

Editorial**Input, Process and Output: system approach in education to assure the quality and excellence in performance***Salam A*

System approach is a term that means to do something systematically. In educational industry, to teach systematically teachers must consider input, process and output and decide objectives, contents, methods and assessment. The inputs are basically the objectives and objectified contents that teachers put in while the processes are the methods of delivery of contents. Outputs are the end-product of educational inputs and process those must be assessed based on objectives. Probably the most difficult struggle facing the educational industry is about how the curriculum to be customized. Curriculum is the result of piecing together of a number of information including vision and mission statements of educational institutions. Objectives, contents, methods and assessment are the key elements of a curriculum. Though medical education is in the process of changing, there are big problem in undergraduate medical education due to lack of objectivity, overloaded content, improper methods of content delivery and inappropriate ways of assessment of output.^{1,2,3} The input, process and output must be relevant and there must have the right mix of curricular objectives, contents, methods and assessment aimed to produce competent and confident medical practitioners. This paper briefly emphasizes on the needs of alignment of key elements of a curriculum and fit these as input, process and output to meet up the system approach in education. By proper implementation of the system approach the educational managers can be able to raise the standard of education and assure the quality and excellence in performance.

An input should include objectives and objectified contents. Objectives are statements of desire, expected to achieve by the learners at the end of an educational programme. The purpose of learning objective is to communi-

cate the desire. Excessive details or a vague statement of desire is a common concern in inputs which may obscure the overall concepts or aim of the curriculum.^{2,4} Educational objectives are classified in three domains. Cognitive relates to thinking, affective relates to feeling and psychomotor domain relates to acting or doing. Well written learning objectives in terms of thinking, feeling and doing are the heart of any curriculum. To write an objective, educators need to consider four parts, the acronym of which is ABCD, where "A" stands for the audience or the learners for whom the objectives are written; "B" stands for behaviour which is a verb that describes what the learners will be able to think, feel and do at the end of the instruction; "C" stands for the conditions which are the circumstances under which the objectives must be completed; "D" stands for degree which are the standard or accuracy that learners have to achieve. Learning objectives should be SMART, an acronym of specific, measurable, attainable, realistic and time bounding. If objectives are identified clearly then the outcomes, which are the end results of any curriculum or programme can be pre-determined and achieved. If any part of the objective is missing from the statement, it cannot be communicated accurately and the outcome cannot be determined firmly.

Contents as inputs should be matched with objectives i.e. it should be clearly correlated with the objectives which are then named as objectified contents. Objectified contents should be specified in terms of cognitive, affective and psychomotor skills learning. Content overload with unrelated specific objectives is a common concern in medical education. To select content, educators have to decide the core and optional portion of a topic or curriculum⁵ and should consider "Must

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know,” “Good to know,” and “Nice to know” while deciding core and optional. Mastery of the core guarantees the maintenance of standard and the options offers areas to the learners for study depending on individual needs or interest.

After deciding the objectified contents, the next step is to decide the teaching methods / process for delivery of the inputs. Teaching methods may be in large group or in small group format and may be in the hospital or community settings. Depending on the settings and format, we select different audio-visual media to facilitate learning. Selection of appropriate media or activities involved in content or input deliveries have impact on learning. These activities includes structuring or designing of power point slides, example setting during presentation, enhancing key points, summarising key points before ending, interaction like eye contact/allowing questions and audibility. Good audibility includes a clearly spoken speech that is loud enough to be heard with use of varied tone and rate to hold attention. .

Output is the product of educational input and process which must be assessed. Teaching and assessment can be regarded as two sides of the same coin.^{6,7} Assessment should be guided directly by the objectives. Assessment drives learning and learning drives practice.⁸ The quality of assessment carried

out to measure the output in medical school has been a growing concern for medical educators.⁹ The purpose of assessment is to grade or rank the students, pass or fail the students, provides students’ counselling and updates the course contents and teaching methods. Students counselling and updating the teaching methods based on assessment results unfortunately are not done. Objectivity, validity, reliability and practicability which are the pillars of an assessment have been found defective in medical schools. A variety of comprehensive assessment tools like multiple choice questions, modified essay questions, objective structured practical /clinical examinations, long and short cases etc. are used by the medical educators to make the assessment reliable, valid, objective and practicable in order to produce good output or competent and confident medical practitioners.

Inputs, processes and outputs are system approaches in education. Objectives, contents, methods and assessments are the integral part of system approach and key elements in any educational planning which is inter-related with each other. Before asking the question “What type of product should medical schools produce?” medical educators must ask “How do medical schools nurture or grow their garden?”

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