

Interdisciplinary Teaching of Science and English at an Early School Age

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Abstract

Interdisciplinary teaching plays an important role at all educational levels, particularly at an early school age. Apart from providing a basis for joint learning, it enables correlation of segmented knowledge as well as additional practice and reinforcement of the newly acquired knowledge. It stimulates an awareness of the importance of cross-curricular cognition and prepares the individual for lifelong learning. This paper investigates the possibilities for the interaction of the teaching contents of science with those of English as a foreign language in the first four grades of primary school within the Croatian educational context. It also points to the importance, need and advantages of the interdisciplinary teaching from the very start of schooling and illustrates the possibilities and modes of vertical as well as horizontal interdisciplinary teaching of the two school subjects.

Key words: *correlation; interdisciplinary models; primary education; teaching topics.*

Introduction

Due to the increase of the overall knowledge in the process of globalization, scientific disciplines have been perceived as being unnecessarily segmented into separate academic divisions and isolated from one another. There has been an increasing need for changes based on interdisciplinary approaches to all scientific disciplines (LaFever, 2008). It was already in the 19th century that the German philosopher and educator, Johann Friedrich Herbert, emphasized the need for the integration of various disciplines in the process of teaching (Klein, 2006). The first pedagogical implications emerged in the 1960s when teachers started creating collaborative topics. It was exactly during that period of time that two schools of thought were formed within relevant pedagogical circles. The first school of thought supported learning across

disciplines and opposed everything that could undermine the integrity of a particular discipline, whereas the second one preferred interdisciplinary teaching as a basis for the acquisition of thorough knowledge and the development of higher skills. Although the integration of various disciplines gained momentum during the last decade of the 20th century, there is still no unanimous explanation of interdisciplinary learning and teaching (Klein, 2006). Consequently, current pedagogical literature in this area offers different concepts such as interdisciplinary teaching, integrated teaching, integrated curriculum, topic-based teaching, synergistic teaching, etc.

Although the term *interdisciplinary* has been used in diversified educational contexts (as a concept, methodology, process or philosophy), in a more general pedagogical sense it refers to the process of constructing knowledge in which learners and teachers analyse a problem together by applying approaches stemming from various disciplines, and synthesise cognisance into new, more complex forms (Jacobs, 2007). The integration of different disciplines is viewed upon as a means of providing a reply to posed questions or solving a problem which cannot be satisfactorily solved using a single discipline approach. It is the results of an interdisciplinary approach that enable interdisciplinary understanding, integration of knowledge and thinking (Klein, 2006), that is to say, cognitive progressing which, certainly, could not have been achieved by teaching within only one discipline. Therefore, Jacobs (2007) defines interdisciplinary learning as a conscious application of methodology, knowledge, principles, values and languages of two or more disciplines to the elaboration of a subject, problem or process. Borton and Smith (2000) point out that it is particularly important in the first grade of primary school as it provides authentic interdisciplinary experiences. The integration of the contents of various disciplines at the very start of schooling enables the creation of liaisons among social, humanistic and natural sciences. Furthermore, it provides children with opportunities to explore diversified topics related to particular facets of their surroundings, to acquire knowledge on the basis of perceiving new relationships, to create new models, systems and structures, to develop higher order skills as well as to apply the acquired knowledge to more than one field. In addition, it motivates children to engage in interdisciplinary studying and prepares them for lifelong learning.

Interdisciplinary teaching enables teachers to create, in terms of timing and expertise, high-quality lessons. In order to stimulate and facilitate learning, teachers need to plan such teaching which involves the strategies of interaction as well as manifold learning styles that contribute to active teaching oriented towards learners, i.e. towards integrative learning (Buljubašić, 2007). Learning networked contents of various disciplines is the process which is closer to the way human brain naturally functions. Such an approach supports didactic movement in the direction of the concept of activities-oriented teaching. In other words, it enables learning which best fits learning in real life and which provides a new quality to the process of learning by networking different areas of development.

Models of Interdisciplinary Teaching

According to Forgaty, there are three models of interdisciplinary teaching (Figure 1) ranging from simpler to more complex forms, depending on specific situations, teaching contents, targeted outcomes and the learners' age (Forgaty 1991, according to Cone, Werner, & Cone, 2009).

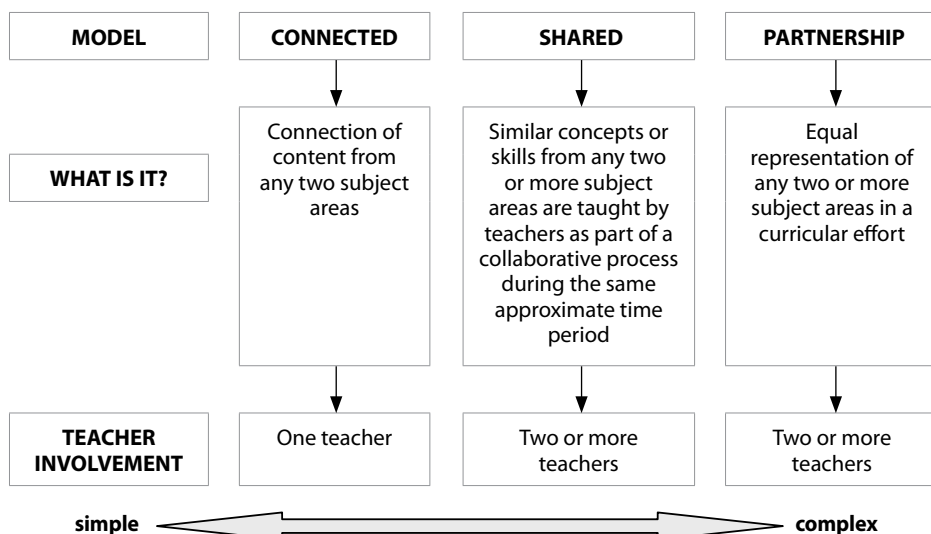


Figure 1. Interdisciplinary teaching models (Forgaty 1991, according to Cone, Werner, & Cone, 2009)

The simplest model - *the connected model* - uses a simple approach in which content from one subject area is used to augment or supplement the learning experience in another subject area. It is used by one teacher who independently plans, schedules and chooses the subject area content for the correlation. However, the teacher may want to consult colleagues about resources and accuracy of information. The connected model can be used when introducing a new concept or when the content of other subject area can supplement or reinforce what is being taught. *The shared model* is a somewhat more complex model which integrates similar topics, skills and concepts of two or more subjects and requires agreement between the teachers on the content, skill and on the time line for teaching. This model can be realized so that one teacher explores pre-knowledge and initiates teaching, which is then followed by the integration of the content of other subject areas, or if more teachers work simultaneously. Regardless of the method of realization, this model enables the first step in establishing collaboration between two or more teachers, their joint discussion, planning and presenting the shared topic as well as finding ways to teach a topic from different aspects. *The partnership model* refers to the equal representation of two or more subject areas in a curricular effort. They are blended together so that learning takes place simultaneously in all subject areas; the teachers teach together at the same time in the same classroom,

collaborating to deliver an agreed-on content within the curricular areas. This model is the most complex one as it takes considerable planning, a willingness to seek common areas, the identification of a time period for teaching in this manner, and a significant effort to identify links between specific curricular areas. Although challenging for the teachers, this model enables students to better understand the interconnectedness of all subject areas and to apply their knowledge in different contexts.

The Importance of Interdisciplinary Teaching

Interdisciplinary teaching can be accomplished in various ways: by analyzing a topic, working on a project, applying extracurricular teaching sources and the like. This type of teaching fosters the acquisition of “real” experiences, curiosity, creative problem solving and decision making. Furthermore, it stimulates creating natural and logical connections as well as the application of knowledge in a meaningful way. The integration of different subject areas is important in the process of skill development, in the process of learning how to learn, holistic integrative learning, promoting group cohesiveness and interaction with others within a learning community as well as in the process of understanding and appreciating the differences. At the same time, integrative learning provides support for individual needs and additional motivation of both teachers and students. Therefore, integrative learning plays an important role at all educational levels, particularly in early childhood (Benson, 2004) where it presents a foundation for common, problem-oriented learning and prepares an individual for lifelong learning.

Interdisciplinary teaching increases students’ motivation for personal involvement in the process of knowledge acquisition and developing skills (Resnick, 1989), stimulates an awareness of the importance of comprehension and enables the integration of segmented knowledge. Its interactivity improves learning and enables its efficient application (Duran, Duran, & Worch, 2009).

Integrating independent and collaborative interdisciplinary work in solving problems related to a certain topic, and students’ involvement in the strategies of active learning lead to the improvement of critical thinking, the ability to analyse, synthesise, apply and evaluate knowledge. It is through good coordination of teachers from different subject areas, their precise team planning, choice of diversified information sources, and application of various creative individual or group work activities that the interdisciplinary approach reduces superfluous repetition and accumulation of the same content from different disciplines, reduces taking one-sided view and enables versatile development of each individual.

Problem, Objectives and Research Procedure

Bearing in mind the importance of interdisciplinary teaching, generalist teachers early primary classroom teachers blend content areas of science with those of other school subjects. However, this tendency is rather rarely implemented, and when it is, it almost always involves the interdisciplinary teaching of science and subjects

such as arts, music or physical education (Dobrota, & Kuščević, 2002; Kuščević, & Mišurac, 2003; Hus et al., 2008). On the other hand, English as a foreign language (EFL), which was introduced as a compulsory school subject in the first grade of primary school eight years ago, has been taught completely isolated from other subject areas. Such a finding is surprising, especially if we take into consideration the fact that EFL, as a subject where both teaching and language contents follow in many aspects the current trends in today's process of globalization, provides a high quality basis for accomplishing interdisciplinary teaching. This refers primarily to the role the English language has as a language of global communication (*lingua franca*) and whose functional significance in this multicultural world of today is reflected in efforts to promote one's own national and cultural identity and to occupy a legitimate place in the process of globalization (Tsui, 2005). It is exactly those elements of teaching contents, which refer to the natural and cultural heritage of both the student's immediate surroundings and Croatia as her/his homeland, that are presented in science curriculum to the largest extent. Based on what has been stated so far, the objective of this paper is to explore and to establish the possibilities of using interdisciplinary approach to integrate the teaching contents of science and EFL in the first four grades of primary school. In addition, the authors intend to draw special attention to the importance and need for interdisciplinary teaching of these subject areas from the very start of formal schooling.

With respect to the stated research objectives, a hypothesis was formulated according to which generalist teachers and English teachers have at their disposal a large number of teaching units adequate for implementing interdisciplinary teaching of science and English from the first to the fourth grade of primary school.

In order to establish opportunities for the interdisciplinary teaching of science and EFL in the first four grades of primary school, the authors carried out an analysis of the curricula of both subjects as well as educational achievements and key concepts stated in the curricula (MZOŠ, 2006). The analysis also included those aspects of the science teaching contents that could constitute up to 10% of the optional EFL teaching topics in the third and fourth grade of primary school.

Results and Discussion

The comparison of the content areas, educational achievements and key concepts in the field of science and EFL pointed to the possibility for organizing interdisciplinary teaching in the domain of seven teaching units (Table 1). At the very start of the first grade, science and EFL teaching cover several similar topics: *I am a pupil/Encounters and greetings*, *Life and work at school/Classroom language* and *My classroom*. These topics are aimed at familiarizing young pupils with school politics, their own rights and duties, rules of decent behaviour as well as the importance of mutual respect and tolerance. As the aforesaid topics are taught at the very beginning of the school year, with the pupils getting acquainted with one another and different content areas,

and in getting used to school obligations, early primary school teachers and EFL teachers should start teaching the topics independently, according to the simple interdisciplinary approach of *the connected model*. Towards the end of teaching, the

Table 1. Presentation of the science and EFL first grade topics that can be taught via the interdisciplinary approach

1st GRADE					
SCIENCE			ENGLISH		
Teaching topic	Key words	Achievements	Teaching topic	Key words	Achievements
I am a pupil	Pupil, teacher, class	Application of the rules of decent behaviour (greetings, excuses, asking for a favour)	Meetings and greetings	Hello! Hi! Good morning/afternoon! Bye!/Miss/Mr/Mrs What's your name? I'm ...How are you today? Fine, thanks. Not well. Please... Sorry... Thank you.	Greetings and communicational forms, decent behaviour, addressing someone
Life and work at school	School staff, school house rules	Meeting school staff, applying the most important regulations of the house rules (in-and-out-of classroom behaviour)	Classroom language	Sit down! Stand up! Go...! Come here! Draw! Colour! Listen! Repeat! Open! Close! Can I go out, please?	Understanding instructions and acting upon them, asking for a permission
			My classroom	Open/Close the door. This is a chair/a desk...Let's draw! Let's go out!	Naming objects, inviting to activities
Family members	Family, family members	Naming family members	Me and my family	This is my family. Who is this? This is my mum/dad/ sister/brother.	Introducing family members
Holidays	Home-made Bread Day	Participating in celebrating holidays, congratulating	-	-	-
	Christmas		Christmas	Merry Christmas; Santa Claus/Father Christmas Happy New Year.	Congratulating, singing and reciting occasional songs
	Easter		Easter	Happy Easter. Easter eggs...	
Health	Health, healthy food, disease prevention	Understanding the importance of regular and healthy food, health care and medical treatment	Breakfast	What's for breakfast? I like/ don't like milk/bread and butter.	Naming breakfast food and drinks
Nature is changing (autumn changes)	Autumn	Perceiving autumn changes in the immediate environment and their influence on life	Colours	What colour is it? It's white/black/ red/yellow/ blue/green. Colour the ball blue!	Naming basic colours, describing objects

teachers should repeat and reinforce the teaching content together. In this way, young pupils would gradually be introduced into the interdisciplinary approach, whereas teachers would be provided with an opportunity to collaborate, plan and prepare lessons together and, in perspective, to work together on a more complex interdisciplinary teaching model.

The science teaching topic *Family members* and the English teaching topic *Me and my family* are based on learning the names of family members, describing their characteristics and expressing feelings in Croatian and English. While teaching *Me and my family*, English teachers rely on their pupils' preknowledge from everyday life as well as on the knowledge previously gained within science curriculum. For the purpose of thorough comprehension, the science teaching topic *Family* can be taught in an interdisciplinary manner following *the shared model*, with the teachers first establishing their pupils' preknowledge and working on the key concepts, and then, on a collaborative basis, establishing the similarities and differences in the family members' names in both Croatian and English. It is through this form of a more complex interdisciplinary approach that generalist teachers and English teachers will lay the foundations for further cooperation and planning of blending other subject areas. In addition, pupils will be enabled, in this way, to understand and view teaching content areas from different aspects.

The first grade teaching topic *Holidays* includes two units which are the same in both science and English and which can, consequently, be connected in an interdisciplinary fashion. These are *Christmas* and *Easter*. These two units can also be taught through the interdisciplinary *shared model* with the science and English language teacher teaching the customs related to celebrating Christmas and Easter in Croatia and English speaking countries respectively, and then, on a collaborative basis, reinforcing the content, comparing and establishing the similarities and differences.

The science and EFL first grade teaching curricula offer some partially overlapping teaching topics which could be planned and successfully realized within interdisciplinary teaching. A good example is the science teaching topic *Health* and the EFL topic *Breakfast*. Within science, apart from understanding the need for preventive vaccination and possible medical treatment, pupils are expected to develop an awareness of and realize the importance of regular and healthy nourishment for health maintenance, which can be interactively connected via *the shared model* with the EFL teaching topic *Breakfast*. As can be seen from Table 1, the key English words related to the above mentioned topic, which are presented in the first grade EFL textbooks, refer to milk, bread and butter. These words describe food which is crucial for children's healthy nourishment. However, this does not imply that English teachers are not allowed to expand the topic-based vocabulary by also including the words which pupils learn as relevant for this topic within the science teaching content.

Another example is related to two teaching topics which seemingly cannot be connected. These are the science teaching topic *The nature is changing – autumn*

Table 2. Presentation of the science and EFL second grade topics that can be taught using the interdisciplinary approach

2nd GRADE					
SCIENCE			ENGLISH		
Teaching topic	Key words	Achievements	Teaching topic	Key words	Achievements
School behaviour and pupils' relationships	Decent behaviour, pupils' rights and duties, mutual respect	Decent behaviour, peaceful conflict resolution, helping one another, becoming acquainted with one's rights and duties	Greetings and addressing	Hello! Good morning/ afternoon / evening! Good bye/ night! Mr/Mrs/Miss What's your name? I'm... How are you? I'm fine, thank you. And you?	Greetings on arrival and departure, at a formal and informal level, introducing oneself and addressing
Family	Immediate family, extended family	Differentiating and naming members of an immediate as well as extended family (father, mother, children, parents, grandfathers and grandmothers)	My family	My, your, his, her; This is my mum/ dad /brother/uncle/ aunt I've got/ I have... You've got/You have... S/he's got/S/he has...	Introducing members of one's immediate and extended family, expressing possession
Holidays	Holiday	Celebrating the holidays in the Republic of Croatia, becoming acquainted with the traditional customs of celebrating a holiday	Holidays	Christmas tree/ presents /cards/carols, Father Christmas, Easter bunny / eggs... Merry Christmas! Happy New Year! Happy Easter! – We Wish you ...!	Acquisition of the concepts related to holidays, congratulating and singing occasional songs, naming actions typical of holidays
Child	Girl, boy	Perceiving physical differences and similarities between boys and girls	My body	He's got brown hair/big hand's small nose/blue eyes... He's drawing/ jumping/eating...	Describing persons, describing an action being performed at the present moment
Health	Hygienic habits, health, illness	Acquisition of hygienic habits, health preservation; proper clothing, the importance of doing sports	Clothes	What are you wearing? Ann is wearing jeans, a T – shirt...	Naming of the clothes most frequently worn by children
Food	Meals, food	Becoming acquainted with the food that is important for human health, recognizing the relationship between diversified and regular food and health	Main daily meals	I have... for breakfast/ lunch/ dinner/ supper. I like sandwiches. I don't like coffee.	Acquiring the names for daily meals, the most frequent food and drinks, expressing attitudes towards food and drinks

changes and the EFL topic *Colours*. Although, according to the EFL curriculum, pupils should be taught to use English words for naming the colours of certain objects, English teachers can apply a simple principle of interdisciplinary networking via *the connected model*. Instead of naming colours of some usable things and objects, they could describe autumn changes in nature as well as name the colours of autumn fruit.

In the second grade of primary school, it is possible to establish interdisciplinary relations among six teaching topics (Table 2). The EFL teaching topic *Greetings and addressing* is grounded on analyzing forms of addressing one another, introducing oneself and greeting, which is, at the same time, at the core of the science teaching topic *School behaviour and pupil relationships*. It is possible to start teaching this topic by using the interdisciplinary *shared model*. As a follow-up to the topic, generalist teachers can supplement and expand the teaching material with the contents related to acceptable in-school and out-of-school behaviour, peaceful conflict resolution, mutual support and respect as well as getting acquainted with children's rights and obligations.

The aim of the EFL second grade teaching topic *My body* is to enable the pupils to name and describe the main body parts in English. Additionally, pupils acquire the English vocabulary items related to describing the actions we perform with particular parts of our body. Taking into consideration the fact that the above stated content is a basis of the science topic entitled *Child*, these teaching materials can be interrelated in an interdisciplinary manner according to *the shared model*, which would reinforce gender similarities and differences, deepen the acceptance of otherness and develop the sensitivity toward the disabled.

Within the science topic *Health* children are taught about basic hygiene habits, the importance of doing sports, and spending free time outdoors and enjoying fresh air as well as the importance of wearing appropriate clothes and shoes in accordance with weather conditions. The teaching material related to wearing appropriate clothes and shoes can be successfully blended, through *the shared model*, with the EFL topic *Clothes*, aimed at acquiring the English words for the types of clothes.

The names of the main daily meals and the most frequent food and drinks that pupils need to acquire while being involved with the EFL topic *Main dishes* can be blended with the science teaching theme *Food*. Apart from reinforcing the similarities and differences in the labels and eating habits between the Croatian people and the ones living in the English speaking countries, the above mentioned content can be related in an interdisciplinary manner to the already covered teaching material *Health*, in accordance with *the shared model*. This provides an additional opportunity to reinforce the importance of diversified and regular nutrition for human health.

The contents of the teaching topic *Family* can be vertically blended with the equivalent first grade topics in both science and English. If the topic *Family* was taught in the first grade using interdisciplinary *shared model*, in the second grade it could

be planned and accomplished by using a more complex interdisciplinary approach – *the partnership model*. In this way pupils will acquire the names for individual family members (e.g. in Croatian, male members of the extended family can be referred to as *ujak*, *stric* or *tetak* for what is known in English only as *uncle*).

As a starting point for teaching the second grade topic *Holidays*, vertical blending can be applied with the equivalent first grade topics. Upon having finished teaching the basic concepts, generalist teachers and English teachers can apply *the partnership model*. Following this model, the pupils will be able to compare the customs, the ways of celebrating, congratulating and singing the songs characteristic of particular holidays in Croatia with the ones in the countries belonging to the Anglo-Saxon cultural identity. This could serve as a stimulus for an additional joint interdisciplinary research project related to celebrating holidays round the world, for example, Valentine's Day and Halloween, which is, among other things, aimed at developing the awareness of interculturalism as one of the current educational trends.

In the third grade of primary school, the science teaching areas are based on pupils' becoming acquainted with their homeland. In this respect, the stated content may be related in an interdisciplinary manner to three EFL teaching areas (Table 3). During their science lessons, first grade pupils were trained to observe, follow, compare and differentiate the weather phenomena characteristic of every single season. Therefore, generalist teachers can, within vertical intra-subject networking, teach the topic *Climate, weather characteristics of native region* and establish the interdependence of climates and living communities in the native region. Simultaneously, English teachers can teach the contents related to the topic *Time* with regard to chronological time telling (hours, days in a week, months, season) by using vertical networking based on *the connected model* with the science teaching content from the first up to the third grade of primary school. This could be followed by interdisciplinary networking of the teaching contents related to the weather characteristics of native regions, based on *the shared model*. This could also encourage additional thematic comparison of season characteristics in Croatia with the ones in English speaking countries. Furthermore, this could serve as a basis for blending the teaching contents of mathematics and arts.

The third grade science teaching topic *Economic activity in the native region* deals with the most prominent economic branches in each of the Croatian regions. As in each of these regions a certain number of the population is involved characteristically with animal husbandry, it is feasible for the stated content to be related to the EFL topic *Domestic and wild animals*. These content areas could enable the acquisition of animal names in both Croatian and English (e.g. *magarac* – donkey, *krava* – cow, *ovca* – sheep). At the same time, they could provide a basis for familiarizing the pupils with particular regionalisms and dialectal names for autochthonous species (for example, some of the vernacular terms for a donkey in Croatian are: *magare*, *tovar*, *kenjac*, *osao* or *oslo*).

Proper day activities schedule, correct rotation of work and recess time and the importance of being active during one's free time are the teaching areas of the English topic *Free time and sport*. These areas can vertically be connected to the related second

Table 3. Presentation of the science and EFL third grade topics that can be taught via the interdisciplinary approach

3rd GRADE					
SCIENCE			ENGLISH		
Teaching topic	Key words	Achievements	Teaching topic	Key words	Achievements
Climate, weather conditions of the homeland region	Climate	Perceiving, monitoring, comparing the weather phenomena of the four seasons; recognizing the interdependence of the climate and life community, stating the plants and animals of the homeland region	Weather	When do you go to school? What time do you play tennis? On Saturday/ At 4 o' clock. What time is it? It is five o' clock. / It is half past five. What month is it? It is May. What season is it? It is summer. It is cloudy, rainy, sunny.	Expressing the chronological time; days in a week, telling the time, seasons, months of the year, expressing the atmospheric weather
Economy of the homeland region	The economy, economic branches	Becoming acquainted with the characteristics of the homeland economy, recognizing and understanding the relationship between the economy branches and the homeland region characteristics	Domestic and wild animals	The pig has four legs/ one tail. The dog is black/ small/strong. The rabbit can run fast/jump high.	Naming and describing animals
Health	Health care, infectious diseases, medical treatment	Understanding the ways of disease transmission, following a physician's instructions, recognizing bullying and asking for help	Free time and sport	I am playing football./ She is playing the violin. He can run./ Can you/she... I have got a ball. She has got a bike.	Naming sports and activities, expressing possession

grade teaching contents and can also be related in an interdisciplinary manner, via *the partnership model*, to the science topic *Health*.

Within the fourth grade curriculum, it is possible to relate in an interdisciplinary manner three science teaching content areas with five EFL ones (*My body/My body and health care, Daily meals and Free time, Animal life/Animals, Towns/In town*).

Since the structure and function of the particular body parts, healthy diet and proper exchange of daily activities are taught via different teaching topics within the science curricula in the first four grades of primary school, the English teaching topics *My body and health care, Daily meals and Free time* can be taught by vertically relating

Table 4. Presentation of the science and EFL fourth grade topics that can be taught using the interdisciplinary approach

4th GRADE					
SCIENCE			ENGLISH		
Teaching topic	Key words	Achievements	Teaching topic	Key words	Achievements
My body	Body changes, puberty	Understanding that one's body and behaviour change while growing, understanding the importance of proper diet and physical activities, understanding the hazards of addiction, recognizing forms of bullying, knowing whom to contact in case of a problem	My body and health care	I'm scared. Foot/feet; What's the matter with you? I've got a toothache/a cold. Brush your teeth! Wash your hands! I take a shower every day. Do exercises every morning.	Reinforcing and extending the vocabulary related to body parts and emotions, describing the body and health state, understanding the instructions related to health care
			Free time	I play ... every day. Who do you play/ walk/ go... with? When do you watch TV? How often...? How many hours... ?	Reinforcing and extending the vocabulary related to the topic
			Daily meals	How many apples ...? I've got an apple/two apples. I go to the shop every day. I buy bread at the baker's. How much is it/are they?	Acquisition of the words related to meals, food, fruit and vegetables, making a grocery list, shops, prices
Animal life	Domestic animals, wild animals	Distinguishing animals by the food they eat, explaining the relationship between plants and animals	Animals	Mouse; Birds can fly. A cat has (got) a ... It miaows. The neighbour's dog barks at the cat.	Reinforcing the words related to animals, describing parts of an animal's body and its call
Places, homeland	Towns, villages	Stating towns and finding towns on a map, describing the appearance of a town	In a town/ in the country	My village /town is big / small/ noisy;/ My street is... There is a... near my home. His house is..., Our car is; Cross the road at the traffic lights. I go to school by car/on foot.	Means of transport, places in a city/in the country, describing a place of living, learning about how to behave in traffic, giving one's address/address of one's school

them to the science teaching areas. *The shared model* enables the generalist and English teachers to realize interdisciplinary networking during teaching the science topic *My body* as well. In this way, teachers enable their pupils to acquire knowledge related not only to physical changes in puberty, needs for healthy food, body care and doing physical activities as being important for each individual's development, but also to become aware of the hazards of addiction.

A part of the fourth grade science syllabus is aimed at gaining knowledge about pupils' homeland, recognizing and naming places as well as describing and stating the

most significant characteristics of particular towns in Croatia. These teaching areas can be reinforced by using interdisciplinary teaching, according to *the shared model* which would encourage young pupils to use both Croatian and English for describing their native town and comparing towns and villages. Beside that, this could serve as a stimulus for involving pupils in an interdisciplinary thematic research on the similarities and differences between a place in Croatia and a place of pupil's choice in one of the English speaking countries.

Within the third and fourth grade EFL syllabus, 10% of the teaching lessons allow for optional teaching contents that are taught according to the pupils' interests. Pupils can be offered to choose among topics dealing with the natural, cultural and economic characteristics of their homeland or with nature and living conditions which are taught in science (Table 5). Optional English teaching topics related to pupils' homeland, its natural resources and cultural values or living conditions would enable training pupils for presenting this content in English. It is exactly the choice of the optional topics based on the science teaching areas, such as *My homeland*, *My county* and *Traffic* in the third grade and *Homeland symbols* in the fourth grade, that would encourage not only correlation with the English teaching areas but also the development of the pupil's own national and cultural identity as well as better understanding of the multicultural world of today. Similarly, optional topics related to nature and living conditions would provide, apart from reinforcement and teaching content networking, additional understanding of natural values and the role of each individual in preserving the natural balance and developing environmental educational values in both school subjects.

Table 5. Suggested EFL optional topics in grades 3 and 4

SCIENCE – 3rd GRADE		
Teaching topic	Key words	Achievements
Appearance of the pupil's native place of residence	Lowland-region	Becoming acquainted with the appearance and characteristics of the native region, recognizing the typical features of places in the native region, collecting, researching and systematizing new data and information about the native region, finding the native region on a map
	Rolling region	
	Mountain-region	
	Coastal region	
My county	County	Becoming acquainted with the county's centre or a town in the county, finding the town on a map, understanding the importance of the town for the life of people
Traffic	Land traffic, air traffic and water traffic	Distinguishing the types of roads that connect the native region with other places, finding a road or a railway on the native region/Republic of Croatia map, distinguishing the types of city traffic, following traffic regulations and road safety

SCIENCE – 4th GRADE		
Teaching topics	Key words	Achievements
Homeland symbols	Symbol, flag, coat of arms, anthem, the Croatian currency (<i>kuna</i>)	Stating and describing the symbols of the Republic of Croatia, knowing that each state has its own symbols
Nature	Nature, living and nonliving nature, living conditions	Understanding the concept of nature, distinguishing living and nonliving nature, recognizing the interrelationship between living and nonliving nature and living conditions.
The Sun – a living condition	The Sun, light, heat	Recognizing the relationship between the Sun and the life on Earth as well as the Sun's harmful effects
Water- a living condition	Characteristics of water, circulation of water in nature, boiling and freezing point	Becoming acquainted with the basic characteristics of water on the basis of experiments, understanding water circulation and man's influence on the water pollution and preservation
Air - a living condition	Air, characteristics of air, structure of air	Becoming acquainted with the characteristics of air on the basis of experiments, knowing the structure of air (oxygen, nitrogen, carbon dioxide), understanding the importance of air for living, understanding the importance of preserving air from pollution
Soil - a living condition	Soil, characteristics of soil	Distinguishing the types of soil (colour, appearance); knowing that the most fertile soil is black soil

Conclusion

Due to the specificities of science as a school subject incorporating the contents of both natural and social sciences, generalist teachers often create teaching scenarios for vertical and horizontal intra-subject blending of teaching contents. However, they rarely or partially realize interdisciplinary networking with other school subjects. Even if they do so, it is in most cases with the teaching contents of Croatian, arts and music. In teaching practice, interdisciplinary blending of EFL teaching content areas and the ones in science is very rare. The reason for this probably lies, in the first place, in the fact that teachers are not acquainted with the content possibilities of networking, which is the consequence of the lack of systematically designed methodological and didactic guidelines related to the realization of the stated interdisciplinary parallel, both in textbooks and teachers' manuals. In addition, current early EFL textbooks completely neglect the lexical items related to the elements of the Croatian cultural and natural heritage which present a considerable part of the science teaching content. A further reason for not having an interdisciplinary parallel between science and English can be seen in the assumed lack of collaboration between generalist and EFL teachers (in cases when a generalist teacher does not teach English). We believe that everything that has been stated so far results in the teachers' lack of awareness of the needs, possibilities and advantages of implementing interdisciplinary teaching of science and EFL.

As was elaborated in this paper, the current science and EFL teaching contents from grade 1 to grade 4 enable teachers to teach a significant number of topics by applying an interdisciplinary approach. There are manifold advantages of the interdisciplinary approach to teaching the above stated teaching contents. Regardless of what model is applied, the interdisciplinary teaching of science and English reduces the impression of teaching contents being segmented, enables a complete, active and creative acquisition of knowledge and develops an awareness of the necessity to view a topic/issue from different aspects. Blending the teaching contents of science and English also enables establishing similarities and differences between the Croatian culture and the culture of English speaking countries, developing one's own national and cultural identity and, consequently, provides a better understanding of the multicultural world of today. Furthermore, interdisciplinary teaching provides more opportunities for practice and reinforcement of newly acquired knowledge and skills within the framework of the two school subjects. From the aspect of EFL, such an approach enables pupils to regularly use English in their surroundings. In this, it is important to recognize that reinforcing and practicing English words in the out-of-classroom surrounding consolidates new vocabulary knowledge. Apart from this, the interdisciplinary approach provides pupils with an opportunity to use English to talk about themselves, about their local environment, their homeland, its cultural and natural heritage, which, taking a long-term view, presents a step forward to promoting and preserving the stated values in the process of globalization. In the end, we believe that special attention should be paid to the optional EFL teaching topics related to nature and living conditions as they contribute to the understanding of each individual's role in meeting his/her needs without endangering the life of future generations. This idea is at the very basis of sustainable development.

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Interdisciplinarno poučavanje nastavnih sadržaja prirode i društva i engleskog jezika u ranoj školskoj dobi

Sažetak

Interdisciplinarno poučavanje zauzima značajno mjesto na svim razinama odgoja i obrazovanja, a posebno u ranom djetinjstvu. Osim što osigurava temelj zajedničkom učenju i otkrivanju, interdisciplinarno poučavanje omogućuje povezivanje rascjepkanih znanja, otvara prostor za njihovo dodatno uvježbavanje i utvrđivanje, potiče svjesnost o važnosti interdisciplinarnog spoznavanja i priprema pojedinca za cjeloživotno učenje. U ovom se radu istražuju mogućnosti umrežavanja nastavnih sadržaja prirode i društva i engleskog jezika od 1. do 4. razreda osnovne škole, u okviru hrvatskog obrazovnog konteksta, ukazuje na važnost, potrebu i prednosti interdisciplinarnog umrežavanja već od početka školovanja te ilustrira mogućnosti i načine vertikalnog i horizontalnog interdisciplinarnog povezivanja sadržaja tih dvaju nastavnih predmeta.

Ključne riječi: korelacija; modeli povezivanja; nastavne teme; primarno obrazovanje

Uvod

Povećanjem znanja u aktualnom procesu globalizacije uočava se nepotrebnost podijeljenosti i isključivosti pojedinih disciplina i razvija se potreba za promjenama utemeljenima na interdisciplinarnom djelovanju i umrežavanju svih znanstvenih disciplina (LaFever, 2008). Na potrebu integriranja više disciplina u nastavi upućivao je još u 19. stoljeću njemački filozof i prosvjetitelj Johann Friedrich Herbert (Klein, 2006). Prve pedagoške implikacije javljaju se tijekom šezdesetih godina prošlog stoljeća kada nastavnici sve češće osmišljavaju suradničke teme. Upravo se tada u relevantnim pedagoškim krugovima stvaraju dvije struje: oni koji podržavaju učenje prema disciplinama i protive se svemu što bi moglo narušiti integritet određene discipline i oni koji preferiraju interdisciplinarno učenje kao temelj za usvajanje cjelovitih znanja i razvijanje vještina višeg reda. Iako integracija više disciplina pravu

snagu dobiva tijekom posljednjeg desetljeća dvadesetog stoljeća, još uvijek nema jedinstvenog tumačenja interdisciplinarnog učenja i poučavanja (Klein, 2006), o čemu svjedoči aktualna pedagoška literatura koja za to područje nudi različite pojmove poput: interdisciplinarna nastava, integrirana nastava, integrirani kurikulum, tematska nastava, sinergistička nastava i dr.

Iako se pojam *interdisciplinarnan* koristi u različitim edukativnim kontekstima (kao koncept, metodologija, proces ili filozofija), u općem pedagoškom smislu odnosi se na proces izgradnje znanja u kojem učenici i učitelji zajedno analiziraju problem primjenjujući različite disciplinarnе pristupe te sintetiziraju spoznaje u nove i obuhvatnije oblike (Jacobs, 2004). Integracija različitih disciplina smatra se sredstvom za odgovaranje na postavljena pitanja ili rješavanje postavljenog problema koji se ne mogu zadovoljavajuće riješiti s pomoću samo jednog disciplinskog pristupa. Upravo rezultati interdisciplinarnog pristupa omogućuju interdisciplinarno razumijevanje, integriranje znanja i razmišljanja (Klein, 2006), odnosno, kongnitivno napredovanje koje se zasigurno ne bi moglo ostvariti poučavanjem unutar isključivo jedne discipline. Stoga Heidi Jacobs (2007) interdisciplinarno učenje definira kao svjesno primjenjivanje metodologije, znanja, načela, vrijednosti i jezika dviju ili više disciplina pri obradi određene teme, problema ili procesa. Borton i Smith (2000) naglašavaju kako je ono posebno važno u prvom razredu osnovne škole jer osigurava vjerodostojna interdisciplinarna iskustva. Integriranjem sadržaja više disciplina već na samom početku školovanja stvaraju se poveznice između društvenih, humanističkih i prirodnih znanosti, a djeci se omogućuje istraživanje različitih tema vezanih uz određene aspekte njihova okruženja, stjecanje znanja uz uočavanje novih odnosa, stvaranje novih modela, sustava i struktura, razvijanje vještina višeg reda, primjenjivanje usvojenoga u više od jednog područja, dodatno motiviranje za interdisciplinarno proučavanje te pripremanje za cjeloživotno učenje.

Interdisciplinarno poučavanje omogućuje nastavnicima vremenski učinkovitije i stručno kvalitetnije djelovanje. S ciljem poticanja i olakšavanja učenja nastavnici trebaju planirati takvo poučavanje koje uključuje strategije međudjelovanja i višestruke stilove učenja koji pridonose aktivnoj nastavi usmjerenoj prema učeniku, odnosno prema integrativnom učenju (Buljubašić, 2007). Upravo učenje umreženih sadržaja više disciplina je proces bliži načinu na koji ljudski mozak prirodno djeluje. Takav pristup podržava didaktičko kretanje u smjeru koncepta nastave usmjerene na aktivnosti, odnosno omogućuje učenje koje najbolje odgovara učenju u stvarnom životu i koje, umrežavajući različita područja razvoja, daje novu kvalitetu procesu učenja.

Modeli interdisciplinarnog poučavanja

Prema Forgyaty, postoje tri modela interdisciplinarne nastave (Slika 1.) koje učitelji mogu primjenjivati od jednostavnijih prema složenijim oblicima, ovisno o specifičnim situacijama, nastavnom sadržaju, planiranim ishodima i uzrastu učenika (Cone, Werner i Cone, 2009).

Slika 1.

Najjednostavniji među njima, *model povezivanja*, temelji se na jednostranom umrežavanju teme, vještina i koncepta jednog predmetnog područja s drugim. Koristi ga jedan učitelj koji samostalno bira, raspoređuje i planira međupredmetne veze, pri čemu je ipak nužno konzultiranje s kolegama u vezi s nastavnim sadržajima i točnošću podataka. Model povezivanja može se koristiti kada se uvodi novi pojam ili kada sadržaj drugog predmeta može ilustrirati i nadopuniti poučavano. Nešto složeniji je *model zajedništva* koji integrira slične teme, vještine i koncepte dvaju ili više predmeta i zahtijeva dogovor nastavnika o sadržaju, vremenu i načinu realizacije. Može se realizirati tako da jedan učitelj istraži predznanje i započne obradu, nakon čega slijedi integracija sadržaja drugih predmetnih područja ili da istovremeno radi više učitelja. Neovisno o načinu realizacije taj model omogućuje početak suradnje dvaju ili više učitelja, njihovu zajedničku raspravu, planiranje i izvođenje zajedničke teme te pronalaženje načina podučavanja s različitih aspekata. *Model partnerstva* je najsloženiji jer zahtijeva priličan utrošak vremena; od traženja zajedničke teme, planiranja i utvrđivanja interdisciplinarnih veza pa do vremena i načina realizacije. Na taj se način ravnopravno zastupaju dva ili više predmeta, a interdisciplinarno se učenje odvija istovremeno u svim područjima, nastavnici podučavaju zajedno, u isto vrijeme, u istoj učionici, pri čemu se nastava temelji na timskim suradničkim odnosima. Osim što je taj model za nastavnike izazovan, on rezultira i boljim razumijevanjem interdisciplinarnih odnosa različitih predmetnih područja i boljim primjenjivanjem znanja u drugačijem kontekstu.

Važnost interdisciplinarne nastave

Interdisciplinarna nastava može se ostvariti na više načina: obradom tema, radom na projektima, primjenom izvora koji nadilaze udžbeničke nastavne sadržaje i sl. Taj oblik nastave potiče stjecanje „stvarnih“ iskustava, radoznalost, kreativno rješavanje problema, donošenje odluka, pomaže u stvaranju prirodnih i logičkih veza te prijenosu i primjenjivanju znanja na smislen način. Integriranje sadržaja različitih disciplina je važno u procesu razvijanja vještina, učenja kako učiti, holističkog integriranog učenja, u promicanju grupne kohezivnosti i interakcije s drugima u zajednici učenja, razumijevanju i poštivanju različitosti, ali istovremeno i u podržavanju individualnih potreba te dodatnom motiviranju učenika i učitelja. Stoga integrirana nastava ima važnu ulogu na svim razinama odgoja i obrazovanja, a posebno u ranom djetinjstvu (Benson, 2004) kada predstavlja temelj zajedničkom i problemski usmjerenom učenju te priprema pojedinca za cjeloživotno učenje.

Interdisciplinarna nastava povećava učenikovu motivaciju za osobno angažiranje u procesu stjecanja znanja i razvijanja vještina (Resnick, 1989), potiče svjesnost o važnosti i značenju spoznavanja, omogućuje povezivanje rascjepkanih znanja, a interaktivnim djelovanjem poboljšava učenje i omogućuje njegovu učinkovitu primjenu (Duran, Duran i Worch, 2009).

Umrežavanjem samostalnog i suradničkog interdisciplinarnog rada u rješavanju problema određene teme te uključenjem učenika u strategije aktivnog učenja, potiče se kritičko mišljenje, kao i sposobnost analiziranja, sintetiziranja, primjenjivanja i vrednovanja. Dobrom koordinacijom učitelja različitih nastavnih predmeta, njihovim preciznim timskim planiranjem, odabirom različitih izvora informacija, primjenjivanjem raznovrsnih i kreativnih aktivnosti pojedinaca ili grupa učenika, interdisciplinarni pristup smanjuje nepotrebno ponavljanje i nagomilavanje istih sadržaja iz različitih disciplina, smanjuje pristrano gledište i omogućuje svestran razvoj svakog pojedinca.

Problem, cilj i postupak istraživanja

Svjesni važnosti interdisciplinarne nastave učitelji razredne nastave umrežavaju nastavne sadržaje prirode i društva sa sadržajima drugih školskih predmeta. Međutim, takvu tendenciju pokazuju prilično rijetko, pri čemu je gotovo uvijek riječ o interdisciplinarnom poučavanju prirode i društva i odgojnih nastavnih predmeta (Dobrota i Kuščević, 2002, Kuščević i Mišurac, 2003, Hus i sur., 2008). Pritom se engleski kao strani jezik, koji je prije šest godina uveden kao obavezan školski predmet od prvog razreda osnovne škole, još uvijek u nastavnoj praksi realizira potpuno odvojeno od ostalih predmeta. To iznenađuje ako se u obzir uzme činjenica da engleski jezik, kao školski predmet čiji nastavni, ali i jezični sadržaji u mnogočemu prate aktualne trendove u tekućem procesu globalizacije, pruža iznimno kvalitetnu podlogu za ostvarivanje interdisciplinarnog poučavanja. Ovdje, u prvom redu, mislimo na ulogu engleskoga jezika kao jezika opće komunikacije (*lingua franca*) čija se funkcionalna važnost u današnjem multikulturalnom svijetu ogleda u nastojanjima da se promovira vlastiti nacionalni i kulturni identitet i da se zauzme legitimni položaj u procesu globalizacije (Tsui, 2005). Upravo oni elementi nastavnih sadržaja koji se odnose na prirodnu i kulturnu baštinu učenikova neposrednog okruženja i Hrvatske kao njegove domovine u nastavnom planu i programu prirode i društva zastupljeni su u najvećoj mjeri. Na temelju navedenog cilj ovog rada je istražiti i utvrditi mogućnosti umrežavanja nastavnih sadržaja prirode i društva i engleskog jezika od 1. do 4. razreda osnovne škole i upozoriti na važnost i potrebu umrežavanja tih predmetnih područja već od početka školovanja.

S obzirom na navedeni cilj istraživanja postavljena je hipoteza prema kojoj učitelji razredne nastave i engleskog jezika imaju velik broj nastavnih tema za ostvarivanje interdisciplinarnog umrežavanja nastavnih sadržaja prirode i društva i engleskog jezika od 1. do 4. razreda osnovne škole.

Kako bismo utvrdili mogućnost interdisciplinarnog poučavanja prirode i društva i engleskog jezika od 1. do 4. razreda osnovne škole, analizirali smo nastavne programe oba predmeta, obrazovna postignuća i ključne pojmove navedene u njima (MZOŠ, 2006). Nastavni program prirode i društva analizirali smo i s aspekta onih nastavnih sadržaja koji bi mogli činiti 10% izbornih nastavnih tema engleskog jezika u 3. i 4. razredu osnovne škole.

Rezultati i interpretacija

Usporedbom nastavnih programa, obrazovnih postignuća i ključnih riječi prirode i društva i engleskog jezika u 1. razredu utvrđena je mogućnost organiziranja interdisciplinarnog poučavanja tijekom obrade sedam nastavnih tema (Tablica 1). Na početku 1. razreda u nastavi prirode i društva/engleskog jezika obrađuje se nekoliko sličnih tema: *Ja sam učenik/Susreti i pozdravi*, *Život i rad u školi/Razredni jezik* i *Moja učionica* kojima je cilj uvesti učenike u rad škole, njihova prava i obveze, pravila pristojnog ponašanja te važnost međusobnog poštivanja i toleriranja. Kako se realiziraju na samom početku nastavne godine, kada se učenici međusobno upoznaju, privikavaju na školske obveze i uvode u nastavne sadržaje, učitelji razredne nastave i engleskog jezika trebali bi sadržaje samostalno obrađivati jednostavnim interdisciplinarnim pristupom po *modelu povezivanja*, a po završetku obrade zajedno ponavljati i utvrđivati obrađeno. Na taj način učenici bi se postupno uvodili u interdisciplinarni pristup, a učitelji u zajedničku suradnju, planiranje, pripremanje i kasnije zajedničko realiziranje složenijih modela interdisciplinarne nastave.

Tablica 1.

Nastavna tema prirode i društva *Članovi obitelji* i nastavna tema engleskog jezika *Ja i moja obitelj* temelje se na usvajanju naziva i imenovanju članova uže obitelji, opisivanju njihovih osobina i izricanju osjećaja na hrvatskom i engleskom jeziku. Učitelji engleskog jezika obradu nastavne teme *Ja i moja obitelj* temelje na predznanjima iz svakodnevnog života i na znanjima stečenim tijekom obrade nastavnih sadržaja prirode i društva. S ciljem cjelovitog spoznavanja moguće je interdisciplinarno poučavati temu *Obitelj* po *modelu zajedništva* tako da učitelji odvojeno utvrde predznanja i obrade temeljne pojmove, a potom zajedno utvrde sličnosti i različitosti u nazivima članova obitelji na hrvatskom i engleskom jeziku. Upravo tim oblikom složenijeg interdisciplinarnog pristupa učitelji razredne nastave i engleskog jezika postaviti će temelje za daljnu suradnju i planiranje umrežavanja drugih nastavnih sadržaja, a učenicima omogućiti razumijevanje i sagledavanje nastavnih sadržaja s različitih aspekata.

Nastavna tema *Blagdani* u 1. razredu uključuje dvije istoimene nastavne jedinice prirode i društva i engleskog jezika, *Božić* i *Uskrs*, koje se mogu interdisciplinarno povezati. I kod tih nastavnih jedinica moguće je primijeniti interdisciplinarni *model zajedništva* tako da se odvojeno započne obrada običaja obilježavanja i čestitanja blagdana Božića i Uskrsa hrvatskog naroda, odnosno naroda zemalja engleskoga govornog područja, a potom zajedno ponavlja, uspoređuje i utvrđuju sličnosti i različitosti.

U nastavnom programu prirode i društva i engleskog jezika 1. razreda postoje nastavne teme koje se djelomično preklapaju, a koje bi učitelji mogli planirati i realizirati u sklopu interdisciplinarne nastave. Dobar primjer pružaju nastavne teme prirode i društva *Zdravlje* i nastavna tema engleskog jezika *Doručak*. U nastavi prirode i društva učenici trebaju, uz razumijevanje potrebe preventivnog cijepljenja i

eventualnog liječenja, uočiti i razumjeti važnost redovite i zdrave prehrane u očuvanju zdravlja, što se može umrežiti po *modelu zajedništva* s nastavnom temom engleskog jezika *Doručak*. Kao što je razvidno iz tablice 1., kao ključne riječi u vezi s navedenom nastavnom temom, učenicima se nude engleske riječi za mlijeko, kruh i maslac, namirnice vitalno važne za zdravu prehranu svakog djeteta. No to nikako ne znači da učitelji engleskoga jezika nisu pozvani proširiti tematski vokabular i na riječi koje učenici usvajaju kao relevantne za tu temu i u okviru nastave prirode i društva.

Drugi primjer, naizgled nespojivih nastavnih sadržaja, jest tema prirode i društva *Priroda se mijenja – jesenske promjene* i engleskog jezika *Boje*. Iako bi u engleskom jeziku trebalo imenovati boje različitih predmeta, učitelj može samostalno, po *modelu povezivanja*, primijeniti jednostavan princip interdisciplinarnog umrežavanja. Umjesto navođenja boja uporabnih predmeta moguće je opisivati jesenske promjene u prirodi i imenovati boje jesenskih plodova.

Tablica 2.

U drugom razredu moguće je ostvariti interdisciplinarnu vezu između šest nastavnih tema prirode i društva i engleskog jezika (Tablica 2). Nastavna tema *Pozdravi i oslovljavanje* u engleskom jeziku temelji se na obradi međusobnog oslovljavanja, predstavljanja i pozdravljanja, što je temelj nastavne teme prirode i društva *Ponašanje u školi i odnosi među učenicima*. Obradu te nastavne teme moguće je započeti interdisciplinarnim *modelom zajedništva*, a nakon završetka učitelji razredne nastave mogu obrađeno dopuniti i proširiti sadržajima vezanim uz pristojno ponašanje u školi i izvan nje, mirno rješavanje sukoba, međusobno pomaganje i poštovanje te upoznavanje dječjih prava i obveza.

Cilj nastavne teme engleskog jezika *Moje tijelo* u 2. razredu je znati imenovati i opisati glavne dijelove tijela na engleskom jeziku. K tome, učenici usvajaju engleske vokabularne jedinice vezane uz opisivanje radnji koje izvodimo određenim dijelovima tijela. Nastavne sadržaje nastavne teme prirode i društva *Dijete* moguće je interdisciplinarno umrežiti s nastavnom temom engleskog jezika *Moje tijelo* po *modelu zajedništva* i time utvrditi sličnosti i razlike među spolovima, produbiti prihvaćanje različitosti te razvijati osjetljivost prema invalidnim osobama.

U sklopu nastavne teme prirode i društva *Zdravlje* obrađuju se osnovne higijenske navike, važnost bavljenja sportom i provođenja slobodnog vremena u prirodi i na čistom zraku, kao i važnost pravilnog odijevanja i obuvanja u skladu s vremenskim prilikama. Upravo nastavni sadržaji vezani uz pravilno odijevanje i obuvanje mogu se umrežiti po *modelu zajedništva* s nastavnom temom engleskog jezika *Odjeća*, kojoj je cilj usvajanje engleskih riječi vezanih uz vrste odjeće.

Nazivi glavnih dnevnih obroka, najčešćih jela i pića koje učenici trebaju usvojiti tijekom obrade nastavne teme engleskog jezika *Glavni obroci* mogu se umrežiti sa sadržajima nastavne teme prirode i društva *Prehrana*. Osim utvrđivanja sličnosti i razlika u nazivima i običajima prehrane hrvatskoga naroda i naroda engleskoga

govornog područja, interdisciplinarnim pristupom po *modelu zajedništva* navedeno je moguće povezati s obrađenim nastavnim sadržajima teme *Zdravlje* i tako još jednom utvrditi važnost raznolike i redovite prehrane za zdravlje čovjeka.

Sadržaji nastavne teme *Obitelj* mogu se vertikalno umrežavati s istoimenim nastavnim temama 1. razreda obaju nastavnih predmeta. Ako su učitelji u prvom razredu nastavnu temu *Obitelj* obradili interdisciplinarnim *modelom zajedništva*, onda je u drugom razredu mogu planirati i realizirati primjenom složenijega interdisciplinarnog pristupa po *modelu partnerstva*. Tako će učenici usvojiti nazive i predstavljanje članova šire obitelji na hrvatskom i engleskom jeziku, a zatim utvrditi i razumjeti različitosti u imenovanju pojedinih članova obitelji (npr. u hrvatskom se jeziku razlikuju *ujak*, *stric* i *tetak*, dok se u engleskom jeziku upotrebljava samo *uncle*).

Kao polazište za poučavanje nastavne teme *Blagdani* u 2. razredu moguće je koristiti vertikalno umrežavanje s istoimenim sadržajima prvog razreda. Nakon ponavljanja i utvrđivanja temeljnih pojmova učitelji razredne nastave i engleskog jezika mogu primijeniti *model partnerstva*. Tako će učenici moći usporediti običaje, načine proslavljanja, čestitanja i pjevanja pjesama karakterističnih za pojedine blagdane u Hrvatskoj i zemljama anglosaksonskog kulturološkog indentiteta. Navedeno može poslužiti kao poticaj za dodatno zajedničko interdisciplinarno projektno istraživanje obilježavanja svjetskih blagdana i praznika (npr. Valentinovo, Halloween), što za cilj ima, između ostalog, i razvijanje svijesti o interkulturalizmu kao jednom od aktualnih edukativnih trendova.

U 3. razredu nastavni sadržaji prirode i društva temelje se na upoznavanju zavičaja pa je s engleskim jezikom moguće interdisciplinarno povezati tri nastavne teme (Tablica 3). Budući da su u nastavi prirode i društva učenici od 1. razreda uočavali, pratili, uspoređivali i razlikovali vremenske pojave pojedinih godišnjih doba, učitelji razredne nastave mogu nakon vertikalnog unutarpredmetnog umrežavanja obraditi temu *Podneblje, vremenska obilježja zavičajne regije* i utvrditi međusobnu ovisnost podneblja i životnih zajednica u zavičajnom području. Paralelno, učitelji engleskog jezika mogu obrađivati nastavne sadržaje teme *Vrijeme vezane uz kronološko izricanje vemena (sati, dani u tjednu, mjeseci, godišnja doba)* koristeći vertikalno umrežavanje po *modelu povezivanja* s nastavnim sadržajima prirode i društva od 1. do 3. razreda. Nakon toga, zajedno mogu po *modelu zajedništva* interdisciplinarno umrežiti nastavne sadržaje o vremenskim karakteristikama zavičaja. Navedeno može biti poticaj za dodatno tematsko uspoređivanje godišnjih doba u našoj domovini i u jednoj od zemalja engleskoga govornog područja i može poslužiti kao podloga za umrežavanje nastavnih sadržaja matematike i likovne kulture.

Tablica 3.

U nastavnoj temi 3. razreda prirode i društva *Gospodarstvene djelatnosti zavičajne regije* obrađuju se najzastupljenije gospodarske grane u određenoj regiji naše domovine. Kako se u svakoj od njih dio stanovnika bavi karakterističnom granom

stočarstva, moguće je upravo te nastavne sadržaje povezati sa sadržajima nastavne teme engleskog jezika *Domaće i divlje životinje*. Navedeni sadržaji omogućit će usvajanje naziva životinja na hrvatskom i engleskom jeziku (npr. magarac – donkey, krava – cow, ovca – sheep), a ujedno mogu biti temelj za upoznavanje određenih regionalizama i dijalektalnih naziva autohtonih vrsta zavičaja (npr. neki od pučkih naziva za magarca su: magare, tovar, kenjac, osao ili oslo).

Pravilan raspored dnevnih aktivnosti, pravilna izmjena rada i odmora, kao i važnost aktivnog provođenja slobodnog vremena za zdravlje svakog pojedinca, nastavni su sadržaji teme engleskog jezika *Slobodno vrijeme i sport* koji se mogu vertikalno umrežiti sa srodnim sadržajima 2. razreda te intersicijularno povezati po *modelu zajedništva* s nastavnom temom prirode i društva *Zdravlje*.

U nastavnom programu četvrtog razreda (Tablica 4.) mogu se interdisciplinarno umrežiti tri nastavne teme prirode i društva s pet tema engleskog jezika: *Moje tijelo/ Moje tijelo i čuvanje zdravlja, Dnevni obroci i Slobodno vrijeme, Život životinja/Životinje, Gradska središta/U gradu*.

Tablica 4.

Budući da se u nastavnom predmetu prirode i društva od 1. do 4. razreda u različitim nastavnim temama obrađuje građa i funkcija pojedinih dijelova tijela, pravilna prehrana i pravilna izmjena aktivnosti tijekom dana, nastavne teme *Moje tijelo i čuvanje zdravlja, Slobodno vrijeme i Dnevni obroci* mogu se obraditi vertikalnim umrežavanjem s nastavnim sadržajima prirode i društva. Interdisciplinarno umrežavanje po *modelu zajedništva* učitelji razredne nastave i engleskog jezika mogu ostvariti i tijekom obrade nastavne teme prirode i društva *Moje tijelo*, čime omogućuju, osim usvajanja spoznaja o tjelesnim promjenama u pubertetu, potrebama pravilne prehrane, njege tijela i provođenja tjelesnih aktivnosti za zdrav razvoj svakog pojedinca i razumijevanje štetnosti ovisnosti.

Dio nastavnog programa prirode i društva 4. razreda ima za cilj upoznavanje domovine, prepoznavanje i imenovanje naselja, opisivanje i navođenje najvažnijih obilježja pojedinih gradova. Navedeno je moguće dopuniti primjenom interdisciplinarne nastave po *modelu zajedništva* u okviru koje će učenici na hrvatskom i engleskom jeziku opisivati svoje mjesto te uspoređivati gradove i sela. Osim toga, to može biti poticaj za uključenje u interdisciplinarno tematsko istraživanje o sličnostima i razlikama naselja u Hrvatskoj i jednoj od zemalja engleskoga govornog područja po odabiru učenika.

U nastavnom programu engleskog jezika u 3. i 4. razredu učitelji, u okviru 10% nastavnih sati tijekom godine, obrađuju izborne sadržaje prema interesima učenika. Učenicima se može ponuditi odabir tema o prirodnim, kulturnim i gospodarskim obilježjima zavičaja ili o prirodi i uvjetima života koji se obrađuju u nastavnom predmetu priroda i društvo (Tablica 5). Izborne nastavne teme engleskog jezika o vlastitoj zemlji, njezinim prirodnim ljepotama i kulturnim vrednotama ili o uvjetima života omogućile bi osposobljavanje učenika za prezentiranje navedenih sadržaja na

engleskom jeziku. Upravo odabir izbornih tema koje bi se temeljile na sadržajima prirode i društva 3. razreda *Izgled zavičaja*, *Moja županija* i *Promet* i 4. razreda *Simboli domovine* omogućio bi, osim umrežavanja nastavnih sadržaja s engleskim jezikom, razvoj učenikova vlastitog nacionalnog i kulturnog identiteta, kao i bolje razumijevanje multikulturalnog društva današnjice. Slično tomu, izborne teme o prirodi i uvjetima života omogućile bi, uz ponavljanje i umrežavanje sadržaja, dodatno razumijevanje prirodnih vrijednosti i uloge svakog pojedinca u očuvanju prirodne ravnoteže i razvijanje ekoloških odgojnih vrijednosti u oba nastavna predmeta.

Tablica 5.

Zaključak

Zbog specifičnosti predmeta priroda i društvo koji ujedinjuje sadržaje prirodnih i društvenih znanosti, učitelji razredne nastave često smišljaju nastavne scenarije za vertikalno i horizontalno unutarpredmetno umrežavanje nastavnih sadržaja. Međutim, rijetko ili nepotpuno ostvaruju interdisciplinarno umrežavanje s drugim predmetima. Ako ga i ostvaruju, to je najčešće sa sadržajima nastavnog predmeta hrvatski jezik, likovna i glazbena kultura. U nastavnoj su praksi rijetki slučajevi interdisciplinarnog umrežavanja engleskog jezika s nastavnim sadržajima prirode i društva. Smatramo da razlog za to, u prvom redu, leži u neupućenosti učitelja u sadržajne mogućnosti umrežavanja, što je pak posljedica izostanka sustavno osmišljenih metodičko-didaktičkih smjernica vezanih uz realizaciju navedene interdisciplinarnih paralele, bilo u udžbenicima bilo u priručnicima za učitelje. K tomu, u aktualnim udžbenicima engleskog jezika za ranu školsku dob u potpunosti su zanemarene leksičke jedinice koje se odnose na elemente hrvatske kulturne i prirodne baštine koji predstavljaju znatan dio nastavnog sadržaja prirode i društva. Daljnji razlog nezastupljenosti interdisciplinarnih paralele između prirode i društva i engleskoga jezika vidimo i u mogućoj nesuradnji između učitelja razredne nastave i učitelja engleskog jezika (u slučajevima kada učitelj razredne nastave ne predaje engleski jezik). Navedeno je, vjerujemo, posljedica neosviještenosti učitelja na planu potreba, mogućnosti i prednosti ostvarivanja interdisciplinarnog poučavanja nastavnih sadržaja prirode i društva i engleskoga jezika.

Kako smo prikazali u ovome radu, aktualni nastavni sadržaji predmeta priroda i društvo i engleski jezik od 1. do 4. razreda omogućuju učiteljima obradu većeg broja nastavnih tema interdisciplinarnim pristupom. Prednosti interdisciplinarnog pristupa poučavanju ovdje razmatranih nastavnih sadržaja su višestruke. Neovisno koji se model primjenjuje, interdisciplinarni pristup obradi nastavnih sadržaja prirode i društva i engleskog jezika smanjuje osjećaj rascjepkanosti nastavnih sadržaja, učenicima omogućuje cjelovito, aktivno i kreativno usvajanje znanja, razvija svijest o nužnosti sagledavanja određene teme/problema s različitih aspekata. Umrežavanjem nastavnih sadržaja prirode i društva i engleskog jezika moguće je utvrđivanje sličnosti i razlika u kulturi hrvatskog naroda i naroda engleskoga jezičnog područja,

razvoj vlastitoga nacionalnog i kulturnog identiteta, a time i bolje razumijevanje multikulturalnog društva današnjice. Interdisciplinarno poučavanje otvara prostor za višekratno uvježbavanje i utvrđivanje novostečenih znanja i vještina u okviru dvaju školskih predmeta. S aspekta učenja engleskoga kao stranoga jezika tim se pristupom omogućuje učenicima redovita uporaba engleskog jezika u predmetnoj stvarnosti koja ih okružuje. Pritom je važno uočiti da ponavljanje i uvježbavanje engleskih riječi u izvanučioničkom okruženju konsolidira nova vokabularna znanja. Osim toga, interdisciplinarnim se pristupom učenicima omogućuje da upotrebljavaju engleski jezik u govorenju o sebi, svom lokalnom okruženju, svojoj domovini te njezinu kulturnom i prirodnom nasljeđu, što, dugoročno gledano, predstavlja korak dalje u promoviranju i očuvanju navedenih vrijednosti u procesu globalizacije. Na kraju, posebno važnim smatramo odabir izbornih tema engleskog jezika o prirodi i uvjetima života jer omogućuje razumijevanje uloge svakog pojedinca u zadovoljavanju vlastitih potreba, a da pritom ne narušava život budućih generacija, što je temelj odgoja i obrazovanja za održivi razvoj.