Relationship of Student Participation and Punctuality in Their Performance in E-Learning Sessions in the Current COVID-19 Context

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Abstract: The attitudes of the students of the Food Technology course of the Faculty of Food Industry Engineering of the National University of Frontier were evaluated (Universidad Nacional de Frontera, 2021). This study conducted during the current health crisis by COVID- 19 covered all 32 synchronous virtual classes of the 2020-I academic semester. It was determined that, although internal motivation is not considered in the development of the subject, it does influence the final grade. It was hypothesized that the independent variable "Cognitive behavior", considered as the number of participations minus the number of tardies, which were grouped in three levels: positive, neutral or negative, influences the dependent variable "Student performance" whose results were grouped in two levels: pass or fail. According to the results obtained with the chi-square test with a contingency value of 0.02 lower than 0.05, it was determined that the students's.

1 INTRODUCTION

The transition of the educational era to a completely digital system due to the current global health crisis generated by COVID-19 (IESALC, 2020) has produced the need for evaluations of teaching and learning through synchronous virtual sessions using various video call services, being Google Meet one of the most common, allowing, in addition, follow up on student participation and attendance.

To facilitate the visualization of these synchronous sessions, but asynchronously, they are recorded on platforms such as Moodle, however, this technique was not considered in this study.

The "Cognitive behavior" of the students, considered as the independent variable, is an indicator obtained from the difference between the number of student participations (Alqahtani and Rajkhan, 2020) and tardiness (Davis, 2006) during the development of the subject, acquired through the record registry in Excel during each session and whose levels of the variable were: positive, neutral or negative. The participations were evaluated by means of the interpretative reading methodology applied by the teacher based on lessons of 15 to 20 minutes, in addition to the interventions in each learning session, but in a smaller proportion. On the other hand, unpunctuality was evaluated by noting the absence of students up to 15 minutes after the class had started.

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The "Student performance" established as the dependent variable (Perveen, 2016) and whose two levels were: pass and fail, was obtained from the evaluation of the two partial exams, two graded practices and a formative research work during the development of the two units of the semester.

Adding the previous contributions to the consideration that participation and punctuality are not evaluated in the course, but it is intended to demonstrate that they do represent a cognitive influence for the determination of the performance.

2 METHODOLOGY

2.1 Type of Research

Applied, given that during the 32 sessions all students were evaluated in an auxiliary excel register. During all the sessions of the semesters, the independent variable was evaluated, forming its result.

2.2 Hypothesis

- Null hypothesis (Ho): Cognitive behavior does not significantly influence student performance on the subject evaluation.
- Alternative hypothesis (Ha): Cognitive behavior significantly influences student performance on the subject evaluation.

2.3 Experimental Group

Seventy-six students of the Food Technology course of the Faculty of Food Industry Engineering of the National University of Frontier, Sullana, Piura, Peru, during the 2020-I virtual academic semester.

2.4 Variables

2.4.1 Independent Variable: Cognitive Behavior

The independent variable was obtained through the difference between student participation in class (considering voluntary readings during the teacher's interpretive reading methodology and significant interventions during class) and tardiness, considering a tolerance of 15 minutes after the start of class. Student tardiness was counted before the end of the class, in order to eliminate absent students to avoid possible errors and to ensure the accuracy of the values. The operationalization of the cognitive behavior (CB) is detailed in Table 1.

Table 1: Levels of the independent variable cognitive behavior.

Level of variable	Decision criterion
Positive	CB>0
Neutral	CB=0
Negative	CB<0

2.4.2 Dependent Variable: Student Performance

The two levels of this dependent variable were: pass or fail. The value can range from 0 to 20, and a student is considered to have passed if his or her final grade is greater than or equal to 10.5, and if it is lower, he or she is considered to have failed the course. Table 2 shows the levels of the dependent variable.

Table 2: Levels of the dependent variable student performance.

Level of variable	Decision criterion
Pass	Values greater than or equal to 10.5 up to 20
Fail	Values less than 10.5 to 0

2.5 Experimental Procedure

Using a cross-check table, the students were counted numerically and as a percentage, classifying the independent variable “Cognitive behavior” and its levels: positive, neutral and negative, as well as the dependent variable “Student performance” with its levels: pass and fail. In this sense, there are six different response options.

2.6 Data Analysis

In order to verify that between the two variables under study, which are cognitive behavior and student performance, there is a significant relationship at the 95% confidence level, a chi-square test was performed (Kuehl, 2001).

3 RESULTS

About the evaluated results shown in Table 3, we have that in the first column are groups 1 and 2 that correspond to two groups (morning and afternoon) of the Food Technology I subject and while those in group 3 correspond to Food Technology II.

Among the three groups there is a sample of seventy-six students, in which the calculation of the difference between participation and tardiness is shown in order to determine the cognitive behavior,

as well as the grades obtained corresponding to student performance.

Table 3: Values obtained for cognitive behavior and student performance.

T.G.	S.	P.	T.	C.B.	S.P.
1	1	1	6	-5	10.0
1	2	2	4	-2	10.8
1	3	2	0	2	8.8
1	4	1	3	-2	11.4
1	5	2	7	-5	11.8
1	6	2	7	-5	8.2
1	7	1	0	1	13.4
1	8	2	3	-1	11.6
1	9	1	0	1	14.3
1	10	2	1	1	12.7
1	11	3	1	2	12.7
1	12	1	1	0	7.8
1	13	3	0	3	12.3
1	14	0	2	-2	1.8
1	15	0	7	-7	7.9
1	16	1	2	-1	11.8
1	17	1	6	-5	8.1
1	18	1	3	-2	9.6
1	19	3	0	3	12.6
1	20	1	1	0	9.7
1	21	2	1	1	11.2
1	22	5	1	4	10.1
1	23	0	4	-4	9.5
1	24	1	2	-1	9.3
1	25	3	4	-1	13.2
1	26	2	0	2	12.2
1	27	1	1	0	10.9
1	28	0	3	-3	10.5
1	29	1	0	1	8.1
1	30	2	4	-2	10.4
1	31	0	0	0	13.6
1	32	5	0	5	17.7
1	33	1	3	-2	8.5
1	34	1	4	-3	9.7
2	35	2	5	-3	9.7
2	36	6	1	5	12.9
2	37	0	2	-2	10.7
2	38	3	7	-4	8.6
2	39	0	2	-2	11.8
2	40	8	3	5	14.0
2	41	3	2	1	11.5
2	42	5	1	4	11.2
2	43	6	5	1	11.2
2	44	3	4	-1	10.4
2	45	1	8	-7	10.5
2	46	2	0	2	10.3
2	47	2	2	0	11.4
2	48	3	1	2	10.3
2	49	6	0	6	10.6
2	50	5	0	5	11.5
2	51	1	2	-1	12.1
3	52	0	0	0	10.7
3	53	2	4	-2	9.9
3	54	7	0	7	15.6
3	55	0	1	-1	11.9
3	56	1	5	-4	7.3
3	57	0	2	-2	9.9
3	58	3	1	2	11.2
3	59	2	3	-1	10.5
3	60	0	1	-1	6.8
3	61	2	4	-2	8.3
3	62	4	1	3	17.6
3	63	0	0	0	10.6
3	64	0	0	0	9.0
3	65	3	4	-1	10.7
3	66	3	7	-4	9.4
3	67	0	0	0	12.3
3	68	0	7	-7	8.0
3	69	0	1	-1	11.7
3	70	0	0	0	7.6
3	71	1	0	1	13.5
3	72	0	0	0	10.5
3	73	6	1	5	10.6
3	74	0	10	-10	9.7
3	75	0	4	-4	8.3
3	76	0	1	-1	10.8

Note: T.G. (Technology Group), S. (Student), P. (Participation), T. (Tardiness), C.B. (Cognitive Behavior), S.P. (Student Performance).

After interpreting the data shown in Table 3, the data were grouped in a double-entry table according to the levels of the variables. The results are shown in Table 4.

Table 4: Double-entry results on students' final grades and cognitive behavior.

Cognitive Behavior		Student Performance		Total
Level		Pass	Failed	
Negative	Count	14	24	38
	Total	18.4%	31.6%	50.0%
Neutral	Count	7	5	12
	Total	9.2%	6.6%	15.8%
Positive	Count	21	5	26
	Total	27.6%	6.6%	34.2%
Total	Count	42	34	76
	Total	55.3%	44.7%	100%

The Table 4 shows that in the negative assessment the majority obtained a "failed" grade (31.6%), in the positive assessment the majority obtained a "passed" grade (27.6%) and the neutral attitudinal assessment (0) out of 12 students, 7 obtained a "passed" grade and 5 obtained a "disapproved" grade.

4 DISCUSSION

Table 5 shows the results of the Chi-square test, used to determine if there is a significant relationship between the independent and dependent variable.

As shown in Table 5, since the asymptotic significance value of the obtained Chi-square of 0.002 is lower than the established significance level of 0.05, it is established that the independent variable "Cognitive behavior" significantly influences the dependent variable "Student performance".

Likewise, since the asymptotic significance value of the contingency coefficient (0.002) is also lower than the significance level (0.05), it is ratified that there is a significant relationship between the two variables mentioned.

Table 5: Chi-square test.

Origin	Value	Degrees of freedmon	Sig. asymp-totic (2 sides)
Pearson's Chi square	12.103	2	0.002
Plausibility ratio	12.741	2	0.002
Contingency Coefficient	0.371		0.002
No. of valid cases	76		

5 CONCLUSIONS

The validity of the alternative hypothesis was demonstrated, which proposed the existence of a significant relationship between the independent variable "Cognitive behavior" of the students and the dependent variable "Students' performance" during the development of the subject.

According to the results obtained through the chi-square test, it was determined that, during synchronous virtual teaching in the 2020-I academic semester, cognitive behavior, represented by participation and tardiness of students, has a significant influence on their performance in the courses evaluated.

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