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May Schools Develop Their Students' Intuition?

Jordi Villoro i Armengol¹, Santiago Estaún i Ferrer²

¹Professor at the ESIC Business&Marketing School. Barcelona University Campus.
Passeig Santa Eulàlia, 2. 08017-Barcelona. Teléfono: 93 414 44 44

²Emeritus Professor at the Autonomous University of Barcelona. Department of Basic,
Evolutionary and Educational Psychology. UAB Campus. Calle de Ca N'Altayó, s/n.
08193-Bellaterra-Cerdanyola del Vallès (Barcelona). Teléfono: 93 581 13 77.

Corresponding authors: jordi.villoro@esic.edu; santiago.estaun@uab.cat

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Abstract

The main purpose of the research has been to dictate the role intuition plays in the decision-making of undergraduate marketing students.

The study and process of decision-making has always been focused on statistics and mathematics by the business world and universities, while most psychological aspects have been avoided.

In recent years emotions, cognitive processes, intuition, etc., have increased their importance in the decision-making process; but they still have a long way to go.

The research, which this article is based on, has been performed under a sample of 404 individuals aged 20 to 25 years; half of which are marketing students in ESIC Business & Marketing School. Their decisions are analysed and compared with other collectives to observe if the information is an accurate significant variable for their decision-making.

A questionnaire was administered to the participants in which they were asked the possible success or failure of specific products if they were to be launched on the market. These products were real and chosen by marketing experts.

The participation of the individual in physical, cultural, etc. activities was also taken into account as well as their personal profile and psychographic data.

The results obtained vary significantly from a statistical point of view and prove that training, background, participations on social activities and the perception of one's intuitive capacity are keys to success when it comes to decision-making.

Keywords

Intuition, Marketing, Decisions, University education, Social activities.

1. Introduction

Decision making is a process of thought and action that concludes in a behavioural choice. A decision involves a person having to make a pick from a set of mutually exclusive alternatives. Maturana (1979) maintains that it is a choice among many possible acts.

Five basic elements must be involved in the decision making process: information (relevant data), knowledge (comprehension, understanding), experience (mental record of past experiences), analysis (how the elements are linked) and the criteria (parameter used to evaluate these).

In decision making, one may affirm that more value is given in academic and entrepreneurial settings to knowledge based on logic and analysis of all the variables than knowledge based on intuition, a term that shall be defined later on.

The reason for this is that if an executive makes a decision based on reports and studies and the result is not that expected, the source of the information may be held liable. On the other hand, if he decides to make a decision contrary to the studies based on his own intuition and the outcome is negative, he cannot avoid his responsibility.

The aim here is not to determine whether the corporate setting is the appropriate one for intuition based decision making, or whether one must always resort to an exhaustive analysis of the information, to a validated process with scientific academic rigor. There are numerous examples of major failures by powerful companies based on copious, costly information.

The aim is to corroborate some factors that may boost intuitive decision making success in order that, considering the results obtained, one may encourage debate regarding how these are evaluated and developed in the field of education.

As an anecdote regarding how intuition is represented in the field of psychology, Robin M. Hogarth (2001) analysed the submissions to Psychinfo over ten years. He compared

the word “intuition”, with 2,941 instances, against others such as “attitude” (116,108 instances), “instinct” (22,023) or “insight” (9,087).

The dual-process model (Chaiken & Trope, 1999) is fully accepted by psychology and states that we have one brain, but two minds, one analytical and the other intuitive and holistic, that work in parallel (Gilovich and Griffin, 2002). This theory is based on the case that there are two ways of processing information, called System 1 and System 2 (Evans, 2008; Stanovich and West, 2000).

System 1 is basically based on unconsciously applied heuristics. These reduce and simplify general processing of the information (Gigerenzer, 2000). The processes are swift, automatic, unconscious and scarcely demanding in cognitive terms. They are able to generalise and relate, and based on experience, to make implicit suppositions (Lakoff & Johnson, 1999).

System 2 is formed by logical inferences and algorithmic reasoning. The processes are analytical, conscious, explicit and rule based. They require cognitive effort to process and deliberate all the information (Epstein, 2008). This implies that personal differences are visible in cognitive capacities (Evans, 2008; Stanovich, 2000).

Which of the two systems prevails in processing information and the decision making is conditioned by the nature of the situation, the degree of emotional involvement and the personal characteristics with regard to styles of thought (Epstein, 2008).

SYSTEM 1	SYSTEM 2
Implicit reasoning process Intuitive: feelings not analysed Swift decision making process Acquired by associative learning May cause illusions or deceit	Explicit reasoning process Rational: analysis of logical implications Slow decision making process Acquired by formal learning Allows illusion or deceit to be overcome

Characteristics of the two reasoning systems (Tubau, 2005)

Intuition is a difficult process to describe because it does not correspond with the rational information process, although it provides knowledge and guides decision making. Introspective information use arises with intuition that allows one to reach correct answers that appear to be based on insufficient data.

The first difficulty lies in being to describe exactly what intuition is and what it is not; what intuition is and what distinguishes it from randomness, for example. The major challenge lies in preparing a measuring instrument that allows each person's level of intuition to be quantified.

Intuition is connected to the memory acquired over the years and to experience. The brain stores data in the unconscious and that information suddenly appears, giving rise to an insight. Intuition improves with experience and may be more reliable in uncertain environments.

Jagdish Parikh (1993) considers intuition provides “*access to internal reserve of skill and experience accumulated over the years, and obtaining a response, or an impulse to do something, or an alternative among several, without being aware of how it was obtained*”.

Timothy Wilson (2002) describes the adaptive unconscious as the part of the brain that extracts swift conclusions, and he contrasts it with rational thought based on conscious perceptions.

Weston Agor (1989) defines intuition as the capacity to integrate and use information stored in either side of the brain.

Antonio Damasio (1994) considers intuition is a means of reasoning that does not follow the usual phases of the conscious process, that does not go through the logical phases of thought production.

According to Hammond (1996), intuition is “*a cognitive process that somehow produces an answer, solution, or idea without the use of a conscious, logically defensible, step-by-step process*”.

Gigerenzer (2007) affirms that people know much more than they are able to express. Intuition is a judgement characterised by:

- Appearing rapidly in the awareness.
- One not being sure of the reasons that generate it.
- Being consistent enough to lead to action.

Kirsten Volz (2007) maintains that the brain processes without the person being aware of doing so. She noted that when people had to answer certain questions, a specific region of the brain was triggered, but also the areas that process abstract information, which means that when the brain faces difficult situations, it is not only governed by learned rules of conduct, but also by those it has created over time for swift decision making in critical situations.

Intuition is related to experience-based memory, which is acquired over time and through experience. The brain stores data and information in the unconscious, which it later recovers and also processes unconsciously. That information is the basic element of intuition.

However, considering the enormous amount of information within easy reach, the doubt lies in knowing which information must be taken into account (in quality and quantity) to consider that a rational, objective decision has been made.

The traditional educational model instructs children to accumulate data and think a lot before acting. It concentrates on the conscious part and values logic and analysis. It rewards a precise answer obtained by exercising their memory, and does not invite them to reflect and experiment.

Malcom Gladwell (2005) maintains that correct decisions may be made based on sensation or feelings. He also affirms that it is possible to identify and understand the reason for erroneous decisions based on intuition and thus it is possible to train one’s intuition.

Factors such as personality and culture (beliefs, customs, values ...) act as perceptive variables (prejudices) that distort reality. The interpretation of a fact is subjectivised by cognitive biases (Kahneman & Tversky, 1972).

When the situation is too complex for logical analysis, intuitive mental processes are observed (Neisser, 1963). In that sense, complexity arises from the degree of uncertainty of the problem and the risk associated with the decision. Complex decisions intervene in knowledge, experience and emotions.

Dane & Pratt (2007) and Khatri & Alvin (2000) describe the basic properties of intuition:

- Intuition involves holistic associations in which the environment stimulates profound unconscious sensations. Patterns are generated by linking stimuli instead of by logical considerations.
- Cognitive biases hinder analysis of problems. However, cognitive biases are also present in a rational process, so intuition may be more reliable under uncertain conditions, or with expert decision-makers.

The complexity of situations is due to the large amount of information and difficulty and the difficulty in taking it all into account.

- Intuition is swift, generates automatic responses. It mixes all the experience and learning by the person and instantly provides a response that is perceived as “the” best option.
- It is an unconscious process that makes use of knowledge and experiences stored in the memory, but which are not accessible during a rational remembering process.

One may sum up by stating that intuition:

- Allows access to a major reserve of knowledge one is not aware of.
- Is the way of thinking that works before applying rational thought.
- Is an attribute of the human being that includes both the cognitive as well as emotional level.

- Is motivating and responsible for success in creativity and innovation.
- May be developed and accessed, not at random, but as a result of a process.

Intuition must not be imposed as a preferential resource in decision making, but rather must be taken advantage of by reason. Reason interprets, analyses and takes advantage of the unconscious knowledge.

It is due to this that teaching must include (or continue to include) methods based not only on study and learning knowledge, but also those that work on skills that are harder to measure, but no less important.

2. Literature review

A basic aspect of decision making involves agreeing the criteria that determines what is considered a good decision.

Vlek (1984) considers that in situations of uncertainty, a good decision is that which complies with the statistical model (according to the probability theory) although such decisions do not guarantee a good result.

Maier (1980) considers it necessary to consider two dimensions to evaluate the potential correctness of a decision. On one hand, there is the quality of the decision that will depend on the available information, and on the other, acceptance of the people who will have to implement it.

Majone (2010) considers that the results of a decision are uncertain, so it is difficult to determine the correct decision. When faced with the same problem, diverse valid options and a variety of opinions may appear that hinder evaluation of the result. Thus, Majone emphasises the importance of studying the decision process and not the result alone.

Three important concepts appear in these contributions that influence the efficiency of a decision. That is why it is necessary to emphasise the notion of uncertainty, regarding information and the problems.

According to the model provided by Hellriegel, Jackson & Slocum (2002) decisions, according to the characteristics of the problem to be solved, may be placed in three categories: certainty, uncertainty and risk.

- Certainty conditions are decisions without risk in which the options are clearly defined and identified. All the information is available, the valid alternatives are known and one may identify the impact of the decision with nearly total precision. The aim is to choose the solution that provides the best result.
- Risk conditions arise when there is scarce information and it is ambiguous. A certain amount of information is available that allows the problem to be defined, to identify possibilities and evaluate probabilities of results. The decisions are based on objective and subjective probabilities.
- Uncertain conditions are when decisions are made in ignorance (Yates, 1990). There is little or no information available that may have an effect on the difficulty of clearly defining the problem. Alternatives may be identified, but one cannot precisely measure the impact of each alternative. One may only make reasonable assumptions.

Mintzberg & Westley (2001) or Bransford & Stein (1987) among other authors, maintain that the first step in the decision making process is defining the problem.

A problem is the deviation between an established norm and the reality observed, the cause of which is not known and the importance of which makes one want to know it. A classic approach to problems sorts them in two categories: structured and unstructured problems.

- Structured problems are repetitive, common, with scarce risk, having a well defined procedure.
- Unstructured problems are new, there are few references available, there is uncertainty and risk, and thus they are subject to a point of view.

Routine decisions are valid for structured problems, those that are known and that any person may decide and act on. They are simple, quick decisions.

	STRUCTURED PROBLEMS	UNSTRUCTURED PROBLEMS
Information	Sufficient	Insufficient and dispersed
Experience	There is experience in the solution	Little or no experience in the solution
Algorithm	There is a proven algorithm for the solution	There is no proven algorithm for the solution

Problem features

Innovative decisions are required for unstructured decisions. There is no established procedure and thus each situation requires specific processing. One requires capacity to propose solutions from different points of view.

*Framing*¹ is when the same information is formulated in different ways. The same information may be interpreted differently according to the structure of the message.

Plous (1993) maintains that the choice between two options shall depend on whether the message focuses on profit or loss. There are numerous studies that support that affirmation.

Edwards, Elwyn, Covey, Mathews & Pill (2001) conducted research in the field of health and noted that patient response was different according to how the doctor presented the alternatives. Although it is the same to say an operation has a 90% success rate as there is a 10% chance of dying, as a general rule, patients preferred the positive approach.

Elizabeth Loftus & John Palmer (1974) observed different responses regarding vehicle speed after displaying some images and making a minor change (one word) in the way the question was asked: “About how fast were the cars going when they contacted each other?”, “About how fast were the cars going when they hit each other?”, “About how fast were the cars going when they smashed into each other?”. The differences fell within a range of twenty km/h.

¹ Maintains that comprehension of a message is the result of how it has been explained; a theory, initially studied and developed in the media and political discourse.

Other research carried out by Robert Cialdini (Cialdini, Vincent, Leeis, Catalán, Wheeler & Darby, 1975) approached the same situation in two different ways. They first asked subjects to perform as chaperones for a group of juvenile delinquents on a trip to the zoo and obtained a 17% affirmative response. They then asked another group whether they would be willing to spend two hours a week as volunteer counsellors at a juvenile detention centre for the following two years, obtaining an almost unanimous rejection response. They then asked that same group the same question as they had asked the first group (to chaperone a group of juvenile delinquents from a detention centre on a trip to the zoo) and obtained 50% compliant responses.

The framing questions the use of reasoning in a choice, as it invalidates the variance and independence of irrelevant alternatives. People are sensitive to the way in which a problem is presented. Thus, the decisions are the result of the conclusions reached after processing the information.

Based on the information available, the subject obtains conclusions that allow him to make decisions. When the information is relevant and exact, valid conclusions may be reached.

When one may not be sure of the information, either due to its veracity or insufficiency, and one cannot anticipate the consequences of the alternatives, Holyoak & Nisbett (1988) suggest that processes of inference must be applied.

Kahneman & Tversky (1972) describe the existence of shortcuts that are used when it is necessary to evaluate complex situations. They proved the use of patterns of conduct that are far from judgement and a rational choice process under certain conditions. They attributed such deviations to heuristics and biases that lead to systemic errors.

Gerd Gigerenzer (2008) maintains that heuristics is an adaptation mechanism that does not follow the rules of logic, of probability or rational thought. These are shortcuts to predict and make decisions in uncertain situations. It is a procedure that provides the solution to a problem, but not in a justified manner.

Heuristics works with scarce relevant information. It is based on experience and on the available information. Empirical knowledge is stored in the deep limbic system and is more available than rational thought.

Tversky & Kahneman² affirm that people do not perform complex analyses, nor exhaustive probabilistic reasoning in all the decisions they make. On many occasions, they follow a path that allows them to simplify the process.

Miles & Sadler-Smith (2014) worked with personnel recruitment managers and observed that in situations with lack of specific information or contradiction in the tests, they considered it positive, fair and valid to evaluate the “overall impression” of the candidate.

Beilock, Bertenthak, McCoy & Carr (2004) conducted an investigation of golf players to question or validate the appropriateness of their reflection process in decision making. They distinguished two groups: expert players and beginners. They were asked to strike the ball under two scenarios. First, they were asked to be aware of each and every one of their movements; in the other, they were asked to hit it without thinking. The results were that the beginners hit better in the first case; in the second case, the experts drove best. Unconscious skills may be harmed by excessive thought.

Nalini Ambady (1993) analysed how long a student needs to decide whether a professor is good or not. To do so, he showed a group of students a ten second mute video of a professor and asked them to evaluate him. He then asked another group who had had the same professor for a full year to evaluate him. The valuations were quite similar.

To explain the use of heuristics, Gigerenzer (2007) asked a group of students in the United States which city had the larger population, Detroit or Milwaukee and 60% of the students gave the correct answer that it was Detroit. The fact is that at that time, the difference between both cities was not very significant, which was what led some students to be mistaken. However, the relevant part of the research is that he posed the same question to a group of German students, with a significantly higher correct answer rate. The Germans, who had never heard of Milwaukee, or who had few references, did not have the same doubts the American students did.

The explanation Gigerenzer provided is that the Germans with less knowledge of American geography acted by the rule that if something is well known it is more important. If the name of one city is known and the other is not, one must infer that the well-known city has the larger population.

² Daniel Kahneman, a professional psychologist, was awarded the Nobel Prize in Economic Sciences in 2002 for linking psychological research to the science of Economics, especially in everything related to decisions in uncertain environments. He developed Prospect Theory jointly with Amos Tversky.

All this made Kahneman affirm that a certain degree of ignorance may be positive. Trusting in that which is known may be highly useful on numerous occasions.

Research into heuristics does not yet explain how that skill is acquired, nor under what conditions the mechanism must be used to be effective. Hunt and Agnoli (1991) suggest that heuristics is used by children under 8 or 9 old, and Jacobs and Potenza (1991) describe heuristic conduct in children of six years.

Rationality and logic take second place and people use intuition because one prioritises the most accessible feature or characteristic of the matter (first impression effect); because emotion appears and attention is diverted toward the most remarkable (positive or negative) feature; because the choice has already been made (even without having performed any kind of reflection or analysis).

Gigerenzer (2008) affirms that having little information is better as long as there is a positive degree of ignorance; cognitive limitations are observed; there is excessive information; a major number of alternatives are being handled.

Gigerenzer considers that intuitions based on a single argument are usually right when one has to predict a future that is difficult to foresee, when little time is available, or when one has limited information available. On the contrary, logical analysis is required to speak of the past, to discuss a highly foreseeable future, when there is a large amount of relevant information.

The researcher proposes that the mind acts according to some general rules and a set of personal skills, and it takes advantage of the unconscious to simplify. Fact and theory do not always coincide, so what is important is not to determine whether or not one may trust intuition, but rather to ascertain when one may do so and when it is not convenient. The intelligence of the unconscious involves ascertaining what may work better at each specific moment.

Organisations in present day society (such as schools) encourage accumulation of knowledge and people may be overloaded by so much information. Short term memory is limited. More information and more cognition is not always the best and, on occasions (on many occasions) less may be more.

3. Methodology

Our objective was to determine elements or factors that have an effect on the intuitive process that is specified in the following hypotheses:

The main one is whether a specific training provides the skills to make the best decisions. The secondary one is whether sex, one's own perception of personal intuition and the fact of participating in social activities are factors that influence intuitive skill.

The participants were two age groups between 20 and 25 years, one formed by marketing students at the ESIC, and the other formed by two subgroups: students of other degree subjects and professionals.

The first is comprised exclusively of students from official and private degree courses in Marketing, Advertising and Public Relations on the ESIC campus in Barcelona, Madrid and Valencia. Three classes were selected from each campus, following the criteria of accessibility and the participants were chosen by attendance.

The control group was formed by youths resident in Barcelona, with two differentiated profiles. On one hand, there were students (degree or diploma cycles) and, on the other hand, workers (employed or unemployed).

The students were grouped by specialism. Four groups of students were defined: corporate graduates, scientific or technical graduates, humanistic or literary graduates and training cycles.

The workers were asked for their main occupation to be their employment (or job seeking) although they might be studying or have completed a degree.

The following table summarises the participants:

Group	Amount
ESIC Students	202
Others Students	125
Workers	77 (32 ¹ +45 ²)
Total sample	404

¹ With marketing studies

² Without marketing studies

By sex, there were 205 women and 199 men.

The average of the participants was 22.25 years. By groups, the average ages were:

Group	Age
ESIC Barcelona (Students)	22,60
ESIC Madrid (Students)	21,43
ESIC Valencia (Students)	21,48
Business (Students)	22,37
Technical (Students)	21,96
Arts (Students)	22,04
Professional Training (Students)	21,56
Sales (Workers)	23,87
Administration (Workers)	23,47
Productions (Workers)	23,95
Average	22,25

Average Ages by groups

The sample was of non probabilistic and intentional (Lohr, 2000). Participation was voluntary and with informed consent. The research design considered that a questionnaire was the most appropriate instrument for qualitative assessment of a sample of 404 people.

Double option (yes/no) closed questions and valuation questions (from 1 to 5) were used to increase the effectiveness of the questionnaire.

The content and drafting of the questionnaire was validated according to the triangulation procedure and 90% matching the text drafted by experts in the field of research, by professors with experience in Marketing, by psychologists and professionals from the entrepreneurial field.

In order to decide which products would be included in the questionnaire, what was considered a successful product was defined in a first phase to then proceed to prepare the product list.

We based the product definition on the *Radar de la Innovación*³ that defines all products that provide a new feature to the category as an innovation and considers the innovation to be successful when it exceeds the penetration and average repetition index in the category.

In a second phase, an exhaustive list of products launched on the market in recent years was drawn up, based on criteria from the *Radar de la Innovación*. The list was then submitted to focus group discussion and brainstorming by a group of experts, who selected a sample of products that were classified as a success or failure.

Lastly, a trial was carried out on a pilot group of 15 people representing the group to be studied (ten students from the ESIC and five unrelated youths, all chosen at random) in order to determine whether they had prior knowledge of the products and whether the results provided significant data. Three non-existent products taken from ESIC master student graduation projects were included as a control element.

The result of the trial was positive and validated the idealness of the products chosen.

A questionnaire was prepared with four kinds of questions:

A first block, formed by questions to identify the demographic profile of the participant: age, sex, place of birth ...

A second section intended to identify the leisure and cultural activities the respondent practices or has practiced: association, musical group, day-tripper...

A third group of questions matches the main objective of the research and aims to determine the number of correct answers the participants have obtained with regard to ascertaining whether the products mentioned have been a success or failure. An appraisal was requested for a total of nine products.

³ First continuous *tracking* of innovation in launching major consumer goods. It analyses more than 1,000 SKUs launched on the market each year and identifies the successful innovations. A SKU (*Stock-keeping unit*) is an identifier to recognise the products or services offered on the market. The SKU is the reference number linked to a product, brand, service ... During 2014, 108 major consumer goods were launched on the market and, according to the data from *Radar de la Innovación*, less than 20% were a success.

 <p>Happyjama</p>	 <p>Agua Onura</p>	 <p>Yogur</p>
 <p>McSpaghetti</p>	 <p>Kitchen Entrées</p>	 <p>Bragas BIC</p>
 <p>Fresa Plátano</p>	 <p>Donuts Fresquito</p>	 <p>Maxiroll</p>

The last block included questions with the most significant variables that affect intuition in order to establish the intuitive profile prospectively. These evaluate creativity, attitude to risk, the methodology, reasoning, resistance to change, improvisation, ... A scale has been established with five options from “*definitely not true of myself*” (1 point) to “*definitely true of myself*” (5 points), according to a scale established by Pacini & Epstein (1998) that contained options such as “*I believe in trusting my hunches*” or “*When it comes to trusting people, I can usually rely on my gut feelings*”.

Three types of different profiles have been established with cut-off points calculated by the *k-means*⁴ algorithm:

- High (From 32 to 45 points): People who fully trust their intuition in decision making.
- Medium (From 25 to 31 points): People who, even when trusting their intuition, require other additional factors for decision making.

⁴ Classification algorithm that maximises the differences between cases of the three clusters created.

- Low (From 9 to 24 points): Thoughtful people who find it difficult to make decisions unless they have all kinds of information as the basis for such.

The fieldwork was carried out during September and October 2015. The questionnaire was mainly administered in Business schools, universities or on company training courses.

The questionnaire was administered in a group to all the students at the ESIC and students at other schools, and meetings were called for the other groups. The relevant information was provided on the object of the research and they were told they could decide not to answer without the need to justify their decision. They were informed that it was anonymous, exclusively for research use, and their consent was requested.

The research consisted of asking the participants about the probability of success or failure of some products launched on the national market. They were informed that the products might be real or fictitious, to minimise the conditioning, although finally all the products chosen were real.

The following were used to analyse the results: a) The Mann-Whitney U test for comparisons between ordinal or quantitative variables between groups by two level factors; b) the Kruskal-Wallis test for comparisons between groups by factors with more than two levels.

These two nonparametric tests have been opted for because, in general, some of the variables do not allow normal distribution (e.g.: the number of correct answers is a discrete number between 4 and 9; the normal model takes continuous values without specific lower or upper thresholds).

One may check that the Kolmogorov-Smirnov and Shapiro-Wilk tests reject the null hypothesis that the normal model is acceptable ($p < 0.001$ for correct answers, $p < 0.007$ for time and $p < 0.001$ for the intuitive profile in the two tests):

TEST OF NORMALITY						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Correct Answers	,180	404	,000	,925	404	,000
Time	,070	404	,000	,990	404	,007
Profile	,075	404	,000	,985	404	,000

Lilliefors Significance Correction

A linear multiple regression model has been adjusted for the response time. It has been validated that the residuals in the model admit normal distribution (Kolmogorov-Smirnov with p-value = 0.186, Shapiro-Wilk with p-value = 0.849), in this case there is no need to avoid parametric procedures.

Bivariate correlations between quantitative variables have also been used. The Pearson correlation is reported, as it is the most usual, due to the fact of not detecting linearity assumptions violated, and because it has been checked that the conclusions do not vary if nonparametric correlations are used (Kendall's tau-b, or Spearman's correlation coefficient).

The sample size ($n = 404$) and the fact that the quantitative variables are sufficiently symmetric, assure (due to the well-known Central Limit Theorem) that the conclusions would be similar, even if one had opted for parametric variables in all the cases.

Software: The statistical analysis of the data was performed using the SPSS v. 22 suite.

Demographic studied: Youths from 20 to 25 years.

Sub-set of ESIC students: 540 students.

Demographic size of other groups in the same age range in Barcelona: 95,000 youths.

Global sample: 404 youths.

Segmented sample: 202 ESIC students + 202 youths among students from other degree courses or training cycles and workers (employed or unemployed) from Barcelona.

Margin of error: For a confidence level of 95.5%, the margin of error for the global sample is $\pm 4.87\%$. In the different segments, the margin of error is $\pm 5.46\%$ for the sub-set of ESIC students and $\pm 6.89\%$ for the sub-set of other groups in the same age range.

Neutrality of the sampling conditions: $p=q=0.5$.

Geographic area: The cities of Barcelona, Madrid and Valencia.

Technical File

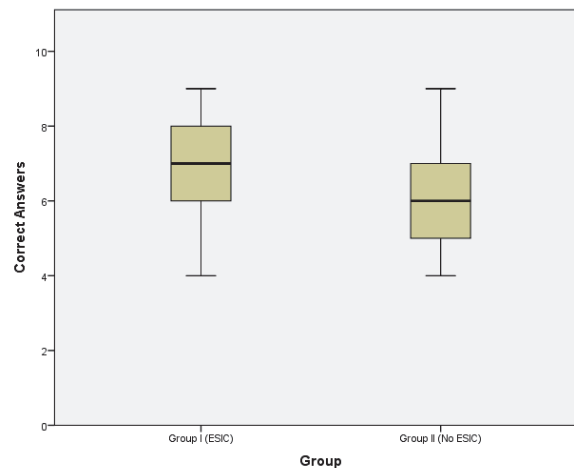
4. Analysis and results

Table 1 records the average number of correct answers in the sample, distinguishing the three groups analysed: ESIC students, students in other degree courses or cycles and workers.

Correct	Average	Standard deviation	Minimum	Percentile 25	Median	Percentile 75	Maximum	Number of cases
ESIC	6.86	1.10	4	6	7	8	9	202
Students	6.21	1.19	4	5	6	7	8	125
Workers	6.42	1.25	4	6	6	7	9	77

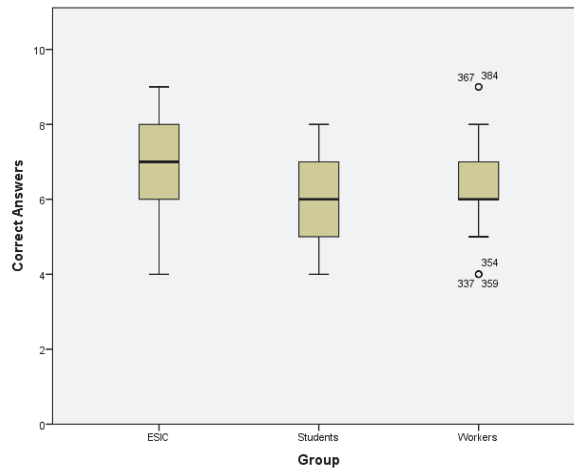
Table 1

A first analysis of these results leads one to think that indeed specific training in Marketing provides cognitive resources that provide a person the skills to obtain better results. This thus confirms the hypothesis that marketing students may have more correct intuitions in related to their scope of study. The distribution of the number of correct answers between the ESIC group and the non-ESIC group is different, as is shown in graph 1 and the relevant statistical analysis ($p < 0.001$. Mann-Whitney test).



Graph 1

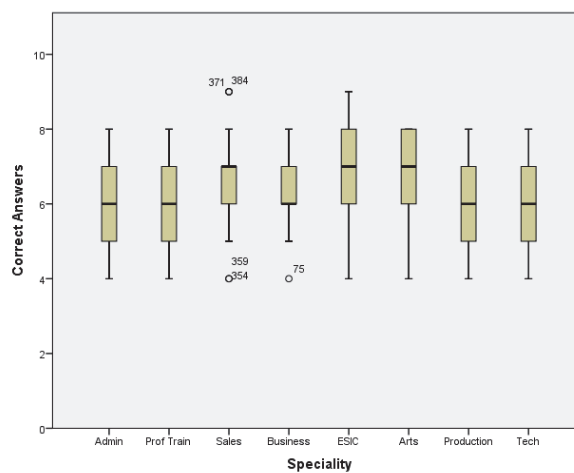
A detailed analysis of the three groups shows that the differences are statistically significant ($p < 0.001$, Kruskal-Wallis test). The differences lie between ESIC and students (adjusted p -value < 0.001) and between ESIC and workers ($p = 0.022$). No differences are observed between students (not from the ESIC) and Workers; $p = 0.743$ (graph 2).



Graph 2

The diversity of the academic and labour situations of the members of these groups requires a more detailed analysis.

Graph 3 shows that students of Economics and humanistics degree courses and workers in the sales field have a greater tendency to obtain correct results than those from more technical studies and those from the administrative and operations fields.



Graph 3

The groups that have a level of correct answers above the average are from ESIC, with an index of 6.9 (the average is 6.57), workers in the sales field and students of literary subjects.

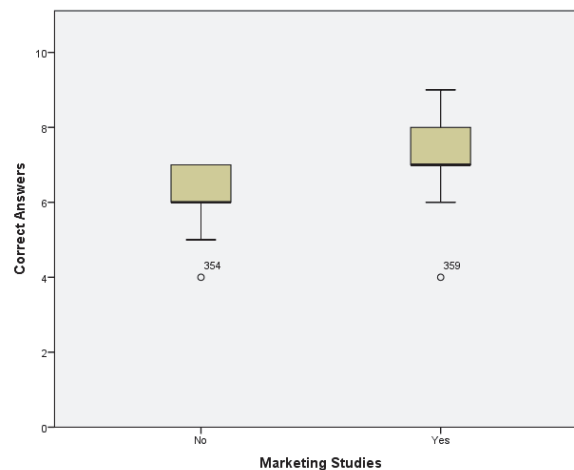
With regard to ESIC students, it is confirmed that specific training enables them to make more correct intuitive decisions (related to the scope of the studies).

With regard to workers from the sales field, there are two reasons that may explain the high level of correct answers. On one hand, the average age is higher (23.9 years against the global average which is 22.2 years) and on the other 65% of the members of the group have Marketing-related studies.

The explanation regarding students of humanistic or literary subjects who have obtained a high level of correct answers may lie in the capacity to interpret conduct and analyse nonstandard situations.

On the contrary, groups that have obtained a lower level of correct answers are the students from technical or scientific courses (this may be explained because they are used to applying mechanical methodologies) and the students in vocational training cycles (5.9 right) even though this case one must specify that if only company related specialities are taken into account (marketing and international commerce), the average number of correct answers is higher (7.1).

It is significant to discriminate the results by the workers in the sales department according to whether or not they have studies directly related to Marketing. Graph 4 shows these results and one notes that the sales force who have such studies are those with a greater number of correct answers (7.2 on average) more than the target public of the research (6.57 ESIC students).



Graph 4

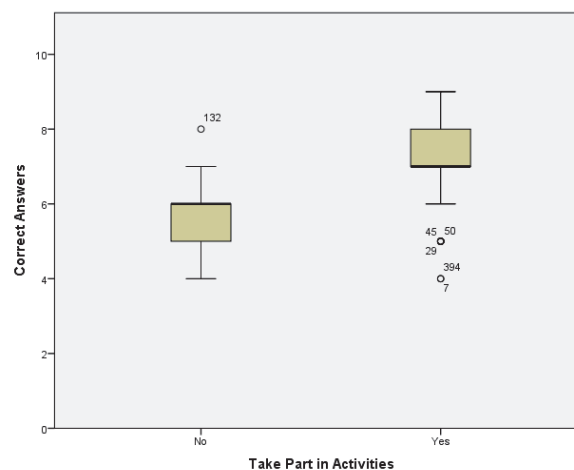
This datum is significantly sufficiently significant to reinforce the hypothesis of the study, and it also coincides with the information gathered from review of the literature. Experience is a determining factor in decision making in uncertain situations. The fact of having specific training is complemented by having professional experience in the sales and/or marketing environment.

The professional experience provided by the years employed in performing professional tasks or activity, even though one may acquire experience in transversal personal skills for any task. In that sense, participating in certain social activities undoubtedly provides baggage and resources to face situations of conflict in which decisions must be made.

It is due to this that we wished to observe the relation between the level of correct answers (and thus intuition) and participation in social activities. Table 2 and graph 5 show that relation.

Correct	Average	Standard deviation	Minimum	Percentile 25	Median	Percentile 75	Maximum	Number of cases
No Activities	5,68	0,88	4	5	6	6	8	176
Activities	7,26	0,91	4	7	7	8	9	228

Table 2



Graph 5

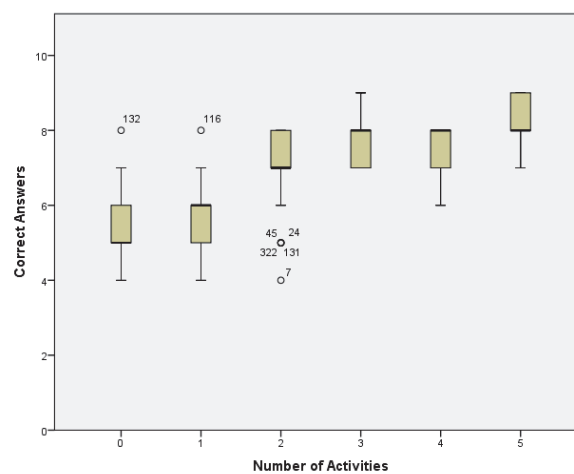
The activities considered and frequency of replies is shown in table 3.

Activity	Frequency	Percentage
Team sports	323	79.95%
Music group	120	29.70%
Voluntary work	100	24.75%
Excursion group	92	22.77%
NGO	36	8.91%
Association	35	8.66%
Political Party	8	1.98%
None	42	10.40%

Table 3

The fact of participating in cultural, sports or leisure activities is positively related and one may even say that it has an explicit influence on non-academic intelligence and thus develop personal and social skills. Comparing the quantity of activities performed with the average of right answers, one observes a trend in the sense that the more activities are performed, the greater the percentage of right answers.

In that sense, as may be seen in graph 6, people who have affirmed that they perform (or in recent years have performed) five of the activities considered, obtained the highest number of write answers (8.1), exceeding the global average. Thus, this group, comprised of members of other groups, is that which achieves the best result.

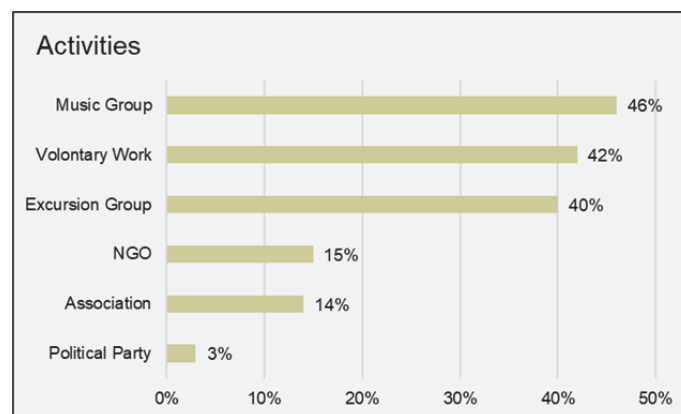


Graph 6

At the other extreme, there are those who say they have not performed, or do not perform any activity. That result (5.5) is the lowest of all, and it is under the group who obtained the worst results (5.8) that was that of students from technical or scientific degree courses.

Nearly perfect attendance has been shown in the other groups, so one affirms that the more social activities, the greater number of correct answers are obtained in decision making, at least with regard to the subject of this research.

The people who achieved nine correct answers (or 7 or 8) all performed or had performed five of the seven activities considered. Graph 7 shows the activities performed by all the persons who obtained correct answers equal to or exceeding seven. In this graph, one may see there are some activities that prevail over others.



In that sense, it is necessary to state that “team sport” has been excluded from activity, as it had a majority response (nearly 90%) and that provides it scarce interest and significance. The reason for that majority response is that they performed some sport at school and in that case the activity, not being a personal option, loses significance in the results.

Among the rest of the activities, there are three that exceed 40%, such as “musical group” (choir, group, band ...), “volunteering” and “day-trip group”. There is a response of about 15% by those who say they have belonged to or collaborated with an “NGO” or an “association” (neighbours, to defend animals, against evictions ...); and only 3% say they have belonged to a “political party”.

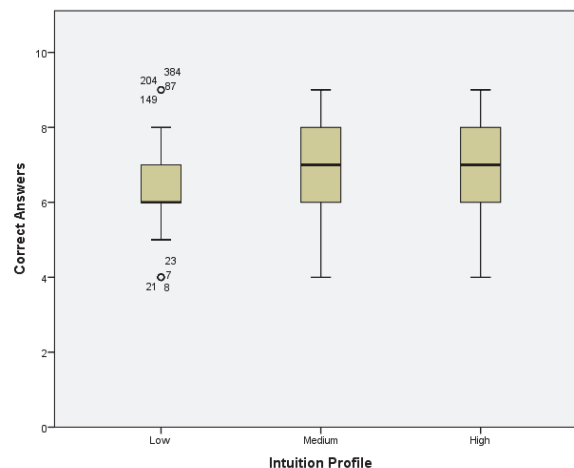
One may consider that the fact of participating in social activities, of whatever type they may be, determines the type of social and promise skills. In any case, one may affirm that the people in that sample who have performed the most activities have obtained more

right answers in their response to the questionnaire. Statistically significant differences in number of right answers have been detected between performing activities or not ($p < 0.001$) in favour of those who perform activities.

Highly related to these personal and social activities performed by the person, there is their own perception of themselves and their level of secureness and confidence in their own capacity.

In that sense the level of confidence and self-esteem was linked to the number of right answers, as it was considered that the way to face a situation and thus the decision making process may vary according to the person's psychological characteristics.

In graph 8, the participant's intuitive profile is linked to the average number of correct answers. The correlation between both terms is 0.121. The higher the intuitive profile, the greater number of correct answers. It is a statistically significant correlation (different from 0 and positive; $p=0.015$).



Graph 8

The trend is clear in that sense: the more intuitive the person is described as, the greater the number of correct answers.

This coincides with the information noted in the bibliographic review, that the fact of trusting in one's own skills and managing emotions has a highly positive contribution to gaining in predictive efficiency. The skills considered in the questionnaire are closely related to cognitive and behavioural skills present in decision making.

5. Discussion and conclusions

The results obtained allow us to affirm that the working hypothesis is valid. Effectively, it is noted that marketing degree students may make better decisions related to their speciality than other youths.

Notwithstanding this, the best results were provided by the group of workers from the sales force with studies in the company speciality. That fact does not invalidate the results, but rather quite the contrary. As reflected in the bibliographic review, experience is absolutely necessary for intuition to act efficiently. If that specific experience has specific training added, the best combination is generated.

It has been noted that the fact of performing (or having performed) some kind of social activity, contributes to improving correct decision making. This is not due so much to the unique nature of the situation the decision concerns, but rather the actual decision making process. It is not a matter of whether or not one has knowledge or experience of the matter concerned, but rather the acquired skills that favour correct decision making. And these skills influence the cognitive processes that are activated by intuition. The fact of belonging to a cultural, sports or leisure group ... develops a kind of skills that are closely linked to intuition.

It has also been noted that having a favourable perception of oneself regarding the intuitive skill improves the results. There are numerous studies in the world of medicine, sports and the corporate world that back the importance of focussing one's thought adequately to achieve the objective. Self-confidence, security as to the records or accepting the actual result (whether positive or negative) are factors that boost success.

In this investigation, it is noted that persons who are described with inherent intuition characteristics obtained a greater number of correct answers. Moreover, they also answered quicker and spent less time on reflecting regarding the answer.

The validation of these hypotheses leads one to think that if the training enables one to decide correctly in an intuitive manner, the aim is to motivate students to use and let themselves be guided by their intuitions. The work lies in helping them to distinguish the situations when they may trust their intuition, and those when a logical, rational, conscious process must be followed.

Schools must continue to include methodologies and objectives to develop overall intelligence and not concentrate exclusively on academic intelligence (logical-mathematical skill and verbal skill) that are the ones that have been taken as a reference to measure personal intelligence.

It is fully accepted that intelligence is plural and that it is comprised of different elements, so one must speak of multiple intelligences. Intelligence is a skill that may be developed independent of genetic or cultural factors. Knowing how to recognise and manage ones' own emotions is a necessary skill to avoid biases in decision making.

Thus, the problem does not lie in deciding whether one must develop students' intuition or not. The answer is undoubtedly affirmative. One must. The difficulty lies in how to do so and in how to include this in the training curriculum.

In that sense, one must complement traditional teaching based on study, memorisation and repetition with develop of other complementary ones that stimulate both parts of the brain, both reasoning systems.

One must explore the issue and whether it is considered appropriate to include new trends in training methodologies: *Gamification, Power Pupils, Happy & Healthy, Lean Entrepreneurship, Techno-Craft, Crowd Power...*

Social activities are predicating factors of more correct decisions, so they must be considered and included in education. The aim is not to debate who is responsible (parents or educational centres) or whether or not these must be evaluated and form part of the curriculum. These must be encouraged, and the students should be motivated to participate and become involved in any kind of activity that obliges them to engage with each other and to develop the greatest number of personal skills.

And due to one's own perception of oneself influencing the results, it is necessary to generate favourable conditions that contribute to increase safety and confidence in oneself. Concepts that are closely linked to emotional intelligence affect intuition. One must effectively extend its application throughout students' training, providing them resources to manage their emotions more positively (frustration resistance, for example).

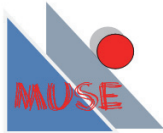
Due to the fact that the validity and idealness of use of intuition under certain circumstances, has been proven, lines of research are proposed based on certain challenges for which a satisfactory response has not yet been provided.

- Unifying and validating the concept of intuition based on academic rigor, clearly establishing the difference between that concept and others such as fate, premonitions, ...
- Preparing an instrument to measure intuition that may be validated and used in a scientific and academic environment.
- Provide a theory (methodology, pedagogical resources, teaching guide ...) that really develops intuition in practical terms.

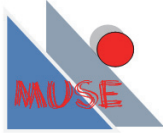
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