diagrams and description. But overloading these with information may make student undecided about essential and non-essential information. For that, separates notes can be made which can explain each slide. Hence, the slides can only contain information solely related to session objectives.

As my micro-teach session was recorded, I could see many discrepancies in my lecture delivery. On top of these are; not speaking clearly, and not using appropriate vocabulary. So a video or audio recording of my lecture will help me to improve myself. It was not mainly related to my speaking skills but also my insufficient preparation for the lecture. So I forgot using many critical words while answering the student's questions.

Keeping a log of questions of a lecture, such as what went wrong, how I feel, and what should be my action plan, can help me self-reflect. After re-watching my own videos, I can write down all the possible flaws in my teaching methods and try to improve these areas. After a while, I can make my own 'reflection check list' for each module, so to check whether I have improved each deficiency or not.

For self-evaluation, I can make my form to observe other skilled educators. I can write their strengths in the same logbook and fill the observing form. Also, I can ask them to observe my one session or more so that they can guide me about my weaknesses which I cannot uncover independently. After 1-2 sessions, I can ask students for a quick survey for their liking or disliking about the session and their recommendations to improve the session experience.

Muhammad Ali said, "The man who views the world at 50 the same as he did at 20 has wasted 30 years of his life"³. Continuous professional development is central in such a rapidly changing teaching environment. Joining professional learning communities (PLC) enables one teacher to share his experience with others mutually. Members can learn each other effective methods early than spending years finally figuring out themselves.

Overall, the student's participation in class is critical. It can be achieved by creatively designing class activities and assessments. Policing is not my approach, but some limits are needed to be set at the start of the class. Self-reflection and self-evaluation are necessary for a teacher to improve his teaching methods. Feedback from peers and students, recording your session, keeping the session's log are required to achieve this. Learning from

³ https://www.goodreads.com/author/quotes/46261.Muhammad_Ali

the same course-level teacher from various institutes and departments can help me achieve it quickly.

A Student Feedback

Student Evaluation Form

Session feedback

How would you rate this seminar / lecture?

Very bad 1 2 3 4 5 6 7 Very Good

7/10 (very good)

What did you enjoy the most?

I enjoyed the SCM seminar

What did you enjoy the least?

N/A

Do you have any suggestions for improvement?

I think it would be great to have more seminars about references/citations (e.g second authors, Harvard referencing, Endnote, Mendeley ..etc)

How are you enjoying this module in general?

Not at all 1 2 3 4 5 6 7 Very much

Thank you

Figure 3: A student feedback from 'Summer School'

Action Plan

Continuous Professional Development Action Plan				
Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Objective/Goal /Learning and Development need	Individual steps needed to achieve objectives	By date	Comments (e.g. funding/resource requirement, etc.)	Evaluation: reflections on learning and the impact /potential use in practice
Learning more about teaching methods, assessment, self-reflection	Seeking PLC to learn, self-learning of materials like by SEDA.	Dec 2020	Besides the current program, I will seek more.	Will significantly help me to prepare lecture, assessments and designing module objectives
Engaging students rather than policing	Prepare more for lectures, seek the help of previous program leader, designing constructive student activities.	Subjected to opportunity	I will go through the entire SEDA course and relate it to my approach and reflection. I will also seek a teaching assistant position to observe the leading teacher and give secondary lectures like lab work.	I will be able to engage more with students. So I can save time and finish all the learning objectives in that session. Students will learn more also.
Student feedback	Making different feedback form based on formats like 'exit slip', 'teacher reflection survey', etc.	Feb 2021	Before the start of modules, in between and at the end. I will pursue it after my PhD.	This gives me to steer myself in the direction of student interest. Also, sometimes they need to learn extra/different from module too (Figure 3)

Industry experience	I have some already Can get more when I write my paper	June 2021	Looking for post-doc Looking for teaching assistance Looking for collaboration when will write my paper	It will significantly help me identify what is most important in the industry so it must be included in the module.
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