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## Teaching assessment strategies and stress perception among students: Case of students of the department of science and technique of physical and sport activities (STAPS/INJEPS/UAC)

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### Abstract

This psycho-pedagogical research is conducted at the National Institute of Youth, Physical Education and Sport (INJEPS) of the University of Abomey-Calavi (UAC), on 100-level students enrolled in the department of Science and Technique of Physical and Sport Activities (STAPS) during the 2017-2018 academic year. They were 246 students (215 males and 31 females) aged  $18.56 \pm 0.39$  years old. They have all been effectively submitted to two Likert Scale questionnaires. One assessing the level of stress perceived by students before and during examination where questions are asked one by one and the other evaluating the same level of stress for a one go set of written examination questions.

The statistical analysis software R (3.4.3.) was used to estimate a logistic model between the evaluation strategy and the level of stress perceived by students during the examination according to the evaluation strategy and for the realisation of the multiple correspondence analysis using the FactoMineR package (F. Husson *et al.* 2017).

Data analysis revealed that the two forms of evaluations strategies generated stress just before and during final examination. But, the level of stress was higher among students when the questions are administered one by one. Accordingly, the evaluation strategy in which the totality of the examination questions is given at once should be prioritised by lecturers in order to assure better academic achievement of their students. However it could also be interesting to test the student's ability to manage stress especially knowing that he/she is a potential candidate of a professional life where stress is permanent.

**Keywords:** evaluation strategy, stress, student

### 1. Introduction

Stress is a term that is increasingly used nowadays and in various circumstances. It is present in several fields, including education. For years now, research has begun to address the issue of stress among learners in academic contexts. And for decades, psychologists, and biologists have begun studies to understand the mechanisms that lead to this phenomenon, the way it manifests and especially to look for solutions to prevent its manifestation among people who are likely to be exposed to it and reduce its consequences on those who are already victims <sup>[14]</sup>. According to the World Health Organization (WHO), stress occurs in someone whose resources and personal management strategies are overwhelmed by the demands placed on them. It can occur as a result of ego threat, novelty of a situation, apprehension of the negative consequences of a result, loss of control or trust. In that case, we refer to the expression anxiety or anguish, especially when the person or potential victim no longer has the means to mobilise resource to consider new perspectives in order to cope with the threatening situation.

All students wish to have a good grade after an evaluation or at the end of an examination. To achieve that goal, they must work hard to overcome the various difficulties related to the tests they are subjected to during the evaluations. These evaluations are the focus of learners, (whether they are junior secondary school, senior secondary school, undergraduate or postgraduate students), because their success and consequently their future depend on it. According to (Pempel, 2005) <sup>[21]</sup>, learning assessment takes

several forms: diagnostic, formative, summative, and certification assessments. Summative assessment is particularly done at the end of a learning unit or training process to appreciate the learner's ability on the taught subject. It takes the name of certification evaluation when it is sanctioned by the issue of a certificate or diploma.

These last two forms of evaluation are those that generate the highest stress among learners since they lead to a numerical score that has become ubiquitous in school and university system and an object of obsession in schools, universities and in society.

The academic evaluation whatever the form it takes, ensures different functions according to the subject. It is formative for pupils and students or learners in general, informative for parents, and indicative for teachers/lecturers <sup>[25]</sup>.

The underpinned idea by an evaluation (success or failure) is at the root of a strong pressure on the student and more generally the learner who wish to satisfy his ego, his parents, teachers/lecturers or the society. James Hillman quoted by Renaud, (2016) <sup>[25]</sup>, explains that school can be a source of stress for children. This pressure is reinforced by scoring, controls, examinations, selection and all that concerns evaluation. Therefore, "academic success" becomes a major concern for both parents and learners <sup>[22]</sup>.

Thus, the search for academic success at any cost can be a major factor of stress for learners (Cote-Famille, 2009) <sup>[4]</sup>. The evaluation become a crucial element for many students who have negative attitudes towards exams. For them, the word "examination" is often linked to long periods of exhausting and stressful study, to the panic that precedes the

day of the examination, to the fear of failure, to disappointment, etc. In the United States, for example, stress (anxiety) in schools severely affects millions of students [28]. Other studies have shown that 66% of students have experienced regular stress over a period of 15 days, with up to 48% of them feeling sad or depressed [10]. It is therefore clear that evaluation is an important source of stress for learners, even in Western countries where learning conditions are better.

But beyond all the above, the manifestation of stress on a subject is function of his personality. Besides, all the studies that have addressed this issue in relation to the problematic of evaluation have remained in the general context without worrying about the strategies of the different forms of evaluation that may be, depending on the case, more or less stressful.

It is for these reasons that the present psycho-educational study approaches the question of the stress generated by the various forms of evaluation based on the way questions are asked: "one by one" or "all at once".

## 2. Concept of Stress

Work on stress began aftermath of the Second World War with Hans Selye [11]. This is a complex notion whose definition varies across disciplines. In biology, it is defined as a physiological reaction (traumatic, thermal or even social) in the face of external aggression [3]. Its manifestation is declined into three successive phases (that of alarm, resistance and exhaustion) It can be positive if the subject manages to adapt from the resistance phase by bringing together new resources. On the contrary, it can be negative if the subject do not find additional resources to deal with the threats. As a medical doctor, Selye only considered the physiological aspects of stress [11, 27], putting the brain and the nervous system in a mechanism of appearance and adaptation of an individual to stress. He explains that when a danger is perceived, the brain sends a message to the nervous system which ramifies on one hand into a sympathetic nervous system which immediately releases the necessary energy to put the body in a condition to react, and on the other hand part in a parasympathetic nervous system that regulates and prevents the sympathetic system from racing by restoring the body to its normal state. It is only question of positive stress in this case. In 1984, Lazarus and Folkman published a reference book that constitute the basis of many studies on psychological stress [5].

### 2.1 Causes and consequences of psychological stress

Holmes-Rahe (1967) [13], developed a scale of assessment of the stress factors in 43 stressful events of which the most salient is the death of one spouse with a value of 100 points and the minor event (of stress) is assimilated to a contravention (a fine) with a value of 11 points. These aetiologies present themselves in four (4) factors (personal, family, social and professional factors) which are in turn grouped into two sources (external and internal) [7, 11, 20, 26]. Stress is very present in our society and appear to be a real problem. Statistics show that in the United States, there are almost nine out of ten (90%) individuals who experience stress one to two times a week, and one out of four (25%), every day [27].

If stress is now recognised as a problem of first priority for adults and that it wreaks havoc on employees, why not

admit the same situation for students, particularly in the university context where the student is not only required to do well and then flourish, but to be always and everywhere the best for a good professional integration. University life is a source of considerable stress. The factors are indeed, many in this context. For example the pressure related to assessments and grades [9], the search for academic success at any award [4], the apprehension of negative consequences, the loss of control are some of the causes of stress.

The educational system has high demands on students and places great importance on the prioritisation and ranking of academic performances. Consequently, results and grading are undeniably stressful [9, 12]. According to the findings of Metboon's research (2006) [18], five (5) major sources of stress are found among learners namely (rewards / punishments, presence of spectator, competitive situations / exams, the presence of new people and the beginning a new job). In addition, Muirhead and Locker (2007) [19], reported that among Canadian dental students, stressors are: university discovery, peer and parent pressure, fear of failure during exams, loneliness and isolation not to mention financial problems. It has negative consequences on an individual at the physical, psychological and cognitive level. Its effects cause lower motivation and thus affect school performance.

As we can see, the causes of stress are as numerous as varied. Its consequences cause damage in several sectors, including education. That why this research has focus on students stress during terminal examinations in STAPS / INJEPS.

### 3. Importance of evaluation in contemporary societies

According to Hadji (2012) [12], evaluation has become a "social calamity". Indeed, numerical evaluation is everywhere, it appears in every field and it is very "obsessive" in our life. It affects sectors such as commerce, large companies and others where stress has emerged.

The stress-related consequences are significant at the company level with an increase in absenteeism and a loss of productivity. In industry, its manifestations are even more serious and can lead to depression, 'burn-out' and suicide.

More than the public administration and the aforementioned sectors, School is one of the first evaluation institutions. As a result, stress is more present among learners in the school environment than among students in higher education (CSA survey, June 2009). According to Georges (2002) [9], "School has become as stressful as company", schoolchildren are therefore comparable to adults in business. The same surveys evoke similarities between these two worlds, such as the extra-work and the pace of work that lead to pressure, especially the one related to evaluation and its challenges. This constitute an important source of stress at school.

#### 3.1 Forms of evaluation at INJEPS

At INJEPS, assessments can be in form of oral written questions. They can also take into account personal or group works. Depending on their importance in grading, we have simple test, partial examination and most important final examination which are essential for the validation of an Education Unit (UE). No student can pass an UE if he or she has not taken part to the final examination of each constitutive component (ECUE) of that UE. This is not the case with regard to other forms of evaluation. In the present

work, only the final examinations were taken into account because, they are the most important (they account for one half to two third in the calculation of the academic results). As For the written exams, several strategies are used by the lecturers for their implementation. They are evaluations in which questions are administered one by one and evaluations in which all the questions are administered at once.

#### a) Evaluation administering the questions one by one

With regard to this type of evaluation, questions of the test are dictated or projected one by one on a screen. So, as soon as the time allotted to the first question is exhausted, we move on to the second question and so on. The time of a question counted by the lecturer himself or the supervisor of the examination may be reduced if he considers that there are murmurs in the classroom or if he suspects something likely to threaten the regularity of the evaluation (communication attempts between students, for example). In that case, the Lecturer or supervisor goes directly to the next question.

#### b) The evaluation administering all the questions at once

Unlike the previous case, in this type of evaluation, the subject is written on a sheet of paper with all the questions at the same time. Each student receives a copy of the test at the beginning of the composition as it is done in all classical examinations. The time of the composition is communicated to the student at the beginning and this one can read all the subject (all the questions). He organises himself to manage the time allotted to the composition and can begin with the question of his choice whereas in the first case, he does not have that possibility.

### 4. Stress and the different forms of evaluation

According to Antibi (2007) <sup>[1]</sup>, evaluation is both an "individual" and a "social" threat. Indeed, at the individual level, there may be a loss of self-confidence, fear of failure, a stomach ache, anxiety, sleeping disorders that can lead to depression, school phobia and in some cases School dropout. At the social level, a heavy tension with the comrades (classmates) is noted. This affect at some point the social relationships. According to Superior Audio visual Council (CSA) survey in 2015 <sup>[17]</sup>, 22% of kindergarten students are stressed, 29% in elementary (primary) school, 32% in junior secondary school, 42% senior secondary school and 37% at university.

According to this survey, an increase in stress is observed over the course of schooling. The causes of stress in schools are multiple. We can mention: the simple passage to the board in front of the whole class; stress related to fear of failure and retaliation of the grade of test, examination or selection; stress related to the relations with peers (aggression, mockery, competition); stress generated by parents regarding academic success; failure; orientation (kindergarten, primary school, secondary school, university). More specifically on the causes of stress, data were published from the CSA survey <sup>[17]</sup>, with the collaboration of parents. According to that survey, student's stress is due to: grades and assessment at 39%, fear of future at 31%, school system not adapted to the student at 30%, relationships with peers at 28%, excessive workload at 28%,

parental pressure at 22%, violence in school at 21%, teacher demands and pressure from society at 19%, the academic results obtained at 16%, and the loss of confidence in the functioning of the school at 15%.

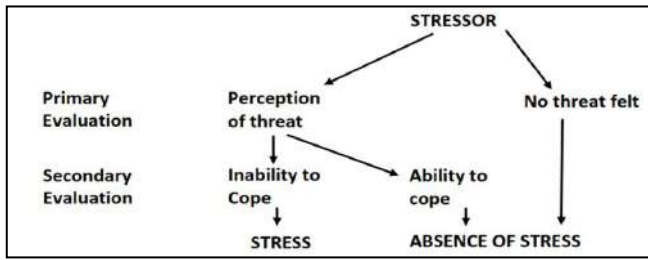
In addition, a study conducted by Zakari *et al.* (2008) <sup>[17]</sup>, based on 252 senior secondary school students, reports the existence of "burn-out" among French school students. That situation noticed among them is mainly due to school stress. Moreover, in a report of July 2013, the National Education Inspectorate notes that students are divided on the different assessment tools they identify as sources of stress. For the majority of them, the grades are "stressful", the opinion of the pupils differs however according to the level and the academic performances. For those in difficulty, the grades are "brittle". On the other hand, good students fully adhere to this rating system. Evaluation remains the central element of this malaise, however.

Parents' fear about the success of their children induces a high level of stress among them during assessment periods. Indeed Hadji (2012) <sup>[12]</sup>, highlights the fears of parents about the future of their descendants.

According to a poll by the Superior Audio visual Council (CSA) <sup>[17]</sup>, 52% of parents are stressed by the success of their child. These fears sometimes explain students' high anxiety about assessment and grades. For these children, failure at school means the loss of their parents' love, to the point that some psycho pedagogues speak of the "tyranny of the grade". From now on, the principle of coeducation places a fundamental role and an important place of the family within the school. This is why evaluation directly involves it. Indeed, it is the family who receives the transcript, who signs it, who request for his child's schooling involvement to the teacher, most of the time the teacher rely on quantitative data (the grades). Parents use them as a reference; this is one of the main link that connect family to school. Generally, the question that comes up often at home is: "Have you got any grade today"? It is on these grades and especially the good one that rely the hopes of the families for the future of their children. This influence the students in the form of stress. These latter are then scared of the bad grade, which means the non-satisfaction of their parents.

### 5. The Transactional Theories of Stress

Several theoretical models have attempted to explain stress. Among them are transactional or bio-psychosocial models. They favour dynamic interactions among the biological, psychological and social dimensions of stress and define it as a process that occurs between the individual and his or her environment <sup>[8, 11]</sup>. According to them, the appearance or not of this phenomenon depends on the perception and the construction that the individual has on the stress or the stressful situation. The stress experienced or perceived by the individual for them, is function of the perceived stakes of the situation in its novelty, its intensity as well as the appreciation of the possibilities to mobilise resources or strategies to better manage the issue. This is the way the subject assesses and perceives the stressful situation as well as his ability to adapt to it. The figure 1 show the explanatory Diagram of the model of psychological stress: double subjective assessment of the situation.



**Fig 1:** The double evaluation according to Lazarus and Folkman (1984) [15].

The cognitive assessment is done in two phases: a primary and a secondary phase. In the primary phase, the individual assesses what is at stake in a situation and determines its nature [26]. In other words, it allows the individual to determine the nature of the situation (threatening or not). If no threat is perceived during the primary phase, there will be no stress and the individual will not have recourse to the secondary phase.

If the individual perceives a threat, he or she will quickly move on to secondary evaluation phase in order to assess his or her resources [26]. In case they are sufficient to cope with the threat, they will be no stress. On the contrary, if they are insufficient, they will be stress.

The individual must mobilise additional strategies to deal with the situation. This is the "coping" phase (a combination of cognitive and behavioural efforts to control, reduce or tolerate internal or external demands that threaten or exceed the resources of the individual). At this phase, a set of strategies is developed and new resources mobilised by the individual to cope with a situation beyond his or her original resources.

**6. Hypothesis**

The level of stress felt by 100-Level STAPS students during examinations is higher when the questions are asked one by one than when they are all administered at once.

**7. Objective**

The objective of this research is to assess the level of stress among 100-level students of the STAPS department according to the evaluation strategy adopted by the lecturer during examinations; and to inform the lecturers on the form of assessment that generate the least stress among students.

**8. Method**

This research is conducted at the National Institute of

Youth, Physical Education and Sport (INJEPS) of the University of Abomey-Calavi (UAC), on 100-level students enrolled in the department Science and Technique of Physical and Sport Activities (STAPS). 246 students (215 males and 31 females aged 18.56±0.39 years old) have participated to the survey. They were all submitted to 2 similar survey questionnaires. One assessing the level of stress perceived by students before and during examination where questions are asked one by one and the other evaluating the same level of stress in the context of examination where all the questions are asked at once.

These are five Likert scale questionnaires developed based on the psychological questionnaire of Lemyre and Tessier (2003) [16]. The fifteen (15) main items of each questionnaire divided into three (3) sub-themes (variables) of five (5) items are related to the manifestations of stress in three dimension (physical, psychological and cognitive). The actual survey took place from 13 to 15 September 2018 in the premises of the INJEPS during the period of the final examinations of the 2<sup>nd</sup> semester of the academic year 2017-2018. It must be said that not all lecturers use the same strategy during final examinations. The students being in the exam period keep fresh memories of the stress felt during the evaluation according to each strategy.

After the data collection, the statistical analysis software R (3.4.3.) was used to estimate a logistic model between the evaluation strategy and the level of stress perceived by students during the examination according to the evaluation strategy and for the realisation of the multiple correspondence analysis using the FactoMineR package [6]. The results are as follows.

**9. Results**

**Table 1:** Results of chi-2 adequacy tests between observations of stress state before and during assessment

	Observation of the state of stress before assessment	Observation of the state of stress during assessment
Chi-2	42.96	93.79
DF	2	2
p.value	4.7E-10	4E-21

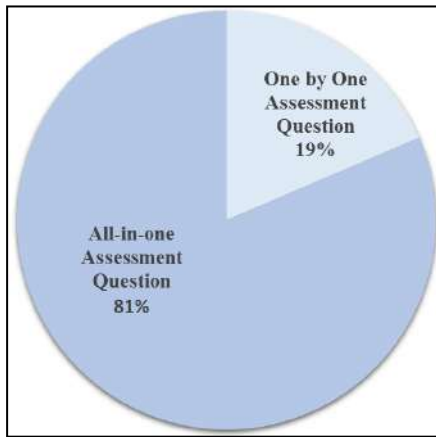
If  $p > 0.05$  then there is no stress felt by the students. On the other hand, if  $p < 0.05$ , there is stress feeling among them. On the basis of the results shown in the table I, it can be said that stress is present among 100-level students of the STAPS department of INJEPS (UAC) before and during final examinations. But the stress level is different during these two moments

**Table 2:** Estimate of the Stress levels from a logistic model

Level of stress	Assessment administering the questions one by one	Assessment administering all the questions at once	Estimation of the logistic model	
	Percentage	Percentage	OR	95% CI
Very calm	23.71%	58.76%	-	-
Somewhat worried	46.39%	34.02%	3.49	[1.81; 6.86]
Very worried	29.90%	7.22%	10.27	[4.13; 28.60]

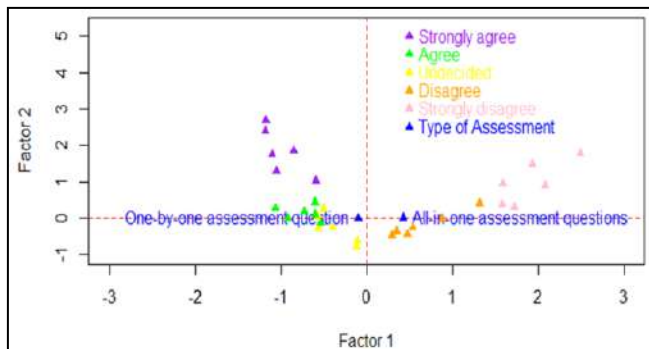
The level of quietness (very quiet) of students is low when the questions are administered one by one while it is high when the totality of the questions are administered at once.

In other word, the level of anxiety (very worried) is higher when the questions are administered one by one than when it is administered in full.



**Fig 1:** Distribution according to the choice of assessment that help to optimise performance.

The figure 1 shows the distribution of students according to the choice of evaluation that help to optimise performance. Thus, they have shown a strong preference for the type of assessment that displays all the questions at once to the one asking the questions one by one.



**Fig 2:** Representation of the modalities of variables resulting from a multiple component analysis

The figure 2 presents the modalities of variables resulting from a multiple component analysis where we note a grouping of modalities of the same order regardless of the type of stress (physical, psychological, cognitive) and whatever the type of evaluation ("strongly agree" "agree", Undecided, disagree and "strongly disagree").

There is also a close relationship between high levels of stress agreement and the choice of preference for an assessment in which all questions are administered at the beginning and a proximity between the low levels of agreement of stress and the choice of preference for an evaluation in which questions are asked one by one.

**10. Discussion**

The present results are similar to those of Antibi (2007) [1], who indicated that assessments are an individual and social threat. Thus, the stress felt by the students exists both before the beginning and during the evaluations. When the lecturer chooses to display the questions one by one the stress level is higher than when all the questions are administered at once.

These results are also similar to those of Metboon's (2006) [18], research, which showed that competitive situations such as interviews, debates, exams, are very stressing moment for learners. They do not differ from those of Muirhead and Locker (2007) [19], who claimed that Canadian dental

students are stressed by exams and fear of failure. They are further confirmed by the results of CSA survey conducted in collaboration with parents of students that revealed that the fear of not having good grades is the first leading source of stress among children [17]. We can also mention the work of Bruno (2015) [2], who concluded (as it is the case among STAPS students) that the summative evaluation can induce stress among students. This especially in a context where they know that the score obtained for the final examination (examination considered for this study) will account for at least 50% in the calculation of their yearly grade point.

Each of the two strategies (the one-by-one and the all-in-one questions), at the beginning as well as during the final examination are stressful for the student. But the difference between the stress levels in each case results from the fact that at the beginning and for the strategy that administers all the questions, the student has more chance to anticipate the negative consequences of the issue of examination. [2, 9, 12, 18, 19].

On the other hand, during the evaluation, the student being already in the action phase only has the solution of the double subjective evaluation of the situation and must directly mobilise his adaptive resources if necessary. In addition, the higher level of stress experienced by students in assessment situations administering the questions one by one than that of the evaluation administering all of the questions, either before or during evaluation, means that the evaluation administering the questions one by one will greatly affect the student knowledge restitution while the evaluation administering the totality of the questions offers an opportunity for the student to better appreciate the different contours of the examination subject. Consequently he will better cope the subject and the grade will be more satisfactory. The level of stress felt is therefore dependent on the external environment that is in this case, each of the two evaluation strategies (the one administering the questions one by one and the one administering all the questions at once).

The results of the adequacy tests lead to the conclusion that the stress profile during an evaluation administering the questions one by one is not the same as that of an assessment administering all the questions. Indeed, during an evaluation where questions are administered one by one, almost all students are worried (93.79%). While for an assessment where all questions are administered, almost half (42.96%) of the students are calm. Evaluation where questions are administered one by one is the most stressful external environment for students. This corroborates the results of Prokofieva *et al.*, (2017) [23], who showed that students are less stressed when the evaluation is not graded than when it is.

The high level of psychological and cognitive stress experienced during both assessment strategies is due to the fact that final examination requires mental effort regardless of the strategy used. Transactional theories of stress as well as the double subjective assessment of the situation (Lazarus and Folkman, 1984) [15], provide a good understanding of the situation. The student during the primary assessment finds whether the situation represents a threat or not. An absence of threat corresponds to an absence of stress and the examination proceeds normally. But if the student perceives a threat, he or she quickly moves on to the secondary assessment, then to the available resources (knowledge on the questions) to answer to the examination questions [26]. In

case the resources are sufficient, he faces the threat. The stress is low or non-existent and the examination continues in good conditions.

On the contrary, if the resources are below the threat, there is a high level of psychological and cognitive stress, as it is the case in the two forms of evaluation among STAPS students at INJEPS. It is not a destructive stress yet; but an acute stress which occur at a specific time. This is the phase of "Alarm reaction" [3]. Students felt a higher level of psychological and cognitive stress in both assessment strategies. They find themselves in situations of adaptation, resistance or balance of stress. If they manage to remobilise new resources (which is the case of the strategy administering the all the questions here), they will perfectly cope their stress. We will talk about positive or favourable stress.

On the other hand, if he does not manage to gather new complementary resources to face the threat, he remains tense and nervous and fails to revive. He finished his composition badly (case of the evaluation administering the questions one by one). This stress becomes chronic when it is permanent or poorly controlled. The student is under adverse and negative stress as the threat is permanent throughout the examination. He is nervous or confused at not being able to answer the current question but also worried about the next question. He will lack concentration and lose all self-confidence. He therefore missed the adaptation phase (resistance stage) and fell into the stage of exhaustion [3]. He failed to cope the effects of the stressor (the subject of examination). He is therefore the victim of a negative stress which corresponds to a decrease of performances. The difference in the level of stress that the students made in each evaluation strategy shows that the stress appears according to the personal interpretation of the situation and its stakes (internal factor), but also the complexity of the context in which this situation take place (external environment) [8].

When asked about the evaluation strategy to optimise student performance, a large number of them indicated the type of evaluation administering all questions at once (81.44%) against a minority (18.56%) who preferred the evaluation administering the questions one by one. This difference is therefore due to the higher level of stress felt by these students in evaluation situations administering the questions one by one. Thus, in the context of this study, we can characterise the stress experienced by the students during the evaluation administering the questions one by one of chronic stress and the one experienced in evaluation, administering all the questions to be optimal for the performance.

To better explain the outcome of data relative to the choice of the evaluation that optimise performance, a multi-component analysis of the variable modalities is done (Figure 2). Indeed, we observe a proximity between the high levels of stress agreement and the preference of an assessment during which all questions are administered at the beginning and a proximity between the low levels of agreement of stress and the preference of an evaluation during which the questions are displayed one by one.

## 11. Conclusion

This research focused on the issue of stress in relation to evaluation in the university context. It was particularly interested in assessing the stress felt by students when

lecturers choose to ask questions one by one or to administer them in their entirety during final examinations. The goal of this research is precisely to quantify the stress generated by each of these two evaluation strategies.

At the end of this work, the results show that the students felt a higher level of stress in the evaluation situation administering the questions one by one than that of the evaluation administering all the questions.

On the basis of these results, it may be suggested to INJEPS lecturers to limit the all-out recourse to the form of evaluation that administers the questions one by one, in the interest of students who just wish to write their exam in less stressful conditions.

These results, however, raise questions about the purposes of evaluation in this case. Should it be only concerned about the control of students' knowledge or also about their ability to deal with the stress related to assessments, if one know that the stress situation exists everywhere and particularly in the professional sector where the student is expected to be.

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