Designing a Model for Children Education through TV with a Cognitive Approach for Environmental Education

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طراحی مدلی برای آموزش کودکان از طریق تلویزیون با رویکرد شناختی برای آموزش محیط‌زیستی

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چکیده:

هدف ما در این پژوهش طراحی یک مدل برای آموزش تلویزیونی کودکان با رویکرد شناختی درباره آموزش محیط‌زیستی است. انسان در عصر رسانه در معرض بمباران اطلاعات است و این مجاورت با اخبار گوناگون باعث شده که یادگیری امری سخت شود. به ویژه این که بخشی از این نوع آموزش توسط همین رسانه‌ها صورت می‌پذیرد. آموزش‌های عمومی که مخاطب آن عموم مردم هستند توسط رسانه‌های جمعی انجام می‌شود. همان‌طور که در آموزش‌های رسمی مدارس، استفاده از رویکرد علوم شناختی به آموزش باعث بالا رفتن بهره‌وری آموزش شده است، یافتن مولفه‌های شکل‌دهنده آموزش شناختی در تلویزیون می‌تواند آموزش از راه دور را بهبود دهد و تا حد زیادی امکان دسترسی به کودکانی که به دلیل زندگی کردن در روستاها و یا مکان‌های دور افتاده از آموزش حضوری با کیفیت محروم هستند را بیشتر کند. با توجه به اکتشافی و چندجانبه بودن این تحقیق، از کارشناسان رشته‌های مختلف (مانند روانشناسی، ارتباطات و آموزش) با اجرای روش کیفی تحقیقی گروه‌های کانونی استفاده شد. نتیجه پژوهش در این مقاله نشان می‌دهد شناخت ویژگی‌های رشد شناختی کودکان در حوزه دیداری و شنیداری و همچنین بهره‌گیری از مبانی آموزش شناختی در جلب توجه، تحلیل و حل مسئله چطور می‌تواند اثر بلندمدت تری برای آموزش شناختی از راه دور رقم بزند تا کودکان فراگیری بهتر و طولانی‌تری درباره مسائل محیط‌زیستی داشته باشند و محدودیت‌های مکانی باعث تاخیر در آموزش‌های ضروری مسائل محیط‌زیستی به مکان‌های دور افتاده نشود.

واژه‌های کلیدی: آموزش شناختی، آموزش از راه دور، محیط‌زیست، کودکان، تلویزیون.

Abstract:

Our aim in this research is to design a model for children TV education with a cognitive approach to environmental education. People are bombarded by information in the media age, and this subjection to various news has made the learning process hard. Especially because a part of this sort of education is done by these media. The public education whose addressees are the public is done by mass media. As in schools' official education, using cognitive science approach toward education increases the efficiency of education, finding the shaping characteristics of cognitive education on TV can improve the long-distance education, and greatly develop access to children living in villages and remote areas deprived of access to high-quality education. Considering the exploratory and multi-dimensionality aspect of this research, we have used experts from different disciplines (like psychology, communication, and education) by implementing focus groups qualitative research method. The result of our research in this study shows how the benefit of knowing the characteristics of children's cognitive development in visual and audio fields, and also utilizing the principles of cognitive education in drawing attention, analyzing and solving problems can have a longer-term effect on cognitive distance education so that children can have better and more lasting learning about environmental issues, and so that the location limitations may not delay the vital education about environmental issues to remote areas.

Keywords: Cognitive Education, Distance Education, Environment, Children, TV.

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Introduction

According to numerous studies, it is estimated that elementary-school-aged children spend 2 to 4 hours of their daily time watching television (Amirteimouri, 2015).

Today, a large part of education takes place through the media, in particular, the television. Studies show that changes in human lifestyle has made the educational role of media analogous to family and school, and led the United Nations to ask television organizations to pay more attention to their educational role.

By the ontological definition of media, they are a fundamental part of human existence. More precisely, the extension of the concept "social affair" (as a form of "pure" interaction), regardless of the role of particular media forms, even if the media are "merely" inclusive of spoken language in face-to-face encounter is problematic (Loon, 2011).

Responsibility and role of television in McQueen's (2004) perspective in various fields are so that, according to Lerner and some theorists of communication and development, the introduction of mass communication media into societies, and in particular the underdeveloped societies, is equal to development.

These theorists believe that literacy produced by television in communities has largely led the communities deprived of official knowledge for any reason to come on the path of development.

Among the experiences of people like Lerner (Farhangi, 2010), who has also had field research in this regard, one of the most important ones is changing agricultural and environmental patterns.

Although critical theories later criticized some of the reasoning constructs of modernization theorists, and the media have even been deemed a cause for knowledge gap, the role of the media cannot be ruled out in creating and expanding various social norms and public culture, especially since today TV is used as one of the most important means of distance learning.

On the other hand, the excessive television messages and the emergence of multimedia and special circumstances of the day-to-day information bombardment negatively affect the effectiveness of media messages, and attention economy requires turning to ways that can draw more attention and create a lasting effect on the mind of the audience. Therefore, formal education requires more efficient approaches to draw attention and durability, and this has led to the transformation of behavioral education into cognitive education. The discovery of cognitive methods for educating children in the media, especially in the field of environmental education, as a common norm which is more important in the media than in the schools, is of absolute necessity.

Most empirical and scientific studies and researches on children's physical and mental development have been done in the twentieth century. Early this century, a French psychologist named Alfred Binet, with the help of his co-worker Simon, developed the first children's intelligence test. During these years, Sigmund Freud also presented his theories about the profound influence of childhood experiences on the morale and behavior in adult age. American John Dewey's beliefs about children's need for education through practice and experience left a great influence on children education, either at school or at home. He believed that education should always consider social change, and there should also be an active and close relationship between school activities and real-life environment (Seyf, 2017).

In this regard, while studying cognitive education using the qualitative method of documentary studies in the field of neurology and cognitive development, and also cognitive literacy on the one hand, and face-to-face negotiation of experts in focus group method on the other hand, we attempted within the framework of interdisciplinary dialogue between experts in educational sciences, cognitive sciences and media, to develop a program-making model to teach environmental issues with a cognitive approach on television for children.

Main areas of cognitive education on TV about the environment

In their research, Mousavi and Rahmanirad (2018) considered attending geographical aspects and the appeals caused by its enthusiasm and excitement as the most important field of use of the cognitive method for environmental education. In their view, visual media can help cognitive attitudes of children and adolescents in the important issue of distance education.

However, we should not forget that using interactive methods, as mentioned in the previous sections, can lead to more effective and longer-lasting educational practices in the field of environment. (Zamani Moghadam, 2013)

Some of the most important possible uses to design an interactive interaction between the child and TV are:

1- Teaching natural geography and dangers of manipulating nature, such as floods and soil erosion

2- Focus on individual diseases caused by non-observance of personal and public health (Meybodi, 2013)

3. Teaching basic and simple concepts of sustainable development

4. Teaching about the planet, air, and soil

(Karimi, 2011)

5. Waste-recycling entertainment

6. Improving public participation in cleaning the environment

7- Holding campaigns and various contests to solve environmental problems of school, neighborhood, and home

8. Identifying disturbing factors in learning by TV new interactive techniques (Yazdi, 2012)

9. Forming social networks on the media for public assistance in the protection and conservation of natural resources

10- Enhancing awareness in favor of cooperation and supportiveness for the environment (Sabzei, 2016)

11. Developing positive sensitivity for the issues and discourse seeking of the environment (Ghanei, 2016)

Based on the experts' suggestion, by creating a matrix of these issues for the proposed methods, one can see the implementation of media programs with a cognitive approach, based on which the impact factor and durability of published messages in this field would improve and lead to attitudes and behaviors.

Now, considering that the most important issue in distance education is the critical issue of drawing attention, we should see how cognitive learning can draw audiences for environmental education on television and develop attitude and persuasion.

Learning and its goals

Thagard believes that many important types of learning can naturally be understood in the form of acquisition, modification, and utilization of rules. Some rules may be intrinsic, meaning they may be a part of biological components with which human beings are born. A physical principle, like: "If something comes toward your eyes, then blink," is not something humans or other

living creatures have to learn. More controversially, many cognitive scientists believe that most language rules are intrinsic. But nobody claims that the rules of how to enroll in a university are intrinsic, then these rules are learned, whether by inductive, deductive, or hypothetical analogy (Thagard, 2015).

If learning is considered any kind of acquisition, it is evident that transformation is nothing but a sequence of learnings. But they usually assign the term of learning to an acquisition which is essentially extraneous, whether the subject is restricted to re-creating responses that are dependent on the repetition of external events (conditioning, etc.), or that they have discovered the repeatability response, and in the latter case, follow a device that utilizes only its sequence of events, without being related to its construct based on the organizer's activity and along with the gradual construction (Dadsetan, 2009).

From Gagne's point of view, the most important mission for a proper qualitative education in every field is to find the answer to achieving the proper way by performing it in the following nine steps. (Kharrazi & Talkhabi, 2012)

According to the information-processing approach toward knowledge and learning, Gagne defined nine educational steps in adaptation to cognitive mechanisms. Although Gagne believed there are some exceptions, he believed that many educational lectures or situations should follow this framework:

Step One: Draw the child's attention

Step Two: Make him aware of the goals of learning to create the right expectations

Step Three: Ask about his previous knowledge about the topic of the lesson to activate the appropriate pattern

Step Four: Provide materials, along with specific encodings

Step Five: Provide cues to retrieve the materials

Step Six: Provide a meaningful and cohesive organization for educational materials to enhance semantic encoding

Step 7: Encourage the learning child to react to the presented material

Step 8: Provide feedback and enhance learning

Step 9: Give the opportunity to practice and repeat (ibid 29)

Of course, it should not be forgotten that the most important issue in creating continued education is self-organization (ibid 98). Self-organization is the prerequisite for learning in complex situations. One needs to be able to modify his mental structures in order to organize his interactions with the outside world in the information society and creates useful information patterns by linking information resources.

Another important mission for television education is social-cognitive development and the audience's critical attitude toward the environment, which is also referred to as cognitive media literacy.

The audience's decision-making center is the most important concept that shows a person's media literacy level. This term refers to somewhere in the mind where decisions about information processing are taken. The position of the decision-making center in the media literacy model is in the center of the model which is depicted consisting of five basic knowledge; this center is the place which controls the skills and capabilities in information processing. A capable decision-making center always drives the individual to use more mental power to process information. The larger the knowledge structure of the audience, the more knowledge their decision-making center will have about

the options (Potter, 2011).

Cognitive development of children at a glance

More than anything, for optimal learning children, which is also referred to as culturalization and normalization, we should know more about children's learning and understanding system.

The development process links the sensorimotor stage structure to the tangible stage structure which occurs between the ages of 7 and 11. Between these two stages, is the pre-operational stage (2 to 7) which is characterized by assimilation with action (symbolic games, lack of mental conservation, pre-causality, etc.) emotional, social and cognitive aspects of behavior are inseparable from each other. Emotions are a powerful source of behavior, and cognition builds its structuration (Piaget, 2003).

When we talk about children education by media, we mean second childhood or the time when usually between 7 and 11, the foundations of many of their mental and emotional states are set. The most important stages of development in this period are:

1- Learning the physical skills required for normal games

2- Developing a healthy and useful attitude in children as a living and growing human

3- Learning peer behavior

4- Beginning of the development of appropriate sexual and social male and female roles

5- Learning the basic skills of reading, writing, and calculation

6. Development of the concepts required for normal and everyday life

7. Development of conscience, morality and value criteria

8. Development of attitudes toward social groups and institutions

9. Achieving personal independence (Seyf, 2017)

The cognitive characteristics of children in this stage are as follows:

A) Mental conservation of concepts

B) Classifying

C) Arranging or organizing

Learning, like any other forms of behavior, is the result of a stimulus or stimuli. The need to depend on and belong to a group, the need for self-expression, and the need for security is the key driver in learning. The need for something allows one to desire and seek that thing. Desiring drives the person to try, as a result of which the person reaches the purpose (Shahiatmadari, 2003).

At these ages, children have the ability to interpret, predict, and change others' feelings. The formation of self-confidence, which has already begun, develops tremendously at these ages. If the child is excessively criticized, threatened or punished at this age, his joyful game and his bold efforts to master new assignments (i.e., assignments to be taught later in school) are suppressed. At these ages, the child becomes capable of engaging in pretend play (a kind of play in which routine and imagery roles such as police and parents are played). These games play a crucial role in the child's development. (Tabrizi, 2015).

The child's brain in media perception

In the first step, there are three reasons for children's interest in watching TV:

1- For fun

2- To obtain information

3- Because of its social benefit (Lowery, 2009)

Mental development during primary school is rapid, and problem-solving skill will be gradually achieved. The extensive experiences children gain overtime at this stage allow them to better understand the cause-effect

relations between phenomena than in previous years. Children's mental development is at the concrete operational stage in which children`s activity is objective and tangible, they are able to exercise rational actions, they can think about the possibility of doing different actions and their results, they don't need to do things through trial and error, and they understand the concept of conservation of mass, numbers, weight, and volume, as well as acquiring the ability to categorize and arrange. Primary school children achieve several important mental skills, including mental reversibility, mental conservation, and reasoning. In reversibility, children can return to the starting point at any moment and consciously repeat the action and predict possible outcomes by hypothesizing, and ensure if their performance is right through converse theorem. Reversibility is widely used in the mathematical operation and physical phenomena (Kadivar, 2017).

Through conservation, children recognize reality better and realize that apparent changes do not disrupt the size and nature of equivalent objects (Shafiabadi, 2009)

Neuroscience researches show that learning changes the brain`s physical structure and consequently, its functional organization. That is why Zull defines teaching as the art of changing the brain because, with each stimulus, the brain can create new experiences, behaviors, and connections. (Kharrazi & Talkhabi, 2012).

Although in the process of achieving learning theories, which has taken an empirical course of about 200 years by starting from the conditioning theory and behavioral theory, associations, and gestalt, we have come to the cognitive-learning and cognitive-behavioral theory, but it cannot be forgotten that in media education all methods, even classical conditioning, should be looked at seriously.

Piaget was the first to find that adults' thinking is distinct from children's thinking and that children think differently at different ages. He devised a stage theory for cognitive development based on his researches. Piaget's theories have had very extensive educational applications and a profound impact on education and the way we think about children.

Piaget's theory about cognitive development is based on three pivot principles: assimilation, accommodation, and equilibrium. But before explaining them, it is important to define the term "schema."

A schema is a cognitive representation of activities or objects. When a baby is born, he has a natural schema for sucking, to ensure that he feeds, and therefore he grows. As the baby develops and his experiences and nutrition change, this schema integrates with other eating schemas.

And the description of those three principles:

Assimilation is the process of putting together a new experience and the pre-existing mental structure (schema). Children's cognitive structures develop to help them make their world meaningful, and when they encounter a new experience, they place it within the framework of schemas he had already expanded.

Accommodation is the revision of existing schemas, due to encountering a new experience. For example, a child may have a schema based on which he describes every flying object as a bird. But when he encounters a toy flying disc, this encounter does not fit his schema. This object is not alive, so a new schema is needed.

As children develop, they encounter experiences that existing schemas cannot explain. Therefore, they must develop new schemas in response to these new experiences. Equilibrium is the search process to achieve

cognitive sustainability through assimilation and accommodation.

When encountering new experiences, children constantly try to interpret and understand the world. Children make an understanding of the world and how it works, but this understanding is constantly challenged by encountering new experiences which contradict their current understanding. Children try to find new schemas to help them in this interpretation process. The motivation to achieve equilibrium is that all these interpretations and schemas fit each other and provide a coherent and logical picture of the world. However, equilibrium is a constantly changing thing, because every time children encounter a new experience, they are in a situation of disrupted equilibrium until assimilation and accommodation occur (Oakley, 2015).

According to Bandura's research, these methods are even used in the treatment of disorders too. (Zarb, 2002)

The stages Bruner suggests in mental development are equivalent to Piaget`s stages (sensorimotor, objective operation, and formal operation).

1. Enactive stage

In this stage, children identify things and events through what they can do with them; however, they are still not able to imagine and think. Intelligence is entirely practical in this stage, and children`s learning is non-verbal and happens through his actions on objects.

2- Iconic stage

At about age three, another system forms in children mental development, which Bruner calls an iconic stage. A major feature of this stage is the start of language learning, which gives children a new ability. From now on, children mentally do what they previously did practically and sensorimotor ally, and owing to the mental images of the objects. Children

do not need much direct manipulation. This intellectual system depends to a great extent on the sense of sight and other senses, in which children benefit from many tangible visual images.

3- Symbolic representation stage

At this point, independent images develop in children's minds, which makes them independent of tangible visual images. This is made possible through using language. The term "symbolic" indicates the mental construct progress through symbolic method learning, without which children cannot internalize their surroundings and thus cannot hypothesize and think about ideas, analogize, and predict (Seyf, 2017).

Distance education by TV

Using technology in education and learning makes life easier and more convenient and useful for us. As a result, it brings welfare to mankind; therefore, the new dimension of life in which technology plays a role, takes on a new meaning by adding the adjective "modern" (Afzalnia, 2013).

Technology expands the classroom and shrinks the structure of the courses. Out-of-university experts and resources can be easily accessed by educators. (Eskandari, 2011).

A simple layout of the stages of the communication-oriented learning experience is depicted below:

1. Awareness and receptivity: At this stage, people are accustomed to "harness the knowledge overflow," and for the first time, they deal with new resources and learning tools in their habitat. If this stage is not cared for with an appropriate motivation background, like the stage of basic skill acquisition, it may lead to a disappointing experience and often leads to the learner exiting the learning environment.

2. Shaping communication and selection

filters: At this stage, people start using tools and using the knowledge obtained in the previous stage to create and form a personal network of resources (individuals and contents). Active learners begin their presence in the learning environment, which is referred to as "consuming or acquiring new resources and tools." Effective and inciting factors such as entertainment, pleasure, positive interaction, and sense of meaningfulness are vital for founding the roots of a personal learning network.

3. Cooperation and participation: In this stage, the learner actively participates in the learning network – It basically becomes a "visible group." At this stage, group culture and social space are key factors for the individual's cooperation and participation.

4- Reflection and meta-cognition: Thinking about processes and products, of knowledge self-reflection and self-evaluation, like meta-cognition (thinking about thinking), plays a prominent role in this stage (Eskandari, 2011). Another important aspect of TV's impact on children education is incidental teaching:

"Incidental teaching takes place when the viewer goes to TV for fun and unconsciously gains some information." According to researchers, children were learning while being entertained, but they did not specifically go to TV to get information. (Lowery & Defleury, 2009).

When instructional TV and its instructional applications are mentioned, the way it is used may not be the same; for example, sometimes instructional TV focuses on formal education and school curricula, while in other cases on public and informal education. Therefore, we can distinguish between educational TV (ETV) and instructional TV (ITV) (Razavi, 2015).

Designing messages in educational TV programs can be studied in four main dimensions:

1. Designing visual elements
2- Designing audio elements
3. Integrating visual and audio elements
4. Educational design

Materials and Methodology

In the interdisciplinary studies where is it talked about the link between different humanities, particularly studies carried out on attention and persuasion in the media and other mass media, it is recommended to use focus group method through documentary studies.

The following table is provided according to a documentary study and also semi-structured exploratory interviews in order to identify the pre-foundations and components of the scheme and its presentation to prepare the model in focus groups (Morgan, 2015), and its encoding, so a model through a chain usage of qualitative research methods (studying documents, interviews and modeling conclusion in focus groups) can be obtained.

To achieve this goal, three focus groups were match-made in the fields of communications and media, including experts in the field of making children programs[1], psychology[2], and school environmental teaching assistants[3] based on focus group methodology (Fern, 2011) for the purpose of the research, and after personal interviews and group discussions, they gathered to determine the main criteria of the model.

Initially, each focus group, separately with the presence of the researcher, proposed the indices for their influence in the field of education, media, and cognitive development. Among these propositions, which were

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[1] They were designated by the IRIB Pooya & Nahal's management
[2] Institute for Cognitive Science Studies
[3] These were selected counseling the Ministry of Education

subsequently compared, in addition to the participants' expertise and knowledge, their experience and also global studies were used.

Finally, the individuals' opinions, as well as their categorization obtained from the individuals' opinions and their emphasis on the thematic interpretation, were compared and concluded during a meeting sponsored by the IRIB Pooya channel.

After the meeting and comparing the views according to the focus group model (Mirak, 2010), the findings were categorized according to the individuals' opinions.

Findings and discussion

The following table is a summary of the components, which will be later described in detail, which was turned into a model according to the researchers' expertise.

Table 1. Identifying the related components and dimensions in media education using a cognitive approach

Number	Component	Source	Degree of importance
1	Game-based	Documents and experts	Cognitive appeal
2	Experience creation	Documents and experts	Cognitive appeal
3	Storytelling	Documents and educational studies	Sensory appeal
4	The musical nature of the message	Documents and experts' opinion	Sensory appeal
5	Appropriate graphics	Experts' opinion	Sensory appeal
6	Collectivism	Experts' educational Research	Cognitive appeal
7	Coaching	Experts' educational Research	Context setting
8	Sleep management	Experts	Context setting
9	Cognitive load	Documentary study	Context and environment management
10	Emotion-based	Experts and documentary study	Sensory appeal
11	Interactivity	Experts, documentary study and academic research	cognitive appeal
12	Responsibility-based	Experts and Medial organization studies	cognitive appeal
13	Challenges-based	Experts	cognitive appeal
14	Excitation	Experts and documents	Internal enhancement
15	Reality-orientation	Experts	Context setting
16	Repetition	Experts and documents	Internal enhancement
17	Practice	Documents and experts	Internal enhancement
18	Role modeling-making	Documents and experts	Internal enhancement
19	Problem-based	Documents and experts	Cognitive appeal and self-improvement
20	Continuity	Documents and experts	Internal enhancement
21	Intelligence Enhancement	Documents and experimental research	Internal enhancement
22	Excitement creation	Documents and experts	Sensory appeal
23	Equilibrium enhancement	Experts	Internal enhancement

Media products have the potential to educate and influence children's attitudes, beliefs and behaviors, and how they are socialized, although this influence depends on many factors such as the child's age, intelligence quotient, parent's education, social class, leisure activities, watching quality, watching time, the type and structure of the program itself. But the important point here is that the role and effect of the media become more prominent especially when the person does not have the experience, knowledge, and awareness, and also does not receive the right information from somewhere, and is not able to find a belief in his personal environment. This is what makes studying the contents of children's programs more important (Dehsoufyani, 2013).

Research on cognitive processes flourished during the 1970s. In this decade, 75 important books and articles were published on this topic. The research reviewed and investigated here is a study of how people remember and understand what they see and hear on TV. Almost all the subjects of this research were children.

When the child lies down in front of the TV and stares at it enthusiastically, what draws him to the device and draws his attention? In an attempt to answer this question, the researchers started to observe children secretly — usually through a one-way mirror — in the playroom with the TV set on. In addition to the TV set, there were also toys that could distract children's attention. The results of these studies were useful charts about the amount of children's attention to TV based on program characteristics, age, and individual differences.

The more people watch the TV screen. They are more likely to continue watching it (Lowery & Defleury, 2009).

Making educational program on television with an expert viewpoint takes place based on the following:

A) Stimulus sending and receiving; Hutchens says that the attention of the audience depends on two major factors: one is the comprehensibility of the content of the television program, and the other is the measures taken in the program. Music, special effects, camera movement, and narration are among these measures.

B) Perception and short-term memory; in the pattern of information processing, after the data is received and recorded in the sensory memory, it enters the short-term memory. This memory holds the information for a few seconds and sometimes for up to one or two minutes. Usually, the information will remain for a short time in short-term storage.

C) Transfer of information to long-term memory and organization; only when the information enters the long-term memory, it can be said that learning has taken place. Also, these materials should be well organized so that they can be remembered when needed (Razavi, 2015).

In contrast to this biotechnological view, program makers next focus are on the cognitive development of the child, which requires reaching these two crucial points in learning.

First, the moral understanding of development is an aspect of cognitive development. In the same way, children try to make the world meaningful in its entirety. They try to make decisions about what is right and wrong, something that is called "moral judgment." Children also need to decide how their behavior should be in a moral situation, something which is called "moral behavior." Piaget sees moral development as intertwined and dependent on cognitive development. He also mentions the importance of interaction with peers in the development of moral understanding. In his view, this is important because it allows

the child to understand different perspectives of other people, as well as learn how to resolve the conflicts. (Oakley, 2015).

The second is quantifiable intelligence; intelligence is generally defined as "the difference in the ability to obtain proper information, thought and reasoning, and efficient and effective coping with the environment." Some aspects of intelligence can be measured, which are measured in intelligence tests. It is noteworthy that these tests measure only certain aspects of intelligence, referred to as quantifiable intelligence (ibid).

For this purpose, the following solutions have been proposed:

1. Mental review strategies. It means memorizing the things you need to learn or the things that include saying words aloud. This strategy helps learners to pay attention to important information and choose them. This information is actively stored in short-term memory.

2. Semantic expansion strategy. This strategy involves explaining or summarizing the learned lessons. Among them are creating examples, active note-taking (versus passive note-taking), explaining the lesson concepts and contents to other people, and asking and answering.

3. Organizing strategy. This strategy results in deeper processing and includes behaviors such as selecting the main contents or the most important concepts from the text, preparing outlines of the contents, and applying specific methods for selecting or organizing concepts (Shafiabadi, 2009).

After studying the child's cognitive development conditions for understanding and institutionalizing learning and transforming it into behavior in their nature, it can be found that educational programs on television can be planned and designed according to the following criteria.

A) Game:

The most important superior tool for children program-making in the field of cognition is transforming contents into games.

Playing in the early stages of development is a behavior in which assimilation is superior to accommodation (that is, behavior approaches the assimilation pole, while the imitation approaches the opposite side of the pole, accommodation). Nearly all of the behaviors seen in the early stages of development are ready to become games, of course, provided that they are accompanied by assimilation in a way that pleasure is achieved from them. Of course, it should not be concluded that playing emerges after imitation and in a later stage is distinguished from adaptive behaviors. Playing begins from the very first stage of development, but its interpretation is simpler than imitation (Piaget, 2015).

In Piaget's view, the most important games that fit this cognitive status of children in this period are:

1- Building games

2. Exploring games

3- Collecting

4. Sport games

5. Entertaining games. (Seyf, 2017) and (Khabiri, 2018)

B) Experience creation

Even a child needs the experience to be able to imitate a model (Piaget, 2015).

Piaget believed that learning is the result of an individual's interaction with the environment, and the process of absorbing experiences in existing conceptual structures and adapting to the outside world is the driving force for cognitive transformation (Kadivar, 2017).

Television programs can lead to sustainable behavioral knowledge that can create a biological experience for them, not just proximity to it.

C) Being based on the roots of culture, language, and geography

According to Vygotsky's theory, the child's knowledge of things is based on three key factors: culture, language, and zone of proximal development, in which culture and zone of proximal development of the child are essential components in his knowledge realm. This means that what the child learns about the world, and the way this knowledge is learned are determined by the community to which the child belongs and the social conditions and setting the child is part of. The child learns things like songs, language, art, and games through interaction with others, and also through the elements of his culture. For example, a child who is growing up in a country dominated by Catholicism is likely to be exposed to some views through language and society. This affects his learning, knowledge, and perspective on this issue. (Oakley, 2015) and (Joyce, 2017)

D) Educator-oriented

The key element in this theory is the role played by a teacher or other expert and experienced persons. The other expert persons play a vital role in guiding the child, offering suggestions and strategies. A young child may try to complete a twenty-five-piece jigsaw puzzle, but the adult working with him might offer solutions such as turning over jigsaw puzzle pieces, completing corners first, or attempting to fit the pieces together. In such a case, the child benefits from the other expert's knowledge, but it is the child himself who completes the jigsaw puzzle. The child is able to achieve something which is not at his own ability level. It is therefore transferred from the actual level to a potential level. The child is not a scientist trying out solutions, but an active learner guided by other experienced people. These others can help the child to develop and enrich his achievements (Piaget,

2015). In this regard, it is very important for the program yo be responsibility-oriented (Wolf, 2004).

E) Challenge-oriented

Without using challenges, the brain does not seek solutions for learning. (Kharrazi & Talkhabi, 2012) For this reason, the programs that can create more realistic challenges can be more successful in cognitive learning. Creating reasonable concerns, such as destruction of the Earth, space, and life, is a desirable challenge.

F) Creating an environment appropriate for the child's brain

The planning principles in the media cannot overlook some of the children's biological issues in order to make programs for him.

One of the most important cognitive needs of the brain to improve learning is paying active attention to sleep as the driving force of the child and an opportunity to educate him in new educational methods (Kharrazi & talkhabi, 2012).

Among other related issues, in addition to sleep, is making time for recreation, which is considered leisure time.

That's why nothing is attractive and useful to a child in the same way.

The other biological pre-requisites for cognitive education is promoting effective and beneficial nutrition for children (Jensen, 2004).

There are certain foods that are useful for the brain, but children rarely get enough of them. These include: green leafy vegetables, salmon, nuts (walnut, hazelnut, and pistachio), fresh meat and fresh fruits (ibid).

G) Creating useful excitement (Hakimara, 2019).

Experts of the research team unanimously emphasized that creating excitement is one of the most important characteristics of a good educational program. Of course, provided that emotions such as virtual games do not

create a dual and fantasy atmosphere for the child (Kharrazi & Talkhabi, 2012).

H) Attending emotions

Emotions lead attention, create meaning, and have their own memory paths. Emotions should be studied, like learning. "The intellectuals who believe that emotions prevent our best choices are completely wrong. Relying on logic, without the ability to feel leads people to do the craziest things,", comments Kagan (Jensen, 2004).

I) Using aesthetics and art

The child's brain optimally uses the art for learning. In programs' decoration, or using music, shapes, and colors (153 out of 4), especially using a simpler layout can draw the child's attention to more important points. The musicality of the educational messages is another foundation of cognitive learning (Wolf, 2004).

J) Executive function development

Learning skills and creating a setting for children to practice in programs such as planting, growing, and harvesting, as well as protecting and preserving assignments for improving responsibility is another major key to the child's cognitive understanding development.

K) Using step-by-step patterns for the precise understanding of superior contents:

Something which is usually almost overlooked in non-cognitive methods is that learning should first start from objective experience and reaches a symbolic understanding in the next step, and eventually after these two steps, one can know that the child is ready to learn the theoretical contents (ibid, 154).

L) Interaction

Unlike what is shaped in the media era, paying attention to creating interactions and group-making is highly important for children's improved cognitive quality (Seyf,

2015).

Creating enthusiasm for turning friendships into environmental campaigns can be one of the most important incentives that will create a deep social vision, and on the other hand, lead an important dimension of his behavior toward development goals (Noori, 2014).

M) Imitation

One of the cognitive learning processes is an imitation, which sometimes occurs unconsciously. In programming, one must ask the question "what does the student imitate and what feedback does it have? (Blakmore, 2009)

N) Using the element of laughter

Studies confirm that laughing stimulates the release of endorphin. The pleasure and joy resulting from laughing are accompanied by the release of endorphin neurotransmitters, following which the consolidation of information in the brain is facilitated (Noori, 2014).

O) Motivation

In the social-cognitive perspective, motivation means that one chooses some goals for oneself, and sets them as a base for his actions. Then, he examines various actions that are possible to make and makes decisions based on the predicted results (internal or external) and inference of his own abilities. The result of the action is evaluated according to external rewards from others and his own self-assessment (Kadivar, 2017). Accordingly, television programs must have a mechanism to enhance behavior.

P) Child and imagination relationship

McQueen argues (2005) that cartoon imaginations disturb children`s cognitive equilibrium, and limit their cognitive development. Researches also suggest problems for children caused by violence on TV.

Q) Co-operation:

Learning can be used to do a collaborative

practice, and the child can be encouraged to learn collaboratively. Learning through collaboration and co-operation for problem-solving increases learners` ability and also leads to improved motivation. In this case, learners will better use learning resources. For example, as for "Improving reading skills," students can be asked to learn through co-operation by putting students in pairs. In this example, one of the students may express the process of his thinking; and the student also asks questions about the inference of his partner (Norouzi, 2017).

R) Conceptual graphics comprehension for children

Color and graphics have several major functions which have special functions in the medium of image:

Decorative; decorative graphics are typically added for aesthetic, cognitive, or motivational purposes.

Representative; visual representative elements exhibit the actual images of the lesson`s contents. The purpose of this is to present the objective exhibition of the contents in a realistic way.

Mnemonic; the visual mnemonic elements help them remember minor facts and the lesson`s concepts.

Organizing; visual organizing elements portray qualitative relations among the lessons` components. Such visual elements are usually represented in the form of tree diagrams, organizing tables, or epistemic charts, consisting of a set of nodes and links.

Relationship-based; visual relationship-based elements are used to convey quantitative relationships between two or more variables, and they include tables and charts like pie charts, linear charts, and column charts. Using relationship-based graphics rose from 900 billion times in 1983 to 2.3 trillion times in 1994. However, only in recent years, systematic researches have been carried out

on types of charts and tables that are the most effective for specific purposes.

Transformational; the visual transformational element reflects transformations occurred in the course of time or within the extent of space. The transformational graphic`s apparent property can incorporate animations, videos, or linear design along with movement pointers. A common usage of visual transformational elements is to educate or to create a reference point for different stages of performing a time-consuming and process-based task. Recent researches have shown that animations are better than static elements for teaching movement-required skills.

Interpretive; interpretive graphics help learners understand events or processes that have an invisible, abstract, or both invisible and abstract characteristic (Clark, 2014).

S) Responsibility assigning

In school, children should have certain duties and responsibilities, and these duties and responsibilities should be designated based on their capacities, and whenever they fulfill their responsibility, though incomplete, they must be encouraged (Khabiri, 2018).

T) Flexibility

In learning purposes, flexibility means that learning activity can be rooted in learners' interests and requirements, or emerge from their continuous life and deeds. A large number of ordinary learning activities are strongly shaped by the existence and nature of evaluation systems or teachers and educational institutions` goals. Flexible learning may be relatively free from such effects (Norouzi, 2017).

U) Using cognitive media load

The cognitive theory of multimedia learning is based on the following three assumptions:

Active memory dual channels; according to this assumption, people process audio and visual content separately. When visual,

animation, video and text materials are exposed to learners 'eyes, they process the contents through their visual channel, and when audio contents such as speech, music, and other sounds are exposed to learners' ears, they process them through their audio channel.

The limited capacity of each dual-channel; based on this assumption, the number of information learners can process through each of the dual audio-visual channels is limited. Upon watching a visual item or animation, learners will be able to record at a time only a few of those images in their working memory. In spite of individual differences, in general, people`s average working memory extent is short and ranges from about 5 to 7 pieces of information.

Active information processing; this assumption is based on the fact that learners play an active role through the cognitive process in order to create mental and consistent representations of their environment experiences.

V) Storytelling

Although stories can be presented in both written and television formats, children at an early age, discover the unreality of written stories sooner than television stories, due to a kind of real-life on TV. Therefore, the TV world is confused with reality more easily than the written world (Harris: 2011, 94). In stories, like music, it is assumed that experience and pleasure occur together. Experience and pleasure are our mental process focus points (Sutherland, 2004).

W) Continuity

The important point here is that the new ads have a meaningful relationship with their previous ads. Like jagged edges of puzzle pieces that fit together, ads must also attach to the existing memory or be encoded by it in mind. This way, people can archive two ads together in memory and keep both (Same).

X) Empathy

One of the most desirable patterns of creating learning for children is creating empathy.

The ability to understand and feel what others feel is empathy and is seen in emotional sympathy, and is considered a very important factor in enjoying the media. If you can understand the feeling of the story character, you will enjoy it more than a comedy. If you have experienced playing with a ball, you enjoy watching a ball game more, or if you easily identify with others suffering, you will enjoy a tragedy more (Harris, 2011).

Y) Excitation

Viewer`s excitation level is an important factor. A person who has been already stimulated physiologically for any reason is more likely to commit a violent act after watching a violent pattern in a medium (426).

Conclusion and recommendations:

Our concluded findings and classified opinions based on the views of the experts (Danaie, 2012) and researchers' expertise into a general classification for media production based on the cognitive approach for children can be seen in table 2.

Based on the discovery of these dimensions as the pivotal, contextual and strategical dimensions, we could reach a proper strategy to produce a media program with a cognitive approach about the environment which is also appropriate for the features and limitations of the medium of television regarding transferring messages.

The way these components come together, and how the design of its respective environmental programs are formed are presented in Table 3 and its following recommendations.

Table 2. The main dimensions required to produce educational television programs with a cognitive approach

Row	Title	Description
1	The environment	A set of factors which cognitive psychology introduce to improve the productivity of the brain organization. Although this component is not considered an independent dimension to develop education, laboratory studies show that environmental contexts are part of planning for all in-person and technology cognitive education. Knowing this section is most important for the media manager to set up the approaches rather than the program-maker.
2	Internal enhancement	This important dimension is related to enhancing the knowledge sectors. In tables 1 and 3, it is pointed out what can lead education to improvement, consolidation of development, and its sustainability in memory. The internal enhancement dimension is also related to the section of the development of individuals' analysis.
3	Sensory appeal	In terms of the internal cognition of the mind, work on emotions and creating pleasure to stimulate the processes leading to intelligence is another work which has an immediate and direct effect on educational messages in cognitive thinking development.
4	Cognitive appeal	Finally, some factors directly influence the child's cognition and understanding. This is the direct impact of codes and direct symbols of cognitive learning.
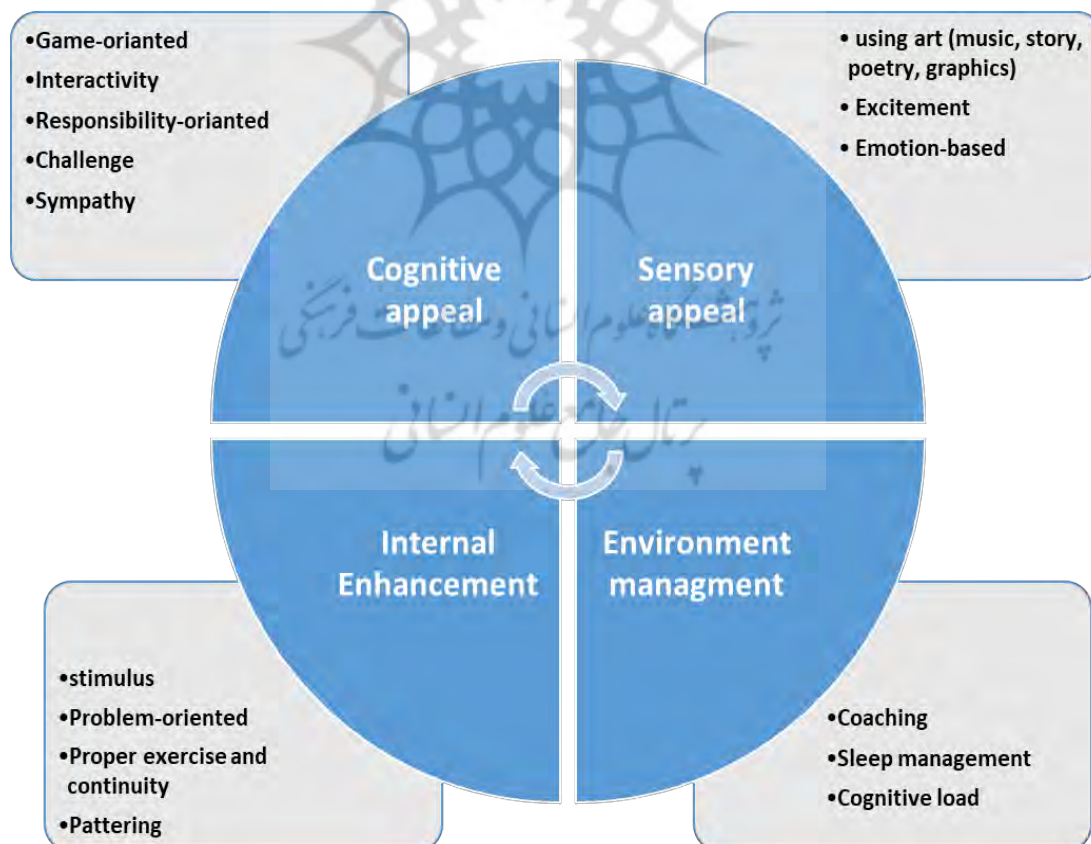
Table 3. Programming attitude in environment section with a cognitive approach

As it can be seen in the diagram, the environmental education requirements presented at the beginning of this article, in addition to the findings of the study and its experts panel to achieve a plan which can make the activity setting of the medium of television more suitable for environmental education is concluded in some suggestions as follows:

A) Given that the nervous system regarding certain conditions reaches the maximum reception, the most important principle in choosing an effective educational program about the environment is to focus on the standards of children media use in the field of neuroscience. Using cognitive load, proper time, proper light, and proper sounds facilitate children's better understanding.

B) Although in recent years, the media have moved towards the disappearance of human communications and automation, the findings of cognitive media emphasize being coach-oriented and using interactive TV facilities to create a mutual relationship.

C) Creating anxiety for children is by no means recommended, but showing a part of the destruction caused by ignoring the principles of sustainable development could create the necessary excitation in the cognitive media space for children and teenagers.

D) Environment and life literacy issue are one of the exploratory attractions of television in the field of program making.

E) Maybe it is safe to say that nothing like the environment issue in television education has the capability to create responsibility and passion in children. Challenges that children could create in this space is that it could facilitate using cognitive methods to consolidate knowledge.

F) Using exotic natural sights, choirs which could be used as a slogan in TV and program making, and facilitate environmental education both in the field of sustainable development and environmental protection.

G) Using contests and live programs has a double cognitive impact on creating interactions and shared feelings for children. Designing environmental games should help create joy and mobility and liveliness.

H) Sustainable development issues should be repeatable and practicable in a non-boring manner. In this regard, the connection of the program with the subject and the main goal, whether in the form of direct discourse or in designing fantasies, is very important.

E) Unlike virtual programs and fictions, environmental programs should enhance the link between the child and reality, and equilibrium in him. Therefore, contrary to the general belief about the relationship between imagination and creativity, the process of training in sustainable development and environment must have a permanent and solid relationship with realities.

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