SUCCESS OR FAILURE AS PARTICULARITIES OF ACADEMIC LEARNING IN INITIAL TRAINING EDUCATION

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Abstract

One of the most researched areas in education is that of the control linked to learning, as well as to motivation for development through education [11] and to perceived stress [16], among other variables. Our study focuses on the relation between these allocations, internal or external, in connection to learning particularities (the learning styles based on Felder and Silverman's revised and improved model, 1987 [7]) and the results obtained in the first year of undergraduate studies during Initial Training Education (ITE). For the purpose of this research, we used questionnaires on control's place in students' academic life and on their learning styles, and the results of specific exam tasks. Previous similar research was done by Barzegar, Majid [3], Ramazan Hamdi, Farzad Pourheidari and Nematulla Moradi [10], Figen Akça [1] or Scherpbier, van der Vleuten, Rethans and van der Steeg [17]. The results of our research lead to the identification of a clear pattern of differences between learning processes with internal and external allocations, although these seem to be minimal. Additional information resulted from the study, which related the success in completing exam tasks to the task type. We believe that a longitudinal and more complex study on educational tasks could bring more insights on this matter.

Keywords: success, academic learning, locus of control, learning styles.

1 LOCUS OF CONTROL, THE MEDIATING VARIABLE IN EDUCATION

1.1 Locus of control from Rotter to success or failure

The concept was introduced by Rotter in 1966, being defined as a stable system of beliefs that divides people into two categories, people with an internal locus of control (who believe that their behaviour determines outcomes in their lives) and people with an external locus of control (who believe that luck or chance are playing a main role in shaping their destiny). Rotter considered that all these beliefs constitute a fairly stable psychological construct. The locus of control is linked to certain organisational aspects. For example, more convinced one is of the internal locus of control, stronger the tendency to perceive the direct connection between effort and performance or between performance and rewards. In other words, these kind of expectancies can play a key role in professional motivation so that a different locus of control can lead to differences in motivation and performance.

Locus of control [5] is conceptualized on a dynamic bipolar continuum spanning from internal to external. Internal locus of control is characterized by the belief that consequences are a result of one's own behaviour. In other words, individuals who believe that their successes or failures result from their own behaviours possess an internal locus of control. Demellow and Imms in 1999 and before Peterson et al. and Rothbaum et al. [10] concluded that individuals with an internal locus of control typically engage in proactive and adaptive behaviours. On the other hand, external locus of control is characterized by the belief that consequences are a result of fate, luck, or powerful others. In other words, individuals who attribute their successes or failures to something incongruent with their own behaviours possess an external locus of control. Thus, individuals with an external locus of control might not take responsibility for their own actions or behaviours. Subsequently, individuals with an external locus of control tend to be reactive and avoid distressing situations (Gomez, 1997, 1998 [16]). Rotter argued that even though locus of control was conceptualized on a dynamic continuum, it is a fairly stable psychological construct. He contended that individuals with an internal locus of control would continue to engage in activities that would reinforce the expectancy that their behaviours affected subsequent consequences. Meanwhile, individuals with an external locus of control would engage in maladaptive behavioural patterns that became self-fulfilling in that they would not perceive connections between their actions and the ensuing consequences. Essentially, individuals' locus of control would impact how they perceived and interacted within their surroundings. Hence, when
individuals were introduced to novel experiences, they would be expected to react in a consistent manner reflective of their locus of control orientation and level of cognitive processing. Further, there is evidence that locus of control is related to cognitive development. Several studies in 1982, 1984 and 1998, conducted by Weisz & Stipek, Shute et al., Skinner et al. [19], have reported that locus of control orientation during childhood tends to be more external than locus of control orientation during adolescence and adulthood.

Additionally, internal locus of control have been found to be related to abstract cognitive reasoning while external locus of control is related to concrete cognitive reasoning [11]. Several studies have investigated effectiveness of culture on locus of control. Western studies of locus of control describe the value of an internal locus of control. In fact, Americans tend to have high internal locus of control scores compared to other cultures: for instance, Americans compared to Chinese and Japanese [11]. While the U.S. tend to place high value on internal locus of control, Asian and other collective cultures tend to value an external locus of control. For example, in Japan an external locus of control is valued and the Japanese accommodate to other people's needs and thus relinquish the sense of personal control. The Japanese tolerate others trying to influence them [11].

1.2 The locus of control in academic learning

There seems to exist a fairly clear relation between locus of control and learning outcomes. Kutanis [3] showed that students with a high level of internal locus of control are more active, more involved and more efficient in their learning. At the same time students with an external locus of control were, by contrast, more passive and less oriented towards good and very good results.

Another study [2] indicated a strong relationship between personality characteristics and academic results. “Further, it was found that for the majority of the interactions with locus of control, first-generation status acted as a sensitizing factor that amplified both the positive and negative effects of locus of control. In contrast, for self-esteem, first generation status acted as a risk factor that only exacerbated the negative effects of low self-esteem. These results are interpreted as reflecting motivational differences between first- and continuing-generation students and are discussed with respect to the social/cultural capital hypothesis that is most frequently presented in the existing literature.”

In addition, Jooa et.al [19] investigate the prediction factors for learning satisfaction, the results and the perseverance in finalizing studies for online undergraduate programmes in South Korea.

As discussed in a previous study [6], there is a strong connection between locus of control as a psychological personality trait and the way individuals regard professional satisfaction and occupational stress level. Perception of work outcomes seems to be determined by the internal or external value: teachers at preschool and primary school levels with an external locus of control seem to have a lower stress level and a moderate satisfaction level, while those ones with an internal system of beliefs tend to show higher stress levels, to get more satisfaction from their teaching work, to have a more clearly defined system of values, to be more coherent and oriented towards results [5].

2 LEARNING FROM PROCESS TO INFORMATION PROCESSING

2.1 Learning styles – theoretical models

In a recent study [9], understanding learning styles proves to be an essential tool for the implementation of new learning procedures. A learning style is not just an ability but rather a preferred way of using one’s abilities; it is stated that the type of input is the key to understanding why some learners learn faster than others do. The findings indicated that there was a positive correlation between aural learning style and metacognitive strategy’s use, as well as aural learning style and affective strategy’s use.

As discussed in previous studies [7], the learning style is a consistent variable in the study of the characteristics of development and academic learning. Similar studies by Andreou [8] showed that learning styles reflect habitual behaviours, which determine distinct preferences within learning situations. Evidence suggests that critical thinking could evolve through learning processes. Variances in critical thinking achievement by nursing students might therefore be influenced by individual learning preferences. The concepts “learning styles” and “critical thinking” have been independently examined in the nursing literature. No reviews were found however exploring their association in
Other studies, such as the one conducted by Beasley et al. [4], revealed that online teachers defined differentiation from two distinct perspectives: a) why a student needs differentiation, and b) what a student needs differentiated. Online teachers stated learning styles as their primary reason for differentiation. This result was not only different from findings in face-to-face classrooms, but does not support research on what impacts student achievement. Online teachers also cited when they differentiate, they adjust content, product, and process (63% coverage). Finally, noticeably absent from the data were references to using assessments in the classroom to inform differentiation. Future research should consider how online teachers differentiate in their learning environments and how they make day-to-day decisions as they adjust instruction to meet the needs of their learners.

Özgen et al. [14] determined that students' attitudes toward problem solving differ significantly according to their gender, learning style and grade level. Similar studies conducted by Moraru and Stoica [12] showed that the student acquires information, interacts with the colleagues and the teachers, participates actively in solving various learning tasks, if there are used two or all learning styles. The teacher, as an educational advisor, has an important role in identifying educational experiences to optimize students' learning opportunities.

3 DEFINING SUCCESS AND FAILURE IN ACADEMIC LEARNING

While ‘failing’ or ‘failure’ is part of everyday experience in universities, it hardly seems to matter in the education literature. There have been few attempts to understand ‘failing’ as an ever-present phenomenon in higher education [15].

This seems to be a rather common debate topic, as we can read in papers focused on the multiple transitions that young people must negotiate nowadays: “at the same time, a parallel area of research and theorising has drawn attention to the multiple transitions that, it is said, young people increasingly must negotiate. The argument is that the majority of young people, more than at any other time in modernity, now feel compelled to balance commitments to employment, higher education, and other personal and relationship matters. At times, the stresses and strains of coping with multiple transitions and their crosscurrents impact adversely upon students, resulting in academic failure”. [18]

The student's profile today is not a unitary one. Specific previous training contexts are able to have great influence on student status, scale of values and even personality:

- some of them already have university experience, bachelor degree;
- others are older than colleagues coming directly from high school banks, thus gaining little social status;
- not a few are working and they participate to formal academic learning in alternation with non-formal ones, according to a program that they are able to negotiate or not;
- widespread and rapid access to modern information sources;
- differentiated free time as a quantitative value and index of social exercising, regarded either as pressure or as an opportunity;
- extensive communication experience based on the direct use of 2-3 foreign languages in documentary, rapid access to intercultural values, or the application of some complex and powerful operating packages; - word processing, interfaces with multiple graphics use;
- increasing value not only by IQ, but also of EQ, consisting of empathic capabilities, emotional control and self-control, communication, etc. ;
- social experimental and methodological attitude;
- general culture fragility, resistance to high theoretical models, presence of risk behaviours, insecurities, reactivity unpredictable to frustration and stress, values uncertainty (Neaşcu, 2006).

Allocating students to certain categories according to learning styles and self-management skills in academic learning is open and correlates with other approaches. A methodological example can be the Inventory for student guiding within undergraduate studies (Entwistle,1988, Romainville, 1993, Chessell, 1997 [13]).
According to these studies, the main categories are:

- focus on search, investigation and research of academic studies – characterised by depth, use of active strategies, associative models in terms of ideas and arguments, intrinsic motivation, larger freedom/ autonomy towards information sources, comprehensive learning approach, productive and reconstructive memory exercises;
- focus on accomplishment – defined by efficient strategies that involve researching outcomes, formative evaluation, intrinsically balanced motivation, dependence on learning sources, gradual understanding, frequent control of results contrasted by self-expectations;
- focus on reproductive behaviour – characterised by superficial learning, use of associative memory-based methods, less preoccupation for globalization, extrinsic motivation, fear of failure, major dependence on documented sources, rationalizing information structures, etc.;
- non-academic focus – characterised by unorganised behaviours, superficial attitude, with some negative values, favouring superficial learning, non-academic motivation, weak predictability, high risk, not likely to take up postgraduate courses [13].

4 METHODOLOGY

4.1 Hypothesis

1. There is a relation between locus of control and the dominant processing type in learning.
2. Students who successfully complete their tasks in the first year have an internalist profile dominated by a specific structure of the learning styles.

4.2 Participants

The sample of participants comprised 76 students in their first year of undergraduate studies in ITE programme, all females, aged in average 22. Six of the participants have less than a year teaching experience, three have more than 3 year-teaching experience in secondary education looking for a specialization in primary and preschool education, the rest having no teaching experience at all.

4.3 Instruments

Instruments were selected according to the variables in focus:

- locus of control was investigated by a WLC variant (Paul Spector) adapted to student activity;
- learning style was investigated through a questionnaire based on the theoretical models of Felder-Silverman and the structure of Kolb, McCarthy and Myers-Griggs’ models of learning style; the same questionnaire was successfully used in previous studies [7]; the variant used in the present study was a simplified version of 34 items grouped in 11 learning styles:
  - **Sensorial processing**
    Students who have a sensorial processing tend to prefer learning outcomes, those who learn intuitively tend to prefer discovering possibilities and relations. Sensorial students are likely to solve problems using clear methods and not to complain about challenges or surprises, to know the truth without using reasoning as innovation and anxious refusal. This type of students are more likely than their more intuitive peers not to be evaluated on the subjects not being explained clearly in class. The sensorial ones tend to be more patient with detailed work, memorize better and do practical lab work. They tend to be more practical in approach and more cautious than their intuitive peers. The first do not enjoy courses that are not relevant to the real world of teaching.
  - **intuitive processing**
    Intuitive individuals can seize better new concepts and are more comfortable with abstractions and mathematical language than the sensorial students. The first tend to work faster and be more innovative. They do not like repetitive (‘plug-and-chug’) courses which involve memorizing and routine work. Everybody feels intuitive sometimes. Preferences for an approach or the other can be strong, moderate or weak. In order to be efficient, one needs to be functioning between the extremes. If one focuses on intuition, he/she can elude
important details or make careless mistakes; if one focuses too much on investigation, he/she can rely too much on memorizing and common methods and lose focus on concentration and creative thinking.

- **the nature of audio processing**
  Those having an auditory learning style get more words – verbal and written. All learn more when the information is delivered in both visual and oral forms.

- **the nature of visual processing**
  Those who are visual in their learning tend to remember better what they see – images, diagrams, organigrams, chronology, films and demonstrations.

- **the nature of kinaesthetic processing**
  The kinaesthetic style is based on movement and performance, practical elements and activities.

- **inductive organisation**
  Inductive style is natural with humans. Babies do not possess from the very beginning a general set of principles, but rather they observe the environment and draw conclusions: “If I throw the bottle and I shout, somebody will show up eventually”. Most of the things that we learn on our own (by contrast with formal education in class) originate in a real situation or a problem that needed to be approached and solved, not in a general principle; deduction can be a part of the solving process, but is never the entire process.

- **deductive organisation**
  Deduction is complementary to induction. If induction involves intuition of principles, consequences are deduced through getting from general and abstract to practical elements necessary to solve concrete problems. On the other hand, deduction is common within technical subjects in secondary and higher education. Setting the regulating and working principles for possible applications, deduction is an efficient and elegant way to organise and understand a material that is already presented. A similar approach is frequently used in individual courses: first the principles are presented, then the applications... if any.

- **active processing**
  Active students tend to retain and understand better information when they actively work with it, discussing about it, applying it or explaining it to others. They tend to favour group work more than reflective learners, who prefer to work alone. Attending conferences without any involvement such as taking notes is more difficult especially for those who learn actively. "Let’s try and see how it works” is the phrase of those who actively learn.

- **reflective processing**
  Reflective students prefer to think quietly about what they learn. We are all reflective from time to time. Preferences can be strong, moderate or weak. A balance is preferable. If you are active, efficient, jumping into things can put you in difficulty and you couldn’t use reflection. "Let’s think this through first” is the answer of the reflective learner.

- **analytical/ sequential understanding**
  Those learning sequentially tend to understand in linear stages, each stage following logically the previous one. They tend to follow the stage logic in finding solutions. Sequential students can fail understanding information completely, but still can use it to do homework or pass tests, if the acquired elements were logically connected.

- **global/holistic understanding**
  Those learning globally can solve fast complex problems or find innovative solutions once they seized the whole image, but they might find it difficult to explain how they did it. Many reading this description may conclude wrongly that they are global, as many people notice what is wrong and can solve the problem. But the whole picture is not always what happened before you bring it under the light. Holistic learners lack sequential reflection and can be wrong about the details when they know too much about a subject, and can also have difficulties in associating different aspects of the same subject or of different ones.

- **The academic results were evaluated at the end of the term through:**
  - seminar tasks that included creating posters, focus groups for small field research;
written papers which involve memorizing, classification operations, comprehension, deduction, integration/conceptual connection (superior induction, reflexivity), arguments (deduction and reflexivity), understanding - explanation (complex induction and deduction).

5 RESULTS AND ANALYSIS

Analysis of collected data had two approaches. On the one hand, we took into consideration reporting data to the independent variable of locus of control, and on the other hand to learning styles.

For this purpose, we used results classification for locus of control (internal and external) and for learning styles separately on data distribution in 4 categories. The focus was on success profiles in evaluated tasks. Therefore, there were students with a very low internal locus of control (up to centile 25), low (centile 25-50), high (centile 50-75), very high (over centile 75), and similarly for learning styles.

Due to the specificity of the data, we applied statistical tests of mean difference (SPSS) for parametric data (scale data).

In order to investigate the first hypothesis (there is a relation between the profile of locus of control and the type of dominant processing in learning), we applied one-way ANOVA (for a significance degree of p <0.05) for the types of the evaluated items as well as for the learning styles. The results are summarised below:

<table>
<thead>
<tr>
<th>INTERNAL locus of control (p&lt;0.05)</th>
<th>EXTERNAL locus of control (p&lt;0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>intuitive processing</td>
<td>visual Input</td>
</tr>
<tr>
<td>kinaesthetic input</td>
<td>inductive organisation</td>
</tr>
<tr>
<td></td>
<td>sequential comprehension</td>
</tr>
<tr>
<td></td>
<td>global comprehension</td>
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</tbody>
</table>

What is worth noticing here is that, despite the fact that the number of learning styles which differ statistically significantly is higher with the externalists, the analysis did not show that there is any style specific to any of the two categories of students. This encourages us to consider the two kinds of locus of control as determining a specific use of learning styles.

Post-hoc analysis brings more light into the matter:

- The **internalist profile**
  - The level of the internal locus of control makes a difference for the high use of the intuitive processing style only for the internalists with a centile of 75;
  - The internalists whose values are between centiles 25 and 50 adopt more frequently the kinaesthetic style.

These two ideas lead us to the conclusion that high levels of internalism (over centile 75) seize faster new concepts and abstracts, having better results in mathematics and sciences; they also have a faster pace when managing input and are attracted by new innovating things which seem to change attitude patterns or thinking stereotypes. The internalists having low to weak values (between centiles 25 and 50) differentiate themselves through significantly higher usage of movement and action upon the learning material.

- The **externalist profile**
  - The level of the external locus of control makes a difference for a higher use of some specific styles.
  - Externalists with very high levels (over centile 75) use mainly a visual style through an inductive organisation of material and a sequential approach of it.
  - Externalists with high levels (centile 50-75) seem to be different of all others by using very poorly the global comprehension style.

These three ideas lead us to the following conclusions: there is a great need of those with high externalist levels to use special well defined means for learning success. These use induction as a
comprehension means which gets us to a partial ad-hoc approach to learning, and at the same time, to a naive and hedonistic view on temporary solutions to a problem. For these ones their personal experiences are assisting their understanding, which disables them in using abstract academic knowledge for subject related problem solving. They also use sequential processing in learning, which determines them to look for general methods applicable to many types of problems, without being forced to identify differences. It is important for them to have general guidelines and patterns with a broad applicability.

Externalists with medium and high values (between centiles 50 and 75) avoid deliberately global understanding processing. This strategy is highly connected to their attempt to reduce hazard factors, naturally associated with high values of externalism. It seems that they clearly prefer a sequential approach rather than a global one and thus they try to apply a more determined control of success in learning.

Results from the two profiles (internal and external) in relation with the post-hoc analysis made us complement with other tests in which we considered the relation between the level of internalism and externalism.

Taking into account that the post-hoc analysis emphasized that only positive marginal groups, characterised by centiles 50 to 75, were different, we tried to find out whether those with a high level (above centile 50) of both internal and external locus of control, by comparison with those with a low level of locus of control on at least one of the two dimensions (internal or external), have a specific learning style.

Therefore, we applied the t test for the difference between the means and we obtained the following styles for which t is statistically significant:

- **Internal and external locus of control** (p<0.05), (mean difference group 1-2)
  - sensorial processing, $t = 2.247$
  - auditory Input, $t = -3.099$
  - kinaesthetic Input, $t = 3.775$
  - inductive organization, $t = 2.208$
  - sequential comprehension, $t = 2.624$

As data suggest, those who have a locus of internal and external control over centile 50 use an input of audio processing which involves both written and oral explanations and determines high results by combining visual and verbal input.

Those characterised by reduced levels of internal and external locus of control use sensorial, kinaesthetic learning, inductive organisation and sequential comprehension. In other words, they are characterised by ad-hoc learning, without conceptualising, with simple algorithm and well operationalised working schemes, who need to interact directly with the material and prefer a more empirical approach in filtering and anchoring input for learning.

For the second hypothesis (students managing successfully complex evaluation tasks have an internalist profile dominated by a specific structure of the learning styles) we applied an ANOVA test (the same 4 groups – up to centile 25, between 25-50, 50-75 and over 75).

Results showed the following significant profiles (p<0.05) for internalists and externalists:

**Table 1. The academic results items that were evaluated determined by the locus of control**

<table>
<thead>
<tr>
<th>INTERNAL locus of control</th>
<th>EXTERNAL locus of control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster and portfolio</td>
<td>memory</td>
</tr>
<tr>
<td>Classification items</td>
<td>**********************</td>
</tr>
<tr>
<td>Small field research</td>
<td>**********************</td>
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<tr>
<td>Memory- comprehension</td>
<td>**********************</td>
</tr>
<tr>
<td>Argument</td>
<td>**********************</td>
</tr>
<tr>
<td>Comprehension – integration/ conceptual relation</td>
<td>Comprehension- relation</td>
</tr>
<tr>
<td>Comprehension - explanation</td>
<td>**********************</td>
</tr>
<tr>
<td>Final grade</td>
<td>**********************</td>
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</table>
6 CONCLUSIONS

The results can be interpreted in two ways. One meaning that can be attributed is the fact that our hypothesis were confirmed. Data was not easy to interpret as thought when considering related research. We have noticed that for the first hypothesis, the post-hoc analysis offered interesting insights as only value intervals of internalism and externalism lead towards certain learning style. Data showed clearly that although the externalist profile is better defined in terms of learning styles, they are oriented towards empirism, own experience, ad-hoc operationalization, lack of generalization abilities and abstract and conceptual use. On the other hand, the internalists are focused on doing and directly operating as they are dominated by the need for innovation and novelty in their learning.

Data confirming the second hypothesis showed that internalists manage more evaluative tasks than the externalists and that these types of tasks involve complex inductive and deductive processing of practical actions in which organization and in-depth understanding are essential and in which visual input combines with the auditory one.

A second meaning that data revealed is connected to further actions. On the one hand, data suggest that success in solving exam tasks is higher with internalists. On the other hand, the way they reach the same results is very different because of the way they process the information and their learning style. It can be noticed that medium and high value externalists adopt a combination of information processing that ensures results. This influence their expectations of the taught content, of the evaluation tasks and of their engagement with learning. It is recommended a multiple development of locus of control, linked to situations and contexts so that the individual can identify better the sources of control that they can apply and the means to achieve the results; encouragement and stimulation of individuals towards learning tasks with various evaluation techniques, at different information processing levels from simple review to comprehension, explanation, practical tasks and previous organisation.

A very interesting resulting data deserving a closer investigation is related to the obvious differences among those who obtain scores above the average (centile 50) both for internal and external locus of control, who show a profile of learning style and success in solving complex evaluation tasks different of all others.

REFERENCES


