

## ORIGINAL ARTICLE



# Communicative Intelligence and Its Relationship to the Performance of the Kinetic Formation of the Hoop in Rhythmic Gymnastics

<sup>1</sup>Zeena Khaled Jasem \*

<sup>1</sup>College of Physical Education and Sports Sciences, University of Baghdad, Baghdad, Iraq.

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## ABSTRACT

**Background.** Communicative intelligence is a concept based on understanding and realizing all forms of communication between female students during the performance of skills in the motor chain and the need to understand and realize skills with the hoop tool. After observing and monitoring the students' performance the researcher noticed that they were facing difficulties, in executing the formations. This could be attributed to the challenges posed by intelligence which is a significant issue, in today's rapidly advancing information production field. **Objectives.** Knowledge of the level of communicative intelligence of the research sample, Knowledge of the performance of the kinetic formation of the hoop in rhythmic gymnastics for female students, and Knowledge of the relationship between communicative intelligence and the performance of the kinetic formation of the hoop in rhythmic gymnastics for female students in the third stage of the Faculty of Physical Education and Sports Sciences. **Methods.** The researcher used a descriptive approach using a survey method and selected all community members except 3 female students who did not adhere to the attendance records. The researcher divided the sample into 12 students for the exploratory sample, 70 for the adaptive sample, and 42 for the application sample. An intelligence scale was then selected and adapted to the research sample. **Results.** The researcher analyzed the data statistically using the SPSS program and the T-test for independent samples, the Guttman scale, Cronbach's alpha, Kurtosis, and Pearson's correlation coefficient, Pearson's correlation coefficient was used for the samples. The final results showed that there is a significant correlation between the communicative intelligence scale and the kinetic formation of the hoop, with a correlation coefficient of 0.543 and a sig of 0.001. **Conclusion.** The researcher concluded that the research sample had communicative intelligence that reached a good level. The sample distinguished the components of the communicative intelligence scale. The research sample was characterized by an average performance of the kinetic formation.

**KEYWORDS:** *Communicative Intelligence, Kinetic Formations, Hoop Performance, Rhythmic Gymnastics.*

## INTRODUCTION

Communicative intelligence contributes to increasing communication between students, as well as increasing mutual knowledge of ideas and skills for better performance through skill activities that enhance interactions between students in a way that is compatible with scientific development and modern learning methods at the present time, the importance of communicative intelligence is manifested in the process of linking

and skill performance between students when performing motor formations, which includes skills and linking them with music, as well as moving within the formation and artistic interconnection of performance as well (1). Modern methods of teaching rhythmic gymnastics skills, in particular in this study, focus on increasing understanding, cognition, and developing communicative intelligence because

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\*. Corresponding Author:

Zeena Khaled Jasem, Ph.D.

E-mail: [zeena.k@cope.uobaghdad.edu.iq](mailto:zeena.k@cope.uobaghdad.edu.iq)

the cornerstone is to show the optimal picture of motor formations (2). University students are impacted by various psychological factors, particularly those that directly influence their academic and practical performance (3). Researchers in this field focus on identifying the most influential variables that affect students' performance in order to provide a foundation of information for lesson planning. This is particularly important in the challenging subject of gymnastics, as certain movements are difficult for both male and female students (4). Gymnastics holds a significant place in the physical education curriculum as it caters to the various age groups and requirements of young individuals. Similar to any other solitary activity, it equips participants with abilities that can be utilized in the long run. Furthermore, it plays a substantial role in enhancing and refining specific aspects of physical fitness (5). Gymnastics is not like other sports because it is an individual sport with specific movement patterns that require a strong connection between the mind, and motor performance (6).

Scientific progress is one of the hallmarks of the present era, as it has encompassed various aspects of life, including the sporting aspect, which has interacted with the natural and human sciences in order to prepare the individual in a comprehensive and balanced manner (7).

The reason may be due to communicative intelligence, one of the most important contemporary challenges imposed by the great developments in the field of Information production and the speed of its transmission, represented by information infrastructure technologies, which allow individuals to communicate and exchange information and ideas within general and sub-cultures, and achieve an acceptable or advanced level in communication between peoples and cultures (8).

Therefore, the researcher found through the above the importance of studying this variable and knowing its role in the performance of the kinetic formation of the hoop in rhythmic gymnastics. So that we work through our role as Instructors of the subject to provide opportunities for success through the descriptive process of these variables and give a healthy picture of them to overcome weaknesses and enhance strengths (9). The research aims to: Adapt the communicative intelligence scale for female students in the third stage of the Faculty of Physical Education and Sports Sciences, University of Baghdad, Identify the level of communicative intelligence of the research sample, Identify the performance of the kinetic formation of the hoop in rhythmic gymnastics for female students, Identify the relationship between communicative intelligence and the performance of the kinetic formation of the hoop in rhythmic gymnastics for female students in the third stage of the Faculty of Physical Education and Sports Sciences.

## MATERIALS AND METHODS

The researcher chose the descriptive approach in the survey style. The research population was determined by the intentional method, represented by female students in the third stage of the Faculty of Physical Education and Sports Sciences, University of Baghdad, with a total of 124 students, consisting of 4 study classes (A, B, C, D). The research sample was selected from all members of the community, except for 3 female students who did not adhere to attendance, and therefore for the necessities of statistical procedures. The researcher divided the sample into 2 students for the exploratory sample, 70 for the adaptation sample, and 42 for the application sample. Table 1 shows the details of the sample division.

**Table 1. Shows details of exploratory, adaptive, and applied examples**

No	Type of sample	No	Patients number (%)
1	Exploratory sample	12	9.67%
2	Adaptation sample	67	54.03%
3	Application sample	42	33.87%
4	Excluded	3	2.41%
5	Total sample	124	100%

**Procedures for implementing the steps of the field research and Procedures for adapting the communicative intelligence scale.** The

researcher chose a tool to measure communicative intelligence for what the research requires. Therefore, the communicative

intelligence scale was developed by Ali Jawad Habib (9). This scale consists of one domains: is nonverbal communication, As described in [Appendix 1](#), which consists of 5 components. The first component: facial expressions consists of 5 statements, the second component: body language consists of 4 statements, the third component: external appearance consists of 4 statements, the fourth component: visual communication consists of 4 statements, and the fifth component: vocal communication. It is worth noting that the scale is five-point in the way of answering its paragraphs and its rating scale is as follows:

1) Always applies to me, 2) Often, 3) Sometimes, 4) Little, 5) Never applies.

The researcher's procedures for adapting the scale are as follows:

Adapt the items to fit the research sample, which in this case are female students of the Faculty of Physical Education and Sports Sciences, University of Baghdad, majoring in rhythmic gymnastics.

Extract the scientific foundations of the scale (validity, reliability, objectivity).

Validity of the scale: Validity refers to the extent to which a scale measures what it was designed to measure. The researcher ensured the validity of the scale in several ways:

Validity of the Expert: The researcher presented the questionnaire to a group of experts specializing in sports psychology and

gymnastics. The researcher responded to the opinions of the experts and deleted the verbal domain because it was not appropriate for the gymnastic formation, as we are dealing with the movements of the female students. In this way, The researcher therefore undertook to remove and modify the suggestions of the experts and specialists. As a result, the scale became 21 statements representing the nonverbal communication domain, which contains 5 components. All of the statements received an approval rate of 85% or more in the initial version of the questionnaire.

#### **Application of the communicative intelligence scale on the adaptation sample.**

After the nonverbal communication domain and its five components, which consist of 21 statements, were selected, they were adapted to simulate third-stage female students at the College of Physical Education and Sports Sciences, University of Baghdad. The researcher made sure that the statements were meaningful with the formation movements. Therefore, the scale was ready for application. It was applied with the help of the assistant team to the sample of preparation, which amounted to 67. Once the main adaptation experiment was finished, the researcher organized the scale questionnaires, made necessary adjustments, and documented the outcomes in order to conduct statistical analysis. Certain statistical measures were obtained for the sample. As shown in [Table 2](#).

**Table 2. Shows the descriptive characteristics of the communicative intelligence scale**

The variable	M	SD	SK	SE
communicative intelligence	66.4328	6.83623	-0.279	0.293

**Psychometric properties of the burnout scale and Psychometric characteristics of the communicative intelligence scale.** It has fulfilled the scientific conditions, which are honesty, consistency, and objectivity because its partners on the scale deduct that. I followed the easy steps, starting with the types of honesty and consistency. However, objectivity is considered achieved because the measure depends on sample advertisements and not on the honesty of experts. It also confirmed other types of honesty, as follows.

**The truth of the matter.** This type is verified through rational analysis of the content of the scale and determining it based on subjective judgments,

and two types of validity are honesty and concrete honesty.

**Virtual validity.** This type of validity was achieved, and the items of the scale were determined with the help of a group of experts in psychology, testing, and measurement. Each arbitrator was asked to determine the validity of each statement (valid, not valid) and to appropriately modify the items to suit the sample used, as explained above.

**Validity of the scale.** Validity is one of the most important factors in assessing the quality of tests and scales. A test or scale is considered valid when it actually measures the trait or characteristic for which it was designed. Validity is a standard test

that the researcher sets to prove the validity of the test or scale as a valid means of measurement (5).

**The item discrimination ability.** Item discrimination is a type of validity used to determine the usefulness of a test. In test construction, an essential factor to consider is the indicator that determines the test's capability to distinguish individuals at various levels (10). Hence, the scores for each item were organized in a sequential manner from the lowest to the highest, and a selection was made of the lowest

scores accounting for 33%, as well as an equivalent proportion from the highest scores. Upon statistical analysis of the outcomes, it was concluded that the items are valid since the values of Sig are lower than the significance level of 0.05 as shown in Table 3.

Table 3 shows that all items on the scale have the ability to distinguish between the upper and lower levels. Therefore, no item was deleted from the scale.

**Table 3. Shows the item discrimination ability of each item of the communicative intelligence scale**

No	Lower Group		Upper Group		T-test	Sig
	M	SD	M	SD		
1	1.4545	0.50965	4.6818	0.47673	-21.691	0.000
2	1.6364	0.72673	4.6364	0.49237	-16.03	0.000
3	1.7273	0.55048	4.7273	0.45584	-19.688	0.000
4	1.5909	0.50324	4.2727	0.63109	-15.584	0.000
5	1.4545	0.50965	4.5909	0.50324	-20.539	0.000
6	1.5	0.51177	4.8182	0.39477	-24.08	0.000
7	1.6818	0.64633	4.8636	0.35125	-20.288	0.000
8	1.5455	0.50965	4.5909	0.50324	-19.944	0.000
9	1.5455	0.50965	4.4545	0.50965	-18.931	0.000
10	1.4545	0.50965	4.6364	0.49237	-21.06	0.000
11	1.5909	0.66613	4.7727	0.42893	-18.837	0.000
12	1.5455	0.50965	4.8636	0.35125	-25.145	0.000
13	1.4091	0.50324	4.6364	0.58109	-19.692	0.000
14	1.6364	0.49237	4.7273	0.45584	-21.607	0.000
15	1.5455	0.50965	4.5	0.51177	-19.187	0.000
16	1.4091	0.50324	4.5909	0.50324	-20.97	0.000
17	1.7727	0.61193	4.5909	0.50324	-16.684	0.000
18	1.7727	0.68534	4.6364	0.49237	-15.917	0.000
19	1.5	0.51177	4.6818	0.47673	-21.338	0.000
20	1.5455	0.50965	4.5455	0.50965	-19.523	0.000
21	1.9091	0.75018	4.5455	0.50965	-13.635	0.000

If the significance level is  $<0.05$  and there are 42 degrees of freedom, it is considered to be statistically significant.

**The measure's internal consistency.** The researcher evaluated the internal coherence of the scale by determining the Pearson correlation coefficient, which measured the relationship between the individual item scores and the overall score of the scale on the sample used for adaptation. The internal consistency of the scale is presented in Table 4.

**Stability of the scale: The researcher extracted the stability in three ways.** The split-half method is utilized to assess the internal consistency of the scale items, as this consistency serves as an indicator of the degree of reliability and stability when responding to all the items. This particular approach entails the computation of the correlation coefficient between the scores of individuals on the two separate halves of the test (11). The researcher

relied on the data of the adaptation sample, which numbered 67 female students, in calculating the stability in this way, using the Statistical Package for the Social Sciences (SPSS). The correlation coefficient of the communicative intelligence scale for half of the scale was extracted, which is 0.584. In order to obtain the stability coefficient of the scale as a whole, the Guttman equation was used because the number of items is individual to correct the correlation coefficient. After correction, the stability coefficient became 0.733, which is a high stability coefficient and can be relied upon to estimate stability.

**Cronbach's alpha.** The researcher extracted the stability using Cronbach's alpha, based on the data of the sample of numbers, and by extracting the stability coefficient, which was 0.690 for the scale.

**The kinetic formation in gymnastics.** The researcher tested the students with the gymnastics formation in rhythmic gymnastics and obtained a score that represents the level of the student through the teaching evaluation of the subject, which is from 10 points.

**Main experiment for the application of the communicative intelligence scale.** After the scale was prepared for application in its final form, the researcher applied the scale to the application sample of 42 female students from the third stage. After completion, the researcher emptied the results for statistical processing.

**Statistical methods.** The researchers used the Statistical Package for the Social Sciences (SPSS) to calculate the following statistical measures:

- Arithmetic mean: It is a measure of central tendency and is used to describe a sample.
- Standard deviation: A measure of dispersion used to determine how far sample scores are from their arithmetic mean.
- T-test for independent samples: to show the differences between the upper and lower groups of the scale.
- Pearson correlation coefficient: to determine the correlation between the item and the scale and to verify the relationship between the variables.
- The skewness coefficient is the normal distribution of a rhombus.
- Cronbach's alpha: reliability coefficient.
- Guttman equation: for the total correlation of the scale.

**Table 4. The data reveals the degree of correlation between the score of each item and the overall score on the scale measuring communicative intelligence**

No	Pearson's r	Sig
1	0.556**	0.000
2	0.563**	0.000
3	0.543**	0.000
4	0.417**	0.000
5	0.453**	0.000
6	0.377**	0.000
7	0.414**	0.000
8	0.335**	0.000
9	0.385**	0.000
10	0.264*	0.000
11	0.247*	0.000
12	0.230**	0.000
13	0.386**	0.000
14	0.376**	0.000
15	0.410**	0.000
16	0.250**	0.000
17	0.286**	0.000
18	0.334**	0.000
19	0.339**	0.000
20	0.280*	0.000
21	0.250**	0.000

\*: is used to represent a statistically significant difference at 0.05; \*\*: is used to represent a statistically significant difference at 0.01.

## RESULTS

**The results of the communicative intelligence scale.** Table 5 shows a significant and strong positive correlation between communicative intelligence and motor formations in gymnasts. The hypothesized mean was 63, while the arithmetic mean was 66.2619, with a standard deviation of 7.53224, The skewness coefficient was 0.260, with a calculated T-value of 2.807, and a significance value of 0.008.

Table 6 shows the hypothetical mean, arithmetic mean, standard deviation, and t-value of the communicative Intelligence Scale, and the test results were as follows:

The hypothetical mean of the facial expression variable was 15, while the arithmetic mean was 15.7619, with a standard deviation of 3.75993, the value of T was 1.313, and the value of significance was 0.196, while the hypothetical mean of the body language variable was 12, while the arithmetic mean was 12.9042, with a standard deviation of 2.60215, the value of T was 2.253, the value of significance

0.030, the hypothetical mean of the external appearance variable was 12, while the arithmetic mean was 13.0714 and with a standard deviation 2.75321, the value of T was 2.522 and the value of the indication was 0.010, The default mean of the visual communication variable was 12 while the arithmetic mean was 12.8810 with a standard deviation of 2.59646 and the value of T was 2.199

and the value of significance was 0.034, and finally the default mean of the voice communication variable was 12 while the arithmetic mean was 12.7143 and with a standard deviation of 2.26625 and the value of T was 2.043 and the value of 0.048, and through the results of this table, it was found that there are significant differences statistically in favor of the arithmetic mean.

**Table 5. Shows the mean, standard deviation, skewness coefficient, calculated (T-test), and significance value for the communicative intelligence scale**

The variable	hypothetical mean	M	SD	skewness coefficient	T	sig
Communicative intelligence	63	66.2619	7.53224	-0.260	2.807	0.008

**Table 6. The data presented encompasses the average, variation, computed (t) statistic, and level of significance corresponding to the factors comprising the communicative intelligence measurement**

The variable	hypothetical mean	M	SD	T	sig
Facial expressions	15	15.7619	3.75993	1.313	0.196
Body language	12	12.9048	2.60215	2.253	0.030
External appearance	12	13.0714	2.75321	2.522	0.010
Eye contact	12	12.8810	2.59646	2.199	0.034
Voice communication	12	12.7143	2.26625	2.043	0.048

**Results of the relationship between communicative intelligence and the kinetic formation of the hoop in rhythmic gymnastics.** Table 7 shows the results of the statistical media for the kinetic configuration variable, where the arithmetic mean was 6.0238 while the standard deviation was 0.84068 and the torsion coefficient was 0.045. Table 8 shows the results of the correlation coefficients

between communicative intelligence and movement formations. The results showed a significant and positive relationship, with a correlation coefficient of 0.543 and a significance value of 0.001. This means that the students had a level of communicative intelligence that played a positive role in their performance of movement formations in gymnastics.

**Table 7. The provided information presents the statistical measures of the arithmetic mean, standard deviation, and torsion coefficient pertaining to kinematic formations**

The variable	M	SD	skewness coefficient
Kinetic configuration	6.0238	0.84068	-0.046

**Table 8. Shows the correlation coefficient between communicative intelligence and motor formations**

The variable	Correlation	Sig
Communicative intelligence - motor formations	0.543	0.001

## DISCUSSION

The results were presented in Tables 5 and 6 of the communicative Intelligence Scale and the researcher, through analyzing these results, found significant differences in favor of the arithmetic mean. This means that the sample has communicative intelligence. This is also what

was shown by the components of communicative intelligence, except for the first component, which is facial expressions. The researcher attributes this to the amount of experiences and information that the sample receives, especially since it practices theoretical and practical lessons, in addition to the amount of information that they



obtain from the subject teachers, which is continuous, ongoing, and updated toward them. "Knowledge is evolving at every moment in terms of the volume of information circulating and the speed of its transmission. It has become imperative to prepare individuals and future generations for this development and to provide them with the skills necessary to access knowledge and to deal efficiently with the complex and dynamic nature of the information world. In order for society to function effectively, it is necessary to develop a system of skills for dealing with information. This is what is called communicative intelligence, which seeks to activate the means of communicative knowledge that allow the accumulation of knowledge and to be usable in the context of contemporary daily life, and to employ it in supporting society and its progress in all fields" (12).

The necessity of communicative intelligence in rhythmic gymnastics is a reality for performing movement formations. In other words, the mutual perception and understanding of skills, as well as the performance itself in terms of weight, shape, and control, are among the most important foundations for good performance and collective movement. Therefore, the possession of communicative intelligence by students leads to their distinction in showing a movement formation, whether individual or collective. Communicative intelligence enables the student to continue the skills in a beautiful movement painting with music, in addition to the ability to express the artistic formation and the few errors during the student's performance of the skills within the movement formation.

Female students practice a lot of movements, and gymnastics movements in particular have the characteristic of being of interest to all students, especially girls. This led the sample to be constantly communicating and interested, giving it the characteristic of communication. The more the student communicates with other students, the more she acquires characteristics and advantages, one of which may be intelligence. The researcher attributes the reason to cognitive openness, tendencies, and desires to communicate with others. Many studies have shown that the first cause of communicative intelligence is this openness. According to Goldin (13), communicative intelligence is affected by the culture of the society to which individuals belong and according to their cultural levels. Naturally,

university students have the ability to communicate with others because of their communication skills, emotions, and a high level of acceptance of the ideas and opinions of others, and not being repelled by opinions and beliefs that contradict their own views.

The results of the second objective showed that third-stage female students at the College of Physical Education and Sports Sciences, University of Baghdad, have communicative intelligence. According to Gardner (14), communicative intelligence is a mental ability that enables a person to harmonize, be familiar with, and interact with others and understand them. It defines the individual's personality and their ability to absorb things, create new ideas, and develop their personality. Communicative intelligence also leads to a balanced improvement in the individual's life, and it plays an important role in the overall improvement of the quality of life as a whole. It is a combination of understanding others and a set of skills needed to interact with them. There is no doubt that an individual's possession of this intelligence can influence their performance and behavior, such as the events and activities they engage in, their regularity, satisfaction, emotions, and performance of their tasks.

As for the results of the relationship between communicative intelligence and the kinetic formation of the hoop in rhythmic gymnastics, the results of the correlation values between communicative intelligence and motor formations showed the presence of a significant relationship. This means that the female students have a degree of communicative intelligence that played a positive role in the performance of the motor formation. This is because the nature of performing gymnastics movements requires the use of mental abilities, including intelligence in how to overcome difficulties during performance. Through communicative intelligence, the student is able to perceive existing relationships and details, and then control this formation. This is consistent with what was mentioned by Muhammad Hassan Alawi (15) that intelligence is a general ability that shows the general muscle level of the individual and an important condition for excellence and sports activities. Alawi mentions that most international champions are close to the skill, planning, and physical level. As a result, there is an important factor that determines the outcome of their struggle during sports competitions (15).

The researcher suggests that the experiences of success and failure in the motor formation test are due to the student's belief in their ability to succeed. This belief is influenced by the student's physical and motor strength, as well as the relative difficulty of the practical test compared to the theoretical exam. The researcher believes that communicative intelligence plays a role in this process, as it allows the students to communicate with the performance of the motor formation and to overcome any challenges that they may face.

## CONCLUSION

The study concluded that the communicative Intelligence Scale for third-stage female students at the Faculty of Physical Education and Sports Sciences, Baghdad University, consists of 21 paragraphs divided into one area consisting of 5 components, as well as the ease of applying the scale to the research sample, and the researcher also concluded that they have a communicative intelligence that reaches the best level to perform hoop skills in rhythmic gymnastics in motor formations.

## APPLICABLE REMARKS

- The need to adopt a communicative Intelligence Scale.
- Continue to develop methods that increase, develop, and develop the personality and intelligence of students.
- To give students the opportunity to appreciate their talents and abilities on an ongoing basis.

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- The need to pay attention to the gymnastics lesson, especially for students.
- Undertaking additional research encompassing diverse metrics and competencies, in conjunction with selecting alternative samples.

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## AUTHORS' CONTRIBUTIONS

Study concept and design: Zeena Khaled Jasem. Acquisition of data: Zeena Khaled Jasem. Analysis and interpretation of data: Zeena Khaled Jasem. Drafting the manuscript: Zeena Khaled Jasem. Critical revision of the manuscript for important intellectual content: Zeena Khaled Jasem. Statistical analysis: Zeena Khaled Jasem. Administrative, technical, and material support: Zeena Khaled Jasem. Study supervision: Zeena Khaled Jasem.

## CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.



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#### **Appendix 1.** Post-adaptation scale.

Non-verbal communication: It is defined as the ability to use and employ hints, signals, and movements emanating from the body. In achieving good communication, it consists of all of the following:

##### **The first component (facial expressions):**

No	Paragraph	Valid	Invalid	To be revised
1	The use of facial expressions in accepting or rejecting a certain position			
2	I use a smile to encourage myself during the performance of the movement formation.			
3	My colleagues often describe me as what is going on in my mind appears on my face.			
4	When I listen to inappropriate speech, I frown and look sullen.			
5	I believe that a smile brings me closer to performing the movement formation successfully.			

#### The second component (body language):

No	Paragraph	Valid	Invalid	To be revised
1	The female student who stands erect during the performance of the movement formation is the most distant from the students.			
2	I believe that it is good to approach the students during the performance at an acceptable and logical distance.			
3	I use signals during the performance to express my rejection of some of the behavior issued.			
4	I use signals and gestures to communicate with others.			

#### The third component (external appearance):

No	Paragraph	Valid	Invalid	To be revised
1	I believe that my colleagues in the department should be elegant and have appropriate clothing.			
2	The external appearance plays a role in influencing others.			
3	I interact with my colleagues who have a wonderful taste that is compatible with their academic level.			
4	I respect the student who always has a neat appearance because it reflects her personality.			

#### The fourth component (eye communication):

No	Paragraph	Valid	Invalid	To be revised
1	I distribute my vision during the performance to focus on the movements.			
2	I know that my colleagues are not happy with me during the performance through their looks at me.			
3	I avoid looking away from some embarrassing situations during the performance for my fellow students.			
4	I follow important conversations about the performance of the movement formation through my looks.			

#### The fifth component (vocal communication):

No	Paragraph	Valid	Invalid	To be revised
1	I change my tone of voice to express my emotions.			
2	I avoid using my voice as a means of dealing with my colleagues.			
3	I avoid using a loud voice in conversations and discussions.			
4	I believe that personal space is very important during conversations between me and my colleagues.			