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ANALYTICAL MATRIX IN PHYSICAL EDUCATION: IMAGES FROM THE TEACHER'S VIEWPOINT

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ABSTRACT

This article reports on the use of an analytical matrix in Physical Education classes to study images of the content of Skateboarding. It portrays photos of the participants, produced at the location where the classes were taught. Our objective was to promote the teaching of the Adventure Body Practice (ACP) Skateboarding in the urban modality. We conducted a bibliographic survey of research that uses image analysis in Physical Education textbooks. The analytical matrix used allows the informative potential of the images demonstrated in this study. The model provides a wide range of analytical categories for understanding images, in Physical Education classes, about the content taught: Skateboarding. We understand that this matrix can also be tested on adventure images present in other teaching materials. Thus, it has the potential to enrich the pictorial analysis, revealing in which dimensions and categories the discrepancies in image representation are evident.

Keywords: Adventure Body Practice. Physical Education. Analytical Matrix. Images. Curriculum.

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INTRODUCTION

We analyzed images produced in Physical Education classes, based on the construction of an analytical matrix. We aim to develop pedagogical elements to use in a future textbook. In this article, we report the use of this material to analyze images of the content Skate (Loro et al., 2021).

In this work, we produced photos of the participants in the place where the classes were taught. Our objective was to promote the teaching of Adventure Body Practices (PCA), about the urban modality Skate.

The internal logic of Skate consists of sliding over the ground and obstacles, and balancing on a board, equipped with four wheels and two axles. Maneuvers are performed in three degrees of difficulty.

The relevance of teaching Skate to students goes beyond balancing on the platform and moving with it. It can favor the discussion of rules of conduct, risk management, behavior, respect, balance, laterality, and strength. It is an activity that connects the school to the so-called youth and urban cultures, with the potential open to the protagonism of these groups (Moreira, Pimentel, and Souza, 2020). In Brazil, there are fruitful teaching experiences, especially in urban adventure. On the other hand, there is little production of images that present the formal aspects of how this knowledge is treated pedagogically in schools. The National Common Curricular Base (BNCC) established PCA as a new knowledge, which is the responsibility of Physical Education in schools (Brazil, 2019). However, it does not mention how to treat the images in textbooks. The teacher, in turn, only finds disparate images, of realities that do not express the experiences of their students. In general, the images contained in textbooks always present experiences outside of school. However, if the teacher, when promoting a pedagogical practice, produces his teaching material using the images constructed by him or by his students, there will be greater identification by his peers. Given the above, we believe there is a need for debates on the use and analysis of images in pedagogical transpositions, contained in textbooks in Physical Education (Moya-Mata et al., 2018).

Brazil has a large-scale National Book and Teaching Material Program (PNLD). It is distributed free of charge to public school students. However, Physical Education is not covered. There is a teacher's manual, but it has not been offered to teachers (Loro et al., 2021).

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In the search for more consolidated experiences, we established a partnership between Brazilian and Spanish researchers, in the use of images about adventure in school. In this sense, based on the current production of the Brazil-Spain exchange, we aim to advance the understanding of images existing in textbooks about PCA content (Inácio and Baena-Extremera, 2020).

However, since there is no instrument to deepen the analytical procedures, work was started to adapt and expand the already disseminated instrument (Moya-Mata et al., 2019). We share and invite the academic community to join this effort to expand knowledge.

METHODOLOGY

We conducted a bibliographic survey of research that uses image analysis in Physical Education textbooks. We identified that Loro et al., (2021) Brazilianized the production of Moya-Mata et al. (2018 and 2019) on the Spanish analytical matrix, that is, a method to study images in textbooks. Loro et al., (2021) produced a reworked reading of images referring to sports activities in nature, in Spanish textbooks.

The authors held meetings for reading and discussion with a view to cross-cultural validation of the material. They prepared preliminary versions, with dimensions, categories, and subcategories adapted to the Brazilian context. Then, four researchers, with doctorates in Physical Education, were invited to analyze the new version of the analytical matrix, critically review the instrument, and score each topic.

The evaluators' responses were then analyzed and tabulated by the study team, from a double-blind perspective and a third to break ties. The results were stored in an electronic spreadsheet.

Although our analytical paradigm is qualitative, we understand that it is a quantitative-qualitative relationship, as it is thus constitutive of the treatment of data in a multivariate manner. Given the categorized tabulation of the descriptions, we considered performing internal validations of the significance of the data. To this end, we used the Kappa coefficient, which is more traditional, or even the AC1 statistic, which provides a more coherent and robust approach.

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DEVELOPMENT

To use the analytical matrix, we report an experience, in Physical Education classes, on the sport of Skateboarding. We understand that it is important to approach Skateboarding beyond the conceptual dimension, contemplating the procedural and attitudinal dimensions, used in this curriculum. action (Darido, 2012).

From these classes, images were produced, which demonstrate the teaching of the modality, in a pedagogical progression of 5 classes. These allowed students to climb on the skateboard, developing balance and steering, with different positions in sequence: balance sitting, kneeling, moving in different directions, and using braking.

The classes were taught to a class of 7th graders of Elementary School II, in a state school in Londrina, Pr. We intended to broaden the understanding that Skateboarding can contribute to: interest in sports at school and outside of it, as well as, broaden the culture of students, encouraging them to play an active role in leisure.

The analytical matrix produced by Loro et al., (2022) in dialogue with the production of Moya-Mata et al., (2019) is a system of five variables, called Dimensions. Each one is subdivided into: category, subcategory, and concept. We used a 3-dimensional cutout to analyze the images produced in the Skate classes. In it, we gave priority to:

- Dimension III - Characteristics of adventure practices;
- Dimension IV - Characteristics of time and space;
- Dimension V - Body interaction with the environment.

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Table 1: Dimension III.

DIMENSION III. CHARACTERISTICS OF ADVENTURE PRACTICES

Category	Subcategory	Concept
MODALITIES	Type of physical adventure practice identified in the image.	
1.	Skate	In different modalities: slalom, street, etc.
2.	Parkour	Adventure gymnastics that covers a route.
3.	Slackline	Use of a tape to move in balance.
4.	Sport Climbing	Climbing on a sports wall, Olympic.
5.	Boulder Climbing	Natural climbing without ropes and harnesses.
6.	Cycling	Modalities such as BMX and mountain bike.
7.	Surf	Sliding over waves on surfboards.
8.	Kitesurf	Surfing with a parachute-like kite.
9.	Trekking/walking	Trails in nature.
10.	Tree climbing	Passing through platforms on treetops.
11.	Orienteering Run	Foot race in Orienteering sport.
12.	Different modalities	Combination of more than one adventure practice in the image.
13.	Not identified	The image cannot be identified.
INTERNAL MOTOR LOGIC	Interpersonal relationships are present in the motor action (Parlebas, 2016).	
1.	Psychomotor	No interaction with others.
2.	Cooperation	Sociomotor. Help each other to carry out the activity.
3.	Opposition	Sociomotor. Compete against each other, interfering with others.
4.	Cooperation-Opposition	Cooperates with peers, and opposes the opponent.
5.	Others	When there is doubt in identifying, for example, a combination of psychomotor and sociomotor.
6.	Does not apply	Justify if it is considered that the classification does not apply.
MATERIAL	Determining practice, characterizing it either for practice or prepared to facilitate initiation.	
1.	Pedagogical	Educational material manufactured and produced with technology for initiation to the modality (e.g., skateboard simulator).
2.	Own sports material	Specific material, manufactured with technology for the practice of the modality (e.g., slackline tape, skateboard).
3.	Adapted object	Specific material from other practices used in class (e.g., roller cart instead of skateboard).
4.	Own and Adapted	In the image, an object is used that is both own and adapted or an object that has been adapted (e.g., a board with a brick support).
5.	Produced object	Objects made by students and/or the teacher as part of their initiation to the modality.
6.	Not identified	Impossible to characterize the physical material present.
7.	Does not apply	When there is no material, and in fact, the sport does not require material.

Source: Loro et al., (2022).

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Table 2: Dimension IV.

DIMENSION IV. CHARACTERISTICS OF THE SPACE

Category	Subcategory	Concept
ENVIRONMENT	Element of interface or slide where interactions occur.	
1.	Land	Ground environments, such as grass, rock, sand, etc.
2.	Air	Some form of flight is present in the image.
3.	Water	Activity occurs in a liquid environment: river, lake, pool, sea.
4.	Mixed	Practice takes place with a combination of land and air, water and air, or land and water.
5.	Does not apply	Categorization is not relevant to the context of the image.
6.	Not identified	It is impossible to identify the necessary elements.
LOCATION	Whether it occurs in an open or closed area (Ambience)	
1.	Indoor	Internal area, with a roof.
2.	Outdoor	External area, open-air.
3.	Does not apply	Categorization is not relevant to the context of the image.
4.	Not identified	It is impossible to identify the necessary elements.
TYPOLOGY OF SPORTS EQUIPMENT	Typology of equipment (Pina, 2017)	
1.	Not equipped	Natural environment without human infrastructure.
2.	Not specific	Environment with infrastructure not originally planned for these practices.
3.	Specialized specific	Environment equipped for that modality.
4.	Specialized versatile	Environment equipped for multiple modalities.
5.	Does not apply	Categorization is not relevant to the context of the image.
6.	Not identified	It is impossible to identify the necessary elements.
ANTHROPOMORPHISM OF THE SPACE	Geographical features are managed or not by humans.	
1.	Natural landscape	Wild pole, absence of human intervention.
2.	Built anthropomorphic landscape	Urban, predominance of standardized cultural elements of the city.
3.	Modified anthropomorphic landscape	Natural with predominant human intervention on the land. Example: farm, park.
4.	Does not apply	Not identified or not relevant.

Source: Loro et al., (2022).

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Table 3: Dimension V.

DIMENSION V. BODILY INTERACTIONS WITH THE ENVIRONMENT

Category	Subcategory	Concept
SOCIAL CONFIGURATION OF THE SPACE	Configuration of social use or specific layout of the environment.	
1.	Domestic	Family microsystem.
2.	School	School microsystem, including outdoor.
3.	Physical/sportive	Non-school sports structure.
4.	Touristic	Tourist spots in nature or otherwise.
5.	Others	Not identified; describe what it is...
ORGANIZATION OF PEOPLE IN THE SPACE	1. Line	In column.
2.	Circle	In circle.
3.	Others	Various formations.
4.	Free	Without conventional formation identification.
EFFORT LEVEL		
1.	Very active	Advanced performance, high effort, Borg >8.
2.	Active	Intermediate, moderate effort; Borg 6-7.
3.	Little active	Beginner, low effort; Borg 3-5.
4.	Sedentary	No effort. Borg 0.
5.	Does not apply	Impossible to identify.
NUMBER OF PARTICIPANTS	Number of people in action in the image.	
1.	Individual	One person.
2.	Pair	Two people.
3.	Trio	Three people.
4.	Quartet	Four people.
5.	More than 4 people	More than 4 people.
6.	Not identified	Impossible to identify the number of participants.
INTERACTION CONTEXT WITH THE MODALITY	Interaction with the modality.	
1.	Contemplative	Observing the environment.
2.	Learning	In the process of learning.
3.	Teaching	Teaching the modality.
4.	Learning/Teaching	Learning or teaching the modality.
5.	Executing as leisure	Practicing in free time, as leisure.
6.	High-performance	In a sports competition setting.
7.	Others	Describe. Example: Functional practice of physical activity (quality of life, health, etc).

Source: Loro et al., (2022).

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Figure 1: Developing balance with risk management.

Source: AUTHORS.

When applying the analytical matrix in Dimension III, in Characteristics of Adventure Practices, we can observe:

- in the modality item, we verify the absence of the object specific to the modality, since the image does not identify the PCA-Skate;

- in the internal motor logic category (Parlebas, 2016), falls under oculomotor cooperation, where we observe the presence of an adult in support of carrying out the activity;

- regarding the use of the material determining the practice, which characterizes it, whether for practice or prepared to facilitate initiation, we perceive the use of adapted material.

In dimension IV - Characteristics of the Space, it is possible to note that:

- in the environment category, the activity was carried out on land, demonstrating the grassy soil environment;

- regarding the location, by the grass context it is understood to be an outdoor environment, that is, an outdoor area;

- in the typology of sports equipment, it does not apply, because the category is not relevant to the context of the image (Pina, 2017); - in the anthropomorphization of space, it demonstrates an anthropomorphic constructed and urban landscape, with a predominance of standardized cultural elements of the city.

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In dimension V - Body Interactions with the Environment, we consider that:

- in the social configuration of the space, the image denotes a school category. It would be placed in item 5 (others) as unidentified. Although we know that, in this case, the origin of the image occurred in a school environment, in a textbook it would be difficult to identify it. For example: the lack of school uniforms;

- in the organization of people in the space, the image has a free characteristic, that is, without identification of a conventional form (wheel, circle, row, columns, or various formations);

- when we verify the level of effort made by the participant, the image is in the low-active category, demonstrating a beginner and low-effort movement;

- in the number of participants, that is, people who appear in the image, we verify only two, one being a male teenager and the other an adult woman;

- in the final analysis, in the context of interaction with the modality, the image fits into the learning/teaching category, when we perceive the interaction between a teacher and another learner.

Image 2, below, shows the students moving seated on the Skateboard, and image 3, moving standing up, with the help of the other.

Image 2: Seated movement. Image 3: Standing movement.

Source Authors.

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When applying the analytical matrix in Dimension III, in Characteristics of Adventure Practices in both images, we found that:

- in the modality item, we found the presence of the skateboard object, identifying an urban PCA;

- in the internal motor logic category (Parlebas, 2016), the image fits into oculomotor cooperation, in which we observe help between peers;

- regarding the use of the material determining the practice, we notice the use of specific sports equipment. We understand this item to be specific material, manufactured with technology for practicing the modality;

In Dimension IV - Characteristics of the Space, it is stated that:

- in the environment category, the activity was carried out on land, demonstrating the concrete ground environment, in a multi-sports court;

- regarding the location, based on the context of the image, it is understood to be an indoor environment;

- in the typology of sports equipment, it fits into non-specific equipment, because the environment was not designed for the practice of Skateboarding (Pina, 2017); - in anthropomorphization of space, it demonstrates a constructed, urban anthropomorphic landscape, with a predominance of standardized cultural elements of the city;

In dimension V - Body Interactions with the Environment, we can see:

- in social configuration of space, it is in the school category, due to the presence of the use of uniforms;

- in the organization of people in space, the images have the characteristic of a line;

- when we verify the level of effort made by the participant, image 2 is in the active category. One student sitting on the skateboard and the other pushing while moving, the image itself demonstrates the initiation of a movement. Image 3 is in the category of not very active since we notice that the students are initiating the movement;

- in the number of participants, we verify the participation of pairs in both images;

- in the context of interaction with the modality, both images fit into the learning/teaching category, when we perceive the interaction with each other. However, we noticed risk management, that is, measures to help students prevent falls and injuries during sports practice.

Images 4 and 5 below, both show the same characteristics of dimensions III and IV.

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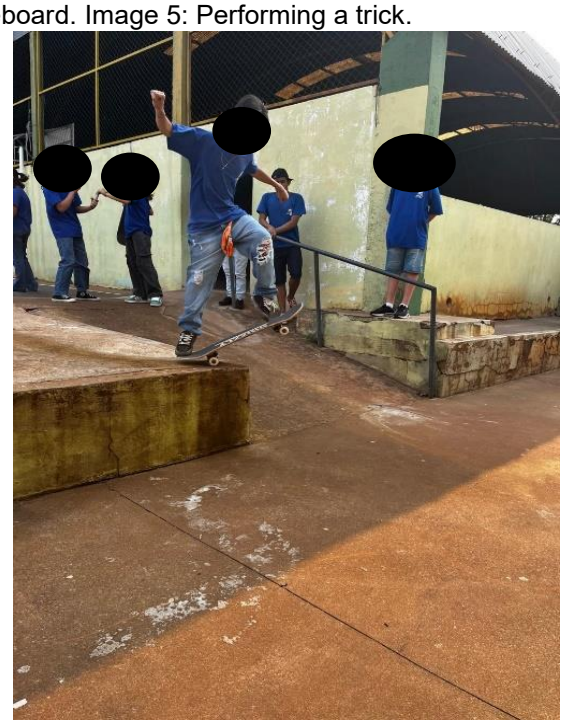
ImAct 4: Learning to get on the skateboard. Image 5: Performing a trick.

Source: Prepared by the authors themselves.

Dimension V demonstrates that:

- the social configuration of the space indicates the specificity of a school microsystem, including outdoor activities;

- regarding the organization of people in the space, the images have a free characteristic, without identifying a conventional formation;

- when we check the level of effort made by the participants, image 4 is in the low-activity category, the student is starting to get on the skateboard, with low effort; image 5 is in the very active category, as we notice that the student is performing maneuvers, with advanced performance and high effort;

- in terms of the number of participants, we see that in image 4 there is participation in pairs. Image 5 presents two subcategories, that is: in the first one, a student performs a skateboard maneuver; in the second, four people appear to observe the scene;

- in the last analysis, in the context of interaction with the sport, image 4 falls into the learning category, in which one student performs the movement and the other manages the risk. Image 5 shows two moments: the student performing the maneuver and the others in a contemplative moment while observing him.

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CONCLUSION

The analytical matrix used allows the informative potential of the images demonstrated in this study. The model provides a wide range of analytical categories for understanding images in Physical Education classes, on the content taught: Skateboarding.

We assume that this matrix can also be tested on adventure images present in other teaching materials (learning objects). In this way, it will enrich the pictorial analysis, revealing the dimensions and categories that evidence the inequalities of image representation.

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