Evaluation of Games in Games and Physical Activity Course Curriculum in terms of Common Basic Skills

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Abstract

The purpose of this study was to provide an overview of the games in the "I am Playing Games" (IPG) compilation booklet that was used in the Games and Physical Activity (GPA) curriculum. 257 games in IPG compilation booklet were coded whether they had elements that would enable development of common basic skills or not. Common basic skills were critical thinking, creative thinking, communication, research, problem solving, using information technologies, entrepreneurship, speaking Turkish correctly, effectively, and fluently. Common Skills Control List (CSCL) that includes sub-skills belonging to each common basic skill was used for coding (Doğan, 2014).

The results of the study indicated that the games in IPG compilation booklet included elements of critical thinking, creative thinking, and communication skills in all grades. The findings showed that problem solving and entrepreneurship skills were mostly represented in all grades except the first grade. And, research skills were the less used skills in the games. The effort of the study may guide educators and game experts to focus on particular common basic skills in order to create games for particular grade levels.

Keywords: educational programs, basic skills, physical activity, play

1. Introduction

It can be seen that a series of life patterns developed at and after birth are grouped under the term of the game. Children mostly play games in developing senses. Touching an object for discovering, attempting to taste something can be thought as the first trigger of games. There are various statements about game in literature; toy, movement, effort, fantasy and role modeling (McCusker & Van Doren, 2007), rough, tumble, and rolling (Tannock, 2011), violence and offensive behaviors (Dilekmen, Ada, & Alver, 2011; Flanders, Simard, Paquette, Parent, Vitaro, Pihl, & Seguin, 2010), discharge of energy (And, 2003; Schiller, 1954), fun (Wolff, 2000), joy of living (Badegruber, 2006; Nutku, 1998), instrument of learning (Dienstmann, 2008), social and emotional development (De Grove et al., 2012; İnan, 2003; İnan, 2005; Oktay, 1999; Onay, 2007; Önder, 1999; Pehlivan, 2005; Sevinç, 2004), interaction and association (Ruben, 1999) are the most common ones. Huizinga defines games as "older than culture" (1949, p.173) and regards it as an important instrument, which "serves as a resource for the birth of various types of culture" (İnan, Karagözoğlu, & Şimşek, 2014, p.52).

Games can be regarded as a magical instrument used in education. Games are not only used in the education of children but also program contents of education shareholders. Games are an important part of physical education programs and constitute a majority of time in most physical education programs (Holt et al., 2002). This situation can be observed in lesson curriculums of many countries (i.e., Canada, Australia, and the US). In Turkey, especially in recent years, there is an increasing dominance of games in curriculums (Ministry of Education [MEB], 2007; 2012) in the sense of Games and Physical Activities (GPA) course curriculum.

In 2012, physical education, which has been included in elementary education curriculum throughout the history of the Turkish republic, was adapted to the curriculum of GPA, which was designed based on a holistic approach. GPA is comprised of educational processes, which makes a contribution to the development of physical, cognitive, intrapersonal, emotional, and interpersonal skills of elementary school students (i.e., from 1st to 4th grade). In the first three grades, GPA course is taught 5 hours a week, while it is taught 2 hours a week in the fourth grade. GPA is not taught by physical

education teachers, but only taught by homeroom teachers, which might be problematic in terms of lack of expertise in physical education.

GPA is a game centered approach (GCA), as its focus is teaching students not only the skills to play a particular game but also understand the concepts of the game (Bunker & Thorpe, 1982). The idea of using a GCA is creating a better link between cognitive and physical demands of the game (Kirk & MacPhail, 2002; Miller, 2015). Through GPA, students' grade levels, prior learning, and interests, locality need to be taken into consideration by teachers. GPA is based on two core learning and development scopes, "movement competency" and "active and healthy lifestyle". In addition, to these two scopes, intrapersonal, interpersonal, and thinking skills are also included in GPA (Figure 1).

In the curriculum of GPA (MEB, 2012); it is stated that "students participating in GPA have the opportunity to improve physical, emotional, social, and mental traits and enhance their health" (p.6). Moreover, it is aimed to "develop the habit of regular participation in games and physical activities among students beginning from elementary school and provide a fund of knowledge accordingly" (p.6). The importance of regular participation in physical activity and games is also emphasized.

Competency in movement patterns
- Fundamental movement skills
- Fundamental movement concepts
- Game strategies and tactics

Active and healthy life style (AHLS)
- Principles and concepts AHLS
- Practices of AHLS
- Cultural background and values

Inter-personal skills
- Personal awareness
- Responsibility
- Self-esteem
- Time management
- Enjoyment

Thinking skills
- Observation
- Planning
- Applying
- Information processing
- Reflection

Intra-personal skills
- Communication
- Cooperation
- Fairplay
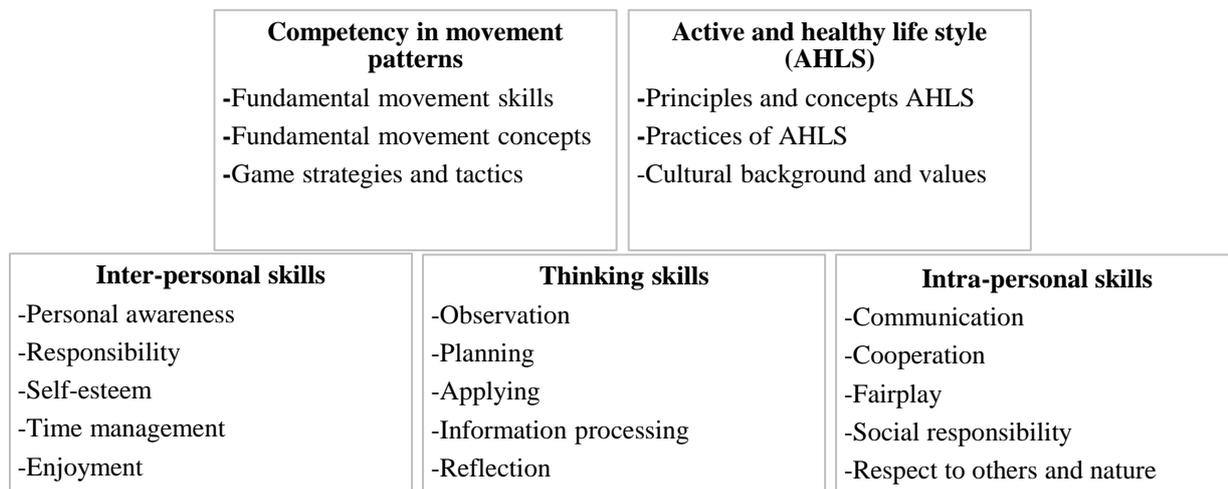- Social responsibility
- Respect to others and nature

Figure 1. Scopes of games and physical activity course

No particular teaching method or an instructional model is suggested to be used in GPA. However, it has common principles with some game models. Similar to adventure-based learning (ABL) model, GPA is not outcome based but rather a process (Dyson & Brown, 2010). ABL uses a tool named challenge by choice to allow students to have a choice in how they participate in the activities. Challenge by choice helps students to feel emotionally safe while taking part in activities. In GPA course, students are expected to construct their own learning through student-centered games and activities. One of the important aspects of GPA course is providing homeroom teachers flexibility in order to enhance student participation. Considering the outcomes of the GPA course, teachers might allow students to have a voice on what game to play and how to participate in the games. Even though sports are not taught in GPA course, both GPA and teaching games for understanding (TGfU) model focus on developing learners' abilities to play games (Meltzer, 2000). GPA also puts emphasis on problem solving skills (e.g., moving to an open space in a tag game), which is associated to using strategies and tactics in games (Griffin & Buttler, 2005). Improving problem solving skills through games in GPA makes a contribution to cognitive skills along with movement development (MEB, 2012).

IPG compilation booklet is comprised of local, traditional, and creative games and activities, which are created based on the development levels of pupils. These games and activities vary from individual to dual and team games and activities. It includes 257 games in total. 80 games in first grade, 69 games in second grade, 49 games in third grade, and 59 games in fourth grade are provided to homeroom teachers, who teach GPA course in elementary schools as an auxiliary material. IPG includes games and activities that are designed to develop locomotor skills (i.e., walking, running, and jumping), balance skills (i.e., twisting, standing, and swinging), manipulative skills (i.e., throwing, catching, and striking), and combined skills (i.e., aiming, sending, and movement games). In addition to motor skills, students are expected to acquire health-related skills (e.g., healthy nutrition, knowing the positive effects of physical activity to health).

Basic skills (MEB, 2007) are stated as "skills, which are related with the development of students in learning fields, acquired through the year, and vertically at the end of eighth grade and use throughout their life" (p.13). These were named as (MEB, 2004), "critical thinking, creative thinking, communication, research, problem solving, using

information technologies, entrepreneurship, and speaking Turkish correctly, effectively, and fluently" (p.11). One of the important aspects of GPA course curriculum is its contribution to developing life skills such as intrapersonal, interpersonal, and thinking skills. GPA puts emphasis on improving creativity, critical thinking, and reflection, problem solving in its principles. This emphasis might be linked to basic skills in the elementary education curriculum.

Various studies have been carried out in order to determine the effectiveness of elementary education curriculum in terms of the development of basic skills (Semerci &Yanpar Yelken, 2010; Özmantar, Bingölbali, Demir, Sağlam, & Keser, 2009; Hotaman, 2008, Demir, 2007). A common characteristic of these studies is that views of teachers were consulted in order to put forward effectiveness of elementary education programs in developing basic skills. In a literature review, there was no study concerning the contribution of games in "I am Playing Games" (IPG) compilation booklet (Ministry of Education, Department of Primary Education [MEBTEGM], 2012) included in GPA curriculum on developing these mentioned basic skills.

This study was conducted with the thought of how common basic skills in all courses of elementary education curriculums correspond with contents given as an auxiliary material in curriculums. It was aimed to determine whether games in IPG compilation booklet given in elementary school GPA course curriculum include elements that would enable development of common basic skills or not.

2. Method

257 games in IPG compilation booklet was the main data source of this study. 80 games in elementary first grade, 69 games in second grade, 49 games in third grade, and 59 games in fourth grade given in elementary school GPA course curriculum appendix were coded whether they had elements that would enable development of common basic skills or not. Common Skills Control List (CSCL) that includes sub-skills belonging to each common basic skill was used for coding (Doğan, 2014). Common basic skills were critical thinking, creative thinking, communication, research, problem solving, using information technologies, entrepreneurship, speaking Turkish correctly, effectively, and fluently.

Data were coded by three coders. First, each coder was trained by learning the definition of common basic skills and passed a written test matching definitions to common basic skills; the criterion to pass was 100%. Then, the coders were given thirty different games selected from physical activity cards (i.e., yellow cards group) and asked to code them, with a criterion of 90%. Yellow physical activity cards group, which is not the focus of this study, is also designed for GPA course, particularly to contribute the development of fundamental movement skills, movement concepts, and game tactics and strategies. If coders failed to meet the criterion at any point they returned to the beginning of the process and started with the definitions of common basic skills. Inter-coder agreement was conducted on 100% of the games. The mean agreement was 92.6% (range, from 90.5-94.1%).

3. Findings

In this section, findings were given about the games in IPG that would enable development of common basic skills in elementary education curriculums. Since there was no finding of games related with the skill of using information technologies among common basic skills, this skill was excluded from the study.

3.1 Critical Thinking Skills

In the table below, frequencies and percentiles of games that would contribute to the development of critical thinking skills according to grade levels were given.

Table 1. Frequencies and percentiles of games that would contribute to the development of critical thinking skills according to grade levels

	Critical Thinking Skills	1st Grade (80 Games)		2nd Grade (69 Games)		3rd Grade (49 Games)		4th Grade (59 Games)		Total (257 Games)	
		F	%	f	%	F	%	F	%	f	%
1	Differing what is known and unknown	21	26	48	70	49	100	57	97	175	68
2	Determining correctness of what is known	21	26	48	70	49	100	57	97	175	68
3	Questioning the reason of facts	13	16	48	70	49	100	57	97	167	65
4	Making relation between cases and facts	22	28	48	70	49	100	57	97	176	68
5	Determining correctness and integrity of provided information	7	9	39	57	49	100	57	97	152	59
6	Defining irrationality and misreasoning in provided information	5	6	39	57	49	100	57	97	150	58
7	Differing facts and opinions (phenomenon and ideas)	10	13	39	57	49	100	57	97	155	60
8	Determining logical criteria to evaluate value or compatibility of an action or behavior	4	5	36	52	49	100	57	97	146	57
9	Sharing the logic between ideas and views	1	1	36	52	49	100	57	97	143	56
10	Making judgment and reaching logical results	7	9	43	62	49	100	57	97	156	61

When Table 1 is analyzed, it is seen that frequency and percentile of games that would develop critical thinking skills varies based on the grade level. According to this, in the IPG compilation book at first grade level includes fewer elements that would enable students to use their critical thinking skills compared to other grade levels. Therefore, nearly all of the games in third and fourth grades and most of them in second grade have more contribution in the sense of elements they include in developing critical thinking skill of students.

3.2 Creative Thinking Skill

Table 2 shows the frequencies and percentiles of games that would contribute to the development of creative thinking skill according to grade levels.

Table 2. Frequencies and percentiles of games that would contribute to the development of creative thinking skills according to grade levels.

	Creative Thinking Skills	1st Grade (80 Games)		2nd Grade (69 Games)		3rd Grade (49 Games)		4th Grade (59 Games)		Total (257 Games)	
		f	%	F	%	f	%	F	%	f	%
1	Originality and creating new ideas	5	6	31	45	49	100	59	100	144	56
2	Imagination	22	28	45	65	49	100	59	100	175	68
3	Making extraordinary relations	14	18	42	61	49	100	59	100	164	64
4	Being open to intuitions, emotions and desires	39	49	52	75	49	100	59	100	199	77
5	Taking risks, showing courage and challenging	44	55	64	93	49	100	59	100	216	84

In Table 2, distribution of games, which enables development of creative thinking skills according to four grade levels, is presented. According to this, all of the games at third and fourth grade level, most of the games in secondgrade level include elements that would enable development creative thinking skill. In this sense, contrary to the games at first grade level, it can be said that games in other grade levels have more contribution to the development of creative thinking skills of students.

3.3 Research Skills

In this category, distribution of elements included in games given in IPG compilation booklet is shown according to research skills.

Table 3. Frequencies and percentiles of games that would contribute to the development of research skills according to grade levels.

	Research Skills	1st Grade (80 Games)		2nd Grade (69 Games)		3rd Grade (49 Games)		4th Grade (59 Games)		Total (257 Games)	
		f	%	F	%	F	%	f	%	f	%
1	Asking Question	29	24	52	75	49	100	57	97	177	69
2	Observation	42	53	58	84	49	100	57	97	206	80
3	Estimation	44	55	68	99	49	100	57	97	218	85
4	Data Collection	2	3	0	0	0	0	1	2	3	1
5	Data Recording	0	0	0	0	0	0	1	2	1	0,39
6	Data Correction	1	1	0	0	0	0	1	2	2	1
7	Data Explanation	0	0	0	0	0	0	1	2	1	0,39
8	Presenting Research Results	0	0	0	0	0	0	1	2	1	0,39

Table 3 demonstrates "asking question, observation and estimation" are the only research skills that are observed in all grade levels. It can be said that nearly all of the games in third and fourth grade level and most of the games in the second grade level have more contribution to the development of the first three research skills compared to games at first grade level.

3.4 Communication Skills

In this category, distribution of elements included in games given in IPG compilation booklet is given according to communication skills.

Table 4. Frequencies and percentiles of games that would contribute to the development of communication skills according to grade levels.

	Communication Skills	1st Grade (80 Games)		2nd Grade (69 Games)		3rd Grade (49 Games)		4th Grade (59 Games)		Total (257 Games)	
		f	%	f	%	f	%	F	%	f	%
1	Listening	69	86	69	100	49	100	59	100	246	96
2	Stating emotions and thoughts verbally, written and through body language	45	56	59	86	49	100	59	100	212	82
3	Taking and giving feedback	22	28	58	84	49	100	59	100	188	73
4	Using communication Tools	23	29	58	84	49	100	59	100	189	74
5	Displaying behavioral grace	29	36	58	84	49	100	59	100	195	76
6	Discussing	1	1	0	0	0	0	0	0	1	0,39
7	Making relations	16	20	3	4	0	0	0	0	19	7
8	Being broad-minded	3	4	0	0	0	0	0	0	3	1
9	Persuading	2	3	0	0	0	0	0	0	2	1
10	Gathering around a common purpose	65	81	69	100	49	100	59	100	242	94

According to Table 4, nearly all of the games included in fourth grade level of IPG compilation booklet do not include elements that would enable development of skills of "discussion, making relations, being broad-minded and persuading". Table 4 shows that great majority of games at secondgrade, all the games in third and fourth grade levels have more contribution for the development of other six communication skills compared to games at first grade level.

3.5 Problem Solving

In this category, distribution of elements included in games given in IPG compilation booklet is given according to problem solving skills.

Table 5. Frequencies and percentiles of games that would contribute to the development of problem solving skills according to grade levels.

	Problem Solving Skills	1st Grade (80 Games)		2nd Grade (69 Games)		3rd Grade (49 Games)		4th Grade (59 Games)		Total (257 Games)	
		f	%	f	%	f	%	F	%	f	%
1	Recognizing problem	31	39	58	84	49	100	59	100	197	77
2	Determining whom the problem belongs to	17	21	57	83	49	100	59	100	182	71
3	Creating appropriate questions to enlighten problem	27	21	56	81	49	100	59	100	182	71
4	Defining and explaining problem	22	28	56	81	49	100	59	100	186	72
5	Recognizing source of information specific to problem	19	24	56	81	49	100	59	100	183	71
6	Determining options of solution	28	35	56	81	49	100	59	100	192	75

		f	%	f	%	f	%	f	%	f	%
	specific to problem										
7	Thinking possible results of each solution	31	39	56	81	49	100	59	100	195	76
8	Choosing the most appropriate way	33	41	57	83	49	100	59	100	198	77
9	Determining whether there is need for help or not in solving the problem	30	38	56	81	49	100	59	100	194	75
10	Applying the appropriate solving method	35	44	58	84	49	100	59	100	201	78

Table 5 shows that games in IPG compilation booklet have contribution to problem solving skills for each grade level. Similar to other basic skills, percentile for first grade games are lower than other grades games. As the level of grade increases, the number of games that contributes problem solving skills increases. Contrary to other common basic skills, each skill in the category of problem solving skills is included in games in all grade levels.

3.6 Entrepreneurship Skills

In this category, distribution of elements included in games in IPG compilation booklet is given according to entrepreneurship skills.

Table 6. Frequencies and percentiles of games that would contribute to the development of entrepreneurship skills according to grade levels.

	Entrepreneurship Skills	1st Grade (80 Games)		2nd Grade (69 Games)		3rd Grade (49 Games)		4th Grade (59 Games)		Total (257 Games)	
		f	%	f	%	f	%	f	%	f	%
1	Being sensible to common needs of group which have not been recognized yet	24	30	23	33	49	100	57	97	153	60
2	Taking risks	52	65	68	99	49	100	57	97	226	88
3	Being open to new ideas, information and skills	17	21	53	77	49	100	57	97	176	68
4	Being open to possible critics and failures	39	49	69	100	49	100	59	100	216	84
5	Showing courage to try innovations by risking losing and taking pleasure of it	55	69	67	97	49	100	57	97	228	89

According to Table 6, it is seen that important contributions can be provided to entrepreneurship skills through skills of "taking risks", "being open to possible critics and failures", and "showing courage to try innovation by risking losing and taking pleasure of it". It is understood that games in third and fourthgrade can contribute to the development of each skill in the category of entrepreneurship skills.

3.7 Speaking Turkish Correctly, Effectively and Fluently

Distribution of elements included in games is shown according to skills of speaking Turkish correctly, effectively and fluently.

Table 7. Frequencies and percentiles of games that would contribute to the development of skills of speaking Turkish correctly, effectively and fluently according to grade levels.

	Skills of speaking Turkish correctly, effectively and fluently.	1st Grade (80 Games)		2nd Grade (69 Games)		3rd Grade (49 Games)		4th Grade (59 Games)		Total (257 Games)	
		f	%	f	%	f	%	f	%	f	%
1	Speaking Turkish correctly	10	13	0	0	0	0	1	2	11	4
2	Speaking and writing eligibly	21	26	58	84	49	100	57	97	185	72
3	Controlling whether understood correctly or not	40	50	58	84	49	100	59	100	206	80
4	Writing legibly	0	0	0	0	0	0	1	2	1	0,39
5	Listening effectively	62	78	59	86	49	100	59	100	229	89
6	Speaking Turkish appropriately	2	3	0	0	0	0	1	2	3	1

Table 7 demonstrates that skills of "speaking and writing eligibly", "controlling whether understood correctly or not", and "listening effectively" are observed in games for each grade level. Similar to other common skills, games in first grade level, which require using skills of speaking Turkish correctly, effectively, and fluently used less comparison to the games at other grade levels.

4. Discussion

Data suggest that games for all grade levels include elements of critical thinking skills, which are "differing what is known and unknown", "determining the correctness of what is known", "questioning the correctness of what is known", and

"questioning the reason of facts", "making relation between cases and facts". The distinction here is the games prepared for first grade level. Games in IPG compilation booklet for first graders do not include skills apart from those stated above, whereas the games for other grade levels include all items of critical thinking skills.

In his research about the effect of educational games on critical thinking, Şahhüseyinoğlu (2007) stated that having joy in educational games had positive contributions to problem solving and as well as critical thinking skills. Besides, enjoyment of participation in games and activities increases physical activity level (Wallhead & Buckworth, 2004). In another study (Kazu & Şentürk, 2010), it was specified that branch and homeroom teachers think that elementary education curriculum seem to develop critical thinking skills. Learning to play games fosters the development of cognitive skills such as strategic thinking and problem solving (Aspin, 1976).

Games in the IPG compilation booklet include the elements of creative thinking skills for all grade levels. However, some items in creative thinking skills such as "originality and creating new ideas", "imagination", and "making extraordinary relations" are not properly represented in the first grade games. It might be concluded that all the other items, which contribute to the development of creative thinking skills are represented at high rate. It is important that all the games in third and fourth grade include the elements of creative thinking skills.

Even though, games for the first grade refer to some items in research skills, "asking question", "observation", and "estimation", other items "data collection, recording, arranging, explaining" and "presenting research results" are not coded in games at any grade level. As it is expected to be carried out effectively by children to play games, "listening" was the most coded communication skill in games at all grade levels. Some items of communication skills such as "discussing", "making relation", "being broad-minded", and "persuading" were less or not included in games at any grade level. This finding seems to demonstrate that the games are designed with a focus on psychomotor aspects rather than cognitive. Another important point is that the item "gathering around a common purpose" was highly coded in games at all grade levels. In line with our findings, Aksoy (2014) determined that games enable children to improve living, communication, and language skills.

According to the findings, "recognizing problem", "thinking possible results of each solution", "choosing the most appropriate way", and "determining whether there is need for help or not in solving the problem" were coded many times in games at all grade levels. Games at all grades, except first grade, also referred to the other items of problem solving with a high rate. This finding seems to show the lack of readiness of first graders in terms of abstraction skills. There are different variables, such as personality, classroom environment, grade level and socio-economic status that affect problem solving skills (Özer, Gelen & Öcal, 2009; Gömleksiz & Bozpolat, 2012). Aksoy (2014) emphasized that traditional games facilitate problem solving and self-management skills in childhood.

Games in the IPG compilation booklet include the elements of entrepreneurship skills for all grade levels. "Taking risk" and "showing courage to try innovations by risking losing and taking pleasure of it" were the most coded items in all grade levels. On the contrary, "being open to new ideas, information and skills" was the least referred element of entrepreneurship skills to all grades, particularly to first grade. Bacanak (2013) claimed that student-centered approaches and strategies might be effective in developing entrepreneurship skills of students. This seems to confirm the findings of our study in the sense of entrepreneurship skills, as games in IPG booklet are designed within student-centered approach.

"Speaking Turkish correctly", "writing legibly", and "speaking Turkish appropriately" are the elements, which were less or not included in games at all grades. This might be interpreted by the focus of the games, as psychomotor aspects are predominant. Games contribute to the development of communication and language skills of children, where they find opportunities of interact, share, and discuss (Aksoy, 2014; Şahhüseyinoğlu, 2007). In a study carried out in the sense of common skills in elementary curriculum, Temizkan (2014) determined that Turkish course books are not at expected level. Our analysis of IPG compilation booklet showed that "speaking Turkish correctly, effectively and fluently", skills of "speaking Turkish correctly", "writing legibly", and "speaking Turkish appropriately" are elements which were barely used in games at all grade levels that is in line with the findings of Temizkan's (2014) study. One of the important findings was the games referred to research skills with the lowest percentage at all grade levels.

Our findings seemed to demonstrate that critical thinking, creative thinking, and in particular listening (i.e., a communication skill) were the most coded skills in the IPG booklet. Problem solving and entrepreneurship skills were less coded in the games of the first grade. On the contrary, games of second, third, and fourth grades were highly referred to these skills. Kirk & MacPhail, (2002) asserted that approaches to learn playing games such as the TGfU might be consistent with cognitive and constructivist theories of learning (Dodds, Griffin, & Placek, 2001; Rovegno, Nevett, & Babiarz, 2001). These theories emphasize the social, cognitive, and physical learning that physical activities and games can promote. In this context, we believe that games in IPG booklet also might contribute to thinking skills, as they are designed to make students construct their own learning.

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