

Formative Assessment-Existing and Expected for Quality Education in Higher Education Institutions of Pakistan



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Abstract: *Formative Assessment being the most important part of assessment in education is for students' needs for learning and improvement in it at daily basis. This paper discusses the elements of existing formative assessment model and compares it with the expected formative assessment model in the study area. Data was collected quantitatively from 428 students, 50 teachers and qualitatively from 40 students of three disciplines of universities of Khyber Pakhtunkhwa Province-Pakistan. Findings suggest that missing elements of formative assessment model can be incorporated systematically semester wise for quality education. Consequently, understanding and implementation of all approaches of formative assessment can enhance self-regulation and deep learning in students.*

Keywords: Formative Assessment, Elements of formative assessment, Formative assessment model, Learning at Higher education, Quality education

Introduction

Assessment is an essential component in teaching-learning process. It is a tool to systematically collect information, analyse and interpret the learner's performance according to educational goals. It gives teachers an understanding of students' knowledge of information and provides the students with the feedback about their learning progress. Such a process involves vigilant and systematic gathering of evidence for optimal and fruitful utilization. The present assessment practices have been reported to be inadequate for preparation of lasting learning of learners (Boud, 2000). Hence focus was demanded for better assessment that can promote students as self-regulated learners not only at their learning institutions but also at their workplaces in future (Boud & Falchikov, 2007).

In the current change in higher education

throughout the globe, these institutions are called upon to reconsider their purpose of assessment in order to prospect their learners with the capabilities for their future workplace. More importantly institutions of higher education have been advised to strive for variety of methods and models of formative and summative assessment for lifelong learning and producing learners with the competencies of regulating and monitoring their learning (Shute & Becker, 2010).

When learning is assessed for grading and promotion at completion of the course, it is called summative assessment. Although it is an assessment of learning yet it is only marginally supportive for individuals' learning. However, when assessment is carried out during class interaction for the purpose of students' needs for learning and improvement in existing learning it is said to be formative assessment (Buldu &

Buldu, 2010). It has been acknowledged that assessment can support students' learning if used as elementary part of teaching rather than using it supplementary (Shavelson, (2006).

If done correctly and presented to students in the right way, formative assessment (FA) can provide a continuous stream of evidence towards progress of students' learning and in mastering the knowledge and skills according to quality assurance indicators (McKenna, 2011). Additionally, if FA is done properly and a timely

feedback is provided, then according to the students, FA is very helpful in increasing their learning capabilities presently and working competencies for the future. However, FA requires extra time, resources and a lot of passion. Therefore, higher education institutions have to take bold steps to implement it in such a way as to ensure improvement in self-regulated learning (Craddock & Mathias, 2009).

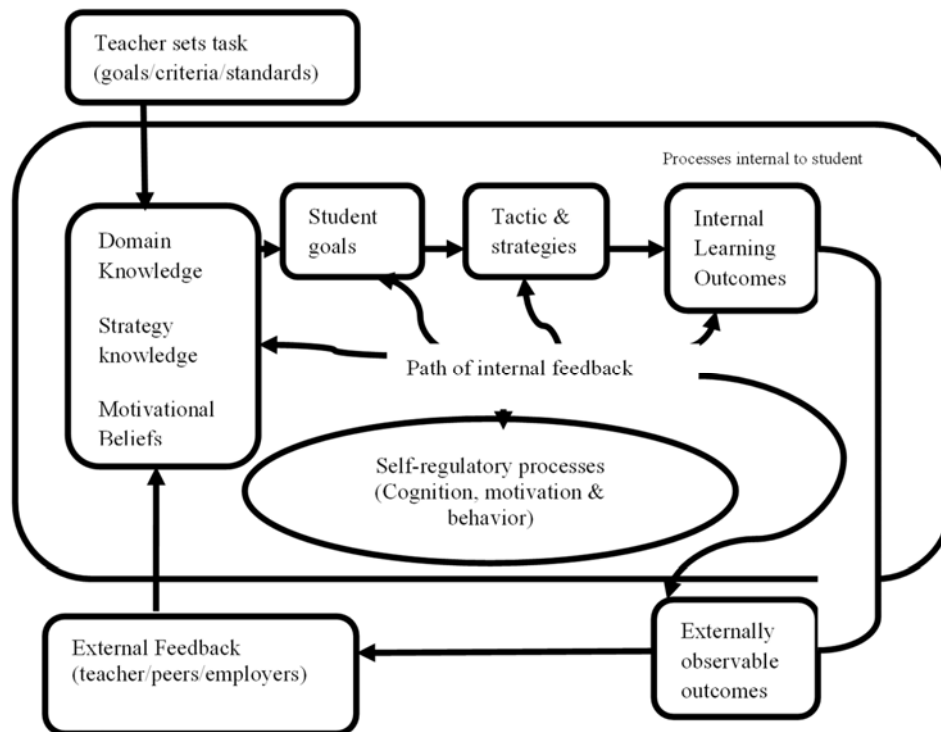


Figure 1. A model of self-regulated learning (Nicol & Macfarlane-Dick, 2006)

The whole process of FA acts as a tool to help teachers in integrating the assessment process using all its elements and serves as a basis for developing the measuring tools of quality assurance indicators. According to (Nicol & Macfarlane-Dick, 2006), the students need to be self-regulated regarding their learning, they presented a model emphasizing students' self-monitoring with the help of FA as shown in figure 1.

Organization for Economic Cooperation & Development (OECD, 2008). presented a model indicating five elements for FA. The model is

shown in figure 2 and it explains that FA encourages interactive classroom culture by using various assessment tools. Additionally, it formulates learning targets, uses various approaches of instructions with assessment tools, provides feedback on students' performance and actively involves students in the class room activities.

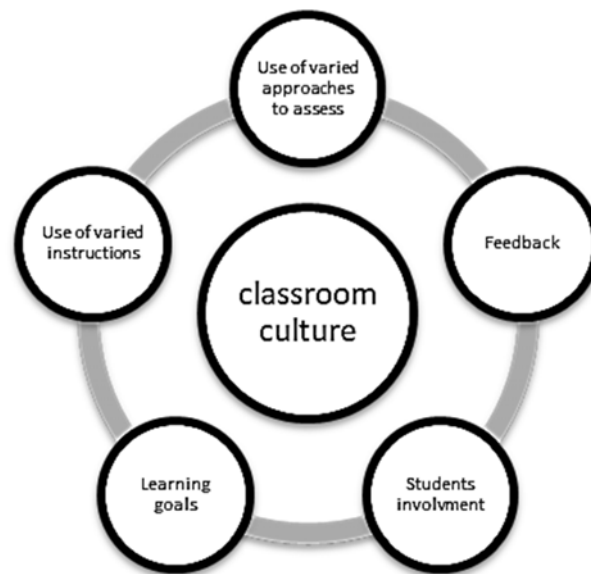


Figure 2. The six key elements of formative assessment (OECD, 2008).

The elements of FA according to (Heritage, 2010), are interdependent rather than discrete

and can be framed in a cycle

(Figure 3), representing that FA is a continuous process and has interdependent elements.

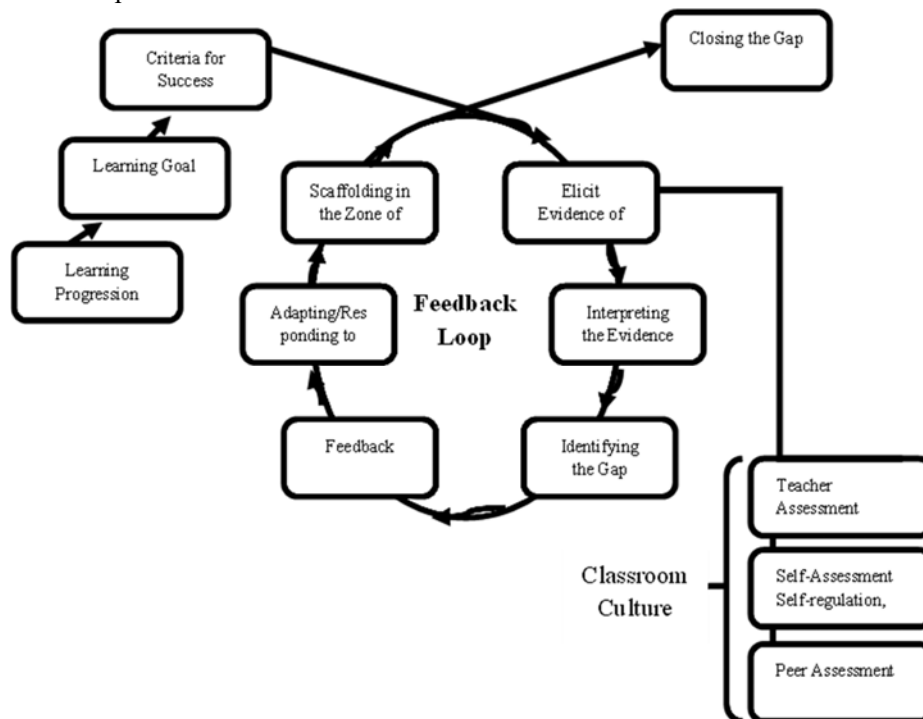


Figure 3. Initial Framework of Formative assessment (Heritage, 2010).

Figure 3 also shows that the feedback is a connecting element that closes the identified gap between learning and instructions, if any. As in higher education, the students find lesser opportunities to use feedback as is required for a

better learning, due to a number of constraints, so some specific strategies were required for students' help to use feedback and regulate their own learning.

In Pakistan, the elements of FA have been described by its Higher Education Commission (HEC), following National Professional

Standards for Teachers in Pakistan (Government of Pakistan, 2009), set by the ministry of education. To ensure their implementation, HEC has established a quality assurance agency (QAA), who demands from all public and private universities to establish their individual quality enhancement cell (QEC). For keeping the quality of education to the required standards, these QECs have to take steps for implementation of indicators set by HEC for producing self-regulated learners (Batool et al, 2010). It is a known fact that excellent norms and systems are mainly dependent on the dealing hands, which in our case are the university teachers.

Different researchers like (Ali & Iqbal, 2013) and (Dilshad, 2010) have pointed out deficiencies of pedagogical know-how at the tertiary level teachers in Pakistan, due to which, all required elements of FA are not implemented and hence the quality of education is compromised.

So there was a great need of developing a model that addresses all indicators of an internationally accepted model including all elements suggested by HEC. This article discusses the use of FA in the higher education institutions of Khyber Pakhtunkhwa, difficulties in implementing FA in these institutions, possibilities of formulating a model that includes all internationally accepted standards, addressing national requirements in the same model and making it easily implementable in the classroom by a routine university teacher.

Research Methodology

The purpose of this work is to develop an

Table 1 HEC's Masters Structure for Undergraduate Student

Total No. of Credit Hours	30 (minimum 24 credit hours of Course Work + 6 credit hours of Research)
Semester Duration	16- 18 weeks
Course Duration	1.5 – 2 years
Number of Regular Semesters	3-4
Number of Summer Sessions	1 – 2 in one academic year
Course Load per Semester	9 – 12 Credit Hours

Source: HEC the standard scheme of study
Because of its elements, the model suggested by

internationally acceptable FA model according to quality assurance indicators of HEC. For this purpose, the FA pattern was studied in the study area and then it was compared with the models used internationally. Thus a suitable model for all types of higher education institutions was developed by using (Engineering Statistics handbook, 2012) guidelines for the purpose and including all missing elements noted in the study area.

To study the implemented FA pattern in the study area, data was collected quantitatively using stratified random sampling, from 428 students and 50 teachers of the target departments (the departments of chemistry, mathematics and biology) of ten universities working in Khyber Pakhtunkhwa, Pakistan. A set of qualitative data was also collected from 40 students of these three disciplines. Semi structured interview for students and Questionnaires for both teachers and students were served as data collection instruments.

Data was analysed with the help of Statistical Package for Social Sciences version 20 (SPSS 20). The means and standard deviations were calculated using Descriptive statistics. The basic steps involved in development of a model are as follows (Engineering Statistics handbook, 2012):

The FA pattern was investigated in the study and then compared to the internationally practiced models and national professional teacher standards to pin point the short comings and was compared with master level program requirements of HEC, shown in Table 1.

¹⁰ was found most suitable for developing a new FA model keeping in view all the above

discussed requirements of the study area. The model thus suggested as a result of the study was validated by the educational experts from higher education institutions, having vast experience in the fields of pedagogy, student-teacher psychology and quality control. The suggestions and feedback provided by these experts was

incorporated and the improved model was sent to the same experts for re-examination. The process of improvement was continued till the satisfaction of these experts and their opinions on the finalized model were quantitatively analysed.

Results of the study

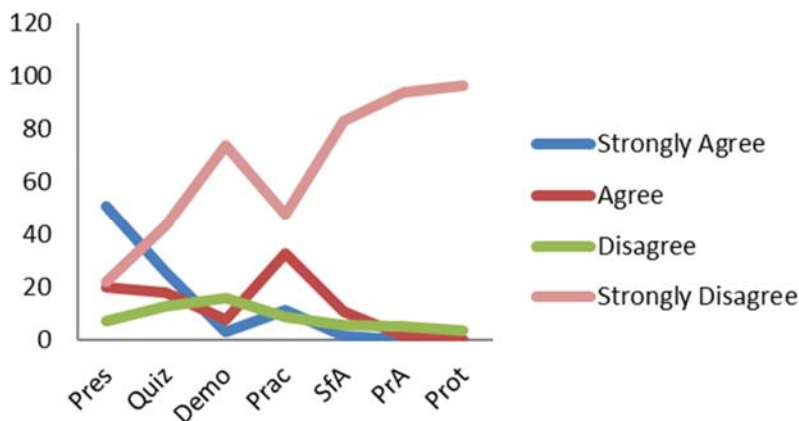


Figure 4. Students' response about use of Alternative assessment methods

The student respondents of the studied departments were of the opinion that only presentations, quizzes and practical work (only in chemistry and biology departments) were used to assess them in the classroom as indicated in figure 4. They ranked self-assessment, peer assessment and portfolios as lowest used strategies which indicates that all the FA

elements are not implemented at classroom level.

The teacher respondents (figure 5) ranked presentations and assignments as the most used assessment methods in the classroom. The difference of opinions of both the students and the teachers is because of lack of knowledge of varied assessment strategies and vague learning objectives.

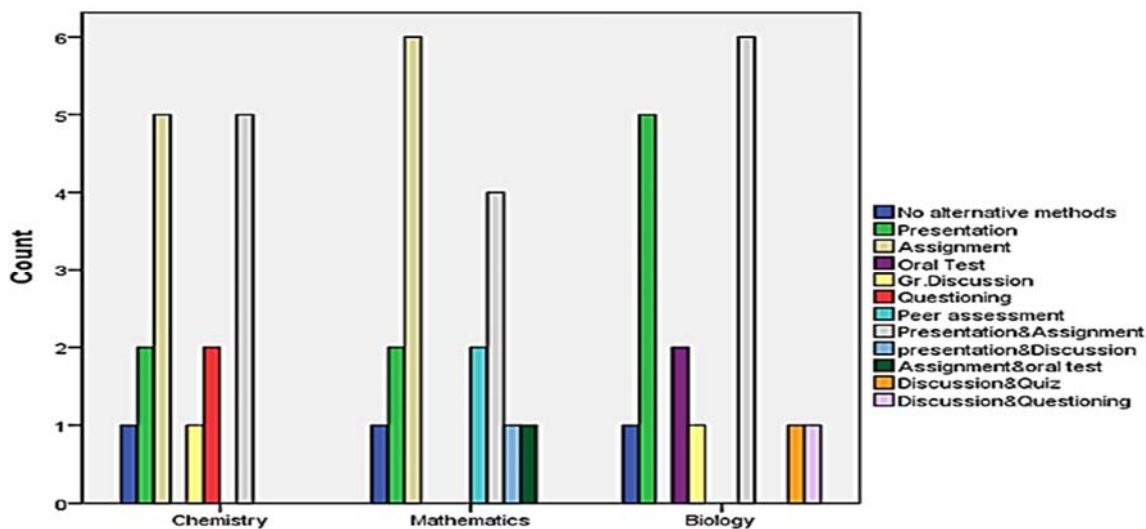


Figure 5. Teachers' preferences about Alternative assessment methods

The students' interviews revealed that they along with being unaware of varied assessment

strategies, were also unaware of effectiveness of various assessment strategies. Their choice of classroom assessment, summarized in table 2, were questioning and presentation.

Table 2 Choice of Assessment method–Interviewee Responses

Theme	High scorer	Low scorer
Assignments	05	04
Quizzes	04	09
MCQs	03	03
Presentations	06	01
Discussions	04	03
Total	22	20

Their responses indicated that they realized what was happening in their classrooms and what was helpful in their learning but they could not summarize all what was happening as FA. They took questioning and other FA elements as wastage of time since it does not influence their achievements i.e. grades. Some students, especially the high scorers were a little more educated about the classroom assessment and were not satisfied with the use of limited strategies in their classrooms. It was also noted

that the teachers were not following HEC guidelines as required for reliable outcomes. They were unaware of learning objectives and target strategies of the courses taught by them. Not only that, most of them were also unaware of the benefits of using varied approaches for different learners in their classrooms. The teachers were also not paying due attention to FA because of its least contribution towards summative assessment.

Table 3 Assessment methods used, Means & Ranking according to Students' responses

Assessment Methods	N	Mean	Ranking
Essay Writing	428	3.54	9
Multiple Choice	428	2.91	5
True-False	428	3.33	8
Short-Answer	428	3.12	7
Assignment	428	1.83	1
Discussion	428	2.80	4
Project	428	3.67	11
Report-Writing	428	3.72	13
Presentation	428	2.00	2
Quiz	428	2.74	3
Demonstration	428	3.61	10
Practical	428	2.93	6
Self-Assessment	428	3.70	12
Peer-Assessment	428	3.93	14
Portfolio	428	3.96	15

The study revealed that the most important element of FA, the use of varied instruction methods, was totally missing in the surveyed

higher education institutions. Only assignments, presentations, demonstrations and quizzes were applied to develop the students' ideas and

understanding. Figure 1 throws light on the fact that Feedback, being an important element of FA was also found unimplemented in these institutions.

Similarly course file was not maintained as require by HEC, whereas the article 22 of the implementation policy of semester system in higher education institutions by HEC clearly mentions that maintenance of Course File is compulsory for the teacher at university level. The course file must contain description of course/course contents, course coding, weekly teaching schedule, dates of mid-semester

examination, grading policy for each summative assessment content, copy of assignments, quizzes, mid semester examinations, grading sheets of the course detailing statistical data on the grades obtained by students and difficulties /problems faced during classroom / course delivery.

From the emerging themes of students' interviews it was clear that they were not aware of such a course file maintained by their teachers. Table 3, indicates that portfolio was also not a part of FA in the study area as it has been ranked lowest by the students.

Table 4 Comparison of Norms

Indicator (A): Knowledge & Understanding (teacher knows & understands)		
Elements	Expected Norms in set standards	Practice Norms by Teachers
Knowledge of instructions	How learning take place in classroom.	Demonstrates factual knowledge of subject matter and the pedagogy it requires by sometimes engaging students in learning experiences around complex knowledge and skills in the subject.
Strategies for effective classroom management	Know the strategies that promote purposeful learning activities in classroom.	Designs units of instruction that address some knowledge and skills defined in state standards/local curricula, but some student outcomes are poorly defined and/or tasks rarely require higher-order thinking skills.
Learning for all	How the classroom environment promotes positive learning for all students.	May create and maintain a safe physical environment but inconsistently maintains rituals, routines, and responses needed to prevent and/or stop behaviors that interfere with all students' learning.
Student motivation	How participation in classroom support learning.	Directs all learning experiences, providing few, if any, opportunities for students to take academic risks or challenge themselves to learn.

Indicator (B): Dispositions (teacher valued and committed to)		
Peer relationship	Value the role of student in promoting each other's learning.	Establishes an environment in which students generally demonstrate respect for individual differences

Responsibility	Establish constructive environment not only in classroom but institution as a whole.	Within and beyond the classroom, inconsistently reinforces school wide behavior and learning expectations for all students, and/or makes a limited contribution to their learning by inconsistently sharing responsibility for meeting their needs.
Democracy	Use democratic values in classroom.	May participate in planning and decision making at the school, department, and/or grade level but rarely contributes relevant ideas or expertise.

Indicator (C): Performance & skill (teacher engaged in activities to)		
Professional development	Develop & share classroom management and discipline plan.	Sometimes demonstrates questionable judgment and/or inadvertently shares confidential information.
Collaborative learning	Maintain students to work collaboratively and participate in decision making.	Does not consistently collaborate with colleagues in ways that support productive team effort.
Facilitator	Create positive classroom environment by practicing group discussions.	Sometimes demonstrates questionable judgment and/or inadvertently shares confidential information.
Safe and healthy learning environment	Create positive classroom which is socially, emotionally and physically safe.	May create and maintain a safe physical environment but inconsistently maintains rituals, routines, and responses needed to prevent and/or stop behaviors that interfere with all students' learning.
Healthy Competition	Establish and maintain competitive behavior.	Teaches some interpersonal, group, and communication skills and provides some opportunities for students to work in groups.
Devotion	Use instructional time effectively.	Develops lessons with only some elements of appropriate student engagement strategies, pacing, sequence, activities, materials, resources, and grouping.

It was also noted that same as the instructions of HEC, the standards provided by the National Professional Standards for Teachers in Pakistan

(2009) were also not completely followed, for example, in standard 5, Appendix A, the teachers are instructed to use multiple

assessment strategies for promotion of learning and continuous development of student. Standard 6 of the same document is about the 'Learning Environment' which necessitates a self-motivated, actively engaging and socially interactive environment. However, the results of the study revealed that practiced norms by the teachers also needed considerable improvement (Table 4).

To make FA easily implementable at tertiary level educational institutions, the requirement of a model was felt at different levels of assessment. Findings of the current survey, related literature, and guidelines by HEC for the FA at the higher education levels, provided a sound basis for developing a new model of FA that could be used with a degree of confidence and ease. The findings of the current study highlighted some drawbacks of the used formative assessment process in the higher education institutions. Thus suggestions emerged for the improvement of formative assessment in vogue.

Salient features of the proposed model

The proposed model (figure 6) may be implemented, semester wise, to master level studies, comprising of four semesters. The model suggests that in the first semester the students may be provided with the learning targets, including learning objectives and goals of the course after the courses have been selected by them.

Secondly, it is suggested that the course file must be prepared from the first day of first semester. Also, the teachers must be encouraged to design strategies as per the learning targets of their courses and design strategies accordingly. These strategies must be based on students' learning outcomes and must be scheduled prior to the start of course, however, they must be flexible enough to be altered according to learning environment and situation in the classroom.

The model also suggests that the criteria for formative assessment including rubrics, table of specifications and checklists etc. must be provided to make it transparent and reliable. In this way not only teachers will get aware of

learning difficulties of the students but students will also get involved in the assessment process and will start working in coordination with their teachers. At this stage of the course i.e. during the first semester, self and peer assessment will be dominantly used, along with other in-practice methods. Not only that, the teacher must give feedback to the students if necessary, however, he/she may also modify the various instructions for improvement of the task and learning of students at this stage in the model. In addition to this, all the assessments done in semester one as well as in the coming three semesters, must be compiled in the students' file for the portfolio of their work till the end of fourth semester.

In the second semester, all activities of the first semester will be followed with the only difference of the assessment method. In this semester, instead of self and peer assessment, the students will select the Project/ Proposal. For this purpose.

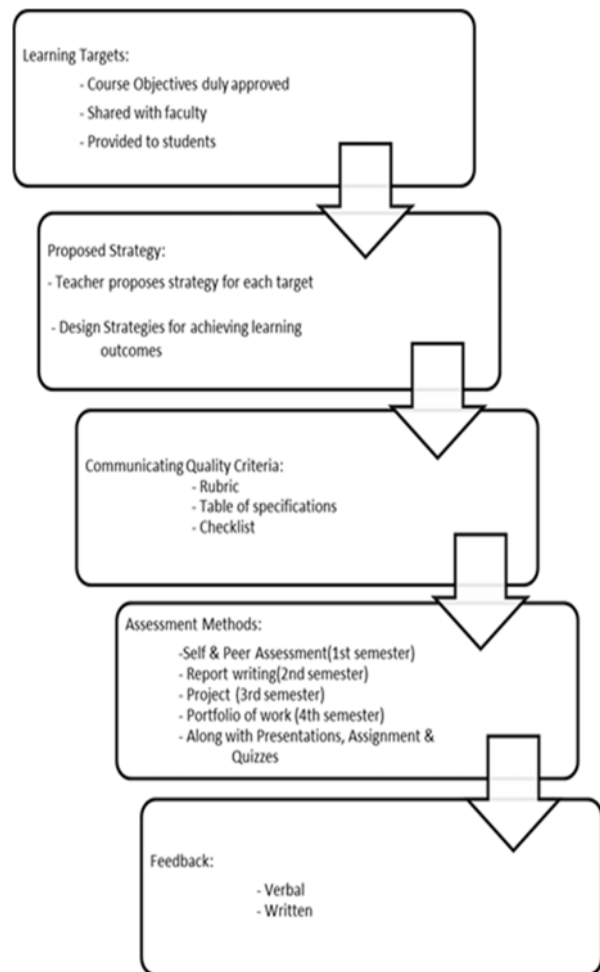


Figure 6: Proposed Jaffar's formative assessment model at university level they will be required to write a review paper related to their chosen research topics.

In the third semester, formative assessment procedure will be same as mentioned above only the students will use project in practical form, as the assessment method, along with presentations assignments and other practiced methods.

In the semester four, the formative assessment cycle will be repeated as per figure 6 for each course of study. Emphasis will be given to the completion and presentation of the portfolio prepared during all four semesters. The students must also be required to relate their work to the practical world problems by presenting and defending their projects proposed by them in the third semester. In addition, portfolio containing complete students' learning record, including record of their assignments with proper feedback, photographs and tests will also be defended.

Applicability of the proposed model

This proposed model is applicable to higher education institutions, whether public or private, demanding no additional resources and efforts both by the teachers and by students for

implementation. What makes the model different from others is its semester-wise compulsory implementation.

General objectives of the proposed formative assessment model are vital and will enable teachers to focus on and motivate students towards their learning goals, take actions to move closer to them, enable students to regulate their learning and provide descriptive feedback. Along with these general objectives the proposed model will also help students to become actively engaged in the review process, understand the use of learning targets, set their learning goals and assess their learning progress.

The model (figure 6), was also proposed for easy understanding of the elements of formative assessment pattern, to be used in higher education without any difficulty.

Validation of the proposed model

The proposed model was validated by teachers, educationists and educational psychologists. A fourteen-point validation proforma was given to them and the means of their responses have been tabulated as in Table 5. According to which the model has been found implementable and important in achieving the related goals. Also the model fulfils all HEC requirements of FA.

Table 5 Mean scores of Feedbacks of Experts

S. No	Expected Features/characteristics	Mean Score
1	The model fulfills all HEC suggestions/requirements of formative Assessment	4
2	The model is fully helpful in achieving learning objectives of different programs in higher education	4
3	The model addresses all the formative assessment characteristics e.g. Diverse, Authentic, Ongoing, Transparent, involving students & harmonious with planned instructions.	3.5
4	Diagram of the model is self-explanatory	3.7
5	The suggested model indicates all the formative assessment steps	3.8
6	The model is easily applicable for teachers	3.7
7	The model suggests students' involvement in learning process.	3.6
8	The model contains suggestions for positive reinforcement of students	3.9
9	The model suggests due incentive for formative assessment	3.8
10	The model suggests steps for proficiency & self-regulation of the students	4

11	The model provides reflection of students' learning	4
12	The model facilitates teachers to gauge students learning as well as their own	3.9
13	The model hardly involves any extra efforts in implementation	3.7
14	The model is equally applicable in both private & public sectors	4

Conclusions & Recommendations

Although HEC emphasizes a proper and complete use of FA at tertiary level of education but all elements of FA are not applied in the higher education institutions of the study area due to one reason or another. Both the students and teachers are either unaware or reluctant to apply different FA elements and need a proper training for the purpose however, they do apply FA to some extent which is insufficient for an optimally acceptable learning environment. Students of the study area were also unaware of FA and were only working for summative assessment in and outside the classroom which needs to be properly addressed.

The difficulties in implementing FA as required by the governing bodies like ministry of education and HEC etc. were identified to be teachers' lack of knowledge about learning and achievement, importance of FA, lack of pedagogical trainings, proper time management, violation of HEC guidelines etc. It was also noted that the teachers required an implementable model that is easy to use. Keeping this in view a new model of FA is suggested in this study.

This model has been found implementable and of great use at tertiary level of education as validated by the experts. If implemented the proposed model will change the attitudes and behaviour of teachers and students towards learning and accepting the challenges of the real world.

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Appendix A

Standard–5: Assessment

5-A: Knowledge and Understanding: *Teachers know and understand:*

- Different types of assessments to assess students' learning and performance.
- The results of assessment to evaluate and improve teaching and learning.
- Assessment-related issues, such as validity, reliability, business and scoring concerns.

5-B: Dispositions: *Teachers give value and are committed to:*

- The belief that students' learning outcomes are the basis for growth and the deficiencies are opportunities for learning.
- Fair, objective assessment and reporting to students and families.

5-C: Performance and Skills: *Teachers engage in activities to:*

Develop and use teacher made tests for continuous internal assessment of students' performance

- Analyze students' performance using multiple sources of data
- Help students engage in objective self-assessment.
- Develop and use objective assessment tools to measure students' progress.

Standard–6: Learning Environment

6-A: Knowledge and Understanding: *Teachers know and understand:*

- How learning takes place in classrooms.
- How the classroom environment influences learning and promotes positive behavior for all
- How classroom participation supports students' commitment to learning?

Dispositions: *Teachers give value and are committed to:*

- The role of students in promoting each other's learning and recognize the importance of peer relationships in creating a conducive climate of learning.
- Use democratic values in the classroom.
- Taking responsibility for establishing a constructive and engaging climate in the classroom and participate in maintaining such a climate in the school as a whole.

6-C: Performance and Skills: *Teachers engage in activities to:*

- Maintain a learning community in which students assume responsibility for themselves and one another.
- Create a cooperative classroom climate for all students which is socially, emotionally and physically safe.
- Use instructional time effectively.