REVIEW ARTICLE

The Aim of Higher Education

MUHAMMAD JAWAD HASHIM
Department of Family Medicine, College of Medicine and Health Sciences, United Arab Emirates University, Al Ain, UAE
Correspondence to Dr. M. Jawad Hashim, email: jhashim@uaeu.ac.ae; physicianthinker@gmail.com, Tel: +971 3 971 3655,

ABSTRACT

The aim of higher education is to nurture higher order thinking. College students attain mastery by acquiring expert ways of thinking. Learning is reflecting. Teachers should aim to stimulate curiosity and a desire to learn. A teacher's enthusiasm drives learning. Teaching should not cover all topics in the curriculum as this is based on a misperception of the teacher's role. Teaching is inspiring. Learning during higher education ought to extend beyond discipline-specific expertise to include four higher-order competencies: liberated learning, deep thinking, clear communication, and focused resilience. These in turn, are based on five core skills, namely, writing, numeracy, financial acumen, computing expertise, and design skills. Operationalization of these aims can be achieved via careful course planning, matching assessment to learning goals, and teaching strategies such as Lecture Plus. Lecture Plus is a lecture followed by a learning activity. Learning activities include small-group exercises. Course planning should aim for higher order thinking.
Keywords: Education, Graduate; Education, Professional; Teaching Methods

INTRODUCTION

What are the goals of higher education? This fundamental question can be addressed at three levels: students, faculty, and the college administration. All three stakeholders must share a common vision, yet the preparation needed, and the routes taken are different.

The aim for college students is to gain mastery in their fields. Going beyond foundational knowledge, students must acquire expert ways of thinking and problem solving. This metamorphosis from novice to a deep thinker requires extensive reading, critical reflection and familiarity gained with repeated practice under expert supervision – an apprenticeship. Mastery learning should be the goal of all university students. Seeking it in formal instruction as well as in one-to-one interactions with professors. Of note, mastery does not come about from simply acquiring facts. While familiarity with discipline-specific knowledge is an essential first step, students must reflect on the subject matter. Reflection is the state of consciously thinking about the subject matter as well as one's own cognitive responses[1]. Learning is reflecting.

The aim for university teachers is to inspire. Inspiring students to learn and reflect can occur by sharing stories of case studies illustrating key concepts, or through the joy of guided self-discovery. The constant target of teaching remains stimulating curiosity. A key ingredient is the energy that a teacher brings to the classroom. A teacher's enthusiasm drives learning. College students should be motivated to learn independently while relying on teachers for clarification of difficult concepts. Unfortunately, many college instructors tend to obsess on content[2]. This misguided mindset stems from the urge to 'cover the topics' and the mistaken notion that 'to include a topic in the exam, it must be taught.' Lectures packed with facts on projected slides are uninspiring and do not lead to learning[3]. Surveys of university students show that teaching quality needs improvement[4]. Students are inspired by role-models who share insights and experiences. Teaching should be holistic and learner centered.[5]Outstanding teachers care deeply for their students. Teaching is inspiring.

The aim for universities and colleges is to build a nurturing learning environment. This can only occur in an atmosphere of openness, emotional warmth, and safety[6]. Teachers can create this at the micro-level in their classrooms and in their one-to-one interactions with students. Sarcasm and pessimism are to be avoided even when students 'deserve it'. Stress levels among college students are already unacceptably high[7]. College administration can foster a learning environment by respecting and supporting teachers. Unfortunately, when teachers feel intimidated and disrespected, their commitment to teaching and learning falters.[8] They cease to care deeply. At the systems level, university

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leadership should strive to be inclusive, understand the key requirements of different stakeholders, use a participatory planning process and implement comprehensive systems for measuring institutional performance. Key performance indicators have to be carefully mapped to the strategic, long-term aims of the institutions. Systems thinking starts with a people first attitude and leads to enabling systems that are respected and upheld[9].

This leaves us with the overall vision of higher education. In contrast to vocational training, university education should extend beyond technical knowledge and skills. Higher education should lead to higher order thinking. This level of cognition involves synthesis of new ideas by linking across disciplines and critical re-evaluation of prevailing theories. University education is a fundamentally liberating experience. It imparts upon the learner the cognitive ability to overcome preconceived beliefs and view others' perspectivesdispassionately.[10] This rational consciousness, along with core disciplinary competencies, distinguishes the university graduate from a technician. Ultimately, such thinkers see beyond self-interest and drive social change for the betterment of the society. Higher education advances civilization.

Core competencies in higher education: Based on this vision, four higher-order competencies can be identified, listed somewhat hierarchically:

Liberated learning – it is the desire to seek true knowledge as well as the aspiration to acquire new skills and expertise – rekindled curiosity. College graduates should be able to learn independently. Self-directed learning requires the ability to set own goals and the yearning to explore new knowledge territories.

Deep thinking – a composite of critical reasoning and reflective mindfulness, it includes appraisal of information for reliability and authenticity. Deep thinking requires familiarity with logic as well as

Clear communication– a skill set that includes oral and written communication. It builds upon empathic understanding of others' views through active listening as well as awareness of one's own emotions[11]. Examples include engaging through storytelling, data visualization, and collaboration in teams face-to-face and via digital platforms. Effective communication is critical for leadership (inspiring change) and mediation (problem solving in times of conflict).

Focused resilience: the transition from textbook exercises to adaptive problem-solving within real world constraints requires more than mere application of knowledge; learners have to demonstrate a sustained, intense focus on a single problem. In the pursuit of a viable solution, qualities that determine success include perseverance, the ability to learn from failure and seeking feedback from impartial critics.

Cognitive skills: Certain core skills support the higher order competencies mentioned above. Cognitive skills are the gears of the intellectual engine that drives higher-level thinking[12]. These essential skills are:

Numeracy – a core skill for college students, numeracy includes arithmetic operations (including ratios), geometry, and algebraic notation. This extends into quantitative reasoning and statistical inference such as multivariate analysis and effect **Financial acumen** – familiarity with budgeting, meticulous record-keeping for accountability and audits, and the time value of money are essential for college students engaging in project management.

Computing expertise– from word processing and file management to data storage and reuse, computing skills cannot be taken for granted even among the newer cohorts of students.[14] Advanced computing skills such ascoding and designing data

Design skills – all students should strive to improve the aesthetics of their work. Design qualities includelay out, color choice, and new combinations that inspire wonder. Craftsmanship of any product, including written work, should exhibit elegance and attention to detail. Design thinking requires proactive planning for intended function as well as artistic form.

Figure 1 summarizes the skills and competencies of higher education. Operationalization of these goals will require a set of strategies that are aligned to the aim of higher education. For example, instead of making calculus compulsory, new courses should be offered on clear writing, storytelling, graphic design, applied statistics, and financial management. These pedagogical strategies in university education can be implemented in three overlapping phases: course planning, instructional strategy and assessment.

Fig. 1: Higher education competencies
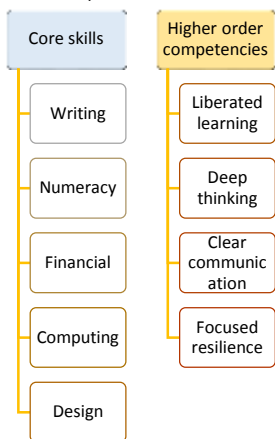
Course Planning: Course planning starts with a huddle of two to three teachers writing down the overall aim of a course, its target students, exit competencies, a list of topics and key assessment methods (Table 1), taking care to avoid overambitious targets[15]. A common fault is to incorporate too many assignments and assessments. While based on a well-intentioned desire to keep students busy with coursework, it goes against the principles of adult learning and is harmful to students' innate desire to learn.

Instructional strategy: Figure 2 provides a hierarchical pyramid of teaching strategies based on learning effectiveness. Small-group teaching should be favored, although instructors often use large-group lectures for efficiency. The use of technology for independent self-pace distance learning has gained popularity in higher education[16]. Technology should serve learners' needs. Avoid using technology to distance learners. Caution should be exercised in using open (and distracting) platforms such as social media in higher education[17]. Formative assessments (practice quizzes)that do not carry any weight in the course grade are a vital part of the teaching-feedback process.

During a lecture, expert thought process should be modelled through step-by-step problem-solving. Common student errors should be pointed out. Ideally, these should be written out live on a whiteboard instead of showing PowerPoint slides or videos.

Teachers should practice and take pride in their handwriting and diagramming skills.

Although used infrequently, intimidation is not an effective teaching technique. Warnings and threats of low grades may induce submissive behavior but do not inspire a desire to learn. A friendly environment in which teachers communicate cooperatively with their students should be nurtured.[18]A bibliography with a list of references is not very useful, instead, students can be guided to one to two recommended readings (preferably available as free full-text online, printable documents) with brief annotations by the instructor. End of course feedback from students can be invaluable.

Fig.2: Teaching pyramid
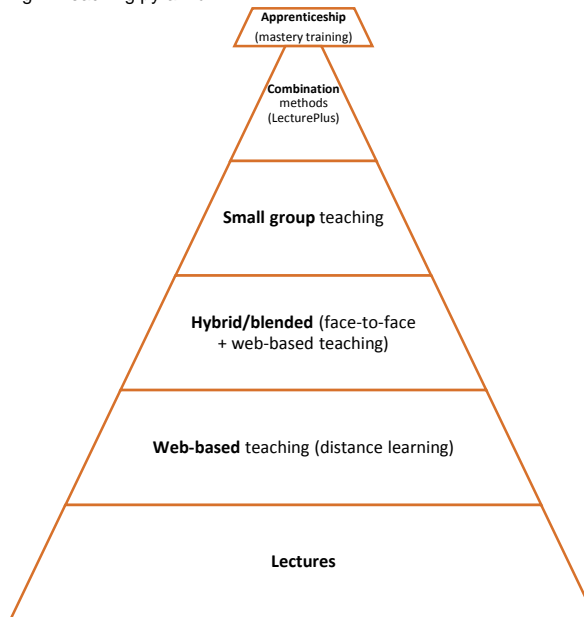
Lecture Plusis specially designed for higher education as an alternative to lectures. Lecture Plusis a lecture followed by an activity (Figure 3). The lecture in Lecture Plusis brief (typically less than 20 minutes) and didactic. It should include definitions, examples, common errors, and sample exam questions. Students should defer their questions to the end of the lecture. Student questions during a lecture interrupt the train of thought of other students. Typically, these questions are asked by more vocal students. Often these questions are addressed in subsequent slides. A highly interactive discussion often degenerates into an informal conversation (an exchange of opinions unsupported by research evidence). The second part of the Lecture Plus is a learning activity. For example, the class could be divided into small groups of three students (triads). Case-based short-answer questions are then distributed to these triads. Other exercises can also be used such as role-play, computer-based simulations, laboratory experiments, or project planning. The teacher walks around and assists any groups that are struggling. At the end, closure is achieved by displaying recommended answers. While some disciplines may not have single, correct answer to a problem, it is nevertheless important to have a satisfying closure by displaying a model solution. It is important to show students at least one potential solution. Advantages of the Lecture Plus include a complete single session that caters to different learning styles. This format is based on the principles of adult learning, formative self-assessment, and interactive learning in small groups. Pre-session reading materials should be online. Pre- and post-session assessments are not always needed.

A common urge among faculty members is to 'cover all the course topics' with lectures. This impulse stems from a

misperception about the teacher's role as well as the need to defend against students' (untenable) complaints about examination questions on topics that were 'not taught to us.' While examinations can map the entire course, lectures should address two areas. Firstly, fundamental topics should be taught including definitions and worked examples. Secondly, difficult concepts (as indicated by student mistakes in recent assessments)should be explained.

Time should be blocked towards the end of the course for Proactive Remedial Sessions. These one-to-one sessions should tutor the weakest learners as identified in mid-course practice quizzes. Often these students are reluctant to ask for help. Teachers should take extra effort to help the weakest students.

Assessment: Examination questions should map the entire curriculum. The process of matching assessment to course objectives is known as blueprinting. Blueprinting is more likely to be feasible with a large number of brief questions such as multiple-choice questions (MCQs) than with a few essay questions (Table 1). Questions should be modified even if slightly when reusing from a question bank.

Subjective assessments measure depth of learning. Students should be shown the rubrics for such assessments. Essays, reports, projects and oral (interview) examinations are prone to assessor bias. Students seek hidden factors that are known to appease each examiner. These factors can include details such as formatting of the essay, specific terms to use or to avoid, and even to how dress for the interview. Unfortunately, these specifics can become the focus of student preparation for the assignment, detracting from subject content. Students pass on to each other descriptions of specific preferences favored by each

teacher. More insidiously, teachers often grade student assignments based on these subconscious preferences. These drawbacks are avoided with objectively marked questions such as MCQs. Students prefer the MCQ format.[20] Objective assessments keep students focused.

CONCLUSIONS

Faculty and the leadership in higher education can gain clarity by reviewing these aims when setting their institution vision and mission. Operational decisions including budget allocations should serve these strategic goals. When stakeholder groups such as faculty, staff, students, and the public look beyond self-interest and align with the aims of the higher education, the university can advance society.

Figure 3: Lecture Plus

Lecture Plus is a teaching session consisting of a lecture followed by an activity. The lecture within a Lecture Plus should be brief and non-interactive. The learning activity can be small group problem-solving exercises. Small groups should be no more than three students per group. During exercises, the teacher should walk around and assist struggling groups. Closure is achieved by displaying model answers at the end.

Table1: Course matrix

Level	Cognitive level	Learning objective verbs	Instructional strategies	Subjective Assessment	Objective assessment
1A	Remembering (knowledge)	Define Classify List	Lecture	Essay	MCQ
1B	Understanding (comprehension	Describe Summarize	LecturePlus	Essay	SAQ
2A	Applying	Apply Solve Interpret	LecturePlus	Short essay	MCQ
2B	Analyzing	Criticize Distinguish Appraise	Project-based learning	Essay	SAQ
2C	Practicing	Do Show	Practical laboratory or field work	Project	SPEX
3A	Building (synthesis)	Design Formulate	Workshop Tutorial	Thesis	SAQ
3B	Evaluating	Assess Evaluate	Project-based learning	Report	SAQ
3C	Performing	Perform Conduct	Project-based learning	Project	SPEX

MCQ, multiple-choice questions; SAQ, short-answer questions; SPEx, structured practical examination.

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