

Motivation Intended to Inform Design Teaching Practice

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Abstract: Academic success is a difficult task that often involves struggles and mistakes, requiring effort and engagement on the part of students. As the literature is vast and complex, this work focuses on motivation with the intention of informing teaching practice. Design pedagogy is also affected by these aspects, which can influence student success, mastery and autonomy. Although the theme deserves attention, there are not many research reports on the impact of these factors in design teaching and learning. This work is a qualitative study based on subjective evaluation of specific aspects of motivation science regarding learning. The research design was developed with the intention of understanding the impact of non-cognitive factors in design education, by compared perspectives. Twenty-one professors of diverse design (studio) courses and 49 design students, also of different institutions, answered a survey containing twelve questions under three themes: the development of self-determination basic characteristics; the utilization of grades, rewards and praise; and seven statements regarding rewards and praise to ensure motivation, presented to collect subjective perceptions. The results show that students have a much more positive perception of self-developed skills regarding self-determination elements compared to their colleagues. A finding is related to the different perception of the subjects about the utilization of praise. The discrepancy can be a symptom of instructional problems, lack of information by educational professionals or even indicates a poor communication channel in the classroom. Another finding refers to the two groups' opposite views regarding three statements on the usage of rewards and praise for motivation. Apparently, professors utilize grades vastly, which is a clear opposition to the best practices signalized by scientists in the field. Students, also, do not seem to understand that the praise used is sincere and deserved, which could be an indication of lack of trust. Finally, although professors seem to agree that the emphasis of praise and rewards are associated to process and effort, students tend to feel that skill is the key point.

Keywords: *motivation; design education; perception; self-determination; praise*

1 Introduction

The study of motivation encompasses a scientific area dedicated to understanding human behaviour and factors that can change it. Among these factors, commitment, will and self-determination are some of the main ones. The focus of



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this research relies on motivation and will be intended to inform teaching practice. This work is a qualitative study based on subjective evaluation of specific aspects of motivation science regarding learning. This research design was developed with the intention of understanding the impact of non-cognitive factors in design education, by compared perspectives.

The motivation, according to the theory of self-determination, is composed of intrinsic and extrinsic aspects and both make up a constellation of supposedly invisible factors that regulate human behaviour. This theory gained strength in the twentieth century mainly due to the contributions of Deci, Koestner and Ryan, (1999, p. 658), who observe that "intrinsic motivation supports and energizes activities through spontaneous satisfactions inherent in effectively volitional actions. It is manifest in behaviours such as playing, exploring, and competing for external rewards, as people often do." In this study we will bring to the fore, important aspects related to the self-determination of design students, as well as professors' perception, specifically linked to the following four factors: interpersonal connection, competence and mastery, independence and autonomy, purpose and meaning.

In addition to its complexity and variability, these behaviours can change from individual to individual according to the area, age and gender, among other factors. Conceived and defined scientifically, motivation is understood as "the attribute that implies us to do something or not" (Gredler, Broussard & Garrison, 2004, p. 106). Guay et al. (2010), on the other hand, point out that motivation refers to the *underlying reasons for behaviour*. Even more interesting for this work approach, Gottfried (1990, p. 525) defines academic motivation as "the pleasure of academic learning characterized by mastery orientation, curiosity, persistence, and learning challenges, difficulties and tasks". Turner (1995, p. 413) considers academic motivation as synonymous with cognitive engagement, which is defined by the author as "voluntary uses of self-regulated, high-level learning strategies such as dedicated attention, connection, planning and monitoring."

Much of the theory regarding motivational studies is associated with individual goals and values. They have a direct link to the extrinsic aspects of motivation. According to Stipek (1996), initial approaches to the study of motivation were structured on the basis of extrinsic reinforcement literature. In these parameters, all behaviour, including the sense of personal fulfilment, would be governed by reinforcement contingencies. Positive reinforcements or rewards are understood as consequences that increase the likelihood of a given behaviour by the removal or reduction of some negative external stimuli.

Stipek (1996) points out that this approach becomes limited because rewards or punishments do not have the same effects on all students, and some desirable academic behaviours, such as paying attention for example, are not easily reinforced. Further, the author states that the effects of rewards usage tend to be less effective over time, and that individual goals and objectives are stronger reasons for engaging tasks and activities. Also, goals can be divided into mastery goals (intrinsic values) and performance goals (extrinsic values) (Broussard & Garrison, 2004).

Research such as that by Gottfried (1990), proves the aspects of variation linked to motivation and also presents evidence that behaviours can be manipulated from certain instructional practices. When applied well, these practices can increase motivation and consequently improve student performance. When poorly applied, however, they can generate negative impacts. Thus, it is understood that well directed instructional practices, according to these scientific findings can positively manipulate the motivation and behaviour of students to support the learning process.

The studies show that from the educational point of view, especially when coming from the teachers' view, the intrinsic aspect of the motivation would be beneficial or at least it is the most valued (Deci et al., 1999). However, research in the field of social psychology shows that extrinsic rewards can positively affect motivation, also increase the interest, commitment, and willingness of individuals in relation to a given task.

Use of rewards and praise is an important topic for understanding motivation in learning situations. Recent findings from neuroscience and cognitive science respond that we can rather use both rewards and praise to improve the non-cognitive aspects of learning, among them, motivation. Studies such as that of Murayama and Kitagami (2014) in addition to Howard-Jones and Jay (2016) present results consistent with the above statements and confirm the response to reward stimuli by the brain. But as mentioned earlier, the use of rewards does not always have a positive impact. A phenomenon called the undermining effect or over justification effect (Lepper, Greene & Nisbett, 1973; Deci et al., 1999) suggests that extrinsic rewards are not always beneficial to learning. That is, in specific cases extrinsic rewards could decrease intrinsic motivation.

Briefly, this whole range of findings presented a scenario that confirms the hypothesis that rewards would facilitate learning. The use of rewards has a positive effect on motivation and improves academic performance as evidenced by neural linkage studies linking motivation (reward) and memory systems in the brain (Murayama & Kuhbandner, 2011). But in some conditions, such as when a task is intrinsically interesting and rewards could decrease motivation, it could not bring benefits to learning (McGillivray, Murayama & Castel, 2015).

Praise is also a powerful motivational tool. Research shows that praise is underused and under-estimated by teachers (Brophy, 1981; Kern, 2007; Hawkins & Heflin, 2011). Some recommendations can facilitate the use of praise to maximize the positive impacts on student learning and are basically constituted of two elements: the description of the academic performance or behaviour that one wishes to emphasize, and a sign of approval by the teacher.

Studies show that the power of praise to shape positive student behaviours is linked to the ability to indicate exactly what kind of behaviour or academic performance is being valued and how it fits into the teacher's expectations (Burnett, 2001). Also, as in the use of rewards, the use of praise will only have positive effects on academic behaviour and motivation in situations where students are encouraged (Akin-Little, Eckert, Lovett & Little, 2004).

A compliment that does not point exactly to a description of the behaviour being rewarded, for example, will not have a positive effect on student motivation (Hawkins & Heflin, 2011). The authors' work demonstrates that what behaviour is being praised should be clearly described to the student. Literature also runs counter to the praise of skills. Instead, teachers should focus on compliments on effort, and as evidenced (Burnett, 2001), vague praise for ability can reduce students' interest in risk taking. When properly employed, praise helps students see a direct link between effort dedicated to a task and improvement in academic performance or behaviour.

The third and final aspect concerns the manner and context of how praise is provided to the student. There are several ways to approach the subject, and research indicates that the teacher should tailor the praising situation to the student's preference. For example, students who are predisposed to feel uncomfortable with compliments given in public, should be addressed individually, or even in writing, in the tests and papers given to the teacher. To summarize the main points related to the literature review (Dweck & Molden, 2005; Farrington et al., 2012; Dweck 2015) of the work's theme, a table was crafted to organize the main guidelines for the use of praise and rewards (Table 1).

Table 1. Guidelines for using rewards and praise for motivation, as found in literature.

USING REWARDS AND PRAISE FOR MOTIVATION GUIDELINES	
USING REWARDS	USING PRAISE
1. rewards usually have short-term effect	1. praise should be always sincere and earned
2. constant use of rewards can demotivate	2. avoid controlling language when praising
3. rewards should be used only for <i>dull</i> tasks	3. emphasize process, not ability in praises
4. teachers should seek other alternatives	

Since motivation characteristics linked to self-determination are important skills for professionals in many fields including design, the purpose of this study is to investigate the perception of teachers and students of design on aspects related to the motivation and findings of applied science to academic behaviour. This collection of subjective impressions, linked to non-cognitive factors of the science of learning in design, can present important points of improvement both in the instructional practice of design teachers and in the students' learning strategies.

Understanding the impact of emotional factors on design pedagogy through the perception of students and teachers can be a determining task. With this data, one can identify critical areas in the teaching-learning relationship in order to structure strategies based on instructional models and improved processes.

2 Methods

The focus of this research relies on motivation and will be intended to inform teaching practice. This work is a qualitative study based on subjective evaluation of specific aspects of motivation science regarding learning. Twenty-one professors of six diverse studio design courses and forty-nine undergraduate design students from three studio courses answered a survey containing twelve questions regarding three main areas or themes: the first is the development of self-determination basic characteristics, the second, the utilization of grades, rewards and praise.

Finally, seven statements regarding rewards and praise to ensure motivation in learning were presented to collect subjective perceptions (Table 2).

Table 2. Basic research design.

THEME	QUESTIONS	MEASUREMENT / SCALE
Development of SELF-DETERMINATION aspects during course;	1. During my course, <u>I have developed</u> ; 2. During my course, I noticed that <u>most of the students and colleagues developed</u> ; 3. During course, <u>my students develop</u> ;	1. No Development 2. Unsatisfactory Development 3. Satisfactory Development 4. Full Development
Utilization of GRADES, REWARDS and PRAISE	1. Rewards and grades: are / were used: 2. Praises are / were used:	1. Never Used 2. Rarely Used 3. Frequently Used 4. Always Used
Perception on statements regarding REWARDS and PRAISE	1. For me, the effects of stimuli attached to grades are short-term; 2. Grades may cause / cause demotivation; 3. Grades are / were used on "minor" tasks; 4. Teachers seek / sought to avoid application of grades and seek to find other alternatives; 5. Praises are / were always sincere and deserved; 6. Controlling language is / was avoided in compliments; 7. Process and effort are / were emphasized, not skill;	1. I Totally Agree 2. I Agree 3. Neutral 4. I Disagree 5. I Totally Disagree
TOTAL: 12 QUESTIONS		

This research design was developed with the intention of understanding the impact of non-cognitive factors in design education, by compared perspectives. To ensure clarity and maintain scientific rigor appropriate to the selected research method, all the questionnaires used were totally identical. The questions were always executed in the same order and with the same values and criteria. All participants participated voluntarily in the research and signed the informed consent that presented the structure and objectives of the research. There was no risk associated with participation in the research; on the contrary, participation only gives the volunteer a chance to learn about the topics covered. Regarding the applicability of the same research project to other schools and universities, this study becomes fully feasible since the form can be used in a simple and direct way, both in the version directed to students of design, as in the version that investigates the positioning of teachers.

Two types of graphs were selected for the analysis of the obtained data: one of them was dedicated to the presentation of the answers of the themes 1 and 2 of the research (Figure 1 to Figure 5). In these charts, we have the visualization of the answers related to the development of abilities (without development, unsatisfactory, satisfactory and full development) and also the use of rewards and praise (never, rarely, often and always). The second type of chart was used to visualize the answers related to the agreement or disagreement regarding the use of rewards and praises. In these charts, the answers of teachers and design students on the same theme are presented in a comparative way on the same charts (Figure 6 to Figure 12).

3 Results and Discussion

The premise of this research is to present motivation science and theory elements, intended to inform design teaching practice. In order to do that, this paper confronts design students and professors to the science of motivation in education, to understand their perspective on those themes in a comparative approach.

3.1. Development of Self-Determination Aspects during Course

As shown in the methodological part of this work, the goal of these particular questions is to uncover discrepancies amongst the perception of professors and students regarding the four basic elements of self-determination:

- Competence and mastery
- Independence and autonomy
- Purpose and meaning
- Interpersonal connection

Professors answered on their perception of students' levels of development of those qualities during the course, students also were questioned on the matter, but twofold: first regarding themselves, and secondly, regarding their

colleagues. Responses of students were much more optimistic and positive regarding their own accomplishments, than compared to their peers (Figures 1 and 2). Interpersonal connection is the most developed quality according to students' experiences of their courses, in opposition to competence and mastery, which is the less developed of the characteristics in the two initial questions directed to them.

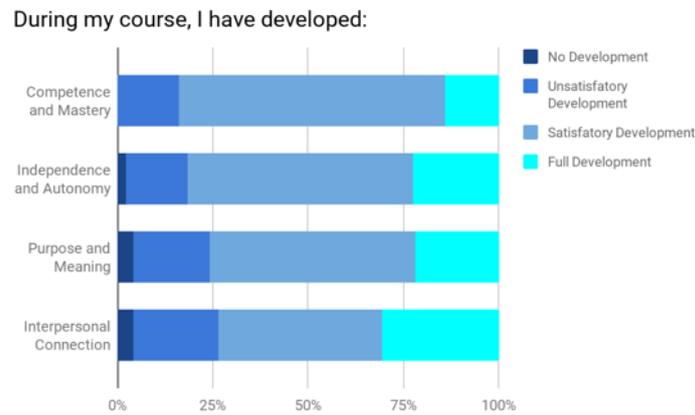


Figure 1. Students' perception of self-determination aspects, self-development: The self-assessment of design students about themselves is far more positive than the assessment they make of fellow students of the same course. Competence and mastery are the most satisfactorily developed characteristics.

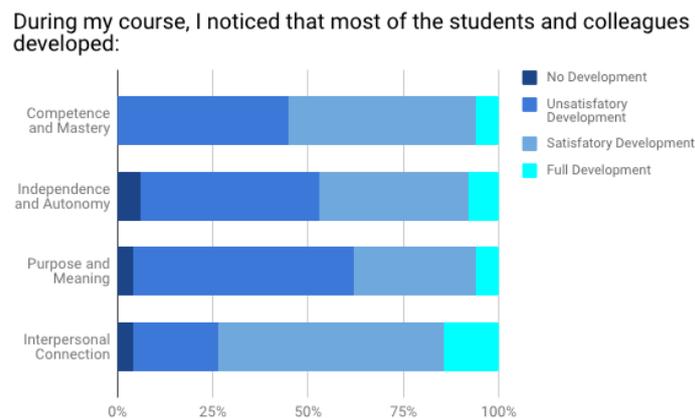


Figure 2. Students' perception of self-determination aspects, development of colleagues: Besides interpersonal connection, which is practically unchanged, the students' perception of the other three topics was much worse, with a perception of poor development, with an average of close to 50%.

When assessed, students rated competence and mastery as the most well-developed trait in their ongoing design experiences. In this evaluation it is noticed that the four topics evaluated reach about 75% of opinions with full or satisfactory development. Competence and mastery, which is related to the domain of technical aspects of the course content, is the only element that was never perceived as "never developed" by the subjects.

Used as a technical resource, which helps prevent perceptual study results from being driven only by the subjectivity and self-perception of the subjects involved, questions directed at peer evaluation can be used as a way of understanding students' real performance. When the students evaluate themselves, they give an opinion about their experience and also about an egocentric approach. When evaluating colleagues, in turn, it is evaluating a larger number of individuals and establishes a much more relevant average for the study in question. Thus, we can perceive that it is necessary to improve the communication of important values for the group in question, regarding the understanding of the purpose and meaning of the activities and knowledge passed in the evaluated design courses.

Professors' perception of the development of those characteristics did not differ much to students' self-evaluation responses, as all of them were mostly evaluated as satisfactorily developed. Yet, none of the elements were indicated as "never developed" in this group of subjects (Figure 3).

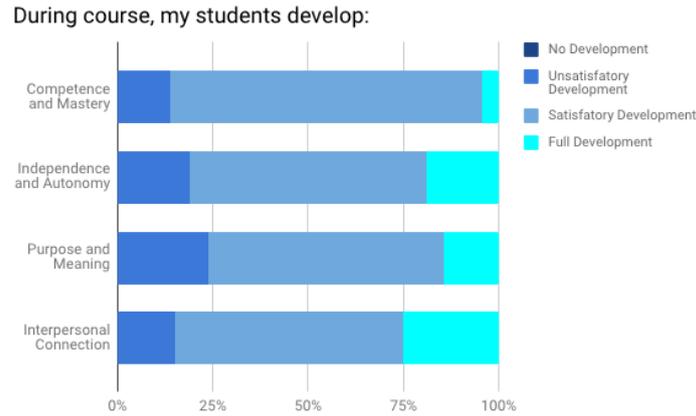


Figure 3. Professors' perception of self-determination aspects, development of students: With very positive results, none of the topics was assessed as undeveloped. In spite of this, it is necessary to emphasize that a question directed to the work of other teachers, or the evaluation of own practices compared to that of departmental colleagues, for example, was not carried out.

3.2. Rewards and Praise for Motivation

The usage of rewards, grades and praise in education is a crucial matter in motivation. As discussed earlier, there are parameters and guidelines that can determine success or failure regarding the utilization of those topics in the classroom. Regarding rewards and grades, almost 75% of the students claimed that it was always or frequently utilized. Amongst professors more than 75% of subjects affirmed using these resources in their practice (Figure 4).

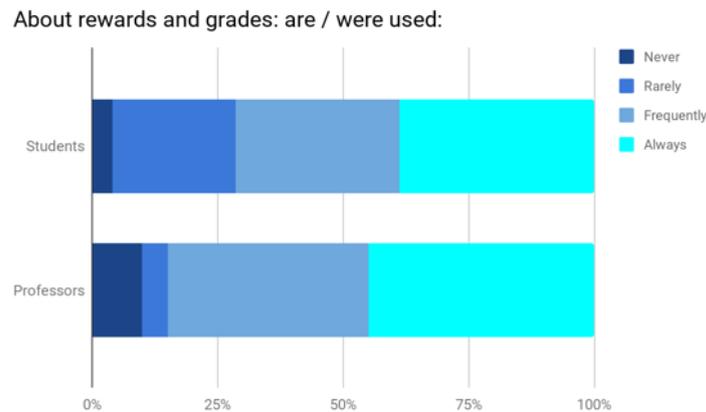


Figure 4. Usage of rewards and grades in design disciplines: Teachers and students similarly perceive the use of rewards and grades.

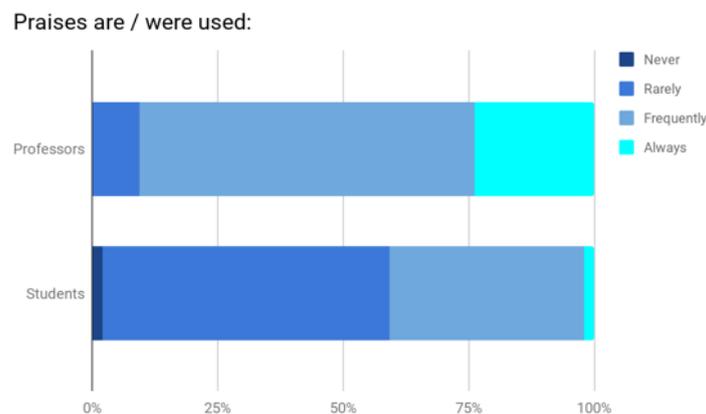


Figure 5. Usage of praise in design discipline: Teachers and students perceive the use of praise very differently.

In contrast, the utilization of praise is differently perceived by the groups. Almost 90% of professors declared the constant usage of praise, but only 40% of the students noticed it in that way (Figure 5). The high difference in the perception of the use of praise is a matter of concern, since the literature dedicated to the subject points to empirical findings that indicate that this resource is extremely impactful on the motivation and construction of the academic mindset of students. With these results, it is possible to establish that the optimization of this topic would be crucial for the improvement of non-cognitive aspects related to the learning of design in these courses. Still, the correct use of praise could directly improve the indexes of purpose and meaning, which were deficient in previous issues.

3.3. Perception on Statements Regarding Rewards and Praise

Subjects of this study have been presented with seven statements regarding rewards and praise, which are:

1. For me, the effects of stimuli attached to grades are short-term;
2. Grades may cause / cause demotivation;
3. Grades are / were used on *minor* tasks;
4. Teachers seek / sought to avoid application of grades and seek to find other alternatives;
5. Praises are / were always sincere and deserved;
6. Controlling language is / was avoided in compliments;
7. Process and effort are / were emphasized, not skill;

From these assertions, all the individuals participating in the research, students and teachers, were invited to stand in agreement or against, one next time. For each of the statements, the subjects could agree totally, only agree, demonstrate neutrality, disagree or totally disagree. Figures 6 to 12 show the results of these comparative analyses. The graphs used for the presentation of the data were selected to demonstrate two lines opposing each other in an area that goes from total agreement, passes through neutrality and arrives at total disagreement. The highest points of the lines, which represent the largest number of positions between the subjects surveyed for the two groups, students and teachers, were then compared.

Three of those statements' perception were extremely diverse regarding professors and students' points of view, they are related to the usage of grades for *minor* tasks (Figure 8), to the sincerity and deservedness of praises (Figure 10), and the emphasis on effort and process and not skill (Figure 12). Results regarding the perception of subjects on the other statements did not differ much for each group and are presented in figures 6, 7, 9 and 11.

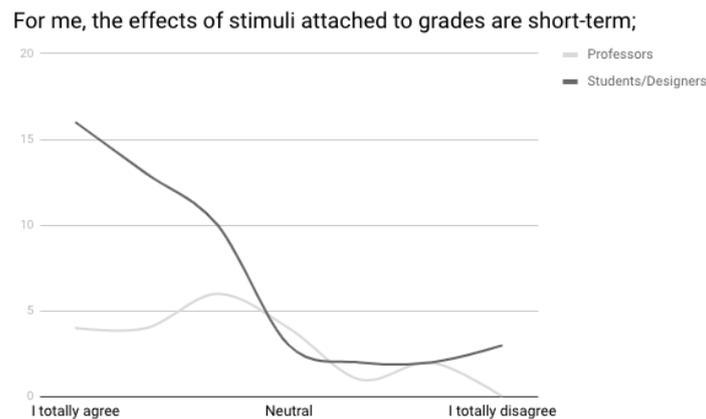


Figure 6. Perception regarding stimuli of grades: The perception of teachers and students are similar about this item.

Teachers and design students evaluated in the research tend to agree that the use of grades tend to serve as short-term stimuli, in agreement with the literature of the area. Although both groups of subjects demonstrated agreement with the statement that the scores cause or can cause demotivation, it is possible to notice that the students presented a position much more in line with the literature. Teachers, on the other hand, presented a position of concordance that approaches neutrality (Figure 7).

On the claim that grades were used in *minor* tasks, for example (Figure 8), the majority of professors disagreed with the statement, but differently, students had a divided opinion with a much more neutral opinion. In this topic we find a key point of investigation, since both groups position themselves differently to the newest findings of cognitive

science and the science of learning. The use of grades in smaller tasks has shown to be positive, for building a growth mindset, keeping students on repetitive tasks, or gaining skills.

On the search for other alternatives to grades, teachers and students tended to disagree (Figure 9). This may not only reveal an ignorance of the literature devoted to learning science but may also indicate a deficiency in continuing teacher education.

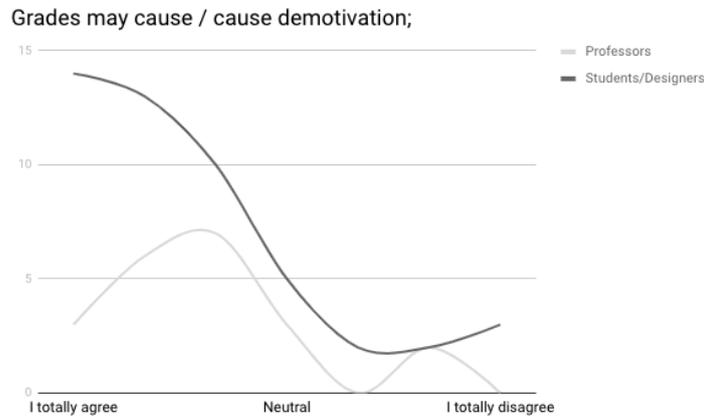


Figure 7. Perception on grades and demotivation: Although both groups were in agreement, teachers tended more towards neutrality.

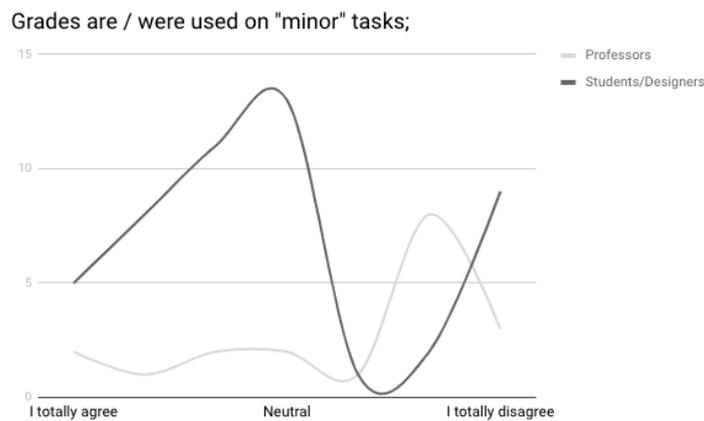


Figure 8. Perception on grades usage for minor tasks: Both groups were negatively positioned, with more students being neutral. However, the use of grades in smaller activities has been studied and presents very positive results in relation to the construction of a growth mindset.

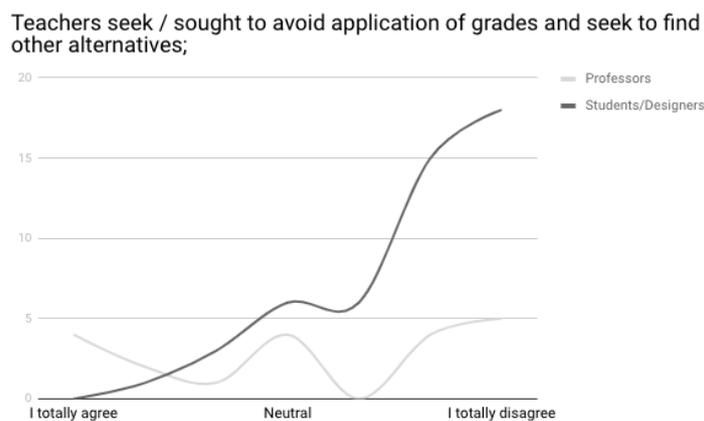


Figure 9. Perception on application of other alternatives to grades: The two groups evaluated disagree that teachers seek alternatives to evaluation other than grades.

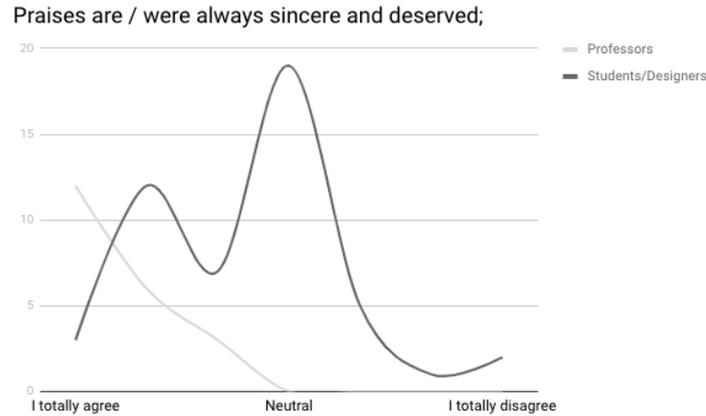


Figure 10. Perception on sincerity of praises: While professors agree that they praise in a sincere and deserved way, the students apparently cannot understand the praise in the same way.

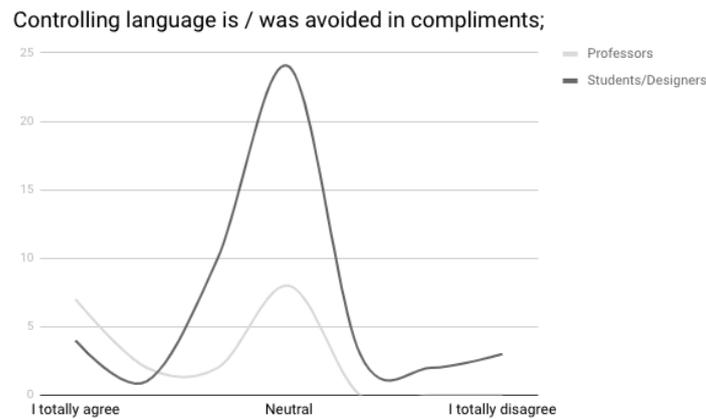


Figure 11. Perception on controlling language in compliments: In this item specifically, both groups were positioned in a neutral way.

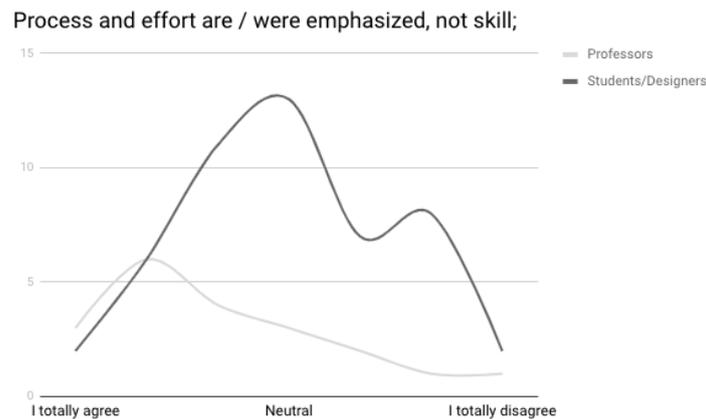


Figure 12. Perception on emphasis of compliments and feedbacks: Although teachers agree with the statement, students, differently, tend to be neutral or disagree.

On the statement that affirms the usage of praise as sincere and deserved, professors had a positive agreement response to the matter, but students have, once again, taken a neutral posture towards the topic (Figure 10).

As can be seen in the literature dedicated to motivation and non-cognitive aspects related to learning, the correct use of praise can positively contribute to a better student performance. In addition to making clear which attitudes, behaviours, and practices are considered appropriate in the learning process, praise, when well placed, can help the

student feel embedded in the group context, feel empowered and engaged, and foster mentality for personal development. Because of all that has been presented, this finding of research becomes extremely relevant. Regarding the usage of controlling language in compliments, both groups were positioned in a neutral way. It can be inferred that there is a lack of knowledge among the researched ones about the subject. Still, it is important to point out that the literature presents important research results that show that the use of controlling language should be avoided when teachers are praising students.

Finally, the third critical finding is related to the emphasis in process and effort on the praising. Although the majority of participant professors agreed with the statement, most of the students tended to be neutral towards or disagree with the matter (Figure 12). Again, as seen in previous topics, there seems to be a flaw in the clarity of communication between teachers and design students. To praise correctly, as the literature proposes, is a crucial factor in positively affecting the non-cognitive factors that impact learning. However, as seen in the results of this research, it is possible that there is a lack of communication between teachers and students. Besides the clarity of the praises and clear establishment of purpose for the subjects studied, teacher training can be an important factor to correct these topics.

4 Conclusion

This research is important to reveal the perceptions of design students and professors regarding motivation and self-determination. The results can be used for comparative analysis in other courses and areas, establish guidelines for teaching practice or even set directions to the development of educational technologies. In addition, as future studies, one can cite the possibility of using this information to adjust curriculum, to select other related courses and to target complementary teacher training and, also, to adapt teaching methods and correct use of educational technologies.

The first important finding of the research concerns the comparative perception of design students about themselves and their colleagues. In this phase of the research they were invited to evaluate the development of four important aspects related to self-determination. The self-assessment of design students about themselves is far more positive than the assessment they make of fellow students of the same course. Competence and mastery are the most satisfactory developed characteristic. Besides interpersonal connection, which is practically unchanged, the students' perception of the other three topics was much worse, with a perception of poor development, with an average of close to 50%. Also, we can perceive that it is necessary to improve the communication of important values for the group in question, regarding the understanding of the purpose and meaning of the activities and knowledge passed in the evaluated design courses. With very positive results, none of the topics was assessed as undeveloped by the professors. In spite of this, it is necessary to emphasize that a question directed to the work of other teachers, or the evaluation of own practices compared to that of departmental colleagues, for example, was not carried out.

Another important finding is related to the different perception of students and teachers about the utilization of praise. This discrepancy can be a symptom of instructional problems, and lack of information by educational professionals, or even indicate a poor communication channel through the peers in the classroom. With these results, it is possible to establish that the optimization of this topic would be crucial for the improvement of non-cognitive aspects related to the learning of design in these courses.

Also, very relevant findings, refer to the two groups' opposite views regarding three statements on the usage of rewards and praise for motivation. Apparently, professors utilize grades vastly, which is a clear opposition to the best practices signalized by scientists on the field. Students, also, do not seem to understand that used praise is always sincere and deserved, which could be an indication of untrusty parameters. Finally, although professors seem to agree that the emphasis of praise and rewards are associated to process and effort, students tend to feel that skill is the key point. Another clear violation of guidelines regarding the matter on motivation science. To praise correctly, as the literature proposes, is a crucial factor in positively affecting the non-cognitive factors that impact learning. However, as seen in the results of this research, it is possible that there is a lack of communication between teachers and students. In the matter of the perception on grades usage for *minor* tasks, both groups were negatively positioned. With more students being neutral, however, the use of grades in smaller activities has been studied and presents very positive results in relation to the construction of a growth mindset.

Based on these findings, these design courses and professors can establish ways to diminish the most critical discrepancies related to the motivational aspects of design pedagogy and teaching. The clearest limitation of the study is due to low sampling. However, since the applicability of questionnaires in other schools, courses and universities does not present great obstacles and difficulties, new applications may be made in the near future, and other courses

can assess these motivational topics and decide whether any measure should be taken to improve some aspects of design teaching practice.

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