SELF-REGULATION OF GYMNASTIC SKILLS LEARNING IN INITIAL TRAINING: STUDENT-CENTERED STRATEGIES

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Abstract

Within the framework of the perspectives of self-determination, self-control and self-regulation, this research analyses the management of difficulties encountered during the implementation of strategies to support autonomy and collaboration in gymnastic learning. The approach of the study is qualitative and is based on the experiences of university students of Physical Activity and Sport Sciences, using personal diaries during classroom practice as an information tool. The data analysis is carried out using AQUAD 7 software. The results show that during the learning process, students experience difficulties associated with anxiety, especially in the final moments of educational process, together with perceptions of gymnastic incompetence, which decreases as the training period ends. As a response to coping with learning difficulties, students mainly resort to personal reflection, adopt attitudes of victimisation and, to a lesser extent, turn to their peers to help solve their problems, among others. The high level of the sense of victimisation in high pressure situations reveals the need to design emotional management strategies to reduce students' resistance to assessment tasks that can damage and distort the action achieved in the learning process and reduce self-control.

Keywords: *higher education, decision-making, gymnastics, autonomy support, collaboration.*

INTRODUCTION

In teaching and learning of Physical Education (PE), it is necessary to consider self-determination, self-control, and self-regulation since there are many situations of anxiety, frustration, and mental blocks in performances and tests of motor execution. Several authors (Haarens et al., 2018; Reeve, 2009; Ryan & Deci, 2017) have specifically investigated human behaviour in relation to motivation as applied to teaching and learning. In this sense, the authors identify three basic needs in students: the need for autonomy, the need for achievement and training, and the need for inter-relationships. In the field of physical education, self-determination theory has been extensively researched. Currant et al. (2016), Woods et al. (2012) or Rhodes, McEwan, and Rebar (2019), among others, stipulate that the need to be autonomous, to meet challenges and to interrelate with others are aspects to be considered by PE teachers as they help to establish commitments with the proposed tasks. These initial needs and motivations must be considered when planning learning strategies in an appropriate way. Autonomy must be worked on and if it is not developed, it loses effectiveness. Its absence can generate difficulties in learning contexts, as some students may opt for

dependence on the teacher. Similarly, it can also be considered that there are other related needs, such as self-esteem or pleasure and the relationship between ability, motivation, and opportunity (Rhodes et al., 2019) as other determining factors. Positive attitudes towards practice were strongly associated with gaining physical, personal, and social benefits from PE (Li, Chen, & Baker, 2014) and these attitudes clearly corresponded with students' needs. However, considering that the benefits require effort, motivation must be defined by conscious evaluation of physical activity, which requires cognitive and mental action if we want it to lead to a continuous practice of physical activity and sport in the future (Rhodes et al., 2019).

Also, attention control theories (ACT) are important because they help us understand students' responses to actions under pressure, as generated by competitions, quizzes, and tests. Taylor, Boat and Murphy (2018) propose models which integrate self-control and motivation as key elements. Baumeister, Vohs and Tice's (2007) model of self-control claims that the practitioner is unable to persevere in difficult taskswhen he or she wants to reduce discomfort and uneasiness. In these cases, self-control allows us to focus our attention on long-distance targets and on the task to distance ourselves from the present discomfort or tiredness. Therefore, we believe that working on internal motivation together with self-control are two important factors in achieving training and improvement. In this sense, Englert and Bertrams (2015) studied the responses of people facing pressure and situations of anxiety and ego depletion or exhaustion. Their research found that self-control reduces anxiety and increases positive behaviors under pressure. Participants with high anxiety have more trouble maintaining self-control during high-pressure situations. In their studies, Englert and Bertrams (2015) used the ACT and they concluded that pressure produces anxiety, and this causes distraction, disruption, and disturbance on the attention level. On the other hand, attention regulation is an act of self-control which moderates anxiety and improves performance. Acting under pressure occurs for example in tests and exams and it is therefore a factor of concern to teachers. Teachers observe how this may not occur in class assignments since in the absence of pressure the ability to control oneself can overcome any difficulty or impairment, just as self-control can counteract the effects of low anxiety. But in times of greater pressure, such as exams and tests, the authors describe the phenomenon of "ego depletion", a momentary block produced by anxiety. They use the right muscle metaphor. Just as it is necessary to train a muscle for its development and effective use, it is equally important to learn self-control if we want to use it in moments of tension (Lang et al., 2016). According to Englert (2016), self-control is what makes it possible to regulate emotions and activate persistence in the face of difficulties and pressures. Likewise, Hagger et al. (2010), point out that the power of self-control during stressful situations can diminish which leads to the ego becoming blocked. In this regard, Hill et al. (2018) highlight how resilience allows us to adapt to adverse contexts to a greater or lesser degree. In our opinion, the capacity of resilience would be a sustained self-control.

Strategies for autonomy and collaboration in the gymnastic field

The most innovative teaching strategies that can make it easier for teachers to anticipate students' responses and needs by giving them the prominence in their learning process can still be overshadowed by more conventional strategies (Moy et al., 2019). Conventional methodologies refer to those where students have little participation in the teaching and learning process. Where teaching is centered on a technical and analytical model, the student has a passive role at a cognitive level. The characteristics of the tasks are centered on repetition, detailed

explanations by the teacher who acquires a technical or instructor role, generating a great dependence. Among them we can mention the style of direct command or the assignment of tasks (Núñez & Oliver, 2020).

Current methodologies such as active methodologies, for example Cooperative Learning, the Comprehensive Model of Sport Initiation, the Personal and Social Responsibility Model, and other more current methodologies such as Attitudinal Style, Adventure Education, Motor Literacy, Health Education, or hybrid models (Fernández-Ríos et al., 2016), allow learners to take responsibility and make independent decisions, leading them to report greater enjoyment and perceived competence compared to PE lessons delivered through traditional direct instruction (Gil-Arias et al., 2020). In this sense, PE teachers should master the mentioned methodologies based on different models since the combined use of strategies can allow for diversification of teachers' and students' functions, depending on the time of the teaching-learning period (Fletcher y Casey, 2014). Gradually, educational trends known as Model Based Practices or pedagogical models are being implemented, such as the Sport Education Model (Hastie & Casey, 2014); the Activist Pedagogical Model that aims to offer learning options and possibilities for all and to challenge stereotypes (Oliver & Kirk, 2015), or student-centered research models as a curriculum that combines the actions of students and teachers, taking into account the voice of students and the social construction of the contents to be integrated in the curriculum (Oliver & Oesterreich, 2013). Clearly, the teaching methodology alone will not be more effective in facilitating learning for students, and it cannot be the only variable. The new methodologies applied to the field of PE and to the context of educational gymnastics can contribute to the long-term benefits, but they also require that both students and teachers familiarize themselves with them and are able to build upon them.

Collaborative work, together with strategies of autonomy and decision-making to learn gymnastic skills, can help a group of students to reach a common goal jointly (O'Grady, 2012). Likewise, in the gymnastic context, collaborative work facilitates reinforcement of students' skills, increasing their satisfaction as well as their predisposition towards gymnastic activities (Bayraktar, 2011). The group itself offers almost immediate feedback to its members; their contributions are interconnected and added up as has been the case in other collaborative studies conducted in the context of Physical Activity and Sport (Collins, Overson, & Benassi, 2020; O'Grady, 2012). Sharing responsibilities and dealing with and solving difficulties together will allow them to learn in a more authentic environment.

From these premises, this research aims to identify the difficulties encountered in a teaching intervention to support autonomy and collaboration in the learning of gymnastics and to analyze how students manage these problems.

METHODS

Topics such as motivation, difficulties encountered, perceived competence or achievement expectations are relevant lines of study in Physical Education. Qualitative and interpretive or narrative approach as part of qualitative research is necessary and appropriate to understand what participants perceive, feel or experience (Jha, 2018), in this case, in the teaching-learning process of gymnastic content.

Our intentional sample included 38 students: 10 women and 28 men (average age 19.3 years ± 2.72 years) belonging to one of three internship groups that study the subject of Gymnastics Skills as part of their degree in Sciences of Physical Activity and Sport (PASS) at a Spanish public university. In addition, students were

informed that the collected data were used for research purposes and that the study was carried out according to the Helsinki declaration and involved the approval of the Ethics Committee of the university (UA-2020-09-28).

The instrument for data collection was a journal of personal reflection. Students should reflect and write after each practice on the following issues:

✓ What difficulties did you encounter during the session and how did you solve them?

✓ Remarks you want to provide.

The diary was kept and collected after each practice. The students had a room with a relaxed and personal atmosphere where they spent on average 20-25 minutes to write down their reflections. They submitted them via the university's online platform and in word format. This procedure ensured that students' anonymity was maintained. The teaching staff was not present at the time of completing the reflections but was accessible in case a student needed help. 494 diaries were originally collected. Finally, it was decided to analyse 190 diaries for sessions 1, 5, 6 ,7 and 13 - as the most representative sessions of each phase according to three experts in the field, and to develop the method of using the class diaries. In this way, the influence of classroom activities specific to each learning phase, e.g., some assessment activities, collaborative work, etc., were represented and analysed. In addition, the selected personal diaries had to belong to students who attended all practical sessions of the subject.

Initially, the strategy to support autonomy and collaboration was developed by two teachers specialized in PE and gymnastics.

The strategy was implemented throughout the 13 practical sessions (3 hours per session) of the subject. Throughout the educational process, the classroom was organized into 6 teams made up of 6-7 students who were grouped according to their preference. Students took up three roles: performer, assistant, observer-informant. The design of the learning process was organized into 3 phases: initial, progress and final. The main strategies developed are listed in Table 1.

Session 1. This session corresponds to one of the 4 sessions of the initial phase. In it, the functioning of the subject was explained, an initial test of execution of four basic acrobatic skills was carried out and the main activity was developed where motor gymnastic actions were implemented. Students enter university with a very basic previous experience in gymnastic content. This fact can generate some insecurity in the initial assessment, especially for students who have not practised these contents before, even though the initial test is composed of very basic skills. For this reason, students could decide whether to perform the skill at this initial stage if they did not feel confident or had never performed the skill before. Also, decision-making was present for the self-selection of groups and the assignment of major work roles.

Sessions 5, 6 and 7. These sessions are three of the six that make up the progress phase. They were carried out in the group structures noted above. Students developed group and individual decision-making actions associated with designing progression exercises, implementing them, and detecting and correcting errors in the proposed gymnastic tasks. In addition, six-station circuit design and implementation tasks were performed. Practice of progression exercise activities for cartwheel learning, handstand, roundoff, handspring forward, …, in which all three roles (executor, observer, and assistant) were exercised, through a rotating system. Decision-making was also developed through the design and group implementation of an Acrosport practice.

Session13. It is the last session of the three belonging to the final phase of the learning strategy. In it, the final resolution of 4 practical assumptions of the competences developed in relation to the

role of assistant and observer was carried out. The score obtained included an individual percentage (50%) and a group percentage (50%).

The role of the researchers was to place themselves in the context of the participants; to immerse themselves in the observation and in the reading and interpretation of the class journal, and to establish relationships between the keys emerging from the diaries and the conceptual framework that has guided the structure of the research.

From the selected journals, the first interpretative readings led to a categorization that connected the emerging codes from student narratives with the conceptual framework and research issues. After repeated approximations, the final theme and categories were determined as follows:

Theme I. Management and evolution of difficulties in gymnastic learning:

Category 1. Perceived difficulties in autonomous and collaborative gymnastic learning.

Category 2. Management strategies for difficulties during gymnastics learning.

The data has been analyzed using the AQUAD 7 software (Huber & Gürtler, 2015). The choice of this software is based on its potentialto interconnect the categories arising from students' reflections with the process of conceptualization and structuring as set by the two researchers on the basis of the state of content analysis. The emerging categories are interpreted and organized in a recursive process as advised by Miles and Huberman (1994). The units of meaning in the reflective diaries of meaning in the participants' reflective diaries are coded in line with the categories deduced both from the state of the field of knowledge and those that emerged from the meanings from the diaries. The AQUAD program allows for this flexible and revisable process of continuous dialogue between the categories of analysis that emerge from the students' own reflections and the effort of structuring and consistency that the researchers must make in the categorization based on the conceptual framework. The resulting code maps have been discussed and validated on the basis of triangulation of the assessments of three teachers, leaving the definitive configuration for the analysis of this research to a mixed deductive-inductive method. In this way, this program allowed us to organize the categories and encodings extracted from the student reflections and thus complement the qualitative analysis with quantification. For this reason, we present the code tables with the absolute frequency (AF) or the number of findings related to a concept and the percentage of it (%AF) in the results.

RESULTS

The presentation of the results is organized according to the categories extracted from the research. Complementarily, there are several excerpts from student journals that exemplify the codes of analysis. To guarantee anonymity, students were assigned numbers (e.g., Student12), and to identify the session to which the submitted diary excerpts belong, the initial “S” is used next to the corresponding session number (S1; S5; S6; S7 or S13).

Perceived difficulties in autonomous and collaborative gymnastic learning

The deficiencies and incompetence perceived by university students (Table 2) in executing a gymnastic or acrobatic skills are the main causes of dissatisfaction in the progress phase of the implemented strategy (S5: 59%; S6: 56.63%):

> *I have very little flexibility and strength, for example. I noticed when performing the work, we didthe "bridge" and handstands (Student12.S5).*

Table 1
Main strategies developed during the implementation of Gymnastic and Artistic Skills.

Initial Phase (Sessions 1-4)	Progress Phase (Sessions 5-10)	Final Phase (Sessions11-13)
Subject description. Distribution of spaces. Methodology to be used. Creation of work teams. Function of the journals.	Progressions of acrobatics of greater technical difficulty such as the roundoff or the backward roll to handstand. Development of Acrobatic Gymnastics discipline.	Final tests were prepared in groups according to the needs and in a mutually supportive way.
Initial test of individual performance.	Students group and individual decision-making actions associated with: Designing progression exercises. Implementing them. Detecting and correcting errors in the proposed gymnastic tasks. Decision-making also developed through the design and group implementation of an Acrobatic Gymnastic practice. Group practical test of this discipline.	Test of individual technical execution.
Main activity practice gymnastic motor actions in pairs, quartets, and sextets. Progression exercises. Main errors were identified. Protocol of support.	Meets for reviewed and clarified doubts.	Final resolution of 4 practical assumptions of the competences developed in relation to the role of assistant and observer.
Decision-making for the self-selection of groups and the assignment of major work roles (execution, observation, and support).	Students in their groups worked on the competence to identify errors, on the feedback and on the aids in a collaborative way. Design decision-making and implementation.	Final meeting for subject assessment.
Completion of reflection journals at the end of the session.		

Table 2
Causes of dissatisfaction with gymnastic learning, by session.

	IP (S1)		PP (S5)		PP (S6)		PP (S7)		FP(S13)	
Codes	AF	%AF	AF	%AF	AF	%AF	AF	%AF	AF	%AF
Gymnastic incompetence	79	45.6	105	59	64	56.6	79	49.7	68	30.1
Fear and anxiety	59	34.1	33	18.5	23	20.4	37	23.3	137	60.6
Lack of peer support	18	10.4	18	10.1	0	0	17	10.7	12	5.3
Physical discomfort	6	3.5	14	7.9	5	4.2	12	7.5	5	2.2
No dissatisfaction	11	6.4	8	4.5	21	18.6	14	8.8	4	1.8
TOTAL	173		178		113		159		226	

Legend: IP: initial phase; PP: progress phase; FP: final phase; AF: absolute frequency.

Table 3
Management strategies for difficulties during gymnastics learning, by session.

	IP (S1)		PP (S5)		PP (S6)		PP (S7)		FP(S13)	
Codes	AF	%AF	AF	%AF	AF	%AF	AF	%AF	AF	%AF
Self-assessment	41	29.5	39	47	32	26.7	47	35.6	48	31.2
Victimisation	39	28	9	10.8	15	12.5	34	25.7	71	46.1
Group support	34	24.5	25	30.1	37	30.8	29	22	17	11
Support from teachers	8	5.8	7	8.5	13	10.8	9	6.8	1	0.7
No reflection	17	12.2	3	3.6	23	19.2	13	9.8	17	11
TOTAL	139		83		120		132		154	

Legend: IP: initial phase; PP: progress phase; FP: final phase; AF: absolute frequency.

Another cause of perceived dissatisfaction was fear and anxiety, especially in the final phase (S13: 60.6%) and in the initial phase (S1: 34.1%) of the learning process:

> *In the initial test, my feeling was negative as I was not able to perform the acrobatic skills correctly (Student12.S1).*
>
> *At the beginning, I was nervous, as it is normal when there is an exam, because although you feel that you control the subject you do not know where the questions can go; additionally, it was oral and hence there were more nerves and silly mistakes. The problems I had were the doubts in regards to some questions, but in the end, I knew how to solve it by taking my time and getting the idea of each execution in my head (Student25.S13).*

Groupmates were also noted with some dissatisfaction. The lack of commitment on the part of their peers was mentioned, albeit less frequently. This perception was present mainly in the progress phase (S7: 10.7%) and in the initial phase (S1: 10.4%):

> *I have felt very uncomfortable, since in some of the exercises we did at the stations, we had partners who were not helping, they were unfocused. (Student31.S7).*
>
> *In this first session, I observed my companion's difficulties like mine, as well as lack of initiative in some colleagues when it comes to acting and helping (Student10.S1).*

Finally, there were few mentions of muscle discomfort, especially in the progress phase (S5: 7. 9%; S7: 7. 5%):

> *In this week's session, my feeling could not be good because in the middle of the session, while doing backwards rolls, I hurt my neck and could not continue. So, my big problem in this session was that*

I got hurt; I tried to continue with the help of my teammates but it was not possible (Student09.S7).

It should be noted that there were many statements in which students specified that they had no reason for dissatisfaction; this was noted particularly in the progress phase (S6:18. 6%; S7: 8.8%):

I have had no problems this week and no problems last week either, I am very comfortable in the class (Student24.S6).

Management strategies for difficulties during gymnastics learning.

We present how PASS students dealt with the difficulties and obstacles encountered throughout the development of Gymnastics Skills sessions (Table 3). The participants significantly reflected on their diagnosis and personal analysis of the situation to manage and solve their problems. This strategy was used mainly in the progress phase (S5: 47%; S7:35.6%):

When it comes to performing an acrobatic series, I lack coordination; with practice, more time and reinforcement exercises, I think I will improve (Student06.S5).

Other difficulties that I have observed were that I needed a little more flexibility to perform exercises; with this I became aware that I had to improve (Student04.S7).

Similarly, victimization reactions to problems also occurred and these attitudes were reflected on, particularly in the final phase of the process (S13: 46.1%) when the test was closer, and in the initial phase (S1: 28%):

It is true that the exam has been chaotic and there have been complicated moments, but what has bothered me is that one classmate blamed me for performing poorly when perhaps it was him who was not performing well (Student03.S13).

At the beginning of the exam when the teacher was throwing questions to the whole group, I felt comfortable and answered correctly, but when it was my turn to solve a question, I just went blank. I was angry and helpless because I remembered everything only a few minutes earlier, but during the exam, I failed, and I felt very bad (Student01.S13).

Students also pointed out that in the face of obstacles they relied on the group of colleagues to solve difficulties, especially in the progress phase (S6: 30.8%; S5: 30.1%):

In the handstand, I find it hard to hold myself up for long with my legs together. I solved all of this by asking two of my classmates for help, and with time, I know that I will be able to do it correctly without any help (Student07.S6).

I felt quite useful in the aids part. Besides, with the support of my group I discovered that changing partners and looking for people of my own weight was easier (Student 06.S5).

In addition, the participants went to teachers to a lesser extent to solve their difficulties; they turned to the teacher more frequently in the progress phase (S6: 10.8%; S5: 8.5%):

At the beginning, when the positions of the aids were new, I did them carefully in case I could not manage to catch my partner in time, but I called the teacher and she explained it to me again, helping me with the first intervention. This helped me feel more confident and secure and helped also my classmate be confident (Student10.S5).

Finally, we noted a group of statements that indicated that students did not react to

the difficulties or reflect on the possible drawbacks. This lack of reaction was particularly strong in session six (19.2%):

> *I found the class a little boring, especially the topic of error correction, since I had passed the rolls and therefore spent a lot of time doing nothing (Student03.S6).*

DISCUSSION AND CONCLUSSIONS

The capacity for self-assessment and reflection on one's learning is an essential variable for student's autonomy. We may say that this has been a relevant achievement of our methodological strategy since it progressed increasingly from the beginning, and its decrease in the last session was not alarming despite the pressure of the final examination. One could say that students reflected enough on their own mistakes. Conversely, reports that do not show any reflection on students' achievements in the tasks after they were completed are fewer, but they certainly reveal that there are students who prefer not to reflect on their actions, thus not taking an opportunity to learn from their mistakes or successes. In this context, Giacobbi and Weinberg (2000) studied responses from athletes facing sporting events. An athlete can react in an emotional or a problem-focused way. If he or she focuses on the problem, he or she will try to solve it by increasing his or her effort by planning and/or imagining alternatives, or using breathing strategies to get out of the block. The acceptance of errors, structuring of a problem and reflection are valuable and valid strategies. We must ensure that the ability to deal with a problem in a reflective way becomes a stable attitude to reduce anxiety. Undoubtedly, all reflective strategies, such as the task journal in our case, are formulas which should be encouraged and analyzed in the learning of PE, and specifically in gymnastic skills. In our study, reflections in the class journal were maintained and did not diminish nor were abandoned even in the moments of evaluation. This shows that communication and reflection strategies, such as journals, self-talk or think-aloud, and narrative interviews (Jha, 2018), all work. Ekkekakis and Brand (2019) insist that knowing how people feel when learning and practicing is an important predictor of their perseverance.

Victimization statements occurred intermittently but continuously; the lowest level occurring in the middle of the process and peaking in the final session. This is a studied psychological strategy that shows the way in which people face a problem or failure by becoming victims of circumstances (Nicholls et al., 2016). It is worrying that in the last session the victimization exceeded the capacity to reflect positively. The high presence of variables on fears, worries and anxiety, such as perceived dissatisfaction during tasks, indicated the presence of this very negative defence strategy. Anxiety is cognitive and somatic; it should not be forgotten. Therefore, there are many adaptive and maladaptive responses. The more anxiety, the less adaptive responses and the more victimization, as we have observed in this study. Anxiety before competition is the most researched obstacle in athletes, but not so in PE students. Ahsan and Kumar (2016) in a study on anxiety in PE students found that students with better study habits and strategies had less test anxiety. The greater the mastery of learning, the lower the anxiety.

The fact that people seek support, according to their narratives, evolves up to the session six, but falls off in the pressure sessions, following the most frequent pattern established for the rest of the variables. When the student's goals and expectations are very high, it generates greater anxiety; the teacher must therefore help generate alternatives that are more realistic and appropriate to the student's abilities (Nicholls et al., 2016). Additionally, the feedback offered by both teachers and peers is of vital importance,

since it may encourage learning. Alternatively, depending on its provision, it may also lead to a loss of confidence and abandonment of the task (Krijgsman et al., 2019; O'Grady, 2012).

This dimension may have been underdeveloped in this intervention as we focused more on enabling autonomy and collaboration. Although an initial test of competencies was carried out in our intervention, we did not perceive any case in which students could not achieve the expected results. Then we focused more on anxiety and emotional distress than on real competency difficulty.

Finally, within the limits of this research, we appreciate that students' narratives indicate that this strategy is valuable and worth implementing. The initial and middle phases of the process were associated with negative perception of gymnastic competition, while self-control of fears and insecurities was managed. This changed in the third phase of the intervention where anxiety increased. Therefore, the problem, not quite expected by teachers, was the drop in motivation and satisfaction as students became unable to control the pressure of the final tests (Sonlleva et al., 2018). Teachers should strive to create environments of focus on the task, motivation, and reflection on self-perception of one's ability to work under pressure. In this way students will become more involved in the process of learning and their performance will be more effective.

Among the limitations of the study, we found that we could increase the sample and make some association in terms of students' gender and previous experience in gymnastics. However, the strategy implemented has been valuable, as it has allowed us to identify students' problems and their strategies to solve them. These results will guide us to readapt the implemented strategy by revising the evaluation activities. In future research, assessment activities could be designed more in line with the collaborative and autonomous strategy as a whole; for example, role-play practices, activities that simulate the type of assessment test, and even creating discussion groups for students and teachers to share their reflections on the practice.

In short, we point out that further research by considering some variables associated with management of evaluation tasks along these methodological lines is necessary. This could reduce the pressure and underline the achievements that positive and optimal learning based on autonomy and the collaboration can provide.

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