The Perspective’s Analysis of Formative Assessment with University Students

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Abstract – Starting or ending an academic semester leads to the concern of teachers because a teaching-learning methodology has to be applied, often forcing them to inquire or consult methodological advances to improve the quality of education, especially the evaluation part. Therefore, our research objective is to analyze the perspectives of formative assessment with university students, so we used the methodology of quantitative and descriptive-correlational, non-experimental approach through an online survey with a validated measurement instrument, as the sample consisted of 3944 university students. The results are significant and validated by different statistics such as Cronbach’s Alpha (0.951) in the Peruvian context, the formative evaluation methodology is accepted by university students in a positive way. Concluding that there are still teachers who do not adequately apply formative evaluation and that students are still shy to communicate with their teachers in order to request a feedback.

Keywords – formative assessment, feedback, learning, teaching, university students.

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1. Introduction

In the learning theory, the existence and use of formative assessment for university students are factors of barriers and opportunities to develop the process of learning and teaching [1], since it is of utmost importance at all levels of education and it is the one that is practiced more frequently than the other types of assessments (summative, diagnostic, formative and evaluative), these help in improving their experience, organize schedules, develop feelings, calm anxiety and achieve the notion of what has been learned [2]. When teachers were made aware about usage of formative evaluation in two groups, three levels resulted (conscious, eclectic and naive level) with the largest number of teachers achieving the eclectic level, i.e. they know and should know the importance and use of how to evaluate formatively, but there are also teachers who do not know how to use formative evaluation, so in some cases the contradiction of knowing and not knowing [3], remembering that "evaluate" means to compare results (initial process and final process) with information criteria and some measure on teaching and learning [4]. Despite the existence of the educational deficit to apply technology in education there are supports to perform formative evaluations achieving the development of systems (administrative, teacher and student advisor) in support of teachers, administrative staff and managers to improve efficiency within the classroom and the educational institution [5].

Considering the learning style at international level, many institutions encourage their teachers to use formative assessment combined with summative assessment to reinforce feedback and promote learning in teaching styles [6]; these forms of assessment should be conceived focusing on students only for academic purposes as it has many advantages for students, despite its difficulties for implementation in some institutions [7].
When using assessment tools to achieve the advancement of reflective learning guided by the different assessments (for example, the portfolio for online education) should be initiated with rigorous work according to the level and cultural diversity of in order to students, always keep track of results [8]. The application of assessments is a link in education, whose motivation of its application encourages the quality of student for which various methods and forms of assessment are explored focused on the needs of the students themselves [9], which is evaluated in the components of each assessment even more in the responsibility of online learning [10], to overcome barriers and include record systems in the online assessments [11].

Applications and experiences evaluated and design programs are starting points of many researches in these last years with the sole purpose of empowering and strengthening some curricula more than anything in formative assessment [12]. Feedback development, elaboration, implementation and response of students [13], managing to gain experience in evaluation and in the development of teaching-learning always supported from the multiple tools and applications that are used for both online and face-to-face teaching [14]. Formative assessment is used in many fields such as sports and generally in the education sector that achieve significant impacts [15]; this process has developed affective interventions for treatments in medicine that were guided by formative assessment and theories to be implemented in all academic programs [16].

The importance of formative assessment focuses on feedback based on content analysis. The literature, whose evaluation process is based on constructive and critical reflection, personality and contextualization with the sole purpose of providing solutions [17] and achieving the expected effects of formative assessment on academic performance [18]. With the alliance of parents, the effects of formative assessment in children have a greater significant impact, but there were some difficulties for teachers and parents to engage in educational functions [19]. The importance of learning theory with the Kolb method helped in formative assessment so its implementation in learning sections of the health area improved the experiences, observations, conceptualizations and intention to implement formative knowledge and confidence of students [20].

The advancement of technology in the education sector evolved exponentially with the implementation of technologies never seen before and with which many parents manage to realize for the sake of their children's education and if feasible some institutions invest in technologies such as virtual reality and artificial intelligence [21].

The leap in digitization motivated by the pandemic managed to cross educational boundaries between students, teachers, researchers and anyone who used technology to perform educational and academic exchange [22]. The effect of digitization changed the ways of teaching and activities leading to thinking and computational self-efficacy [23].

1.1 Justification and objectives of the study

The arrival of Covid-19 allowed reflections and criticisms to be made in the educational sector, especially in educational institutions that rejected technology and did not accept to be in line with its advancement due to lack of training and empathy from older teachers. Formative evaluation has been practiced for a long time, but little or nothing was done to improve it and follow up on it because its application was left aside. Formative evaluation has been taking off at the higher education level (undergraduate universities) because significant effects are achieved with the development and implementation of this in university classrooms and even more with feedback, a key point to raise the academic performance of university students. As a consequence of these studies and applications in many universities, the main objective of this research is to analyze the perspectives of the application in formative assessment with university students in Peru. It also follows specific objectives:

- Identify and analyze the frequency and mean of feedback perspective assessment in university students.
- To identify and analyze the frequency and mean of the valuation of the perspective of the development and implementation of formative evaluation in university students.

2. Methodology

The methodology used in this research is quantitative, descriptive-correlational, non-experimental and cross-sectional. To analyze the perspectives of the application of formative assessment in university students in a Peruvian context [24].

2.1. Sample

University students from Peru participated in this research, with the formative assessment type. The sample consisted of 3944 students, 56.9% of whom were female and 43.1% male. Students representing state universities accounted for 54.5% and private universities for 45.5%. The range of ages representing the ages [15 - 20] years is 58.1%, the range of ages [21 -25] years is 30.5% and the range of ages [25 - 30] years is 7.1% followed by the other ages in minimum percentages from 30 years to more in a percentage of 4.3%.
In addition, the participants of the present investigation are students of professional careers in Sciences (Mathematics, Physics, Chemistry, Biology, etc.) 6.9%, Engineering careers (Civil, Mining, Systems, etc.) 36.2%, Literature careers (Law, Administration, Accounting, etc.) 27.3%, Social Sciences careers (Archaeology, Social Service, Education, etc.) 14.5% and Health careers (Medicine, Nursing, Psychology, etc.).

2.2. Instrument

To collect the data we used the instrument validated by [25] in the neighboring country of Chile, this instrument in its original version has three dimensions (feedback, elaboration and implementation and responses of the students), but in the Peruvian version we decided to use only two dimensions because the survey was conducted with university students and they are not our students directly and therefore we did not use the third dimension (response of the students).

The measurement instrument is made up of 14 items which are grouped into two dimensions: 1. Feedback (R) with 9 items (R1: The teacher observes and points out how to improve, R2: The teacher asks key questions, R3: The teacher gives clear and precise indications, R4: The teacher gives feedback regarding the results obtained in the tasks, R5: The teacher reinforces achievements at the end of the class and points out tasks, R6: Teacher dedicates more time to students with more difficulties, R7: Teacher observes and stimulates students with greater problems to achieve learning, R8: Teacher only points out that the task is poorly done, but not how to improve it, and R9: Teacher provides feedback in a positive way, without disqualifying those who have difficulties) and 2. Elaboration and implementation (EeI) with 5 items (EeI1: The teacher encourages students to support each other by evaluating each other, EeI2: The teacher generates agreements regarding the evaluation criteria and encourages participation during self-evaluation and co-evaluation, EeI3: The teacher socializes the results, incorporates co-evaluation and self-evaluation in the evaluation process, EeI4: The teacher carries out summative evaluations, uses an instrument that evaluates learning proposed in the competencies and that are known by the students, and EeI5: The instrument applied establishes dimensions and indicators).

The instrument adapted to the Peruvian version, with its 2 dimensions and 14 items, allows analyzing the perspectives of the application of formative evaluation with Peruvian university students, taking into account observation, key questions, indications, feedback, achievements in classes, dedication, stimuli, improvements and above all empathy in the feedback.

Also taken into account were support among students, student participation, socialization of results, types of summative evaluation and the application of the study dimensions. In the instrument applied to university students, a 5-point Likert scale was used, evaluating an average of 6 courses of different branches and areas. In the socio-demographic items we used the dichotomous scale and ten scales to know the academic cycles.

In the original manuscript there is an acceptable value in the reliability level of 0.85 [25]. When applying it to the Peruvian context the first thing that was done is to select the dimensions to subsequently validate it with the following tests such as: Cronbach's Alpha 0.951; ANOVA with Tukey's test for non-additivity 1791.223, F=277.237 and Sig. 0.000; Hoteling's T squared Preuba 1457.117, F=11.745 Sig. 0.000; KMO test 0.962 and Bartlett 47575.283 Sig. 0.000; Chi-square goodness-of-fit test 2134.683, Sig. 0.000.

2.3. Procedure and data analysis.

The research began in April 2022 when the research objectives were established to analyze the perspectives of formative assessment with university students. The measurement instrument was selected for its respective application in the Peruvian context. For which the sample was selected intentionally due to the easy access of university students, for which support was requested from teaching colleagues (34) from different universities in Peru for its application to their own students.

Work meetings were held constantly through google meet to analyze each dimension and item before preparing the online survey. Once all the items had been defined, the online survey was prepared in Google Form, since it is an easily accessible tool and can be distributed more quickly among teachers and students. At first, the survey was tested with 120 students, resulting in a Cronbach's Alpha of 0.855, which was valid continuing with the research. The link to the survey was distributed among teachers who taught online classes due to the pandemic, we are going through and they shared it with their students so that they could answer using their digital applications they had, always explaining the purpose of the study and that the survey is anonymous and voluntary.

The survey was only programmed to be answered by a single person through a Google account.

The survey was conducted during two months, April and May, to obtain the data in the form and proceed to download and adapt them in Excel, so that could be analyzed if any answer or alternative was missing. Once no error was found in the data, the SPSS version 25 program was used to format the data.
The parametric tests and reliability values were obtained with values apt to continue with the research, the correlation between the elements of the research resulting highly significant, we proceeded to describe the sociodemographic data as the data was analyzed together with the normal curve.

3. Results

In the analysis of the descriptive data from the two dimensions, the valuations of medium-high type are shown, that is to say that their values are higher than 3.5, managing to find the mean of the dimensions with significant values as shown in Table 1. In the dimension of feedback, the lowest mean (2.9) corresponds to R8: The teacher only points out that the task is poorly done, but not how to improve it, that is, the teacher does not have the time or the attitude to indicate the errors of each assigned task so that the student can improve for the next task or activity. The highest mean (3.64) corresponds to R3: The teacher provides clear and precise indications, that is, the teacher is prepared and indicates how to perform the tasks and/or activities in a precise manner. While in the dimension of elaboration and implementation, the lowest mean (3.47) corresponds to EeI1: The teacher encourages students to support each other by evaluating each other, that is, the students themselves have academic jealousy, which is why the mean is low, and the highest mean (3.54) corresponds to EeI4: The teacher performs summative evaluations, uses an instrument that evaluates learning proposed in the competencies and that are known by the students, that is, the students are satisfied with the way of evaluating, since they know and accept it.

Table 1. Distribution of item means

<table>
<thead>
<tr>
<th>Media</th>
<th>Desviation</th>
<th>Variance</th>
<th>Asymmetry</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>3.53</td>
<td>1.078</td>
<td>1.163</td>
<td>-0.606</td>
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<tr>
<td>R2</td>
<td>3.57</td>
<td>1.057</td>
<td>1.118</td>
<td>-0.647</td>
</tr>
<tr>
<td>R3</td>
<td>3.64</td>
<td>1.064</td>
<td>1.133</td>
<td>-0.667</td>
</tr>
<tr>
<td>R4</td>
<td>3.55</td>
<td>1.075</td>
<td>1.116</td>
<td>-0.545</td>
</tr>
<tr>
<td>R5</td>
<td>3.56</td>
<td>1.082</td>
<td>1.171</td>
<td>-0.592</td>
</tr>
<tr>
<td>R6</td>
<td>3.28</td>
<td>1.146</td>
<td>1.312</td>
<td>-0.320</td>
</tr>
<tr>
<td>R7</td>
<td>3.35</td>
<td>1.130</td>
<td>1.278</td>
<td>-0.390</td>
</tr>
<tr>
<td>R8</td>
<td>2.90</td>
<td>1.241</td>
<td>1.540</td>
<td>-0.001</td>
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<tr>
<td>R9</td>
<td>3.45</td>
<td>1.125</td>
<td>1.265</td>
<td>-0.449</td>
</tr>
<tr>
<td>EeI1</td>
<td>3.47</td>
<td>1.105</td>
<td>1.221</td>
<td>-0.523</td>
</tr>
<tr>
<td>EeI2</td>
<td>3.55</td>
<td>1.023</td>
<td>1.047</td>
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</tr>
<tr>
<td>EeI3</td>
<td>3.51</td>
<td>1.036</td>
<td>1.073</td>
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</tr>
<tr>
<td>EeI4</td>
<td>3.56</td>
<td>1.052</td>
<td>1.107</td>
<td>-0.571</td>
</tr>
<tr>
<td>EeI5</td>
<td>3.54</td>
<td>1.052</td>
<td>1.107</td>
<td>-0.562</td>
</tr>
</tbody>
</table>

Table 2 shows the relationship between study elements, finding a positive and significant relationship.

Table 2. Correlation between Feedback and Elaboration and Implementation

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
<th>R7</th>
<th>R8</th>
<th>R9</th>
<th>EeI1</th>
<th>EeI2</th>
<th>EeI3</th>
<th>EeI4</th>
<th>EeI5</th>
</tr>
</thead>
<tbody>
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<tr>
<td>R2</td>
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<td></td>
<td>0.767</td>
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<tr>
<td>R3</td>
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<td></td>
<td>0.759</td>
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<tr>
<td>R4</td>
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<td>0.716</td>
<td></td>
<td>0.752</td>
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<tr>
<td>R5</td>
<td>0.719</td>
<td>0.705</td>
<td>0.750</td>
<td></td>
<td>0.760</td>
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<tr>
<td>R6</td>
<td>0.612</td>
<td>0.596</td>
<td>0.628</td>
<td>0.658</td>
<td>0.648</td>
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<tr>
<td>R7</td>
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<td>0.625</td>
<td>0.666</td>
<td>0.681</td>
<td>0.709</td>
<td>0.799</td>
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<tr>
<td>R8</td>
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<td>0.259</td>
<td>0.297</td>
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<td>0.325</td>
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<tr>
<td>R9</td>
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<td>0.564</td>
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<td>EeI2</td>
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<tr>
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<td>0.599</td>
<td>0.614</td>
<td>0.562</td>
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<td>0.520</td>
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<td>0.654</td>
<td>0.725</td>
<td>0.739</td>
<td>0.789</td>
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</tbody>
</table>

Figure 1 shows the data describing the dimension Feedback in formative assessment in university students with R1 (M=3.53, SD=1.078), R2 (M=3.57, SD=1.057), R3 (M=3.64, SD=1.064), R4 (M=3.55, SD=1.075), R5 (M=3.56, SD=1.082), R6 (M=3.28, SD=1.146), R7 (M=3.35, SD=1.130), R8 (M=2.90, SD=1.241) and R9 (M=3.45, SD=1.125). The data show that there is a low qualification in R8, so it is recommended that teachers take into account this point to be able to support the development of students in their teaching-learning, as well as another low point is R6, where the teacher despite having one or more hours of tutoring or for the attention to the student. The student's perspectives towards the teacher are low because when the student has difficulties he/she does not dare to consult or ask about the subject for different reasons such as fear, shyness and/or rejection of the teacher since some of them do not have time to pay attention to the student.
Figure 2 shows the data describing the dimension of elaboration and implementation of formative evaluation in university students with EeI1 (M=3.47, SD=1.105), EeI2 (M=3.55, SD=1.023), EeI3 (M=3.51, SD=1.036), EeI4 (M=3.56, SD=1.052) and EeI5 (M=3.54, SD=1.052). The results show that there is a deficiency of the teachers in item EeI1, that is to say that the teacher does not encourage the students to support each other in order to evaluate each other. What happens is that the students are still in the online teaching version and for this reason the teacher cannot verify the veracity of whether or not it was peer reviewed.

The values of the means (weighted) of each dimension studied are in fact above what was expected in the research, therefore, there is a good perspective from the students to the formative evaluation used at the university level in the different courses and professional careers, recommending that some teachers should better apply their formative evaluation to improve the results of university students.

4. Discussion

A teacher-student hierarchy is created in a way to cause a limit to request constructive feedback from the student to the teacher [1]. Formative assessment provides students with greater access and opportunity to improve their academic standing and performance in the course they are enrolled in.
Training should be generated permanently at all educational levels on formative assessment to improve and reinforce knowledge whose application will be in the classroom with their students [3] and can be measured in the results of the same at the end of the semester, so these trainings should be planned at the beginning of each semester.

It has been accomplished that the feedback is permanent in students to achieve goals set and then take corrective measures to obtain good quality teaching [4] and achieve good competitive professionals to face life and hard work for the good of society and humanity.

The portfolio in both face-to-face education and online modality help in the process and development of the student [8], because students have to manage to maintain and update 6 to 7 portfolios of the different courses, this will make them maintain an order of their academic life. It is also requested from application of the inverted classroom to evaluate and analyze the learning process of students [9] because in our country as in others is returning to face-to-face education and it will be possible to apply some methods learned from online education.

It has been verified that formative evaluation is not applied correctly in physical education students because it is not a common practice of recent graduates in pedagogy, because there is no dialogue in the evaluation and self-evaluation [13] between teachers and students, which leads in usage of another method where participation and communication is horizontal between teacher and student.

Feedback is a key element to achieve meaningful learning, which will improve the level of knowledge [17] of the students and they will be adequately trained to be able to exercise their professional careers well. A great leap in digital knowledge has been achieved in students, teachers and anyone who wants to navigate this new digital environment [22] leaving aside the traditional education.

This research will contribute in a theoretical and practical way for future research at the local, national and international level, as it contains valuable information on formative assessment with its dimensions of feedback, elaboration and implementation, so it is completed and validated in the Peruvian context for its study and possible replication at other educational levels.

As several countries are returning to face-to-face classes and the question is what methodology will be used, will we return to traditional education and forget everything we have learned with reference to digital competencies, or will we discover new methods already combined with everything we have learned? Or will life in the education sector prepare us for uncertain futures?

We will be attentive to the new teaching-learning methodologies for their application, replication and optimization.

5. Conclusion

It can be concluded that the application of formative assessment has been accepted by students in a positive way so it is a methodology that every student can adapt. The perspectives of formative evaluation are medium-high due to its lack of knowledge and lack of a good application in university classrooms, a point that teachers should be trained before the beginning of each semester to be applied to university students.

It was possible to analyze the frequencies and means of the dimension perspectives of elaboration and implementation is also at a medium-high level, that are waiting for measures to be taken to improve the formative evaluation of university students.

Work should be done from the psychology and/or tutoring offices so that the student can communicate with the teacher and can ask or request any doubts about what he/she is learning in class.

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